

WCCM ECCOMAS 2026 Technical Programme

Last updated: 2026-10-14 07:13

Sunday, 19/07/2026

Sun, 19/07/2026 08:30 - 09:30
Short Course Registration

ICM - FOYER Ground floor

Sun, 19/07/2026 09:00 - 17:30
IACM Short Course
Machine Learning for Solid Mechanics
Main Organizer: Dr. Nikolaos Napoleon Vlassis (Rutgers University)

ICM - 11a

Sun, 19/07/2026 16:00 - 18:00
NGCE - City Quest
Reservation is required

Sun, 19/07/2026 16:30 - 20:00
Registration
Congress Registration - ICM FOYER Ground floor

ICM - FOYER Ground floor

Sun, 19/07/2026 18:00 - 20:00
Welcome Reception

ICM - FOYER Ground floor

Monday, 20/07/2026

Mon, 20/07/2026 08:00 - 18:00

ICM - FOYER Ground floor

Registration

Congress Registration - ICM FOYER Ground floor

Mon, 20/07/2026 09:00 - 10:15

ICM - 14 Plenary Room

OP01 - Welcome Address and Award Ceremony

Mon, 20/07/2026 10:15 - 11:00

ICM - 14 Plenary Room

PL00A - Opening Lecture

Chaired by: Prof. Wolfgang A. Wall (Technical University of Munich)

Trust in Science
*P. Strohschneider

Mon, 20/07/2026 11:00 - 11:30

Coffee Break

Mon, 20/07/2026 11:30 - 13:00

ICM - 1 Auditorium

MS120A - Recent Advances in Computational Methods for the Cardiovascular System I

Main Organizer: Dr. Richard Schussnig (Ruhr University Bochum)

Chaired by: Dr. Richard Schussnig (Ruhr University Bochum), Ms. Anna Ranno (RWTH Aachen University)

Cardiovascular Fluid-Solid-Growth Interaction Keynote
*M. Pfaller, M. Latorre, E. Schwarz, F. Gerosa, J. Szafron, J. Humphrey, A. Marsden
A parametric study of fluid-structure interaction phenomena on bioprosthetic aortic valves
*D. Ribereau, I. Cheylan, J. Favier, L. Macé
Strain-Based Finite-Time Lyapunov Exponents for Calcification Risk Classification in Bioprosthetic and Elastomeric Aortic Valves
*P. Corso, F. Coulter
A fully-coupled personalized fluid-structure interaction framework for post-TAVI hemodynamics
*C. Catalano, A. Zerillo, D. Ozturk, M. Bastron, S. Pasta
Patient-Specific Fluid-Structure Interaction Simulations of a Quadricuspid Neonatal Valve Before and After Truncus Arteriosus Repair
*K. Bornemann, P. Choi, J. Huber, A. Reed, A. Sharir, S. Maskatia, A. Marsden, M. Ma, A. Kaiser

Mon, 20/07/2026 11:30 - 13:00

ICM – 2

MS208A - Innovative Methods for Fluid-Structure Interaction I

Main Organizer: Prof. Harald van Brummelen (Eindhoven University of Technology)

Chaired by: Prof. Harald van Brummelen (Eindhoven University of Technology), Prof. Joris Degroote (Ghent University)

Fitted and Unfitted Finite Element Discretisations for Fully Eulerian Fluid-Structure-Contact Interactions Keynote
*S. Frei, T. Knoke, T. Wick
Fluid–Structure Interaction Benchmark Using an Arbitrary Lagrangian–Eulerian Approach and Adaptive Re-Meshing
J. Fara, S. Schwarzacher, *K. T?ma
Numerical Modeling and Simulations of Fully Eulerian Fluid-Structure Interaction using a Ghost-Penalty Cut Finite Element Approach
S. Frei, T. Knoke, M. Steinbach, A. Wenske, *T. Wick
Numerical simulation of fluid–structure–contact interactions: a comparative study
D. Corti, *M. Fernández
A Fluid-Structure-Contact Interaction Framework for Skin-Pass Rolling
*M. Billen, N. Hosters

MS191A - Explainable AI for the Discovery and Control of Complex Systems in Engineering and Applied Sciences I**Main Organizer:** Dr. Gianmarco Mengaldo (National University of Singapore)**Chaired by:** Ms. Jiawen WEI (National University of Singapore), Mr. Leonardo Pesce (National University of Singapore)

Explainable Operator Learning: Differentiable Autoencoders and Integral Decompositions

***A. Arzani**, S. Viknesh, M. Alishiri

Leveraging Explainable AI to Guide Experimental Design for Cryogenic Etching Mechanisms

***P. Seo**, Y. Sunwoo, T. Kim, J. Yoo, H. Jeong, B. Kim

Interpretable Scientific Machine Learning for Contrail Mitigation to Advance Aviation Sustainability

***M. Lal**, U. Fasel, S. Eastham

Data-Driven Detection of Nonlinear Mode Interactions Using Post-Hoc Interpretable Deep Learning

***B. Abusalameh**, G. Mengaldo

Improving MEMS-Based Impact Localization in CFRP Composites through Explainable AI

***E. von Cramon-Taubadel**, M. Becker, P. Weißgraeber

Improving turbulence control through explainable deep reinforcement learning

R. Vinuesa, ***F. Tonti****MS024A - Advanced Discretization Schemes for Computational Structural Dynamics I****Main Organizer:** Prof. Bastian Oesterle (Hamburg University of Technology)**Chaired by:** Prof. Bastian Oesterle (Hamburg University of Technology), Prof. Alexander Düster (Hamburg University of Technology)

Critical Time Step Analysis for Trimmed B-Splines, LR-Splines, and THB-Splines in Explicit Dynamics

***C. Hollweck**, L. Leidinger, S. Hartmann, M. Wagner, R. Wüchner

Immersed IGA and Mass Lumping for Explicit Dynamics of Structural Elements

***A. Pagnas**, L. Radtke, M. Torre, T. Hughes, A. Düster, G. Sangalli, A. Reali

Matrix-free immersed spectral elements

***P. Kopp**, T. Büchner, L. Radtke, S. Kollmannsberger

Data-Based Time Step Estimation in Explicit Dynamics: Efficient, Accurate, and Conservative Estimators

***M. Schilling**, L. Reinken, M. Bischoff

Data-Based Time Step Estimation in Explicit Dynamics: On the Choice of Shape Parametrization

L. Reinken**, M. Schilling, M. Bischoff**MS071A - Recent advances in numerical methods for hyperbolic systems in fluid dynamics I*Main Organizer:** Phd. Irene Gómez Bueno (University of Málaga)**Chaired by:** Mr. Ernesto Pimentel-García (University of Málaga), Phd. Irene Gómez Bueno (University of Málaga)Modeling and Simulation of Dry Avalanches in Shallow Framework **Keynote*****T. Morales de Luna**

Well-balanced methods for two dimensional linear and non-linear shallow water equations with Coriolis forces

M. Castro-Díaz, J. García-Rodríguez, ***V. González-Tabernero**, M. Ricchiuto

Design of High-Order Discontinuous Galerkin Schemes Based on SIAC Reconstruction for Fluid Mechanics Applications

***L. Tezkratt**, J. Chapelier, E. Lamballais

The Structural Method for Partial Differential Equations

***V. Bertrand**, R. Côte, E. Franck, V. Michel-Dansac

Dynamics and Thermal Transport of CFRPs Enabled by Hybrid Metallic–Ceramic Interfacial Design

M. Sharif**, P. Wang, K. Jibrel, S. Xu**MS009A - Complex Fluid Flows in Engineering: Modeling, Simulation, and Optimization I*Main Organizer:** Dr. Fabian Key (TU Wien)**Chaired by:** Dr. Fabian Key (TU Wien), Prof. Stefanie Elgeti (TU Wien)Efficient Geometry Representation Strategies for the Shape Optimization of Profile Extrusion Dies **Keynote*****J. Sasse**, M. Esser, M. Mügge, S. Turek

Geometry Optimization of Static Mixers Using a Simulation-Based Design Framework

***H. Knobloch**, S. Holtzhausen, U. Scheithauer, H. Wiemer

Multi-scale Isogeometric Design Optimization of Static Mixers

***M. Riegler**, S. Elgeti

Digital modelling tools for designing and optimizing MILD biomass combustion

***W. Adamczyk**, A. Ryfa, A. Klimanek, P. G?adysz, T. Krysi?ski, K. B??dzi?ski

Geometrical Optimisation of an Orifice Plate in a Turbulent Pipe Flow

***D. Palmer**, D. Ahmed, A. Yudianto, A. Revell, M. Nabawy

MS039A - Recent Developments and Applications of Meshfree Methods I**Main Organizer:** Prof. Tsung-Hui (Alex) Huang (National Taiwan University)**Chaired by:** Prof. Kuan-Chung Lin (National Cheng Kung University), Prof. Tsung-Hui (Alex) Huang (National Taiwan University)Stability Enhancement and Time-Step Limit Relaxation in the Material Point Method Keynote***W. Yang**, D. Sulsky

A Semi-Lagrangian Meshfree Galerkin Method for incompressible Navier-Stokes Equations

***Y. Liu**, X. Wang

A Underwater Acoustics Induced by Structural Vibration Using Meshfree Based Methods

***T. Chang**, P. Guan, C. Sun, O. Kwok

Numerical Simulation of Water Droplet Impact on a Flat Plate via The Material Point Method

***Y. Su**, P. Huang, K. Huang

A Stabilized RK-MPM for Air Flow and Air-Structure Interaction Modeling with Vortex and Shocks

T. Huang**, S. Peddavarapu**MS183A - Cut-cell/Embedded Boundary Methods for Fluid and Solid Mechanics I*Main Organizer:** Prof. Panos Papadopoulos (University of California, Berkeley)**Chaired by:** Mr. Wim van Rees (Massachusetts Institute of Technology), Prof. Panos Papadopoulos (University of California, Berkeley)

Optimal Local Truncation Error Method for Solution of PDEs on Irregular Domains and Interfaces with Optimal Accuracy and Unfitted Cartesian Meshes. Comparison with Finite Elements.

***A. Idesman**

Immersed boundary method for high Reynolds number turbulent flows and fluid-structure interactions

***S. Cai**

Cut Mesh Finite Volume and Discontinuous Galerkin Methods for Wetting and Drying

***C. Taylor**

Stable high-order cut-cell boundary treatment for finite-difference schemes

***N. Sharan**, M. Natarajan

AMHOEBA: Adaptive Mesh Higher-Order Embedded Boundary Algorithms

***H. Johansen**, R. Chowdhury, N. Overton-Katz

High-Fidelity Simulation Capabilities of Finite Volume Method with Walsh basis Function Verification via Supersonic Cavity Flow

Y. Gan**, G. Wang, J. Ren**MS050A - Computational and Experimental Approches for Slender Concrete Structures I*Main Organizer:** Prof. Sven Klinkel (Sven Klinkel, Professor, RWTH Aachen University)**Chaired by:** Prof. Sven Klinkel (Sven Klinkel, Professor, RWTH Aachen University), Prof. Rostislav Chudoba (RWTH Aachen University)

A lattice approach for the failure process of reinforced cementitious shells

***P. Grassl**

A finite strain formulation for the modeling of fresh concrete during hydration

***D. Zhao**, J. Storm, M. Kaliske

Upscaling of Textile-Reinforced Concrete Shells Using Computational Homogenization and Effective Sectional Constitutive Modeling

G. Edefors, ***F. Larsson**, K. Lundgren

A Shell-in-Shell Homogenization Framework for the Analysis and Optimization of Periodic Plate Structures

***M. Herrmann**, M. Weiß, S. Klarmann, A. Niemeyer, S. Klinkel

Generative MOR-Based Design of Modular Carbon-Reinforced Concrete Structures

***D. Macek**, F. Döpke, T. Brepols, H. Holthusen

Modeling Thin Folded Carbon-Reinforced Concrete Shells: Effects of Reinforcement Ratio on Load Capacity and Failure Mode

C. Gomes, E. Dilkin, M. Classen, A. Scholzen, ***R. Chudoba**

Mon, 20/07/2026 11:30 - 13:00

ICM - 12b

MS226A - Mechanical metamaterials, metasurfaces and soft robotics: advances in computational mechanics of architected materials I

Main Organizer: Prof. Susmita Naskar (University of Southampton)

Chaired by: Prof. Susmita Naskar (University of Southampton), Prof. Tanmoy Mukhopadhyay (University of Southampton)

Computational Mechanics of Kirigami-Inspired Piezoelectric Metastructures for Broadband Multiaxial Vibration Energy Harvesting

***Y. Zhang**, S. Naskar, T. Mukhopadhyay

A simplified method for quantifying randomness in real-world porous structures

***S. Mondal**, T. Mukhopadhyay, S. Naskar

From Folds to Functions: Programmable origami Curvatures enable Shape reconfigurable metasurfaces for antenna design

***A. Sharma**, S. Naskar, T. Mukhopadhyay

Strain-Rate Dependent Mechanics of Metallic Kirigami

A. Singh, A. Sinha, T. Dunnett, T. Mukhopadhyay, ***M. Walker**

Tunable Elastic Metamaterials for Magnetically Controlled Vibration Mitigation

***A. Tiwari**

Investigation of deformation and strength of amorphous polymer materials using coarse-grained molecular dynamics

***Y. Umeno**, T. Leelaprachakul

Mon, 20/07/2026 11:30 - 13:00

ICM - 13a

MS372A - Phase-field fracture modeling and computation I

Main Organizer: Prof. Laura De Lorenzis (ETH Zurich)

Chaired by: Prof. Blaise Bourdin (McMaster University), Prof. Laura De Lorenzis (ETH Zurich)

Orientation-Dependent Degradation for Anisotropic Phase-Field Fracture

***G. Villalta**, A. Ferrer, F. Otero

Anisotropic phase-field modeling of multiscale fracture processes in heterogeneous fiber-reinforced polymer components

***F. Welschinger**, A. Fajardo Lacave, F. Vicentini, L. De Lorenzis

A consistent basis-independent formulation of spectral split for brittle fracture modeling with an extension for transversely isotropic materials.

***D. Nardi**, A. Ferreira, E. Leonel

Simulation of crack initiation in a heterogeneous domain

***R. Medda**, R. Müller

Towards the effective crack resistance of real microstructures: phase-field numerical experiments based on micro-CT data from AlSi10Mg foams and EBSD data from a hybrid WAAM 17-4PH/316L steel

***A. Schlüter**, M. Hoffmann, B. Blinn, J. Mevert, F. Schäfke, C. Klose, H. Maier, S. Harbusch, T. Beck, A. Triebe, E. Kerscher, R. Müller

Mon, 20/07/2026 11:30 - 13:00

ICM - 13b

MS011A - Advances in Neural Network Approximations of Partial Differential Equations I

Main Organizer: Dr. David Pardo Zubiaur (University of the Basque Country (UPV/EHU))

Chaired by: Mr. Ivan Bioli (University of Pavia), Mr. Ahmad AliAhmad (Brown University)

Deep Dual-Fenchel Methods for Residual Minimization in Scientific Machine Learning

Keynote

***J. Evans**

Neural Network-Based Approximations of Polygonal Basis Functions

S. Berrone, M. Pintore, ***G. Teora**

Energy Minimisation Using Overlapping Tensor-Product Free-Knot B-Splines

***A. Magueresse**, S. Badia

Robust First-Order System Least Squares with Adaptive Neural Network Bases for Transmission Problems

***A. Duque-Salazar**, P. Sepúlveda, C. Uriarte, J. Taylor, D. Pardo

Deep Learning Approach for the Discrete Fracture Networks Method

***N. Zamorano**

Mon, 20/07/2026 11:30 - 13:00

ICM - B11

MS014A - Advanced computational techniques for fracture I

Main Organizer: Prof. Sonia Marfia (Sonia Marfia, Full Professor, University of Roma Tre)

Chaired by: Prof. Laura De Lorenzis (ETH Zurich), Prof. Stefan Löhnert (TUD Dresden University of Technology)

Microstructure-based machine learning for anisotropic bulk and interfacial damage Keynote

*J. Yvonnet, Z. Chafia, Q. He, Y. Rev

Elastic fields of surface steps and notches and associated cracks

*B. Wang

Computational Modeling of Fracture Processes in Residual Stress Fields

*S. Hirobe, K. Oguni

Newly Implemented Solution Methodologies and Modeling Options in Simulation of Fatigue Crack Growth

*M. SARIBAY

On the Application of Edge Detection Algorithms to Displacement Fields to Localize the Crack Tip

*J. Diaz

Mon, 20/07/2026 11:30 - 13:00

ICM - B12

MS174A - Dynamic Coupled Phenomena in Industrial Applications: Efficient Numerical Strategies and Optimization Techniques I

Main Organizer: Dr. Luc Laurent (Conservatoire national des arts et métiers)

Chaired by: Prof. Thomas-Peter Fries (Graz University of Technology), Prof. Antoine Legay (Conservatoire National des Arts et Métiers)

Multi-Fidelity Surrogate-Based Optimization for Compressor Blade Design with Blade/Casing Contact Robustness Assessment

F. Nyssen, R. Nigro, L. Baert, *T. Benamara, J. de Cazenove, C. Cracco

Response Spectrum Optimisation for Lightweight Structures Under Impact

*P. Kühner, M. Habera, A. Zilian

FEM/VTCR hybrid method for vibro-acoustic metamaterials

*R. Thevenot, G. Puel, A. Barbarulo, P. Dec

An extended finite element method for sloshing problems involving immersed structures at arbitrary positions

*H. Bouvet, L. Laurent, A. Legay, C. Hoareau

Optimal Design of Baffle in Liquid-Filled Tank Subjected to Sloshing using XFEM and Bayesian Optimization

*L. Laurent, A. Legay

Regulation of Load Distribution in CHP Boiler Hanger Rods: A Coupled-System Optimization Approach

*J. Tabin, M. Pr?cik, ?. ?acny, M. Wojtala

Mon, 20/07/2026 11:30 - 13:00

ICM - B13

MS327A - Generative and Probabilistic Modeling on Manifolds for Scientific Discovery I

Main Organizer: Prof. Dimitris Giovanis (Johns Hopkins University)

Chaired by: Mr. George Kevrekidis (Johns Hopkins University), Dr. Vladyslav Fediukov (Technische Universität München)

Multi-fidelity surrogate terramechanical modeling for dynamical simulations

*V. Fediukov

Development of an Injection Molding Production Condition Inference System Based on Diffusion Model

*H. Kim, J. Kim, S. Ryu

Patient-informed generative modeling of cardiac anatomy based on normalizing flows and diffeomorphisms

*K. Kevopoulos, B. Moscoloni, B. Alheit, C. Beeche, J. Chirinos, A. Heinlein, M. Peirlinck

Mon, 20/07/2026 11:30 - 13:00

ICM - B21

MS229A - Machine Learning for the Design of Sustainable and High-Performance Vehicles I

Main Organizer: Dr. Andrea Serani (National Research Council-Institute of Marine Engineering)

Chaired by: Dr. Andrea Serani (National Research Council-Institute of Marine Engineering), Prof. Laura Mainini (Imperial College London)

Evaluation of SotA Deep Learning Architectures for Aerodynamical Predictions

*J. Scherz, P. Bekemeyer

Neural Network Generalization and Data Efficiency for Three-Dimensional Aerodynamic Problems

*D. Squillace, U. Iemma, D. Quagliarella

Evaluation of multi-fidelity methods for aero-structure design optimization

*O. Amoignon, E. Jonsäll

Unlocking Smarter Design: Exploring Multifidelity Frameworks to Accelerate Optimization of Vehicles

*H. Pehlivan Solak, F. Di Fiore, R. Pellegrini, A. Serani, M. Diez, L. Mainini

Development of a Mixture-of-Experts Framework using Multi-fidelity Residual Learning for High-dimensional Aerospace Applications

*D. Kilic, M. Nikbay

Accelerating ML Surrogate-Generation with Adaptive Sampling and GPU-CFD Workflow

*N. Hariharan, J. Abras

Mon, 20/07/2026 11:30 - 13:00

ICM - B22

MS144A - Advances and Challenges in Structural and Soft Material Instabilities I

Main Organizer: Prof. Hamid Zahrouni (Université de Lorraine)

Chaired by: Mr. BENOIT TANG (CNES, FRENCH SPACE AGENCY), Prof. Michael BRUN (Université de Lorraine, Arts et Métiers Paris Tech, CNRS)

Buckling of Thin Structures with Conservative and Non-Conservative Forces Using the Asymptotic Numerical Method

***Y. Guevel**, M. Bogey, C. Combescure, G. Girault, J. Cadou

The Rayleigh-Taylor Instability of Hydrogel under Hypergravity

***K. Li**

3D Topology Optimization of Membrane-Substrate Buckling: From Path Dependence to Path Control

***W. Zhou**, R. Hewson, M. Santer

Multi-time step solvers using mortar coupling for the simulation of non-linear dynamic buckling of thin-shell structures

A. Chau, ***M. Brun**, P. Ventura, H. Zahrouni, M. Potier-Ferry

The study of instabilities in hyperelastic materials using ANM and FEM, first applications to bio mechanical problems.

***P. VENTURA**, M. Potier-Ferry, H. ZAHROUNI, M. BRUN, A. CHAU

Mon, 20/07/2026 11:30 - 13:00

ICM - 21a

MS321A - Geometric and structure-preserving methods for computational modeling I

Main Organizer: Dr. Christopher Eldred (Sandia National Laboratories)

Chaired by: Dr. William Barham (Los Alamos National Laboratory), Dr. Artur Palha (Delft University of Technology)

MRX: A Differentiable 3D MHD Equilibrium Solver without Nested Flux Surfaces

***T. Blickhan**, J. Stratton, A. Kaptanoglu

An energy-preserving discretization of the PNPNS equations

***Y. Zhang**

Towards analytic solutions of time dependent, 2-D Euler equations

***B. Gervang**

A Geometric Mechanics Method for Totally Decoupled Dynamics and Tracking Control of Floating-Base Robots

***W. Xu**, J. Chen, Q. Tian, H. Hu

Data-Driven Emergent Dynamics for Hierarchical Systems via Self-Supervised Learning of Metriplectic Brackets

***H. Nguyen**, N. Trask

Mon, 20/07/2026 11:30 - 13:00

ICM - 21b

MS206A - Mechanics of soft, multifunctional materials: experiments, modelling, and simulation I

Main Organizer: Prof. Mokarram Hossain (Swansea University)

Chaired by: Prof. Mokarram Hossain (Swansea University), Dr. Markus Mehnert (Friedrich-Alexander University Erlangen-Nürnberg)

A multi-field plate theory for the magneto-mechanical behaviors and instabilities of hard-magnetic soft material plates

Keynote

***J. Wang**

Multi-material topology optimization for shape-morphing ultra ?soft magneto?active structures

C. Perez-Garcia, ***J. Martínez-Frutos**, R. Ortigosa, D. Garcia-Gonzalez

Partitioned schemes for multiphysics problems

***C. Kadapa**

Growth-based Shape Control of Hyperelastic Plates Under Body Forces

***Z. Li**

A Finite Element Framework for Geometrically Nonlinear Hyperelastic Piezoelectrics

***J. Seibert**, J. Merghem

Mon, 20/07/2026 11:30 - 13:00

ICM - 22a

MS286A - Scalable Linear Solvers for Real-World Applications: Algorithms and Implementations I

Main Organizer: Phd. Àdel Alsalti-Baldellou (University of Padova)

Chaired by: Dr. Pasqua D'Ambra (CNR-Institute for Applied Computing, Napoli)

Multigrid with Linear Storage Complexity

***D. Bauer**, N. Kohl, S. McCormick, R. Tamstorf

A GPU-Based Matrix-Free Geometric Multigrid Preconditioner for Billion-Scale DOF Simulations in Linear Elasticity

***S. Gavranovic**, L. Failer, D. Hartmann

Geometric Multigrid with Implicit Extrapolation for Elliptic Problems on Curved Domains

S. Dasari, ***C. Kruse**, P. Mycek, U. Ruede

On the use of Block Low-Rank approximation in Algebraic Multigrid Preconditioners

A. Buttari, P. D'Ambra, F. Durastante, ***S. Filippone**

Porting Algebraic Multigrid to GPUs in the Chronos Library

***À. Alsalti-Baldellou**, C. Janna

Mon, 20/07/2026 11:30 - 13:00

ICM - 22b

MS104A - Adaptive Digital Twins and Self-Learning for Predictive Intelligence in Physical Systems I

Main Organizer: Mr. Matteo Torzoni (Politecnico di Milano)

Chaired by: Dr. Marco Tezzele (Emory University), Mr. Matteo Torzoni (Politecnico di Milano)

Structured Reinforcement Learning for Autonomous Life-Cycle Decision-Making in the Built Environment Keynote

*C. Andriotis, P. Bhustali, Z. Metwally

Enabling Near Real-Time Maintenance Optimisation in Fleet Digital Twins via Generative Models

*E. Petriconi, G. Aravanis, M. Giglio, C. Sbarufatti

Efficient modal kernels for structural dynamics

*D. Pitchforth, E. Cross

Perception, Action, and Learning in Mechanical Systems via Free Energy Minimization

*M. Torzoni, D. Maisto, A. Manzoni, F. Donnarumma, G. Pezzulo, A. Corigliano

Mon, 20/07/2026 11:30 - 13:00

ICM - 41 (Ostersee A)

MS232A - Uncertainty Quantification for Engineering Systems with Surrogate Models I

Main Organizer: Mr. Hendrik Geisler (Leibniz University Hannover)

Chaired by: Prof. Philipp Junker (Leibniz University Hannover), Mr. Hendrik Geisler (Leibniz University Hannover)

Adaptive Sparse Grid Surrogates for Safety-Critical Uncertainty Quantification in Engineering Systems

*M. Bittens, J. Thiedau, J. Maßmann

On the uncertainty quantification for viscoelastic structures under finite strain using time-separated stochastic mechanics

*L. Kinat, H. Geisler, P. Junker

Surrogate-Based Uncertainty Quantification for Fluid-Structure Interactions

*B. Shrestha, N. Nanal, L. Zhang

Accelerating Gaussian Process Modeling via Tensor Decomposition for Uncertainty Quantification in Dynamical Systems

*Z. Zhou, A. Tombari, H. Rappel

Gradient-Enhanced Spline Dimensional Decomposition via Energy-Balanced Scaling and L1-Regularized Sparse Reconstruction

*E. Heo, D. Lee

Reduced Basis Methods for Domain Uncertainty Quantification of Periodic Gratings

*R. Aylwin Pincheira, J. Pinto Denegri, G. Silva Oelker

Mon, 20/07/2026 11:30 - 13:00

ICM - 42 (Ostersee B+C)

MS353A - Emerging Topology and Shape Optimization Techniques in Computational Design of Materials and Structures I

Main Organizer: Prof. Ahmad Najafi (Drexel University)

Chaired by: Prof. Ahmad Najafi (Drexel University), Mr. Jonathan Gorman (Drexel University)

Stress- and Fatigue-constrained Topology Optimization of Structures made of Triply Periodic Minimal Surface (TPMS) Lattices Keynote

S. Nguyen-Van, K. Hartman, G. Manogharan, L. Huang, *J. Norato

Fatigue-Based Topology Optimization of Structures with Tension{-}Compression Asymmetric Materials

*T. Yang, Z. Du, X. Guo

Ground Structure-Based Topology Optimization for Lightweight Automotive Frame Design Including Joint Flexibility

*D. Kwon, S. Choi

Mon, 20/07/2026 11:30 - 13:00

ICM - 43 (Eibsee)

MS376A - Novel Verification, Validation, and Uncertainty Quantification (VVUQ) Methods for High-Speed Flows I

Main Organizer: Prof. Xinfeng Gao (University of Virginia)

Chaired by: Prof. Xinfeng Gao (University of Virginia), Dr. Kathryn Maupin (Sandia National Laboratories)

A Hybrid Bayesian Inference Framework for Parameter Estimation in Shock Dynamics

*J. Yankow, X. Gao

The Reconstruction of Freestream Conditions in Hypersonic Shock-Tunnels using Bayesian Inference

*L. Scott, A. Dwivedi, A. del Val, G. Candler

Bayesian Calibration of Catalytic Efficiency in Plasma Wind Tunnels Using Free-Stream Temperature Measurements

*J. Pesesse, M. Capriati, E. Anfuso, B. Helber, O. Chazot

Demonstration of Bayesian Validation and Uncertainty Quantification for a Range of CFD Fidelities

*J. Thornock, M. Sands

LES-Based Heat Flux Prediction for a Hypersonic Apollo-Shaped Capsule with Pizza-Box Roughness

*K. Inokuma, A. Yakeno, S. Yatsuyanagi, H. Tanno

Mon, 20/07/2026 11:30 - 13:00

ICM - 44 (Schliersee)

MS201A - Advanced Technologies in Fossil-Free Energy Production, Storage, and Distribution I

Main Organizer: Prof. Bilen Emek Abali (Uppsala University)

Chaired by: Prof. Bilen Emek Abali (Uppsala University), Prof. Fadi Aldakheel (Leibniz Universität Hannover)

Thermo-mechanical modelling of Molten Salt Storage Tanks for high temperature thermal energy storage

E. Riis Hansen, ***A. Panicker**, M. Zeng, M. Chen

Lithiation and mechanics coupling in battery computations

***B. Abali**

On Particle Cracking in Li-ion Si-based Battery Electrodes

***H. Damsgaard Falck**, P. Isaksson

Electrochemical Impedance Modeling of Temperature-Dependent Polarization Pathways in Commercial Lithium-Ion Batteries

***H. Ali**, A. Alzahrani, M. Khalid

Hydrogen Production via In-Situ Combustion Gasification From Heavy Oil

***M. Mohamed**, A. M. Khedr, M. A. Nemitallah

Numerical Simulation of a Helical- Darrieus Vertical-Axis Wind Turbine Using the Actuator Line Method

***S. Fodor**, G. Molano, V. Dossena, O. Lopez

Mon, 20/07/2026 11:30 - 13:00

ICM - 31 (Zugspitze)

MS010A - Non-Conventional and Multi-Scale Methods for Solid and Fluid Mechanics (NMSFM) I

Main Organizer: Prof. Wojciech Sumelka (Poznan University of Technology)

Chaired by: Dr. Konrad Perzyński (AGH University of Krakow), Dr. Marcin Nowak (Poznan University of Technology)

Space-Fractional Finite Element Formulation for 3D Nonlocal Frames **Keynote**

***P. Stempin**, W. Sumelka

Numerical Investigation of Crack Evolution in TiN Thin Films based on Molecular Dynamics Simulations

***B. Kowal**, L. Madej, K. Perzynski

A fractional variational formulation for axial deformation of an elastic bar

***A. Nowak**, D. Kustal, T. B?aszczuk

Rapid Landslide Risk Zoning Using Gradient-Enhanced Active Learning Kriging

***W. Liao**, Y. Sun, J. Ji

Multi-Scale Prediction of Crack Evolution in Thin Films and Coatings Based on the Digital Material Representation Concept, XFEM, Cohesive Elements, and Molecular Dynamics Simulations

***K. Perzynski**, B. Kowal, G. Cios, P. Ba?a, L. Madej

Mon, 20/07/2026 11:30 - 13:00

ICM - 32 (Watzmann)

MS171A - Surrogate and multifidelity enhanced optimization under uncertainty I

Main Organizer: Dr. Alex Gorodetsky (University of Michigan)

Chaired by: Prof. Boris Kramer (University of California San Diego), Prof. Dongjin Lee (Hanyang University)

Stochastic gradient with least-squares control variates for smooth stochastic optimization problems

***F. Nobile**, M. Raviola

A Sequential Bayesian Approach to Sparse Gaussian Process Quantile Optimization: Application to Hydrofoil Design

***H. Nicolas**, O. Le Maître

Adaptive Surrogate Modeling for PDE-Constrained Optimization Under Uncertainty

***B. Chen**, D. Kouri

Risk-Averse Design Optimization via Tail-Region Correction of a Multi-fidelity DD-GPCE Surrogate Model

***G. Lee**, D. Lee

Reducing Computational Cost in Reservoir Management: A Multi-Fidelity Approach for Optimization Under Geological Uncertainty

H. Costa, ***S. Bastos Afonso**, R. Willmersdorf

Mon, 20/07/2026 11:30 - 13:00

BrainLab - Auditorium

MS234A - Quantum Scientific Computing I

Main Organizer: Prof. Yan Wang (Georgia Institute of Technology)

Chaired by: Prof. Yan Wang (Georgia Institute of Technology), Dr. Yuki Sato (Toyota Central R&D Labs., Inc.)

Enhanced Stability in Quantum Carleman Linearization through Pivot Switching

K. Wang, Z. Jia, S. Veerapaneni, ***Z. Ding**

Quantum Circuit Design for Hamiltonian Simulation of Nonlinear Reaction-Diffusion Equation

***S. Sasaki**, T. Kadowaki, Y. Suzuki, K. Endo, M. Muramatsu

Static Finite Element Analysis of Hyperelastic Materials via Hamiltonian Simulation Using Carleman Linearization

***S. Iizuka**, K. Endo, K. Wagatsuma, A. Nakamura, K. Terada

Hamiltonian Simulation of Simple Harmonic Motion of Elastic Structures

***K. Wagatsuma**, K. Endo, K. Terada

Block Encoding and QSVT for Solving Differential Equations

***A. Setty**

Mon, 20/07/2026 11:30 - 13:00

NM - 1 (Multimedia Saal)

MS246A - Numerical Methods for Interface-Resolved Multiphase Flows I

Main Organizer: Dr. Nicolas Valle (TU Delft)

Chaired by: Dr. Nicolas Valle (TU Delft)

Conservative, bounded and minimally dissipative scalar advection using the unsplit geometric VOF method on arbitrary meshes

Keynote

***R. Remmerswaal**, A. Veldman

Arbitrary order discontinuity reconstruction of regularized solutions

***D. Fuster**, E. Sultan, A. Van Hooft

An Entropy Condition for Consistent Mass-Momentum Formulations with Sharp-interface Multiphase Flow Methods

***T. Huang**, N. Valle, A. Lidtke, G. Weymouth

Adaptive Moving Mesh for Conservative Multiphase Flows Discretization

***M. Mosqueda-Otero**, A. Gorobets, G. Colomer, X. Álvarez-Farré, F. Trias

A High-Order Spectral Element Phase Field Solver for Multiphase Flows on GPU Architectures

***E. Sieburgh**, T. Anh Dao, H. Nobis, M. Karp, S. Mirjalili

Mon, 20/07/2026 11:30 - 13:00

NM - 2 (Salzburg)

STS404A - New digitalized methods and tools for new challenges in Green Aerospace Engineering and Scientific Computation I

Main Organizer: Prof. Jacques Periaux (cimne)

Chaired by: Prof. Jacques Periaux (cimne)

Robust Optimization Techniques for Uncertain Aerospace Environments

***N. Gauger**, L. Chen

Incremental MDO Framework for Sizing and Optimisation of H₂-Fuelled Electric Powertrain in General Aviation Propeller Aircraft

***P. Moreno-Escolástico**, M. Raiola, R. Castellanos, A. Cini

Shakedown-driven Design of Reusable Spacecraft Structures via Topology Optimization and Physics-Informed Machine Learning

***G. Chen**, X. Wang, C. Huang, X. Yang, L. Zhang

Operator learning method with adaptive activation function for high speed shock tube problems and airfoil flows

J. Liu, X. Jin, ***H. Li**

Mon, 20/07/2026 11:30 - 13:00

NM - 4 (Hamburg)

MS061A - Multi-Scale Advanced Modeling for Analysis and Design of Composite Structures Including Variable-Angle Tow I

Main Organizer: Dr. Alberto Racionero Sánchez-Majano (Universidad Carlos III de Madrid)

Chaired by: Prof. Avinash Ambika Vijayachandran (University of Washington), Dr. Alberto Racionero Sánchez-Majano (Universidad Carlos III de Madrid)

Analysis of Lamb Wave Propagation in Sandwich Structures using Refined Plate Finite Elements

***M. Abaqin**, A. Pagani, M. Filippi

Multiscale Finite Element Analysis of Binding-Thread Effects on Stress Localization and Fracture in FRP Laminates

***A. Kondratiev**, J. Walter, C. Düreth, R. Protz, B. Grüber, M. Gude

Efficient micro- and mesoscale modelling of composite materials through advanced embedded finite elements

***A. Racionero Sánchez-Majano**, A. Pagani

Multiscale progressive damage modelling of composites using non-intrusive reduced order modelling

***J. Selvaraj**

High-Velocity Impact Analysis of Composite Plates using the Hashin 3D Criterion and Layer-Wise Models

***C. Franceschini**, A. Pagani, M. Petrolo, E. Carrera

Mon, 20/07/2026 11:30 - 13:00

NM - 5 (KK)

MS276A - Beyond classical schemes: Recent developments of high-order structure-preserving methods for compressible flows I

Main Organizer: Prof. Philipp Öffner (TU Clausthal)

Chaired by: Prof. Philipp Öffner (TU Clausthal)

Efficient optimization-based invariant-domain-preserving limiters for gas dynamics equations

Keynote

C. Liu, D. Miclesis, C. Shu, ***X. Zhang**

A multi-resolution limiter for the Runge-Kutta discontinuous Galerkin method

H. Shen, ***B. She**

An Element-Based Convex Limiting Framework for Continuous Galerkin Methods with Nonlinear Stabilization

D. Kuzmin, H. Hajduk, ***J. Vedral**

Invariant domain preserving limiter for time explicit and time implicit discretizations for systems of conservation laws

B. Fanizza, ***F. Renac**

Time-Implicit Discontinuous Galerkin Spectral Element Method for Compressible Flows

***M. Basile**, R. Milani, J. Peter, F. Renac, M. Ricchiuto

Mon, 20/07/2026 11:30 - 13:00

NM - 3 (BB)

MS409A - Modelling and Optimization of Functionally Graded Composites and Structures I

Main Organizer: Dr. M.A.R. Loja (Instituto Superior de Engenharia de Lisboa)

Chaired by: Dr. Inês Barbosa (Instituto Superior de Engenharia de Lisboa), Dr. Matteo Viscoti (University of Salento)

Molecular dynamics modelling of alumina/graphene composites

***E. Postek**, T. Sadowski, A. Rusinek

Multi-Objective Optimization of Sandwich Panel with Graded Auxetic Core Under Blast Loading

***A. VINEETHA UTHAM**, G. WATTS, R. MISHRA

Higher-Order Multifield Modelling of Anisotropic Doubly-Curved Shells of Arbitrary Shape

F. Tornabene, ***M. Viscoti**, R. Dimitri

Linear Buckling and Flutter Analyses of Functionally Graded Plates under Aerothermal Heating with Heat-Flux-Driven Thermal Gradients

***M. Dadu**, S. Pradyumna

Application of Auxetic and FGM Materials to Minimize Warping on a Cantilever C-beam

***I. Barbosa**, A. Carvalho, M. Loja

Mon, 20/07/2026 11:30 - 13:00

H4 - 1 (Ludwig)

MS152A - Advances in Multidisciplinary Design Analysis and Optimization (MDAO): Scalable Algorithms, Software Frameworks and Libraries I

Main Organizer: Dr. Arthur Stueck (German Aerospace Center (DLR))

Chaired by: Dr. Arthur Stueck (German Aerospace Center (DLR)), Prof. John Hwang (University of California San Diego)

Evolutionary is Revolutionary: Rethinking Novelty and Impact in Multidisciplinary Design Analysis and Optimization

Keynote

***B. Phillips**

Multi-Fidelity Surrogate-Based Methodology for Ultra High Aspect Ratio Strut-Braced Wing Conceptual Design

***E. Stragiotti**, E. Nguyen Van, S. Defoort, M. Méheut, O. Atinault, D. Losada Costoso, C. Mollet, F. Moëns, G. Starck, C. Julien, L. Vertonghen, V. Priasso, A. Lannoo

Aero-structural Optimization of a High Aspect Ratio Wing using a Sequential Approximate Optimization Approach

***A. Gastaldi**, M. Carini, C. Blondeau

CAD-Integration for Constrained, Gradient-based High-Fidelity Shape Optimization

***T. Hafemann**, M. Banovi?, A. Büchner, S. Gottfried, A. Stück

CAD-Based Nonconforming Mesh Adaptation for Extremely Coarse Initial Meshes

***M. Höchel**, T. Hafemann, M. Cristofaro, M. Orlt, M. Wegener

Mon, 20/07/2026 11:30 - 13:00

H4 - 2 (Leopold)

MS055A - Digital Twins for Infrastructures – From Models to Decision Support I

Main Organizer: Mr. Max von Danwitz (German Aerospace Center)

Chaired by: Mr. Max von Danwitz (German Aerospace Center), Dr. Daniel Wolff (University of the Bundeswehr Munich)

Hyper-reduced Order Modeling of Inelastic Arbitrary Lagrangian Eulerian Simulations for a Digital Twin of the Road Keynote

***T. Brepols**, J. Kehls, S. Reese, L. Scheunemann

A dynamic multiscale ALE-Microlayer framework for realistic, data-driven tire–pavement interaction under complex driving maneuvers and high-traffic loading

***M. May**, M. Hagmanns, A. Anantheswar, V. Yordanov, I. Wollny, A. Hernandez, L. Eckstein, M. Kaliske

An Agent-Based Digital Twin for Logistics Infrastructure Integrating Vehicles, Drivers, and Cargo under Traffic Uncertainty

***T. Sumire**, T. Aoki, I. Yoshiko, T. Tomoaki

Development and implementation of the digital twin of an innovative pedestrian bridge

***M. Ghienne**, F. Renaud, M. Shih

Load Forecasting Technology for Wastewater Treatment Plants: From Numerical Modeling and Simulation to the Digital Twin

***S. Trentin**, M. Mattuschka, M. von Danwitz, A. Popp

Mon, 20/07/2026 11:30 - 13:00

H4 - 3 (Franz)

MS243A - Progress in Computational Multiphysics Using Open-Source Software I

Main Organizer: Prof. Holger Marschall (Technische Universität Darmstadt)

Chaired by: Prof. Holger Marschall (Technische Universität Darmstadt), Dr. Maximilian Kannapinn (Technical University of Darmstadt)

Scaling Symbolic-Numerics in ModelingToolkit.jl to PDE Auto-Discretization via Array-Based Symbolic Code Generation and Reactant.jl Integration

***C. Rackauckas**

Predicting and Mitigating Urban Flooding: A Framework for Shallow Water Surface Flow, Precipitation and Soil Infiltration Modeling based on multiPhysicsFoam

***Y. Dhote**, S. Raju, G. Pottbrock, C. Habes, M. Kannapinn, S. Kilian, H. Marschall

GReS: A Novel Prototyping Platform for Multi-Physics Problems with Multiple Domains and Fractures

***D. Moretto**, E. Da Silva Castro, A. Franceschini, M. Ferronato

HORSES3D-GPU: A high order discontinuous Galerkin accelerated solver for multi-GPU systems

G. Ntoulkas, G. Rubio, A. Ballout, O. mariño, D. huergo, M. chavez, ***E. ferrer**

A Hyperbolic Momentum Formulation for Non-Equilibrium Flow in Porous Media with Application to Snow Infiltration

***G. Tagliavini**, I. Lunati

Mon, 20/07/2026 11:30 - 13:00

H4 - 4 (Alois)

MS279A - AI for Computational Fluid Dynamics - Opportunities and Challenges I

Main Organizer: Prof. Nils Thuerey (TUM)

Chaired by: Prof. Nils Thuerey (TUM), Dr. Nguyen Anh Khoa Doan (Imperial College London)

Generative Modelling and Data Assimilation of Turbulent Plane Couette Flow Using a Latent Diffusion Transformer Keynote

F. Steinbrenner, B. Turan, H. Teng, ***H. Xiao**

Inner-Layer Forcing Model for Predicting Wall Turbulence Using Deep Learning-Based Discriminator

***Y. Hasegawa**, M. Liu, Z. Liu, C. Kato

Efficient Probabilistic Surrogate Modeling Techniques for Partially-Observed Large-Scale Dynamical Systems

***H. Harder**, A. Vishwasrao, L. Guastoni, R. Vinuesa, S. Peitz

Multi-fidelity Gaussian Process Regression for Efficient Prediction of Bubble Collapse Loads

***J. Xu**, J. Winter, S. Schmidt, N. Adams

Mon, 20/07/2026 11:30 - 13:00

H4 - 5 (Xaver)

MS148A - Data-Driven Uncertainty and Sensitivity Analysis For Dynamical Systems I

Main Organizer: Dr. Dimitrios Loukrezis (Centrum Wiskunde & Informatica)

Chaired by: Dr. Dimitrios Loukrezis (Centrum Wiskunde & Informatica), Prof. Ulrich Römer (TU Braunschweig)

State Space Kriging Model for Uncertainty Quantification of High-dimensional Nonlinear Stochastic Dynamical Systems

***K. Cheng**, I. Papaioannou, D. Straub

Interpretable sensitivity indices for time-dependent models with dependent variables

***M. LAMBONI**

Model Reduction for Systems with Random Parameters Using Spectral Submanifolds

***A. Morsy**, P. Tiso

Bayesian Data Assimilation with Generative Modelling using Stochastic Interpolants

***N. Mücke**, B. Sanderse

Mon, 20/07/2026 11:30 - 13:00

H4 - 6 (Sissi)

MS135A - Local and non-local modelling: concepts, methods and integration in multiphysics damage I

Main Organizer: Dr. Lorenzo Zoboli (Università Campus Bio-Medico di Roma)

Chaired by: Phd. Pierfrancesco Gaziano (University of Rome Tor Vergata), Dr. Arman Shojaei (Helmholtz-Zentrum Hereon)

Geometry-aware Nodal Influence Factors for Mitigating Boundary Effects in Bond-based Peridynamics

***A. Shojaei**, G. Ongaro, A. Hermann, C. Cyron

Peridynamic modelling of bioresorbable screw degradation

***L. Zoboli**, L. Chimenti, P. Gaziano, G. Vairo, A. Gizzi

Local and Nonlocal Modeling of Mg Implant Degradation and Bone Healing

***A. Hermann**, A. Shojaei, C. Cyron

A Modified Peridynamics Formulation for Corrosion Modelling Overcoming Surface Effects in Electrochemical Systems

***S. Chattopadhyay**, A. Shojaei, A. Fuchs, K. Bauer-Trossmann, C. Cyron

Finite Element Modeling of Microdamage in Equine Superficial Digital

B. Amirzade, X. Li, T. Garcia, S. Sushmitha, ***A. Nassiri**

Mon, 20/07/2026 11:30 - 13:00

H4 - 7 (Maximilian)

MS342A - Engineering Challenges and Societal Transformation I

Main Organizer: Dr. Fawaz Annaz (Birmingham City University)

Chaired by: Dr. Fawaz Annaz (Birmingham City University), Dr. Hadi NABIPOUR AFROUZI (Birmingham City University)

Corrosion Inhibition of Mg Alloys and N80 Carbon Steel: DFT Simulations, Grain Refinement, FEA, and Electrochemical Studies

***A. RAI**, S. Bjada, M. Krzyzanowski

Comparative Analysis of Torque-Summed and Velocity-Summed Equalization in Multi-Lane Electromechanical Actuators

***F. Annaz**

A Multi-Task Deep Learning Framework for Segmentation of Interrelated Structures

***A. Zalouk**, K. Ismail, M. Zaalouk, M. Krzyzanowski, E. Vakaj

Workspace Analysis of a Tree-Climbing Firefighting Robot

***P. Mollá-Santamaría**, A. Peidró, L. Payá, Ó. Reinoso

Mon, 20/07/2026 11:30 - 13:00

H4 - 8 (Eventcenter)

MS259A - Generative Models for Inverse Problems, Data Assimilation and Uncertainty Quantification I

Main Organizer: Prof. Assad Oberai (University of Southern California)

Chaired by: Prof. Assad Oberai (University of Southern California)

Multimodal Atmospheric Super-resolution With Deep Generative Models

***D. Chakraborty**, H. Guan, J. Stock, T. Arcomano, G. Cervone, R. Maulik

A Conditional Generative Variational Autoencoder for Uncertainty Quantification of Seismic Images

***C. Barbosa**, C. Silva, B. Silva, F. Rochinha, A. Coutinho

Guiding Diffusion Models to Reconstruct Flow Fields from Sparse Data

***L. Medrano-Navarro**, M. Amorós-Trepat, Q. Liu, L. Guastoni, N. Thuerey

Learning diffeomorphisms of real spaces to infer transport equations of probability densities via discrepancy maps

S. Han, J. Tan, ***K. Garikipati**

Coupling Fourier Neural Operators with Diffusion Models for Broadband Elastodynamic Wavefields

N. Perrone, F. Lehmann, S. Fresca, ***F. Gatti**

Mon, 20/07/2026 11:30 - 13:00

BrainLab - Training

MS223A - Projection-Based and Data-Driven Reduced Order Modeling: Bridging Accuracy and Efficiency I

Main Organizer: Dr. Maria Strazzullo (Politecnico di Torino)

Chaired by: Dr. Maria Strazzullo (Politecnico di Torino), Dr. Federico Pichi (SISSA)

Generative A.I. meets Reduced-Order Modeling: partial knowledge and hidden parameters in physical systems Keynote

***N. Franco**, A. Violante, A. Manzoni

Time-periodic spectral manifolds for reduced-order modeling of fluid flows: application to vortex pairing in an axisymmetric jet

***A. Padovan**, J. Jaquette, J. Mireles James

Spline-enhanced deep learning for model reduction of problems with non-linear manifolds

***V. Chheda**, M. Chasapi

Autoencoder embeddings: latent manifold investigation in Aerodynamics

***E. Saetta**, R. Tognaccini, G. Iaccarino

Mon, 20/07/2026 11:30 - 13:00

NM - 6 (Munich)

MS380A - Cavitation and Bubble Dynamics I

Main Organizer: Prof. Mauro Rodriguez (Brown University)

Chaired by: Prof. Mauro Rodriguez (Brown University)

Nonspherical bubble dynamics within a transverse isotropic viscoelastic material

S. Remillard, J. Yang, J. Estrada, ***M. Rodriguez**

Data-drive identification for high-strain rheometry of soft materials via inertial microbubble dynamics

V. Sanchez, J. Beckett, J. Ulloa, J. Estrada, ***M. Rodriguez Jr.**

Investigating Kidney-Stone Erosion Induced by Dual-Bubble Dynamics: Experiments and Simulations

***A. Ade-Onojobi**, G. Bokman, A. Sieber, C. Brewer, B. Lukic, G. Shakya, M. Belau, A. Kuhl, M. Schlotter, O. Supponen, K. Schmidmayer

Inertial Bubble Collapse Near a Mantis Shrimp Telson

***A. Trevino**, J. Beckett, J. Estrada, M. Rodriguez Jr.

Mon, 20/07/2026 11:30 - 13:00

NM - 7 (Venice)

MS389A - Machine Learning for Molecular Simulations I

Main Organizer: Mr. Franz Görlich (TUM)

Chaired by: Mr. Franz Görlich (TUM), Mr. Weilong Chen (TUM)

Active learning and multifidelity machine learning for molecular simulations

***V. Vinod**, P. Zaspel

Fast-D3 Dispersion Correction for Machine Learning Force Fields

***V. Valeeva**, C. Ho, C. Ortner

Enhanced Sampling for Efficient Learning of Coarse-Grained Machine Learning Potentials

***W. Chen**, F. Görlich, P. Fuchs, J. Zavadlav

Machine-Learning Interatomic Potentials for Million-Atom Molecular Dynamics Simulations of Aluminum Solidification

***I. Störmer**, J. Zavadlav

Mon, 20/07/2026 11:30 - 13:00

ICM - 50 (Seeblick)

NGCE - Computational Methods for Beginners (I)

Mon, 20/07/2026 13:00 - 14:00

Lunch Break

Mon, 20/07/2026 14:00 - 14:45

ICM - 1 Auditorium

MS120B - Recent Advances in Computational Methods for the Cardiovascular System II

Main Organizer: Dr. Richard Schussnig (Ruhr University Bochum)

Chaired by: Dr. Richard Schussnig (Ruhr University Bochum), Ms. Anna Ranno (RWTH Aachen University)

Comparing Pre- and Post-David Procedure Aortic Hemodynamics in a Patient-Specific Heart Model: Methodological Challenges

***F. Gattere**, R. Verzicco, F. Viola

Assessment of Rivaroxaban Effect on Thrombus Formation in the Left Atrial Appendage, Using a Patient-Specific FSI Model

***A. Lo Presti**, A. Tamburini, E. Napoli, G. Burriesci, A. Monteleone

A Continuum Model of Platelet Margination for Patient-Specific Applications

***C. Kratzer**, M. Gee

Mon, 20/07/2026 14:00 - 14:45

ICM – 2

MS208B - Innovative Methods for Fluid-Structure Interaction II

Main Organizer: Prof. Harald van Brummelen (Eindhoven University of Technology)

Chaired by: Dr. Miguel A. Fernández (Inria), Prof. Trond Kvamsdal (Norwegian University of Science and Technology (NTNU))

Model Order Reduction of Prestressed Hydroelastic Vibrations in Liquid-Filled Tanks

***J. Deü**, C. Hoareau, R. Ohayon

Model-Order-Reduction for Non-Linear Fluid-Structure-Concentration Interaction Problems

***C. Hergl**, P. Boucard, D. Neron, T. Wick

A reduced Lagrange multiplier finite element method for fluid-particle interaction

M. Fernandez, ***C. Grandmont**, F. Lespagnol, P. Zunino

Mon, 20/07/2026 14:00 - 14:45

ICM – 3

MS191B - Explainable AI for the Discovery and Control of Complex Systems in Engineering and Applied Sciences II

Main Organizer: Dr. Gianmarco Mengaldo (National University of Singapore)

Chaired by: Dr. Gianmarco Mengaldo (National University of Singapore), Ms. Bayan Abusalameh (National University of Singapore)

Exiaa: Explainable Injections for Adversarial Attack

***L. Pesce**, J. Wei, G. Mengaldo

Evaluating Post-hoc Interpretability in Data-efficient Adversarial Training

***J. Wei**, L. Pesce, G. Mengaldo

Symmetry-Aware Scientific Discovery: From Dimensionless Learning to OpenSymmetry

***Z. Gan**

Mon, 20/07/2026 14:00 - 14:45

ICM – 4a

MS024B - Advanced Discretization Schemes for Computational Structural Dynamics II

Main Organizer: Prof. Bastian Oesterle (Hamburg University of Technology)

Chaired by: Dr. Sascha Eisenträger (Otto von Guericke University Magdeburg), Dr. Lars Radtke (University of Rostock)

Classification and analysis of mass scaling techniques

***Y. Voet**, E. Sande, A. Buffa

A Selective Mass Scaling Method for Non-Linear Explicit Dynamics Employing Solid-Shell Elements

***M. Hoffmann**, A. Tkachuk, M. Bischoff, B. Oesterle

Mon, 20/07/2026 14:00 - 14:45

ICM – 4b

MS071B - Recent advances in numerical methods for hyperbolic systems in fluid dynamics II

Main Organizer: Phd. Irene Gómez Bueno (University of Málaga)

Chaired by: Dr. Tomás Morales (Universidad de Málaga), Phd. Irene Gómez Bueno (University of Málaga)

Fully Well-Balanced Methods for Schwarzschild–Euler Equation in Gullstrand–Painlevé Coordinates

***E. Pimentel-García**, S. Santos-Pérez, I. Cordero-Carrión, C. Parés

Discrete-velocity-direction models of BGK-type with minimum entropy

Y. Chen, T. Li, ***Q. Huang**, W. Yong

Well Balanced High-Order Weno Finite-Difference Methods via a Local Flux Formulation

***M. Kazolea**, C. Pares, B. Ren

Mon, 20/07/2026 14:00 - 14:45

ICM - 5

MS009B - Complex Fluid Flows in Engineering: Modeling, Simulation, and Optimization II

Main Organizer: Dr. Fabian Key (TU Wien)

Chaired by: Dr. Nils Wunsch (Institute of Lightweight Design and Structural Biomechanics, TU Wien), Prof. Stefanie Elgeti (TU Wien)

High Order Methods for deforming domains and free boundaries

***F. Kummer**

Active-Subdomain Predictor–Corrector Method for Accelerated Free-Surface Volume-of-Fluid Simulations

***J. Rettig**, A. Lippert, T. Maric

A Novel Surface Mesh Deformation Method for Component Intersections

***X. Hua**, L. Qiao, S. Jiang, L. Li, J. Bai

Mon, 20/07/2026 14:00 - 14:45

ICM - 11a

MS039B - Recent Developments and Applications of Meshfree Methods II

Main Organizer: Prof. Tsung-Hui (Alex) Huang (National Taiwan University)

Chaired by: Prof. Tsung-Hui (Alex) Huang (National Taiwan University), Prof. Kuan-Chung Lin (National Cheng Kung University)

A Robust Kinetic Meshfree Method for Highly Stretched and Anisotropic Point Clouds

M. Verma, ***A. Nemili**

Applications of Physics Informed Neural Network on Domain Size Effects in External Flow

***M. Chern**, A. Satyadharma, H. Kan

Physics Informed Neural Networks with Selective Mode-based Tip Enrichment for Modeling Linear Elastic Fracture Mechanics

***R. Tangade**, Y. Chou, T. Huang

Mon, 20/07/2026 14:00 - 14:45

ICM - 11b

MS183B - Cut-cell/Embedded Boundary Methods for Fluid and Solid Mechanics II

Main Organizer: Prof. Panos Papadopoulos (University of California, Berkeley)

Chaired by: Dr. Hans Johansen (LBNL), Prof. Panos Papadopoulos (University of California, Berkeley)

A Higher-Order Cut-Cell Finite Element Method for Elliptic Equations in Arbitrary Planar Domains

***Y. Wang**, D. Li, P. Papadopoulos

Directional ghost node approach to elliptic PDEs with arbitrary immersed interfaces

***A. Nitti**

A Fourth Order Adaptive Grid Immersed Interface 3D Incompressible Flow Solver

X. Ji, ***W. van Rees**

Mon, 20/07/2026 14:00 - 14:45

ICM - 12a

MS050B - Computational and Experimental Approches for Slender Concrete Structures II

Main Organizer: Prof. Sven Klinkel (Sven Klinkel, Professor, RWTH Aachen University)

Chaired by: Prof. Sven Klinkel (Sven Klinkel, Professor, RWTH Aachen University), Prof. Rostislav Chudoba (RWTH Aachen University)

CT Scan-Based Modelling of 3D Through Thickness Textile Reinforced Cement Composites

***C. Toderascu**, K. Ehab Moustafa Kamel, T. Massart, T. Tysmans

Component-wise Reduced-order Modeling of Thin-walled Modular Carbon Fiber Reinforced Concrete Structures

***S. Ritzert**, J. Kehls, H. Holthusen, S. Reese, T. Brepols

Corotational Layered Beam Modelling of the Mechanical Response of Externally Strengthened Reinforced Concrete Beams with Carbon Fiber-Reinforced Polymer Strips

***N. Mertens**, D. Snoeck, P. Berke

Mon, 20/07/2026 14:00 - 14:45

ICM - 12b

MS226B - Mechanical metamaterials, metasurfaces and soft robotics: advances in computational mechanics of architected materials II

Main Organizer: Prof. Susmita Naskar (University of Southampton)

Chaired by: Prof. Tanmoy Mukhopadhyay (University of Southampton), Prof. Susmita Naskar (University of Southampton)

Magnetically Actuated Honeycomb Metastructure: A Design Framework for Tuneable and Reconfigurable Metastructures

***T. Gupta**, S. Pathak, A. Dwivedi, B. Bhattacharya

Designing and Optimization of Piezoceramic Metastructure with Multiple Artificial Modes

***Z. Hou**

Topology Optimisation of Mechanical Metamaterials with Contact, Buckling and Viscoelasticity

***C. Aveline**, R. Hewson, M. Santer

Mon, 20/07/2026 14:00 - 14:45

ICM - 13a

MS372B - Phase-field fracture modeling and computation II

Main Organizer: Prof. Laura De Lorenzis (ETH Zurich)

Chaired by: Prof. Yongxing Shen (Shanghai Jiao Tong University)

Numerical Convergence of the AT2 Phase-Field Fracture Model Toward LEFM in Two and Three Dimensions

***P. Saxena**, C. Upadhyay

On the Size-Effect Landscape of Crack-Growth Initiation in the Presence of Stress Gradients

***A. Latyshev**, J. Hale, C. Maurini

Mon, 20/07/2026 14:00 - 14:45

ICM - 13b

MS011B - Advances in Neural Network Approximations of Partial Differential Equations II

Main Organizer: Dr. David Pardo Zubiatur (University of the Basque Country (UPV/EHU))

Chaired by: Dr. Jamie M Taylor (CUNEF Universidad), Dr. Pablo Herrera (Basque Center for Applied Mathematics)

Scalable Natural Gradient Descent for Neural PDE Solvers: Low-Rank Preconditioning and Efficient Implementations

***I. Bioli**, G. Sangalli, C. Marcati

Edge-of-Stability Dynamics in Physics-Informed Neural Networks

***A. AliAhmad**, K. Shukla

Deep Learning-based Trust Region Method for PDE-constrained Optimization Problems with Low-Dimensional Controls

***S. Halilovic**, T. Hamacher

Mon, 20/07/2026 14:00 - 14:45

ICM - 14a

MS200A - Computational Design for Additive Manufacturing I

Main Organizer: Dr. Can Ayas (Delft University of Technology)

Chaired by: Dr. Can Ayas (Delft University of Technology)

Hybrid interface tracking method of multi-phase flows, for additive manufacturing and welding applications

***C. Calonnec**, C. Nahed, A. Jaccon, Y. Saadlaoui, J. Bergheau

Distortion Prediction of Wire-Arc Directed Energy Deposition using Physics-Informed Neural Networks

***J. Wang**, B. Peng, S. McKegney, P. Gauthaman, A. Panesar

Gradient-based Optimization of Alloy Homogeneity in Cold Hearth Melting

***H. Villanueva**, M. Tupek, S. Kairallah, K. Elder, S. Watts, D. Tortorelli

Mon, 20/07/2026 14:00 - 14:45

ICM - 14b

MS092A - Computational Scale Bridging in Materials and Structures I

Main Organizer: Prof. Jörg Schröder (University Duisburg-Essen)

Chaired by: Prof. Jörg Schröder (University Duisburg-Essen), Prof. Kenjiro Terada (Tohoku University)

A Novel Hyper-Reduction Technique for Elastoplastic Computational Homogenization

***H. Goldbeck**, S. Wulfinghoff

Predicting plastic strain localization in porous solids using graph neural networks

R. Jakobsen, T. Kristensen, J. Storm, I. Rocha, ***T. Andriollo**

Variationally Consistent Two-scale Analysis for Thermo-mechanically Coupled Problems

***S. Matsubara**, K. Terada

Mon, 20/07/2026 14:00 - 14:45

ICM - 14c

MS312A - Particle-based methods: advances and applications in DEM, PFEM, SPH, MPM, MPS and others I

Main Organizer: Prof. Eduardo de Moraes Barreto Campello (University of São Paulo)

Chaired by: Prof. Eduardo de Moraes Barreto Campello (University of São Paulo), Prof. Sergio Idelsohn (CIMNE)

A Variational Formulation for Deformable Particle Simulations and its Level-Set Discrete Element Method Implementation

***T. Henzel**, K. Karapiperis

Effect of Thruster Height on Plume–Surface Interaction in Martian Landing: A CFD–DEM Study

***R. Onishi**, A. Oyama

Reduced order modelling for free-surface fluid flows with the Particle Finite Element Method

M. Beckermann, A. Barbarulo, ***M. Cremonesi**

Mon, 20/07/2026 14:00 - 14:45

ICM - B11

MS014B - Advanced computational techniques for fracture II

Main Organizer: Prof. Sonia Marfia (Sonia Marfia, Full Professor, University of Roma Tre)

Chaired by: Prof. Murat Saribay (ISTANBUL BILGI UNIVERSITY), Prof. Stefan Löhnert (TUD Dresden University of Technology)

Thermo Mechanical Damage Modelling With the LIP Field Approach

***M. Goddilla Vani**, G. Legrain, N. Chevaugnon, S. Natarajan

A Highly Scalable Mixed Finite Element Formulation for 3D Crack Propagation

***A. Bijaya**, C. J. Runcie, K. Lewandowski, A. G. Shvarts, L. Kaczmarczyk, C. Pearce

Newton-based path-following solvers with regularized maximum constraints

***G. Rastello**, B. Ribeiro Nogueira

Mon, 20/07/2026 14:00 - 14:45

ICM - B12

MS174B - Dynamic Coupled Phenomena in Industrial Applications: Efficient Numerical Strategies and Optimization Techniques II

Main Organizer: Dr. Luc Laurent (Conservatoire national des arts et métiers)

Chaired by: Dr. Luc Laurent (Conservatoire national des arts et métiers), Prof. Thomas-Peter Fries (Graz University of Technology)

Efficient Thermal Analysis of Mechanical Systems Using Automated Thermal Networks

***C. Bohnert**, O. Koch

Coupling of a Non-linear Material Model for Elastomers with Multi-body Simulations of Centrifuges

***M. Niemeyer**, E. Woschke, D. Juhre

Mon, 20/07/2026 14:00 - 14:45

ICM - B13

MS327B - Generative and Probabilistic Modeling on Manifolds for Scientific Discovery II

Main Organizer: Prof. Dimitris Giovanis (Johns Hopkins University)

Chaired by: Mr. George Kevrekidis (Johns Hopkins University), Mr. Rohan Nolson Thekkekunel (Forschungszentrum Jülich)

Conformal Disentanglement and Latent-Space Curation: A Neural Framework for Perspective Synthesis and Targeted Generation

***G. Kevrekidis**, E. Koronaki, D. Giovanis, Y. Kevrekidis

Designing Continuous Conditioning for GANs from WAE Latent Structure

***P. Potapenko**, S. Bompas, S. Sandfeld

Physics-Consistent Generative Modeling via Function-Space Diffusion Operators

***R. Nolson Thekkekunel**, P. Potapenko, S. Bompas, S. Sandfeld

Mon, 20/07/2026 14:00 - 14:45

ICM - B21

MS229B - Machine Learning for the Design of Sustainable and High-Performance Vehicles II

Main Organizer: Dr. Andrea Serani (National Research Council-Institute of Marine Engineering)

Chaired by: Prof. Laura Mainini (Imperial College London), Dr. Philipp Bekemeyer (DLR)

Neural Networks for Real-Time Adaptive Vehicle Restraint Systems

***Y. Scuratti**, G. Colella, F. Duddeck

Machine Learning Assisted High-Velocity Impact Simulations for Composite Structures

***R. Maas**, N. van Hoorn, W. van den Brink

Contact point response estimation for drive-by monitoring using 3D vehicles

***H. Siu**, C. Papadimitriou, E. Dimitrakopoulos

Mon, 20/07/2026 14:00 - 14:45

ICM - B22

MS144B - Advances and Challenges in Structural and Soft Material Instabilities II

Main Organizer: Prof. Hamid Zahrouni (Université de Lorraine)

Chaired by: Prof. Michael BRUN (Université de Lorraine, Arts et Métiers Paris Tech, CNRS), Mr. BENOIT TANG (CNES, FRENCH SPACE AGENCY)

New Perspectives for Numerical and Experimental Wrinkling Analysis of Thin Membranes

***T. Burgwedel**, M. Neidhard, A. Seils, B. Oesterle

Static and Dynamic Instability Analysis of a Rocket Nozzle Under Blast Wave and Buffeting Loading at Lift-Off

***A. GELLE**, B. TANG, A. CHAU, N. MATHIEU, P. VENTURA, M. BRUN, H. ZAHROUNI

Mon, 20/07/2026 14:00 - 14:45

ICM - 21a

MS321B - Geometric and structure-preserving methods for computational modeling II

Main Organizer: Dr. Christopher Eldred (Sandia National Laboratories)

Chaired by: Dr. Artur Palha (Delft University of Technology), Dr. William Barham (Los Alamos National Laboratory)

Developments in transport noise in geophysical and magnetohydrodynamic flow

***S. Ephrati**, D. Holm, R. Hu, O. Street

Harmonic potentials in the de Rham complex

***M. Campos Pinto**, J. Owezarek

A Hamiltonian and Information-Geometric Regularization of Compressible Flow

***W. Barham**, B. Tran, B. Southworth, F. Schaefer

Mon, 20/07/2026 14:00 - 14:45

ICM - 21b

MS206B - Mechanics of soft, multifunctional materials: experiments, modelling, and simulation II

Main Organizer: Prof. Mokarram Hossain (Swansea University)

Chaired by: Dr. Chennakesava Kadapa (Edinburgh Napier University), Dr. Abhishek Ghosh (Swansea University)

Experiments and Modeling of Light-Matter Interaction in Photo-Sensitive Polymers

***M. Mehnert**, P. Steinmann

Isogeometric analysis of electroelastic thin shells based on subdivision surfaces

***Z. Liu**, W. Huang, P. Saxena, T. Yu, Y. Qu

Computational Modeling of Fiber-Matrix Debonding in Carbon Fiber Structural Battery Electrodes: Damage Evolution and Effects on Multifunctional Performance

C. Metlich, J. Boyd, ***D. Lagoudas**

Numerical Surrogate for Thoracic Blunt Non-Lethal Impact: Design and Validation.

***Y. KEBBAB**, M. LOUAR, A. OUKARA, D. TRIA

Mon, 20/07/2026 14:00 - 14:45

ICM - 22a

MS286B - Scalable Linear Solvers for Real-World Applications: Algorithms and Implementations II

Main Organizer: Phd. Âdel Alsalti-Baldellou (University of Padova)

Chaired by: Phd. Âdel Alsalti-Baldellou (University of Padova)

EIFEM as a new preconditioning technique for large scale lattice simulation and optimization

***R. Rubio**, A. Ferrer, J. Hernández, P. Antolin

Solving Saddle-Point Systems from Contact Mechanics in High Performance Computing Context

***V. Robert**, P. Jolivet, O. Jamond, M. Badri

A GPU-Accelerated ADMM Solver for Large-Scale Lower Bound Finite Element Limit Analysis

***Y. Gao**, C. Martin, P. Goulart

Mon, 20/07/2026 14:00 - 14:45

ICM - 22b

MS104B - Adaptive Digital Twins and Self-Learning for Predictive Intelligence in Physical Systems II

Main Organizer: Mr. Matteo Torzoni (Politecnico di Milano)

Chaired by: Mr. Matteo Torzoni (Politecnico di Milano), Dr. Marco Tezzele (Emory University)

Probabilistic Digital Twins for Monitoring, Inspection, and Maintenance Planning via Decentralized POMDPs

***P. Morato**, K. Papakonstantinou, C. Andriotis, N. Hlaing, D. Straub

A Multi-Agent Digital Twin for Decision-Making dynamics through Active Inference

***F. Mancinelli**, M. Torzoni, D. Maisto, F. Donnarumma, A. Corigliano, G. Pezzulo, A. Manzoni

Sequential Surrogate Models for Bayesian Inversion in Probabilistic Digital Twins

***D. Cotoarb?**, I. Smith, D. Straub

Mon, 20/07/2026 14:00 - 14:45

ICM - 41 (Ostersee A)

MS232B - Uncertainty Quantification for Engineering Systems with Surrogate Models II

Main Organizer: Mr. Hendrik Geisler (Leibniz University Hannover)

Chaired by: Prof. Ulrich Römer (TU Braunschweig), Mr. Hendrik Geisler (Leibniz University Hannover)

Hybrid Non-Intrusive Local/Global Approaches for Robust Optimization: The Role of Metamodeling and Multifidelity Techniques

***L. Karaouni**, L. Chamoin, O. Allix, P. Gosselet

DoE Sampling and Optimization for Multifidelity Multiphysics Shock Absorber Design Studies

***A. Sheikh Al-Shabab**, P. Silva, Y. Wei, P. Tsoutsanis, M. Skote

Dual-Surrogate Active Learning with Gaussian Processes for Data-Efficient Current Interruption KPI Prediction

***S. Guo**, P. Corfdir

Mon, 20/07/2026 14:00 - 14:45

ICM - 42 (Ostersee B+C)

MS353B - Emerging Topology and Shape Optimization Techniques in Computational Design of Materials and Structures II

Main Organizer: Prof. Ahmad Najafi (Drexel University)

Chaired by: Dr. Kai James (Kai James), Prof. Ahmad Najafi (Drexel University)

A Latent Space Approach to Multi-Material Topology Optimization

G. Deodhare, ***K. Suresh**

Towards Patient-Specific Stent Designs: Developing Design Strategies Using Reinforcement Learning

***C. Fricke**, I. Steinbrecher, D. Wolff, F. Key, A. Popp, S. Elgeti

Optimal Design of Auxetic Nitinol Stents via Bayesian Optimization for Aneurysm Consolidation

***C. Chan**, F. Gillot, N. Miki

Mon, 20/07/2026 14:00 - 14:45

ICM - 43 (Eibsee)

MS376B - Novel Verification, Validation, and Uncertainty Quantification (VVUQ) Methods for High-Speed Flows II

Main Organizer: Prof. Xinfeng Gao (University of Virginia)

Chaired by: Prof. Xinfeng Gao (University of Virginia)

Stabilizing High-Order Discretization of Non-Equilibrium Flow Models by means of Physics-based Artificial Viscosity

***G. Perrucci**, A. Ghyyot, P. Schrooyen, D. Henneaux, K. Hillewaert, T. Magin

Laminar-to-Turbulence Transition Prediction in a Hypersonic Boundary Layer using Nonlinear Non-Modal Analysis

***N. Taniguchi**, A. Yakeno

Effect of Blade Geometry on Powder Spreading Behavior for High-Speed PBF

***M. Okugawa**, Y. Koizumi, T. Nakano

Mon, 20/07/2026 14:00 - 14:45

ICM - 44 (Schliersee)

MS201B - Advanced Technologies in Fossil-Free Energy Production, Storage, and Distribution II

Main Organizer: Prof. Bilen Emek Abali (Uppsala University)

Chaired by: Prof. Bilen Emek Abali (Uppsala University), Prof. Yann CHARLES (Université Sorbonne Paris Nord)

Finite element modelling of the impact of voids evolution on hydrogen transport

S. Chroëun, ***Y. Chartles**, J. Mougenot, M. Gaspérini

Multiphysics phase-field modeling of electro-chemo-hydro-mechanical failure in electrolysis systems

***A. Antonini**, S. Punnachalil, F. Aldakheel

Mon, 20/07/2026 14:00 - 14:45

ICM - 31 (Zugspitze)

MS010B - Non-Conventional and Multi-Scale Methods for Solid and Fluid Mechanics (NMSFM) II

Main Organizer: Prof. Wojciech Sumelka (Poznan University of Technology)

Chaired by: Dr. Tomasz B?aszczuk (Czestochowa University of Technology), Dr. Marcin Nowak (Poznan University of Technology)

Towards Optimal Designing of Complex Non-local Bar-like Structures

***K. Szajek**, W. Sumelka

Assessment of Polymer Material Evolution Under Large Deformation Using Virtual Field Method

***M. Nowak**, M. Maj, P. Szepty?ski, S. Musia?

Improving Neural Cellular Automata Training for Grain Growth through GPU-Parallelized Data Generation

***S. Sitarz**, M. Sitko, L. Madej

Mon, 20/07/2026 14:00 - 14:45

ICM - 32 (Watzmann)

MS171B - Surrogate and multifidelity enhanced optimization under uncertainty II

Main Organizer: Dr. Alex Gorodetsky (University of Michigan)

Chaired by: Prof. Boris Kramer (University of California San Diego), Dr. Xun Huan (University of Michigan)

Multi-Fidelity performance of potential flow codes evaluated via viscous flow solvers at suitable grid sizes

G. Grigoropoulos, S. Polyzos, ***I. Grigoropoulos**, D. Mourkogiannis

Sequential Approximate Optimization of Functionally Graded Plates using Multi-Fidelity Surrogate Models

L. Ribeiro, M. Sousa, ***E. Parente Jr.**, A. Melo, E. Barroso

Single-Criterion Optimization for the Maximum Fundamental Frequency and Sensitivity Analysis of the Composite Multi-Layered Square Slab

***P. Smela**, B. Miller

Mon, 20/07/2026 14:00 - 14:45

BrainLab - Auditorium

MS234B - Quantum Scientific Computing II

Main Organizer: Prof. Yan Wang (Georgia Institute of Technology)

Chaired by: Dr. Fabian Key (TU Wien), Dr. NARUETHEP SUKULTHANASORN (Tohoku University)

Quantum Lattice Boltzmann Method: A Denoising Approach

***T. Duong**, M. Möller, N. Hosters

Quantum annealing–based aerodynamic design optimization

***Y. Kuya**, R. Tanaka

Mon, 20/07/2026 14:00 - 14:45

NM - 1 (Multimedia Saal)

MS246B - Numerical Methods for Interface-Resolved Multiphase Flows II

Main Organizer: Dr. Nicolas Valle (TU Delft)

Chaired by: Dr. Nicolas Valle (TU Delft)

Gas Transfer in Turbulent Free-Surface Flows with Air Entrainment: a simple framework for turbulence analysis

***A. lafrati**, S. Di Giorgio

Turbulent fragmentation of droplets unraveled by enstrophy transport mechanisms

***M. Saeedipour**, A. Safak

A Hybrid Two-Phase LBM–FVM Method for Gas Entrainment Simulation

***Y. Sitompul**, K. Sugihara, S. Watanabe, Y. Idomura

Mon, 20/07/2026 14:00 - 14:45

NM - 2 (Salzburg)

STS407A - Additive Manufacturing in Industry: Open Challenges and Future Perspective I

Main Organizer: Dr. Massimo Carraturo (University of Pavia)

Chaired by: Dr. Massimo Carraturo (University of Pavia), Prof. Ferdinando Auricchio (Universita' di Pavia)

Parametric Study of Surface Roughness in Laser Powder Bed Fusion of Ti-6Al-4V

T. Huynh, ***V. Vu**

In-Situ Process Monitoring and Ex-Situ Process-Structure-Property Database Implementation for A Wire-Arc Directed Energy Deposition Cell

***L. Slattey**, T. Belmont, B. Bailey, J. Stinson, Z. McClelland

Mon, 20/07/2026 14:00 - 14:45

NM - 4 (Hamburg)

MS061B - Multi-Scale Advanced Modeling for Analysis and Design of Composite Structures Including Variable-Angle Tow II

Main Organizer: Dr. Alberto Racionero Sánchez-Majano (Universidad Carlos III de Madrid)

Chaired by: Dr. Alberto Racionero Sánchez-Majano (Universidad Carlos III de Madrid), Prof. Avinkrishnan Ambika Vijayachandran (University of Washington)

Constrained Space-Filling Design for Composite Structures with Manufacturing Rules

***S. Zein**, D. Dumas

High-Order Beam and Adjoint-Based Optimisation Framework for Composite Wing Structures

***D. Cardone**, A. Racionero Sánchez-Majano, R. Cavallaro, A. Cini

Effect of Manufacturing Signatures on the optimal fiberpaths for doubly-curved, open surfaces manufactured using Automated Fiber Placement

E. Savin, ***A. A. Vijayachandran**

Mon, 20/07/2026 14:00 - 14:45

NM - 5 (KK)

MS276B - Beyond classical schemes: Recent developments of high-order structure-preserving methods for compressible flows II

Main Organizer: Prof. Philipp Öffner (TU Clausthal)

Chaired by: Prof. Bangwei She (Capital Normal University), Prof. Christiane Helzel (Heinrich-Heine-University Düsseldorf)

Exploring Synergistic Preservation of Algebraic–Differential Constraints in Compressible Magnetohydrodynamics

***K. Wu**

Algebraic flux correction schemes for compressible Navier–Stokes equations

***H. Hajduk**, P. Moujaes, D. Kuzmin, Z. Saki

A Structure-Preserving Active-Flux Scheme with Discrete Divergence-Free Constraints for Two-Fluid Plasma Flows

***J. Agnihotri**, P. Öffner

Mon, 20/07/2026 14:00 - 14:45

NM - 3 (BB)

MS409B - Modelling and Optimization of Functionally Graded Composites and Structures II

Main Organizer: Dr. M.A.R. Loja (Instituto Superior de Engenharia de Lisboa)

Chaired by: Dr. Inês Barbosa (Instituto Superior de Engenharia de Lisboa), Mr. Piyush Agrawal (IIT Ropar)

GPR-Assisted Design of Functionally Graded Material in the Complex Domains

***P. Agrawal**, C. Konda, M. Agrawal

Elastoplastic Finite Element Analysis of Functionally Graded Beams

***C. Valencia Murillo**, M. Gutierrez Rivera, N. Flores Samano

Advanced Flexural Analysis of Functionally Graded Porous Plates: A Parametric Study

***S. Sahoo**

Mon, 20/07/2026 14:00 - 14:45

H4 - 1 (Ludwig)

MS152B - Advances in Multidisciplinary Design Analysis and Optimization (MDAO): Scalable Algorithms, Software Frameworks and Libraries II

Main Organizer: Dr. Arthur Stueck (German Aerospace Center (DLR))

Chaired by: Dr. Arthur Stueck (German Aerospace Center (DLR)), Dr. Francois Gallard (IRT Saint Exupéry)

Scaling Adjoint-Based MDO of Aircraft to Large Numbers of Design Conditions

***J. Hwang**, M. Ruh, N. Orndorff, A. Joshy

Performance Improvements and Extended AD-Coverage of the Adjoint Extension to the CFD Software by ONERA, DLR and Airbus (CODA)

***A. Büchner**, F. Kasielke, A. Schmid, B. Sert, A. Stück

Reverse-mode Sensitivity Analyses for Time-Accurate Coupled Problems Using an MDAO Framework Approach

***F. Roß**, S. Gottfried, A. Stück

Mon, 20/07/2026 14:00 - 14:45

H4 - 2 (Leopold)

MS055B - Digital Twins for Infrastructures – From Models to Decision Support II

Main Organizer: Mr. Max von Danwitz (German Aerospace Center)

Chaired by: Dr. Daniel Wolff (University of the Bundeswehr Munich), Mr. Max von Danwitz (German Aerospace Center)

Bridging the Gap: Experimental and Numerical Approaches for Gas Leakage Detection and Mitigation

***R. Breuch**, M. Mattuschka, T. Reder, N. Wilhelms, G. Schäfer, M. von Danwitz, P. Kaul, A. Popp, K. Konstantynowski

Towards Systematic Simulation Data Management for Digital Twin Applications

***R. Becker**, L. Kühn, K. Franke, T. Koch

Actionable Digital Twin for Nuclear Waste Repository Site Selection

***Q. Chen**, M. Morales Oreamuno, P. Selzer, M. Boxberg, S. Oladyshkin, W. Nowak, J. Kowalski

Mon, 20/07/2026 14:00 - 14:45

H4 - 3 (Franz)

MS243B - Progress in Computational Multiphysics Using Open-Source Software II

Main Organizer: Prof. Holger Marschall (Technische Universität Darmstadt)

Chaired by: Dr. Maximilian Kannapinn (Technical University of Darmstadt), Prof. Holger Marschall (Technische Universität Darmstadt)

Autonomous Digital Twins with multiPhysicsFoam: A Physics-aware, Non-intrusive Reduced-order Modeling Pipeline

***M. Kannapinn**, Y. Dhote, S. Raju, T. Oyediji, C. Habes, F. Roth, O. Weeger, H. Marschall

Coupling in-house and open-source simulation codes via preCICE

J. Chen, ***G. Chourdakis**, I. Desai, C. Homs Pons, F. Neubauer, B. Rodenberg, D. Schneider, M. Schulte, F. Simonis, B. Uekermann

Coupled shallow water and free surface flow simulations in multiPhysicsFoam

***S. Raju**, Y. Dhote, C. Habes, M. Kannapinn, H. Marschall

Mon, 20/07/2026 14:00 - 14:45

H4 - 4 (Alois)

MS279B - AI for Computational Fluid Dynamics - Opportunities and Challenges II

Main Organizer: Prof. Nils Thuerey (TUM)

Chaired by: Dr. Luca Guastoni (Technical University of Munich), Dr. Nguyen Anh Khoa Doan (Imperial College London)

Surrogate modeling of fluid–structure interaction using neural-network latent space representations

***J. LABRO**, D. Zarzoso, J. Jacob, J. Favier

Data-driven Identification of Cavitation Flow Stages Using CNN-Autoencoder-Based Spatiotemporal Representations

***L. Jiang**, S. Schmidt, N. Adams

Scientific Machine Learning for wall-modelled lattice Boltzmann simulation

***J. Li**, C. Coreixas, O. Malaspinas, J. Latt

Mon, 20/07/2026 14:00 - 14:45

H4 - 5 (Xaver)

MS148B - Data-Driven Uncertainty and Sensitivity Analysis For Dynamical Systems II

Main Organizer: Dr. Dimitrios Loukrezis (Centrum Wiskunde & Informatica)

Chaired by: Dr. Dimitrios Loukrezis (Centrum Wiskunde & Informatica), Prof. Kerstin Lux-Gottschalk (Eindhoven University of Technology)

Equilibria and bifurcations in nonlinear reaction-diffusion PDEs with uncertain parameters

***C. Piazzola**

Uncertainty Quantification on Cable Temperature Models

***J. de Lange**, S. Rieken, L. Scarabosio, G. Lord

A unified pipeline for surrogate forecasting with time-varying sensitivity analysis under parameter and state uncertainty

***I. Jovanovic Buha**, H. Bungartz

Mon, 20/07/2026 14:00 - 14:45

H4 - 6 (Sissi)

MS135B - Local and non-local modelling: concepts, methods and integration in multiphysics damage II

Main Organizer: Dr. Lorenzo Zoboli (Università Campus Bio-Medico di Roma)

Chaired by: Dr. Lorenzo Zoboli (Università Campus Bio-Medico di Roma), Dr. Alexander Hermann (Hamburg University of Technology)

A non-local damage model for the accurate prediction of pathological fractures in femurs

***P. Gaziano**, M. Marino, G. Vairo

Phase-Field Fracture Simulation of Compressive Anti-Crack Scenario in Porous Material

***Y. Luo**

Mon, 20/07/2026 14:00 - 14:45

H4 - 7 (Maximilian)

MS342B - Engineering Challenges and Societal Transformation II

Main Organizer: Dr. Fawaz Annaz (Birmingham City University)

Chaired by: Dr. Fawaz Annaz (Birmingham City University), Dr. Waheb Abdullah (Birmingham City University)

Digital Integration and Sustainability-Oriented Leadership for Sustainable Project Delivery in UK Construction Management: A Sequentially Mediated and Moderated Model

A. Sohail, ***M. Adnan**, S. Sair

Internet of Things-Enabled Thermostatic Radiator Valve for Occupancy-Aware Zonal Heating and Domestic Energy Saving

C. Coetzee, ***W. A. Jabbar**

Dynamic Distribution Network Reconfiguration with Integration of Potential Photovoltaic and Hydrokinetic Sources in Kuching, Sarawak

J. Qi Lim, S. Hao Kueh, A. Jun Yung Hee, J. Yong Tang, J. Tavalaei, ***H. NABIPOUR AFROUZI**

Mon, 20/07/2026 14:00 - 14:45

H4 - 8 (Eventcenter)

MS259B - Generative Models for Inverse Problems, Data Assimilation and Uncertainty Quantification II

Main Organizer: Prof. Assad Oberai (University of Southern California)

Chaired by: Prof. Assad Oberai (University of Southern California)

Style-constrained inverse design of microstructures with tailored mechanical properties using unconditional diffusion models

***W. Xu**, Z. Xie, H. Lin, X. Wang, G. Mou, T. Xue

Deep Image Prior-Driven Inverse Method for Identification of Nonhomogeneous Elastic property distribution

H. Liu, ***Y. Mei**

Digital Twin Enhanced Data Generation for Machine Learning with FBG-based Inclinometer Systems

***A. Strauss**

Mon, 20/07/2026 14:00 - 14:45

BrainLab - Training

MS223B - Projection-Based and Data-Driven Reduced Order Modeling: Bridging Accuracy and Efficiency II

Main Organizer: Dr. Maria Strazzullo (Politecnico di Torino)

Chaired by: Dr. Federico Pichi (SISSA), Dr. Maria Strazzullo (Politecnico di Torino)

Numerical Analysis of the Evolve-Filter-Relax Reduced Order Model for Buoyancy-Driven Flows

***M. Demir**, P. Tsai

Stability, Convergence, and Parameter Scalings for the Evolve Filter Relax Reduced Order Model (EFR-ROM)

***J. Reyes**, M. Strazzullo, T. Chacon Rebollo, T. Iliescu

Stability-aware Time Integration for Reduced Order Models for Incompressible flows

***J. Plana-Riu**, H. Rosenberger, B. Sanderse, F. Trias

Mon, 20/07/2026 14:00 - 14:45

NM - 6 (Munich)

MS380B - Cavitation and Bubble Dynamics II

Main Organizer: Prof. Mauro Rodriguez (Brown University)

Chaired by: Prof. Mauro Rodriguez (Brown University)

CLSVOF-Based Numerical Study of Ultrasound-Driven Bubble Dynamics and Tissue Deformation

J. Park, ***G. Son**

Effect of Ultrasound Frequency and Amplitude on the Oscillation of a Near-Wall Bubble

***H. Teimouri**, G. Janiga, M. Gavaises

Continuous Adjoint to a Steady Isothermal Hydrodynamic Solver, Including Cavitation

***A. Bekhradinasab**, E. Papoutsis-Kiachagias, K. Giannakoglou

Mon, 20/07/2026 14:00 - 14:45

NM - 7 (Venice)

MS389B - Machine Learning for Molecular Simulations II

Main Organizer: Mr. Franz Görlich (TUM)

Chaired by: Mr. Franz Görlich (TUM), Mr. Weilong Chen (TUM)

Transferable ML Interatomic Potentials: From Applied Materials to Molecules in Space

***R. Ibragimova**, M. Caro

Towards Accurate Coarse-Grained Machine Learning Potentials

***F. Görlich**, J. Zavadlav

A Computational Workflow to Unravel the Structural Dynamics of Supramolecular Metallacages in Solution

J. Stebani, ***I. Iribarren Aguirre**, G. Siddiqui, D. Wragg, A. Gagliardi, A. Casini

Mon, 20/07/2026 14:00 - 14:45

ICM - 50 (Seeblick)

NGCE - Computational Methods for Beginners (II)

Mon, 20/07/2026 14:45 - 15:00

Short Break

MS120C - Recent Advances in Computational Methods for the Cardiovascular System III**Main Organizer:** Dr. Richard Schussnig (Ruhr University Bochum)**Chaired by:** Dr. Richard Schussnig (Ruhr University Bochum), Ms. Anna Ranno (RWTH Aachen University)

Scalable Automation of Cardiovascular Geometric Modeling for Patient-Specific Simulation

Keynote

*N. Sveinsson Cepero, C. Taylor

Using Computational Angiography to Diagnose Large Vessel and Microvascular Disease

*C. Figueroa

Integrating Complex Flow Patterns from Venous 4-Dimensional Flow MRI into Computational Fluid Dynamics

*A. Huang, P. Winter, S. Schnell, A. Figueroa

A Myocardial Microvascular Transport and Remodeling Framework to Predict the Structure and Function of Capillary Networks

*V. Sturges, D. Uceda, J. Tune, D. Beard, A. Figueroa

A Microstructurally-Motivated Framework to Study Autoregulation in the Coronary Circulation

*M. Eden, H. Gharahi, V. Sturges, D. Uceda, G. Dick, S. Baek, D. Beard, J. Tune, C. Figueroa

MS208C - Innovative Methods for Fluid-Structure Interaction III**Main Organizer:** Prof. Harald van Brummelen (Eindhoven University of Technology)**Chaired by:** Prof. Joris Degroote (Ghent University), Prof. Harald van Brummelen (Eindhoven University of Technology)

A Partitioned Interface-Tracking Method for Combined Phase Change and Rigid Body Motion in Close-Contact Melting

V. Van Riet, W. Beyne, *J. Degroote

A Fast and Consistent Sharp-Interface Immersed Boundary Method for Moving Bodies

*G. Vagnoli, M. Scapolini, R. Verzicco, F. Viola

An Explicit Approach for Tracking Multiple Interacting Surfaces in Embedded Boundary Methods

*E. Rivas, J. Ryerse, K. Wang, E. Lopez Ramos, E. Guzas

A Fully Eulerian Fluid–Structure Interaction Approach with the Boundary Variation Diminishing Principle

*H. Wakimura, K. Sugiyama, S. Li

An Immersed Boundary Hybrid Approach of Sound Generated by Fish Swarm Model

*Y. Yang, C. Zhao²

Conformal Mapping Technique for Modelling Nonlinear Hydroelastic Waves

*Y. Semenov, B. Ni

MS082A - Advances in Computational Models and Methods for Multiphase Flows with Phase Change I**Main Organizer:** Dr. Marica Pelanti (ENSTA - Institut Polytechnique de Paris)**Chaired by:** Dr. Alessio Roccon (Univeristy of Udine), Dr. Marica Pelanti (ENSTA - Institut Polytechnique de Paris)

Rare Events In Phase Change Dynamics

*M. Gallo, F. Occhioni, R. Daniele, C. Casciola

A model for local bubble nucleation in pool boiling applications

A. Lentner, *E. Balaras

Fluctuating Hydrodynamics and Rare-Event Techniques Unveil the Mesoscale Physics of Boiling

*A. Bonanno, F. Occhioni, M. Bussoletti, M. Gallo

Adaptive Direct Numerical Simulations of Nucleate Boiling with Resolved Microlayer and Conjugate Heat Transfer

*A. Millischer, T. Long, J. Pan, E. Cipriano, M. Bucci, S. Zaleski, C. tecchio

Homogeneous Nanodroplets Condensation in Water

*F. Occhioni, M. Bottacchiari, M. Gallo, C. Casciola

From Droplet Coalescence to Ice Nucleation Rates: A Diffuse Interface Approach for Cloud Microphysics

*R. Daniele, M. Gallo, G. Sardina, C. Casciola

MS024C - Advanced Discretization Schemes for Computational Structural Dynamics III**Main Organizer:** Prof. Bastian Oesterle (Hamburg University of Technology)**Chaired by:** Prof. Manfred Bischoff (University of Stuttgart), Prof. Bastian Oesterle (Hamburg University of Technology)Mixed-Dimensional Time-Dependent Analysis for Coupling an Elastic Solid and a Bending Member **Keynote*****D. Givoli**, D. Rabinovich, A. Loula

An Invariant Finite Element Method for Small Deformations Superposed on Large Rotations using Body-fitted and Unfitted Meshes

D. Li, ***P. Papadopoulos**

On the Extension of Mesh Distortion Insensitive Petrov-Galerkin Finite Element Formulations to Linear Elastodynamics

***F. Zähringer**, P. Betsch

3D Elasticity Models vs. CUF High-order 1D Beam Theories

***R. Azzara**, E. Carrera

Intrinsically Selective Mass Scaling With Hierarchic Plate and Shell Formulations

L. Reinken, H. Jakob, B. Oesterle, ***M. Bischoff****MS071C - Recent advances in numerical methods for hyperbolic systems in fluid dynamics III****Main Organizer:** Phd. Irene Gómez Bueno (University of Málaga)**Chaired by:** Dr. Maria Kazolea (Inria), Phd. Irene Gómez Bueno (University of Málaga)

A Well-Balanced Splitting Scheme for Ripa Equations

***M. Muñoz-Ruiz**, C. Caballero-Cárdenas, M. Castro-Díaz, T. Morales de Luna

A Semi-Implicit Finite Volume Relaxation Scheme for 2D Shallow-Water System

***J. Ramírez Fuentes**, M. Muñoz Ruiz, C. Escalante Sánchez, T. Morales de Luna

Study of bifurcations in the two-fluid equation system in a thermohydraulic calculation code and application to a natural circulation loop under two-phase conditions

R. Poo, C. Pozzolini, ***A. Muller**, B. Pier

Minimally Implicit Runge-Kutta (MIRK) Fully Well-Balanced Method for the 1D Shallow Water Equations with Topography and Manning Friction

***I. Martínez-Donato**, C. Caballero-Cárdenas, I. Gómez-Bueno, I. Cordero-Carrión

Low-Froude Shallow Water as a Stiff Wave System: An Asymptotic-Preserving Finite Volume Approach

***D. Inzunza**, V. Perrier

A time-reconstruction solver for the GRPM and its use in Ader schemes for hyperbolic systems

E. Toro*MS009C - Complex Fluid Flows in Engineering: Modeling, Simulation, and Optimization III****Main Organizer:** Dr. Fabian Key (TU Wien)**Chaired by:** Prof. Jaewook Nam (Seoul National University), Dr. Fabian Key (TU Wien)Contaminant Source Identification in Transient Advection-Diffusion Problems **Keynote*****M. von Danwitz**, M. Mattuschka, D. Walter, A. Popp

Viscocapillary Model of Slot-Coating Flow Simulated with Physics-informed Neural Networks

***J. Son**, J. Nam

A numerical approach for coupling the Lattice Boltzmann Method with a membrane finite element to simulate surface tension driven dynamics in 2D

***F. Séguy**, S. Valette, P. Bocher, E. Lévêque, E. Feulvarch

Immersed boundary Lattice Boltzmann analysis for particle dynamics of complex fluid

***G. Jeong**, Y. Lee, J. Nam

High-Definition Simulation of Packed-Bed Liquid Chromatography in Laterally Unconfined Compartments

***X. Xu**, E. von Lieres, M. Behr

Mon, 20/07/2026 15:00 - 16:30

ICM - 11a

MS039C - Recent Developments and Applications of Meshfree Methods III

Main Organizer: Prof. Tsung-Hui (Alex) Huang (National Taiwan University)

Chaired by: Prof. Ming-Jyun Dai (National Cheng Kung University), Prof. Wen-Chia Yang (National Chung Hsing University)

Application of the Particle Swarm Optimization-Method of Fundamental Solutions (PSO-MFS) for Solving Potential Flow Problems

***M. Gu**

A hybrid radial basis function–finite difference method for nonlinear thermo-mechanical analysis

***G. Vuga, B. Mavrič, T. Dobravec, U. Hanoglu, B. Šarler**

Inverse Heat Conduction Problems using Moving Pseudo-Boundary Method of Fundamental Solutions

***J. Grabski, A. Karageorghis**

A Multilevel Localization of the Method of Fundamental Solutions Applied to Biharmonic Problems

***C. Gáspár**

Numerical Analyses of Holed Bluff-Body for Enhanced Gas Mixing

***S. YEN**

A Meshless Numerical Wave Tank Based on the Method of Fundamental Solutions and Particle Swarm Optimization

***C. Fan, T. Lam, Q. Liu**

Mon, 20/07/2026 15:00 - 16:30

ICM - 11b

MS233A - Advancing Computational Mechanics with Equation Discovery and Symbolic Regression I

Main Organizer: Dr. Geoffrey Bomarito (NASA Langley Research Center)

Chaired by: Dr. Geoffrey Bomarito (NASA Langley Research Center), Dr. Gabriel Kronberger (University of Applied Sciences Upper Austria)

Using Description Length to Guide Genetic Programming Improves Symbolic Regression Solutions

***G. Kronberger, D. Bartlett, H. Desmond, P. Ferreira, F. Olivetti de Franca**

Identifying tractable probabilistic models through uncertainty-aware symbolic regression

B. Schuscha, C. Findenig, ***M. Mücke, D. Scheiber**

On the Effect of Prior Specification in Bayesian Symbolic Regression

***G. Bomarito, P. Leser, J. Pribe, G. Weber**

Symbolic discovery of high-dimensional tensorial governing equations from data

***B. Zhang, J. Lei**

Data-Driven Discovery of Governing Equations in Fluid Dynamics from Molecular Simulations

***T. Chen, J. Zhang**

Mon, 20/07/2026 15:00 - 16:30

ICM - 12a

MS285A - Cents & Sensitivities: Exploiting Differentiable Solvers for Low-Cost Optimization in Science and Engineering I

Main Organizer: Mr. Nicholas Zolman (University of Washington)

Chaired by: Mr. Nicholas Zolman (University of Washington), Ms. Sajeda Mokbel (University of Washington)

Learning from AI: The Case for Differentiable PDE Solvers

***N. Thuerey, B. List, A. Franz, L. Guastoni, G. Baldan, R. Winchenbach**

Automatic Differentiation of Adaptive Solvers Does Not Always Converge to the Correct Derivatives

***C. Rackauckas**

Characterizing Extreme Events in Dynamical Systems through Sensitivity-Based Modal Decomposition

***N. Zolman, S. Mokbel, S. Otto, S. Brunton**

Jutul.jl: fully differentiable finite-volume simulation in Julia

O. Møyner, ***Ø. Klemetsdal, A. Brostrøm, S. Krogstad, K. Lie**

Differentiable Finite Element Modeling of Reactive Low-Mach Flows

***B. Hofer, M. Désor, A. Zimmermann, W. Polifke**

Direct differentiation of the structural response in a mixed Lagrangian time-stepping framework

***N. Pollini**

MS012A - Verification, Validation and Uncertainty Quantification in Modeling and Simulation I**Main Organizer:** Prof. Luís Eça (IST Lisbon)**Chaired by:** Prof. Luís Eça (IST Lisbon), Prof. Sharath Girimaji (Texas A&M University)

Effect of Mathematical Model Simplification on Solution Verification Exercises: An Update on Filipe's Work

Keynote

F. Soares Pereira, ***A. Koskelo**, B. Wilson

Toward Physically-Rigorous and Credible Scale-Resolving Turbulence Simulations: Systematic Assessment with the Partially Averaged Navier-Stokes (PANS) Method

***S. Girimaji**

Verification & Validation exercise for full-scale vessel resistance prediction

***J. Muralha**, A. Maximiano, G. Vaz

Application of the Partially-Averaged Navier-Stokes Equations to Propeller-Rudder Interaction

***R. Lopes**, A. Eslamdoost, S. RoyChoudhury, R. Johansson, R. Bensow

Iterative Errors: the forgotten challenge of CFD

L. Eca**, M. Kerkvliet, S. Toxopeus**MS372C - Phase-field fracture modeling and computation III*Main Organizer:** Prof. Laura De Lorenzis (ETH Zurich)**Chaired by:** Dr. Fabian Welschinger (Robert Bosch GmbH)

Variational Phase-Field Models of Fracture with Arbitrary Strength Surfaces

***B. Bourdin**, C. Maurini, J. Marigo

Strength-Based Variational Approach to Fracture: Numerical Implementation and Classification of Classical Strength Criteria

***C. Maurini**, B. Bourdin, M. Moscatelli, J. Marigo

Variational phase-field modeling of cohesive fracture with flexibly tunable strength surface

F. Vicentini, J. Heinzmann, P. Carrara, ***L. De Lorenzis**

Incorporating strength surfaces in variational phase-field models for brittle fracture

***J. Sargado**, J. Mathiesen

A Cohesive-Frictional Phase-Field Model for Hybrid Fracture in Quasi- Brittle Materials Incorporating Strength Criteria

H. Li, ***T. You**, K. Yoshioka, Y. Liu, Y. Rui, F. Zhang**MS011C - Advances in Neural Network Approximations of Partial Differential Equations III****Main Organizer:** Dr. David Pardo Zubiaur (University of the Basque Country (UPV/EHU))**Chaired by:** Mr. Manuel Sanchez (Pontificia Universidad Catolica de Chile), Ms. Shima Baharlouei (University of Basque Country)

Controlling Bias and Variance When Integrating Neural Networks for Solving PDEs

***J. Taylor**, D. Pardo

A novel variance-based loss function for improved physics-informed deep learning optimization

***J. Hanna**, H. Talbot, I. Vignon Clementel

Machine Learning-Derived Stochastic Quadrature Rules for High-Order, Multidimensional Spaces with Unbiasedness Guarantees

T. Teijeiro, J. Taylor, ***D. Pardo**

Multi-Integral Importance Sampling for Solving PDEs Using Neural Networks

***X. Otxandorena**, D. Pardo, M. Croci

Inexact Uzawa- Double Deep Ritz Method for Weak Adversarial Neural Networks

***E. Benny Chacko**, I. Brevis, L. Espath, K. G. van der Zee

RUNNs: Ritz-Uzawa Neural Networks for Solving Variational Problems

***P. Herrera**, I. Muga, J. Taylor, C. Uriarte, K. Van Der Zee, D. Pardo

Mon, 20/07/2026 15:00 - 16:30

ICM - 14a

MS200B - Computational Design for Additive Manufacturing II

Main Organizer: Dr. Can Ayas (Delft University of Technology)

Chaired by: Prof. Josephine Carstensen (MIT)

ML-Assisted Optimisation of Graded Lattices: Considering Material Anisotropy and Geometrical Nonlinearity

***A. Hosoi**, J. Wang, A. Panesar

Stress-Guided Bayesian Optimization via a AI-FEA Framework for Enhanced Lattice Design in Additive Manufacturing

H. Moeinnia, A. Islam, ***W. Kim**

Data-driven Topology Design of Hyperelastic Auxetic Metamaterials with Structural Stability and its Experimental Validation

***Y. Yang**, K. Yaji, K. Fujita

Multi-lattice Design for Laser Powder Bed Fusion via Multi-scale Post-processing of Topology Optimization Results

***O. Vaverka**, D. Koutny

An Automated OpenFOAM-based Optimization of Triply Periodic Minimal Surface Heatsinks in Forced Convection

***A. Hayes**, B. Hayes, A. Yervez, N. Razavi

Effect of Strut Warping on the Stiffness, Strength and Post-Peak Mechanical Behaviour of BCC Lattice Structures

***R. Das**, A. Exner, N. Pelzang Dorji

Mon, 20/07/2026 15:00 - 16:30

ICM - 14b

MS092B - Computational Scale Bridging in Materials and Structures II

Main Organizer: Prof. Jörg Schröder (University Duisburg-Essen)

Chaired by: Prof. Daniel Balzani (Ruhr University Bochum), Dr. Sonja Hellebrand (University of Duisburg-Essen)

Monolithic Variational Computational Homogenization for Multiscale and Inelastic Problems

***A. Kandivakkam Sethuraman**, F. Schmidt, C. Hesch

Real-time Multiscale Exploration of Grain Boundary Effects on Diffusion in Solid Electrolytes

***L. Scholz**, Y. Ou, S. Keshav, B. Grabowski, F. Fritzen

Failure zone averaging for computational homogenization in phase-field fracture simulations

***M. Rohracker**, H. Holthusen, J. Mergheim

A Hierarchical Framework and Multigrid-in-Time Method for Dynamic Poroelasticity

***M. Padhy**, A. Armiti-Juber, T. Ricken

Linear Porous Media Theory through Variationally Consistent Homogenization

***P. Kreutzheide**, F. Larsson, K. Runesson, R. Jänicke

Mon, 20/07/2026 15:00 - 16:30

ICM - 14c

MS312B - Particle-based methods: advances and applications in DEM, PFEM, SPH, MPM, MPS and others II

Main Organizer: Prof. Eduardo de Morais Barreto Campello (University of São Paulo)

Chaired by: Prof. Peter Wriggers (Leibniz University of Hannover), Prof. Eduardo de Morais Barreto Campello (University of São Paulo)

Revisiting Single-Particle Breakage Using a Voronoi-Based Bonded-Cell Model with Fracture-Energy Regularization

***V. Tojaga**, J. Quist

Scalable DEM-FEM Simulations of Railway Tracks

***A. Ullrich**, J. Quist, G. Kettl, M. Ekh

Validation Analysis of Three-phase Two-point Material Point Method against Centrifuge Model Liquefaction Experiments

***Y. Takegawa**, Y. Higo, F. Zhu, D. Uchiyama

Development of a Gas-Liquid Multiphase Boundary Model in Projection-based SPH Methods

***N. Tsuruta**, T. Gotoh, M. Watanabe, A. Khayyer, H. Gotoh

Planar Viscous Flows Past Elliptic Cylinders up to $Re = 10^5$ with the Diffused Vortex Hydrodynamics Method

***C. Pilloton**, D. Durante, A. Colagrossi

Mon, 20/07/2026 15:00 - 16:30

ICM - B11

MS014C - Advanced computational techniques for fracture III

Main Organizer: Prof. Sonia Marfia (Sonia Marfia, Full Professor, University of Roma Tre)

Chaired by: Prof. Julien Yvonnet (Universite Gustave Eiffel), Prof. Sonia Marfia (Sonia Marfia, Full Professor, University of Roma Tre)

Virtual Element Method for Crack Propagation in Heterogeneous Materials using Adaptive Element Splitting and Modified Park-Paulino-Roesler (PPR) Cohesive Model

***H. Choi**, H. Chi, K. Park, G. Paulino

A Novel Method to Simulate 3D Complex Topological Changes in Fracture

***Y. Zhang**, C. Liu

A 2D quadratically convergent BEM model for crack nucleation and propagation

***G. Fernandes**, J. Pituba, E. de Souza Neto

On the Performance of Polygonal Methods for Crack Growth Problems Using Adaptive Meshes

***E. Oheim**, K. Schmitz, B. Sauren, A. Ricoeur, S. Klinkel

Microstructure Based Fracture Prediction for Additively Manufactured Ceramics

***E. Smith**

Mon, 20/07/2026 15:00 - 16:30

ICM - B12

MS077A - Multiphase Microfluidics I

Main Organizer: Phd. Mohammad R. Hashemi (Universitat Politècnica de Catalunya · Barcelona Tech - UPC)

Chaired by: Prof. Uwe Janoske (University Wuppertal), Prof. Mostafa Safdari Shadloo (INSA Rouen Normandy)

Beyond the Cassie-Baxter Model: New Insights for Predicting Imbibition in Complex Systems

***M. Fricke**, L. Gossel, J. De Coninck

Volume-of-Fluid Simulations of Moving Contact Lines in Microchannels

***T. Han**, J. Pan, M. Ni, S. Zaleski

Pinning-Sliding Transition Model for Algebraic VOF

***S. Sanchez Gamero**, W. Edelbauer, G. Janiga, M. Gavaises

A NURBS-Based Interface-Tracking for Sharp-Interface Multiphase Flow Simulations using Enriched Finite Element Method

A. Shamekhi, A. Hashemi, ***M. Hashemi**, P. Ryzhakov, R. Codina

A Multiphase Lattice Boltzmann-Immersed Boundary Method CFD Solver for Cell Processing Applications

***G. Gallagher**, F. Boyle

Mon, 20/07/2026 15:00 - 16:30

ICM - B13

MS271A - Battery Modeling & Validation for Industrial Applications: Multi-Scale and Multi-Physics Approaches I

Main Organizer: Prof. Andre Haufe (ANSYS Germany GmbH)

Chaired by: Prof. Andre Haufe (ANSYS Germany GmbH), Mr. Tobias Aubel (DYNAmore GmbH)

A Constitutive Approach for Modeling the Strain Rate Dependent Mechanical Short Circuit of Li-ion Cells

***F. Andrieux**, A. Trondl, S. Sommer

Validation of the Mechanical Behaviour of charged 21700 Lithium-Ion Battery Under Different Loading Conditions

***M. Bulla**, S. Kolling

Model-assisted Identification of Degradation Kinetics of Li-Ion Batteries during Thermal Abuse

***U. Krewer**

From Cell to Vehicle: Efficient Crash Simulation through Homogenized Battery Models

***S. Kefer**, A. Petermann, O. Kabis

Multi-Physics Simulation-Based Modeling for Vibration and Noise Reduction of a Spoke-Type BLDC Motor

***J. Kim**, S. Jung, T. Yoon

Mon, 20/07/2026 15:00 - 16:30

ICM - B21

MS229C - Machine Learning for the Design of Sustainable and High-Performance Vehicles III

Main Organizer: Dr. Andrea Serani (National Research Council-Institute of Marine Engineering)

Chaired by: Dr. Philipp Bekemeyer (DLR), Dr. Andrea Serani (National Research Council-Institute of Marine Engineering)

Parametric Model Embedding towards Manifold Learning: A Nonlinear Round-Trip for Efficient Shape Optimization

*A. Serani, M. Diez

Design-Space Dimensionality Reduction for Multidisciplinary and Topology Optimization of Prismatic Planing Hulls

*R. Pellegrini, M. Diez, E. Kubina, F. Stern

Transfer Learning of Parameterizations for the Structural Optimization of Cruise Ship Hulls

*L. Fabris, M. Tezzele, C. Busiello, M. Sicchiero, G. Rozza

Mixed-Fidelity design optimization of hull forms using ANNs, viscous and potential flow solvers within an evolutionary algorithm

*G. Grigoropoulos, C. Bakirtzoglou, G. Papadakis, D. Ntouras

Deep Reinforced Learning-based Hull Form Optimization

*I. Lee, K. Lee, J. Seo

Interpretable vs. Black-Box Models: System Identification of Planing Hull Dynamics Using SINDy and Neural ODEs

F. Franciosa, *S. Brent, G. Huntress, C. Hixenbaugh, S. Brizzolara

Mon, 20/07/2026 15:00 - 16:30

ICM - B22

MS128A - Multiphysics Simulation Techniques for High Performance Computing I

Main Organizer: Dr. Tim Wegmann (AIA, RWTH Aachen University)

Chaired by: Dr. Matthias Meinke (RWTH Aachen University), Dr. Tim Wegmann (AIA, RWTH Aachen University)

Development of 2-way SPH-FVM and SPH-FEM coupling framework for multi-physics simulation

*J. Wang, R. Kong, Z. Nie, Z. Ji

Multicode Coupling for Eulerian and Hybrid-Lagrangian Methods

*P. Pébay, G. Houzeaux

Robust Coupling of Heterogeneous Solvers: A Monolithic Multigrid Framework

*M. Ringborg-Sidorovic, M. Kronbichler, W. Wall

Mon, 20/07/2026 15:00 - 16:30

ICM - 21a

MS321C - Geometric and structure-preserving methods for computational modeling III

Main Organizer: Dr. Christopher Eldred (Sandia National Laboratories)

Chaired by: Dr. William Barham (Los Alamos National Laboratory), Dr. Artur Palha (Delft University of Technology)

Structure-Preserving Discretisation of the One-Dimensional Multilayer Shallow-Water Equations in a Rotating Frame

*J. Arthur

Finite Element method for dissipative Euler-Maxwell equations derived from a discrete variational principle

*B. Manach-Perennou, F. Gay-Balmaz

Geometric Numerical Integration and Reduced Precision Computing

*M. Kraus

Low-Mach Compressible Navier-Stokes Using Discrete Exterior Calculus on Rectilinear Grids

*G. Rauta, J. Fairbanks

Vakonomic Discretizations of Ideal Fluids

*R. Roy-Chowdhury, M. Nabizadeh, O. Gross, A. Gruber, A. Chern

Phonon propagation in layered periodic structures with discrete exterior calculus

*M. Myyrä, S. Mönkölä

Mon, 20/07/2026 15:00 - 16:30

ICM - 21b

MS206C - Mechanics of soft, multifunctional materials: experiments, modelling, and simulation III

Main Organizer: Prof. Mokarram Hossain (Swansea University)

Chaired by: Prof. Jesús Martínez Frutos (universidad politécnica de cartagena), Dr. Zhanfeng Li (South China University of Technology)

Geometrically Exact Beam Formulation for Magneto-Active Soft Structures with Contact [Keynote](#)

*A. Ghosh, C. Kadapa, D. Peric, M. Hossain

A Thermodynamically Consistent Statistical–Continuum Model for Nematic Liquid Crystalline Elastomers with Director Microstretch

*A. Kasarla

Computational Modeling for the Thermo-electro-mechanical Coupling in Electroactive Polymers

*J. Kumar, B. Dana, M. Jabareen

Experimental and Finite Element Investigation of the Mechanical Response of Closed-Cell Aluminum Foam

*I. Derbala, Y. Djemaoune, D. Tria

Competition between Mullins and boundary effects in tensile wrinkling of hyperelastic thin films

*P. Chai, T. Wang, Y. Yang, F. Xu

Mon, 20/07/2026 15:00 - 16:30

ICM - 22a

MS286C - Scalable Linear Solvers for Real-World Applications: Algorithms and Implementations III

Main Organizer: Phd. Adel Alsalti-Baldellou (University of Padova)

Chaired by: Dr. Carlo Janna (University of Padova)

A scalable multidimensional fully implicit solver for Hall magnetohydrodynamics **Keynote**

***L. Chacon**

Optimal Preconditioning for the Parallel Finite Element Solution of a Multiphase Flow Model of Vascular Tumour Growth

T. Alrefai, O. Harlen, ***P. Jimack**, M. Walkley

Assessment of Preconditioners for Linearised Frequency Domain Analysis of Unsteady Aerodynamics

***S. Edwards**, S. Timme

Accelerating steady-state CFD simulations by leveraging non-converged linear solutions

***F. Klöppner**, M. Malvestiti, A. Er-Raiy, J. Wendler, A. Rempke, O. Krzikalla, D. Kunhappan, I. Huismann

Weak Scalability of the Pressure in the High-Order Incompressible Flow Solver SOD2D Using Multigrid

***H. Owen**, R. de Olazabal, O. Lehmkuhl

Mon, 20/07/2026 15:00 - 16:30

ICM - 22b

MS067A - Optimal Design of Novel Materials and Structures Using Isogeometric Analysis I

Main Organizer: Prof. Leonardo Leonetti (UNICAL)

Chaired by: Prof. Leonardo Leonetti (UNICAL), Dr. Toan Le (Ho Chi Minh City University of Technology (HCMUT))

Isogeometric and Meshfree Thin Shells: Formulations and Applications **Keynote**

***Y. Bazilevs**

Designing Bone Implants Using Spline-Based Lattice Structures

***C. Meinke**, K. Key, S. Elgeti

Isogeometric Reaction–diffusion B-spline Level-set Method for Triply Periodic Minimal Surface Design

***S. Ruan**, H. Li, X. Wang, S. Zhou

Adaptive isogeometric topology optimization maximizing natural frequency for multi-patch vibrating structures

***X. Xie**, S. Wang

Mon, 20/07/2026 15:00 - 16:30

ICM - 41 (Ostersee A)

MS029A - Advanced and Hardware-In-the-Loop Testing of Railway Vehicle Components I

Main Organizer: Dr. Gioele Isacchi (Politecnico di Milano)

Chaired by: Dr. Gioele Isacchi (Politecnico di Milano), Prof. Francesco Ripamonti (Politecnico di Milano)

Design and Hardware-in-the-Loop Validation of a Wheel Slide Protection System for Articulated Freight Wagons

F. Mazzeo, ***M. Santelia**, E. Di Gialleonardo, S. Melzi

HiL testing and identification of mechatronic railway bogie test bench

***D. Lüdicke**, T. Posielek, A. Heckmann, G. Hippmann

Hardware-in-the-Loop Test Bench for Simulation of Railway Operations Including Real-time Manual Driving

***M. Barbaro**, I. La Paglia, L. Bernardini, A. Collina, R. Corradi

Hardware-in-the-Loop Pantograph Tests Interacting with Rigid Overhead Conductor Rail

***S. Gregori**, M. Tur, G. Vallet, J. Gil, A. Pedrosa, A. Correcher, S. Postigo, F. Fuenmayor

Mon, 20/07/2026 15:00 - 16:30

ICM - 42 (Ostersee B+C)

MS353C - Emerging Topology and Shape Optimization Techniques in Computational Design of Materials and Structures III

Main Organizer: Prof. Ahmad Najafi (Drexel University)

Chaired by: Dr. Alejandro Aragón (Delft University of Technology), Dr. Kai James (Kai James)

Generalizable Neural Topology Optimization via Deep Energy Methods

X. Zhao, A. Iskit, ***X. Qian**

Topology Optimization of a Bistable Airfoil Under Aerodynamic Loading and Natural Frequency Constraints

D. Oluwalana, ***K. James**

Manufacturing Aware Multiobjective Shape Optimization of Bézier Parametrized Nonlinear Exoskeleton Flexible Links

***M. Sartorato**, F. de Paiva Cruz, W. Miranda Dos Santos

On the acceleration of the topology optimization process. The two level perspective

R. Merli Gisbert, E. Moltó Martínez, J. Navarro Jiménez, J. Ródenas García, ***E. Nadal Soriano**

Topology Optimization of Thermal Circuits using Thermo-mechanical Metamaterials (TMMS)

***A. Torres**, A. Gaynor, E. Wetzel

Design of All-Solid-State Battery (ASSB) Electrodes Using Eulerian Shape Optimization

***J. Gorman**, A. Najafi

Mon, 20/07/2026 15:00 - 16:30

ICM - 43 (Eibsee)

MS034A - Advanced Solvers for Poromechanics I

Main Organizer: Prof. Markus Bause (Helmut Schmidt University)

Chaired by: Prof. Markus Bause (Helmut Schmidt University)

A Novel Stabilized Mixed Formulation of Coupled Poroelasticity with Mean Stress Computation

***M. Ferronato**, A. Franceschini, H. Tasinafo Honorio, H. Hajibeygi

Stochastic Galerkin Methods: Potential for Simulation of Poroelasticity in Complex Media?

M. Bause, ***M. Dawor**, N. Margenberg, P. Shamko

Convergence Analysis of the Parareal Algorithm for the Quasi-Static Biot's Consolidation Model

***I. Jimenez-Ciga**, F. Gaspar, K. Kumar, F. Radu

Non-Iterative Sequential Schemes for Biot's Model

X. Hu, F. Gaspar, ***C. Rodrigo**

Mon, 20/07/2026 15:00 - 16:30

ICM - 44 (Schliersee)

MS211A - Geomechanics of the Cryosphere I

Main Organizer: Dr. Kara Peterson (Sandia National Laboratories)

Chaired by: Prof. Deborah Sulsky (University of New Mexico)

Multiscale Models for Sea Ice

***K. Golden**

A continuum visco-elasto brittle model for sea ice with a granular transition

***A. Amblard**, V. Dansereau, J. Weiss

Sea Ice Dynamics Modelling with the tanuki™ Combined Finite Discrete Element Framework

***A. Farsi**, M. Tsamados

Modeling Sea Ice Dynamics in Nares Strait with a Bonded Discrete Element Method

***D. O'Connor**, K. Peterson, A. Turner, S. Nikolov

Mon, 20/07/2026 15:00 - 16:30

ICM - 31 (Zugspitze)

MS010C - Non-Conventional and Multi-Scale Methods for Solid and Fluid Mechanics (NMSFM) III

Main Organizer: Prof. Wojciech Sumelka (Poznan University of Technology)

Chaired by: Dr. Krzysztof Szajek (Poznań University of Technology), Dr. Tomasz Błaszczyk (Czestochowa University of Technology)

Nonlocally Regularised Stress-Fractional Plasticity Model

***Y. Sun**, W. Sumelka

Analytical and Numerical Solutions of a Fractional Continuum Model with Composed Fixed-Memory Derivatives

***D. Kustal**, A. Nowak, T. Błaszczyk

Multiscale Computational Framework for Coral Aragonite Biomechanics: From Molecular Dynamics to Representative Volume

***N. Kvashin**, U. Wolfram

A FEM-based formulation for nanostructures: from allotropes of carbon to proteins

***A. Fernández San Miguel**, I. Couceiro Aguiar, L. Ramírez Palacios, F. Navarrina Martínez

Mon, 20/07/2026 15:00 - 16:30

ICM - 32 (Watzmann)

MS217A - Computational Analysis of Advanced Materials and Structures I

Main Organizer: Prof. Efsthios Theotokoglou (NATIONAL TECHNICAL UNIVERSITY OF ATHENS)

Chaired by: Prof. Efsthios Theotokoglou (NATIONAL TECHNICAL UNIVERSITY OF ATHENS), Mr. Ahmet Alper Akis (Jupiter Bach A/S)

Computational Evaluation of Mechanical Metamaterials Bandgap **Keynote**

P. Lympieropoulos, ***E. Theotokoglou**

Fatigue Damage in Fiber-Reinforced Polymers for the Wind Sector: Method and Validation on a Representative Subcomponent

***A. Akis**

Integration of Thermal-Crystal Plasticity Simulation and Dynamic Mode Decomposition for Cyclic Thermal Loading Analysis

***H. Ohashi**, Y. Aoyagi

Numerical Simulation of the Progressive Debonding Behavior at the Fiber/Matrix Interface in Short-Fiber CFRP Subjected to Cyclic Loading

***S. Horiguchi**, Y. Li, J. Koyanagi

Numerical Study of the Influence of Interlaminar Modelling on the Shock Wave Propagation in Composite Laminates

***B. Better**, C. Espinosa, A. El Malki Alaoui, S. Guetta

Mon, 20/07/2026 15:00 - 16:30

BrainLab - Auditorium

MS234C - Quantum Scientific Computing III

Main Organizer: Prof. Yan Wang (Georgia Institute of Technology)

Chaired by: Dr. Mayu Muramatsu (Keio University), Prof. Zhiyan Ding (University of Michigan)

A Fully Coherent Quantum Approach for PDE-Constrained Optimization

***Y. Sato**, J. Kato, H. Yano, K. Ito, N. Yamamoto

Hybrid Qubit-Bosonic Quantum Optimization

***Y. Wang**

Topology Optimization of Truss Structures Using Quantum Hamiltonian Descent

***M. Katano**, K. Endo, Y. Yamamoto

Scalable Quantum Deformation Analysis of Periodic Truss Structures Using the Quantum Approximate Optimization Algorithm with Fourier-Structured Hamiltonians

***R. Honda**, K. Endo, M. Muramatsu

A Quantum–Classical Spectral Method for Topology Optimisation

***S. Perera**, Y. Jetti, F. Cirak

Hybrid Quantum-Classical Optimization for Aerodynamic Airfoil Design: A Comparative Study of Variational and Search-Based Algorithms

***F. D'Aniello**, G. De Gregorio, D. Quagliarella, G. Nunziata, A. Iodice

Mon, 20/07/2026 15:00 - 16:30

NM - 1 (Multimedia Saal)

MS246C - Numerical Methods for Interface-Resolved Multiphase Flows III

Main Organizer: Dr. Nicolas Valle (TU Delft)

Chaired by: Dr. Nicolas Valle (TU Delft)

A Sharp Front-tracking algorithm for the two-fluid model preserving local interfacial jumps and reducing curvature errors

***P. DEMPOWO**, M. Grosso, E. Jamelot, P. Omnes

Front tracking method for two-phase flows with surfactant-induced surface viscous effects

D. Panda, ***A. Abdal**, L. Kahouadji, O. Matar, S. Shin, J. Chergui, D. Juric

Extension of the Integral Boundary Layer Method to Thin Film Flow Created by Vertical Cylindrical Jet Dispense

***S. Kebinger**, H. Steiner

Toward scale-up simulation of gas-solid-liquid flows based on an interface-resolved VOF-IBM method

***M. Outokesh**, C. Porcaro, M. Hlawitschka, M. Saeedipour

Computational Modelling of Benard-Marangoni Convection with a Deformable Free Surface

***H. Tarmann**

Mon, 20/07/2026 15:00 - 16:30

NM - 2 (Salzburg)

STS421A - Technological and Operational Roadmap for Greening of Aviation I

Main Organizer: Mr. Luis Campos (Universidade de Lisboa)

Chaired by: Prof. Rosa Maria Arnaldo Valdés (Universidad Politécnica de Madrid), Prof. Oleksandr ZAPOROZHETS (Siec Badawcza Lukaszewicz - Instytut Lotnictwa)

Contributions to the Greening of Aviation from the Project EFACA (Environmentally Friendly Aviation for All Classes of Aircraft)

Keynote

***L. Campos**, P. Serrão, J. Marques

Preparation for Testing the Gearbox, Which Combines the Output Power of the GTE and the Electric Engine to Drive the Air Propeller of a Hybrid Turbo-Electric Propulsion

***S. Dmytriyev**, A. Yedynovych, O. Korniychuk, I. Kravchenko

Key Considerations for Defining a Roadmap on the Use of Batteries for Aircraft Propulsion

***M. Zamarreño Suárez**, R. Arnaldo Valdés, R. Delgado-Aguilera Jurado, F. Pérez Moreno, C. Gómez Arnaldo, V. Gómez Comendador

The Design of a Hybrid Turbo-Electric Propulsion (HTEP) With Fuel Cells for a Hybrid Regional Aircraft (HRA) With a Capacity of 80 Passengers and a Range of 1,000 km. Assessment of the Applicability of Energy Supply Concepts.

***M. Kirichkov**, O. Yelans'ky, I. Kravchenko

Comparison of the Alternative Trends of the Global and Regional Aircraft Fleet Evolution on Noise Exposure and Impact on Population

***K. Kazhan**, V. Makarenko, O. Zaporozhets, A. Chyla, V. Tokarev

Comparison of alternative global and regional aircraft fleet development trends that meet ICAO LTAG and ACARE 2050 fuel consumption and emissions targets in specified aircraft classes

***O. Zaporozhets**

Mon, 20/07/2026 15:00 - 16:30

NM - 4 (Hamburg)

STS413A - eVTOL: Configuration, Simulation and Optimization I

Main Organizer: Prof. Ning Zhao (Nanjing University of Aeronautics and Astronautics)

Chaired by: Prof. Ning Qin (University of Sheffield), Prof. Ning Zhao (Nanjing University of Aeronautics and Astronautics)

Numerical Study of the Aerodynamic Interaction between Structure Wake and Lift-plus-cruise eVTOL

Keynote

*Y. Wang, C. Xue, N. Qin, N. Zhao

Mission-Level Feasibility Assessment of eVTOL under Coupled Energy and Thermal Constraints

*H. Nakayama, Y. Inoue, A. Andreeva-Mori, D. Sasaki

Optimal Control-Based Operational Characteristic Analysis and Adjustment Scheme Design for Tilting Electric-Driven Ducted Fans

*Z. Su, B. Zhang, J. Zhu, Y. You

Wind-Resilient eVTOL Configuration and Flight Testing

H. Wang, *X. Shan

Mid-Fidelity Analysis of Aerodynamic Interaction in Lift+Cruise VTOL Urban Air Mobility Concept Aircraft

*Q. Wu, N. Zhao, Y. Song, Q. Wu

Mon, 20/07/2026 15:00 - 16:30

NM - 5 (KK)

MS276C - Beyond classical schemes: Recent developments of high-order structure-preserving methods for compressible flows III

Main Organizer: Prof. Philipp Öffner (TU Clausthal)

Chaired by: Prof. Sandra May (TU Berlin), Dr. Hennes Hajduk (TU Dortmund)

Fully Discrete Active Flux Methods for Hyperbolic Problems

*C. Helzel

A Third-Order Geometry-Compatible Active Flux Method for Hyperbolic PDEs on Arbitrary Manifolds

*N. Afanasev, R. Abgrall

Active Flux Method for Hyperbolic Problems using Multidimensional Evolution Operators and WENO reconstruction

*Z. Tang, M. Lukacova

On the Construction of Mesh-Free Function Space Summation-By-Parts Operators in Multiple Dimensions

*J. Lampert, J. Glaubitz, A. Iske, P. Öffner

An High-Order Entropy-Stable Shock Capturing on Heterogeneous Grids using Discontinuous Galerkin Spectral Element Methods

*A. Schwarz, J. Keim, P. Kopper, A. Beck

An Entropy Stable Discontinuous Galerkin Spectral Element Method on Heterogeneous Grids

*J. Keim, A. Schwarz, P. Kopper, A. Beck, C. Rohde

Mon, 20/07/2026 15:00 - 16:30

NM - 3 (BB)

MS101A - Isogeometric Analysis of Thin Structures I

Main Organizer: Prof. Josef Kiendl (University of the Bundeswehr Munich)

Chaired by: Prof. Josef Kiendl (University of the Bundeswehr Munich), Prof. Bastian Oesterle (Hamburg University of Technology)

Unified CAD–CAE workflow for formfinding and structural analysis of thin shells using IBRA

Keynote

A. Goldbach, *C. Lázaro

An Integrated Design-to-Manufacturing Workflow for Thin-Walled Structures in Additive Manufacturing: An Isogeometric Approach

*M. Wesseler, M. Loibl, J. Kiendl

A Geometrically Nonlinear Reissner-Mindlin Shell with Load ?Step?Driven Mesh Adaptation

*J. Arf, M. Reichle, S. Klinkel, B. Simeon

Dynamic Isogeometric and Finite Element Analysis of Composite Beams with Interlayer Slip

*R. Bergman, C. Adam, T. Furtmüller

Mon, 20/07/2026 15:00 - 16:30

H4 - 1 (Ludwig)

MS152C - Advances in Multidisciplinary Design Analysis and Optimization (MDAO): Scalable Algorithms, Software Frameworks and Libraries III

Main Organizer: Dr. Arthur Stueck (German Aerospace Center (DLR))

Chaired by: Prof. John Hwang (University of California San Diego), Dr. Thomas Hafemann (German Aerospace Center (DLR-SP))

Recent advances in the GEMSEO MDO framework and open challenges

***F. Gallard**

Unified Plugin API FSMDAO for Derivative-Enabled MDAO in the FlowSimulator HPC Ecosystem: Method and Selected CFD-Coupled Examples

S. Gottfried, F. Roß, K. Masilamani, T. Hafemann, J. Park, ***A. Stück**

Global sensitivity analysis-based dimension reduction for multidisciplinary design optimization under uncertainty

***B. Wang**, M. Ruh, A. Tian, L. Scotzniovsky, J. Hwang

Evaluation of CFD-Coupled Adaptive Time-Stepping for Time-Accurate MDA(O)

I. Shuvi, ***F. Roß**, A. Stück

Non-intrusive, Hessian-based transformation to mitigate ill-conditioned optimization problems

H. Idris, ***J. Hicken**

Mon, 20/07/2026 15:00 - 16:30

H4 - 2 (Leopold)

MS055C - Digital Twins for Infrastructures – From Models to Decision Support III

Main Organizer: Mr. Max von Danwitz (German Aerospace Center)

Chaired by: Dr. Tim Brepols (RWTH Aachen University), Dr. Daniel Wolff (University of the Bundeswehr Munich)

Probabilistic Virtual Sensing of Reinforced Concrete Structures Based on Gaussian Processes and Physics-based Models

***B. Maradni**, S. Brandstaeter, A. Popp

Optimized Placement of Distributed Optic Fiber Sensors for Structural Health Monitoring via the Modified Constitutive Relation Error

***J. Pérez Orozco**, L. Chamoin, J. Cortial, M. De-Buhan, B. Soulier

Continuous model updating to track the evolution of structural parameters of a bridge under varying environmental conditions

***I. Rosati**, C. Rainieri

Adaptive Agentic Digital Twin for Retrofitting Decision Making of Concrete Infrastructure

***M. Nouredin**

Fault Detection and Classification for Mass Flow Controller Based on Modularized Neural Networks Approach

***L. Chiang**, T. Huang, Y. Chou

Parameter Identification for a Rail Vehicle Dynamic Digital Twin with Onboard Accelerometers and Real Track Data

***J. Stadlmeier**, J. Groos, A. Lähns

Mon, 20/07/2026 15:00 - 16:30

H4 - 3 (Franz)

MS243C - Progress in Computational Multiphysics Using Open-Source Software III

Main Organizer: Prof. Holger Marschall (Technische Universität Darmstadt)

Chaired by: Prof. Holger Marschall (Technische Universität Darmstadt), Dr. Maximilian Kannapinn (Technical University of Darmstadt)

SOD2D: Spectral high-Order coDe 2 solve partial Differential equations

***L. Gasparino**, J. Muela Castro, F. Spiga, O. Lehmkuhl

An OpenFOAM-based open-source multiphysics framework for modelling cold atmospheric plasmas

***G. Vafakos**, E. Karvelas, A. Iosif, C. Anastassiou, V. Vavourakis

How Open-Source Software and Best Practices Help us to Improve Glaciers in a Global Earth System Model

***B. Rodenberg**

A Multiscale Modelling Framework for Additively Manufactured Heat Exchangers

L. Cibrario, ***I. Cozza**, C. Delprete, A. Ferrero, C. Gastaldi, W. Cherkaoui

Enabling Volumetric Block-Coupling in multiPhysicsFoam

***T. Oyedeji**, C. Habes, M. Kannapinn, A. Yadav, H. Marschall

Multi-region Thermo-Fluid Analysis of Pressure Vessel considering Chemical Reactions

***M. Mabuchi**, H. Kuramae

Mon, 20/07/2026 15:00 - 16:30

H4 - 4 (Alois)

MS279C - AI for Computational Fluid Dynamics - Opportunities and Challenges III

Main Organizer: Prof. Nils Thuerey (TUM)

Chaired by: Dr. Nguyen Anh Khoa Doan (Imperial College London), Prof. Nils Thuerey (TUM)

Insights on long-term stability in auto-regressive AI weather models Keynote

***F. Lehmann**, F. Ozdemir, Y. Cheng, S. Mohebi, O. Fuhrer, T. Hoeffler, S. Mishra, M. Salzmann, S. Schemm, B. Soja

3D Super-Resolution for Fast Prediction of Microscale Urban Wind

***T. Takase**, Y. Onodera, Y. Yasuda, R. Onishi

Data-Driven Prediction of Forced-Motion Unsteady Aerodynamic Surface Quantities Using Graph Neural Ordinary Differential Equations

***H. Lange**, P. Bekemeyer

Data-driven control of extreme events in turbulent flows through latent space clustering

***Y. Shehata**, K. Schuurman, P. Estévez, N. Doan

Mon, 20/07/2026 15:00 - 16:30

H4 - 5 (Xaver)

MS043A - Fracture, Damage and Failure Mechanisms of Cementitious Materials I

Main Organizer: Dr. Rena C. Yu (Universidad de Castilla-La Mancha)

Chaired by: Eng. Olga Sinitsky (BGU), Dr. Petr Miarka (Institute of Physics of Materials, Czech Academy of Sciences)

Computational and experimental assessment of TRC matrix-impregnation bonding using push-out tests

***O. Sinitsky**, A. Peled, E. Priel

A Multi-Mechanism Damage Model for Concrete Structures Based on Microstructural Stress Analysis

***T. Perron**, P. Morenon, A. Papon, A. Sellier, C. Lejouad, J. Adia

Adjustments of Fatigue Crack Growth Rate of Concrete Based on MFEM Numerical Approach

***P. Miarka**, J. Mašek, L. Malíková

Fast Fourier Transform Simulation and Experimental Investigation of Phase-Field Fracture in Glass Bead Concrete

***D. Nguyen**, Q. To, H. Le Quang, F. Schmidt, L. Tran

Mon, 20/07/2026 15:00 - 16:30

H4 - 6 (Sissi)

MS085A - Sharing Advances In Numerical Methods For The Transport, Boltzmann Equation I

Main Organizer: Dr. François Madiot (CEA)

Chaired by: Prof. Matthias Schlottbom (University of Twente), Dr. François Madiot (CEA)

Application of Diffusion Synthetic Acceleration to a Generalized Eigenvalue Problem in the MINARET Transport Solver

***F. Madiot**

Interface layers and coupling conditions for discrete kinetic models on networks: a spectral approach

R. Borsche, T. Damm, A. Klar, ***Y. Zhou**

Multifidelity Variance Reduction Methods for Non-Equilibrium Gases and Plasmas

***G. Yalla**, L. Meredith, B. Reuter, C. Logemann

Cycle-Free Polytopal Mesh Sweeping for Boltzmann Transport

A. Calloo, ***M. Evans**, H. Lockyer, F. Madiot, T. Pryer, L. Zanetti

Variance Reduction Methods in Particle-in-Cell Simulations with Monte Carlo Collisions

***L. Meredith**, B. Reuter, G. Yalla, C. Logemann

An Efficient Low-rank Source Iteration with Diffusion Synthetic Acceleration for Radiative Transfer Equation

W. Guo, ***Z. Peng**

Mon, 20/07/2026 15:00 - 16:30

H4 - 7 (Maximilian)

MS349A - Topology, Shape And Parameter Optimisation For Time-Dependent Systems I

Main Organizer: Dr. Hao Li (University of Southern Denmark)

Chaired by: Phd. Joe Alexandersen (University of Southern Denmark), Dr. Hao Li (University of Southern Denmark)

Parallelization in time for inverse problems

J. Angel, F. Bense, ***S. Götschel**, D. Ruprecht

Towards Fast Topology Optimisation of Non-Linear Heat Transfer with Phase-Change Materials using Space-Time Finite Elements and Space-Time Multigrid

***J. Alexandersen**, M. Appel

Towards Adaptive Space-Time Finite Element Topology Optimisation of Unsteady-State Heat Conduction

***H. Li**, J. Alexandersen

Two-material optimal design problem governed by the heat equation

K. Matsushima, ***T. Oka**

Topology Optimization for Unsteady Surface flow

***Y. Deng**, J. Korvink

Mon, 20/07/2026 15:00 - 16:30

H4 - 8 (Eventcenter)

MS110A - Computational Models for Cancer Research and Oncology I

Main Organizer: Dr. Guillermo Lorenzo (University of A Coruña)

Chaired by: Dr. Guillermo Lorenzo (University of A Coruña)

Foundational advancement toward development and deployment of digital twins for neoadjuvant therapy of triple negative breast cancer

Keynote

***C. Wu**, E. Lima, C. Stowers, Z. Xu, C. Yam, J. Son, J. Ma, G. Rauch, T. Yankeelov

Digital Twins in Computational Oncology: Probabilistic Formulation of Personalized Risk Assessment

***F. Arceci**, P. Vitullo, B. Dionisi Ferrara, M. Tezzele, P. Zunino, T. Rancati

Utilizing Histopathology to Calibrate Digital Twins of Tumors

***P. Schlicke**, N. Fortelny, H. Enderling

Digital-twin framework to investigate the impact of vertebral metastatic lesions on spinal biomechanics.

***S. Laranjeira**, S. Walker-Samuel, R. Shipley

TMEImmune and Beyond: Patient-Specific Computational Models for Precision Cancer Treatment

***L. Shahriyari**

Mon, 20/07/2026 15:00 - 16:30

BrainLab - Training

MS223C - Projection-Based and Data-Driven Reduced Order Modeling: Bridging Accuracy and Efficiency III

Main Organizer: Dr. Maria Strazzullo (Politecnico di Torino)

Chaired by: Dr. Maria Strazzullo (Politecnico di Torino), Dr. Federico Pichi (SISSA)

Collocation-based surrogate modeling approaches to uncertainty quantification of coupled problems

***L. Tamellini**

Optimal Transport-Based Uncertainty Quantification for Reduced Order Models

***G. Lorenzon**, F. Regazzoni

UQ Analysis for Cancer-On-Chip Experiments

***L. Rinaldi**, S. Bertoluzza, G. Bretti, L. Tamellini, P. Zanotti

Likelihood-informed model reduction for Bayesian inference of static structural loads

***J. Scheffels**, E. Qian, I. Papaioannou, E. Ullmann

Mon, 20/07/2026 15:00 - 16:30

NM - 6 (Munich)

MS167A - Design and Manufacturing of Functionally Graded Composites I

Main Organizer: Prof. Stefanie Elgeti (TU Wien)

Chaired by: Mr. Konstantin Key (TU Wien), Dr. Matthias Klaerner (TU Chemnitz, Institute of Lightweight Structures)

Predicting Effective Material Properties of Short Fibre Reinforced Plastics Using a Neural Network

***F. Rückert**, H. Wulf, J. Ihlemann

Automated Optimization of Load-Dedicated Graded Designs for Fiber-Reinforced Plastic Structures

***K. Key**, S. Elgeti

Predicting Local Stress States in Injection-Molded Ribs Using Sparse Sensor Data and Combined Analytical-Simulation Models

L. Haugk, F. Böttger, R. Decker, L. Kroll, ***M. Klaerner**

Adaptive Space-Time Mesh Refinement for Short Fiber-Reinforced Injection-Molding

***G. Kornmaier**, F. González, N. Hosters, M. Behr

Numerical Investigation of Process-Induced Structural Effects in Pressed Braided Thermoplastic Tape Composites

***E. Madia**, G. Tzortzinis, A. Filippatos, M. Gude

Simulation-Based Analysis of Hybrid Architectural and Laminate Honeycomb Structures Under In-Plane Compression Loading

***Y. Djemaoune**, A. Medjahed, M. Bouladjoul

Mon, 20/07/2026 15:00 - 16:30

NM - 7 (Venice)

MS122A - Data-Driven Models and Validation Methods for Aeronautical Design and Simulation I

Main Organizer: Dr. Gonzalo Rubio (UPM)

Chaired by: Dr. Gonzalo Rubio (UPM), Mr. Nicolás Becerra-Zuñiga (Universidad Politécnica de Madrid)

Clustering-Enhanced MLP for Aerodynamic Surface Pressure Prediction

***M. Jaraiz**, F. Gutierrez, P. Yeste, M. Arnabat-Martín, S. Lanzan Ferran, A. Gabín, G. Rubio, E. Valero, L. Lacasa

Next-Gen Models for Aero: Diffusion, Transformers, and Flow Matching

***D. Ramos**, L. Lacasa, M. Arnabat-Martín, A. Mateo-Gabín, S. Lanzan, E. Valero, G. Rubio

Physics-Consistent Calibration of Surrogate Models for Multi-Mesh Pressure Field Prediction

***F. Gutiérrez**, F. Giral, M. Arnabat-Martín, A. Mateo-Gabín, S. Lanzan Ferran, E. Valero, G. Rubio

How to Train Your PINN: Pitfalls and the Perils of Low-Quality Data

***N. Becerra-Zuñiga**, D. Ramos, L. Lacasa, E. Valero, G. Rubio

Machine Learning You Can Certify: Predicting Fatigue Life in Aircraft

***Á. Ladrón**, M. Sánchez-Domínguez, J. Rozalén, F. Sánchez, J. de Vicente, L. Lacasa, E. Valero, G. Rubio

Mon, 20/07/2026 16:30 - 17:00

Coffee Break

Mon, 20/07/2026 17:00 - 18:30

ICM - 1 Auditorium

MS120D - Recent Advances in Computational Methods for the Cardiovascular System IV

Main Organizer: Dr. Richard Schussnig (Ruhr University Bochum)

Chaired by: Ms. Anna Ranno (RWTH Aachen University), Dr. Richard Schussnig (Ruhr University Bochum)

Decoding the Heart: Generating ECG-Based Cardiac Digital Twins at Scale **Keynote**

***E. Zappone**, K. Gillette, T. Schrotter, M. Gsell, G. Plank

Electromechanical modelling of Ventricular Septal Defects: an active formulation for interaction potentials method

***F. De Vita**, F. Caruso Lombardi, R. Verzicco, F. Viola

An Orthotropic Viscoelastic Model for Passive Myocardium: Formulation and Numerical Implementation at Finite Strains

***H. Ge**, B. Cansiz, M. Kaliske

Non-Invasive Estimation of Left Ventricular Filling Pressure for Grading Severity of Diastolic Dysfunction using Lumped Parameter Modelling Framework and Cardiac Shear Wave Elastography

***R. Manoj**, A. Caenen, L. Wouters, J. Voigt, J. D'hooge, L. Rune Hellevik

Numerical Simulation of Aortic Valve Leaflets Calcification Under Cyclic Loading

***M. Susini**, I. Cheylan, L. Macé, J. Favier

Mon, 20/07/2026 17:00 - 18:30

ICM – 2

MS208D - Innovative Methods for Fluid-Structure Interaction IV

Main Organizer: Prof. Harald van Brummelen (Eindhoven University of Technology)

Chaired by: Prof. Harald van Brummelen (Eindhoven University of Technology), Prof. Trond Kvamsdal (Norwegian University of Science and Technology (NTNU))

Immersed Isogeometric Analysis For Vibro-Acoustic Simulations

***C. Hoareau**, T. Landi, R. Citarella, J. Deü, R. Ohayon

On bifurcations and traction forces on an obstacle in incompressible flow

***S. Schwarzacher**

Accelerating High-Fidelity Fluid-Structure Interaction Simulations of Hairy Yarns Subjected to High-Speed Air Flows

***A. Bral**, L. Daelemans, J. Degroote

Efficient computational framework for fluid-structure-piezoelectric interaction problems in energy harvesting procedures

***W. Yang**, Z. Li, A. Ducoin

Strongly Coupled Hybrid Formulation for Non-Conforming Fluid and Structural Subdomains with Fluid Solver Subcycling.

***R. Pulicani**, M. Brun, O. Allain, A. Gravouil

Mon, 20/07/2026 17:00 - 18:30

ICM – 3

MS082B - Advances in Computational Models and Methods for Multiphase Flows with Phase Change II

Main Organizer: Dr. Marica Pelanti (ENSTA - Institut Polytechnique de Paris)

Chaired by: Prof. Mauro Rodriguez (Brown University), Dr. Marica Pelanti (ENSTA - Institut Polytechnique de Paris)

Modeling and simulation of bubble nucleation in magma

***M. Bottacchiari**, J. Gardner, M. Nishiwaki, D. Sahagian, P. Sullivan, F. Wadsworth, M. Gallo

Physics-informed Kolmogorov Arnold Network solves 3D unsteady heat conduction with boiling boundary condition

***S. Khodakarami**, P. Vardhan Vydyula, A. Bora, J. Weibel, G. Karniadakis

A Phase-Field Framework for Transport, Collisions, and Thermally Driven Growth in Incompressible Flow

***L. Hamadi**, M. Reder, D. Schneider, B. Nestler

Unstructured Conservative Level-Set Method for Interfacial Transport Phenomena with Insoluble Surfactants

***N. BALCAZAR ARCINIEGA**, J. RIGOLA, A. OLIVA

Two and Three-Dimensional Benchmarks for Two-Phase Flow Modeling in Boiling

***H. Abdel Ghani**, A. Larcher, E. Hachem

Mon, 20/07/2026 17:00 - 18:30

ICM – 4a

MS024D - Advanced Discretization Schemes for Computational Structural Dynamics IV

Main Organizer: Prof. Bastian Oesterle (Hamburg University of Technology)

Chaired by: Prof. Alexander Düster (Hamburg University of Technology), Dr. Sascha Eisenträger (Otto von Guericke University Magdeburg)

A Time Integration Method for Dynamic Buckling Analysis under Complex Time-Dependent Loadings

***M. Bogey**, G. Girault, C. Combescure, M. Cazuguel, J. Cadou

Intrinsic time integration scheme for directors in geometrically exact shell dynamics

***Y. Ding**, G. Sun, S. Han, Q. Tian

Time Integration Approaches in Rotordynamics

***G. Michaloudis**

Time-Efficient Transient Simulations of Acoustic Black Holes

***F. Bähge**, H. Gravenkamp, D. Juhre, S. Eisenträger

Accurate and Efficient Energy-Decaying Time Integrators for Nonlinear Elastodynamics via Relaxed Monotonicity

***D. Maxam**, K. Tamma

Mon, 20/07/2026 17:00 - 18:30

ICM – 4b

MS040A - New Perspectives in Mechanical and Acoustic Metamaterials Science I

Main Organizer: Prof. Giuseppe Failla (University of Reggio Calabria, Italy)

Chaired by: Prof. Antonio Palermo (University of Bologna), Prof. Giuseppe Failla (University of Reggio Calabria, Italy)

Foldable and Expandable Infinite Plane Structures Enabled by Multi-Hub Chiral Origami

***Z. Zhang**, S. Holzinger, Z. Lv, W. Zhou

Attenuation of surface Love waves via embedded locally resonant metamaterials

***F. Zeighami**

Water-tank MetabARRIER for Seismic Rayleigh Wave Attenuation

***G. Failla**, A. Russillo

Efficient modelling and design of multimodal seismic metasurfaces for broadband ground vibration mitigation

***D. Carneiro**, D. Giannini, S. François, G. Lombaert, G. Degrande

A Parallel ITM-FEM Framework for Modeling Metabarriers Embedded in a Stratified Elastic Half-Space

***T. Hicks**, G. Müller

Mon, 20/07/2026 17:00 - 18:30

ICM - 5

MS009D - Complex Fluid Flows in Engineering: Modeling, Simulation, and Optimization IV

Main Organizer: Dr. Fabian Key (TU Wien)

Chaired by: Prof. Stefanie Elgeti (TU Wien), Dr. Fabian Key (TU Wien)

Viscoelastic effects on the morphological transitions of a rising Newtonian bubble

W. Jo, Y. Kwon, ***J. Nam**

Morphological modeling of GMAW-CMT Additive Manufacturing

***G. Dutrievoz**, Y. Saadlaoui, J. Roux, P. Bocher, E. Feulvarch

Effect of Material Properties on Granular Flow Dynamics over Inclined Surfaces: A Continuum Modelling Approach

***M. H. Biroun**, L. Mazzei

Simulation of Hemodynamics Through The Aortic Valve Using a Multiphase Flow Modeling Framework

***K. Bigaj**, E. Slusarz, A. Ryfa, T. Krysiński, B. Melka, A. Golda, W. Adamczyk, A. Janas

Predictive Modelling of Shear-Thickening Fluid Dampers: From Rheological Characterisation to Validated CFD Simulation

***P. Nagy-György**, B. Balog, R. Sebetýén

Identification of mechanical properties of artificial aortic valve by Kalman Filter

***A. Ryfa**, M. Rojczyk, K. Bigaj, T. Krysiński, Z. Buliński, S. Caban, A. Golda, G. Smolka, A. Janas, W. Adamczyk

Mon, 20/07/2026 17:00 - 18:30

ICM - 11a

MS039D - Recent Developments and Applications of Meshfree Methods IV

Main Organizer: Prof. Tsung-Hui (Alex) Huang (National Taiwan University)

Chaired by: Prof. Yu-Chen Su (National Central University), Prof. Tsung-Hui (Alex) Huang (National Taiwan University)

A Numerical Methodology Using Meshless Radial Basis Functions for Solving Structural Stability Problems

***L. Rocha**, P. Rocha

Mixed Convection with Deformable Bodies: A Local RBF Based Meshfree Approach

***J. Chowdhury**, S. Yedida

Least Squares Meshless Method for Interface Problems

***A. Krowiak**, J. Jażkowiec

RBF-FD Meshless Simulation of Compressible Flows

***R. Zamolo**, A. Ferrero, L. Bacer, M. Munerato

Utilizing Compactly Supported Radial Basis Functions in the Classical Galerkin Elasticity Representation

***R. Piltner**, T. Piltner

Mon, 20/07/2026 17:00 - 18:30

ICM - 11b

MS233B - Advancing Computational Mechanics with Equation Discovery and Symbolic Regression II

Main Organizer: Dr. Geoffrey Bomarito (NASA Langley Research Center)

Chaired by: Dr. Gabriel Kronberger (University of Applied Sciences Upper Austria), Dr. Geoffrey Bomarito (NASA Langley Research Center)

Extending a Physics-based Recrystallization Model using Genetic Programming

***J. Kronsteiner**, S. Raaber, G. Kronberger

Fidelity Compensated Physics-Informed Surrogate Modeling

***S. Shiratori**, A. Shimizu, K. Shukla, Z. Wang, G. Karniadakis

High-throughput training of stochastic creep and plasticity models

***B. Boyce**, S. Inman, A. Robertson, R. Dingreville

Interpretable Physics-Informed, Data-Driven Closure of Harmonic-Balanced Navier–Stokes Equations via Symbolic Regression

***K. Shukla**, G. Rigas, G. Karniadakis

Mon, 20/07/2026 17:00 - 18:30

ICM - 12a

MS285B - Cents & Sensitivities: Exploiting Differentiable Solvers for Low-Cost Optimization in Science and Engineering II

Main Organizer: Mr. Nicholas Zolman (University of Washington)

Chaired by: Mr. Nicholas Zolman (University of Washington), Ms. Sajeda Mokbel (University of Washington)

Kaplan Hydraulic Turbine Optimization against Cavitation using a Continuous Adjoint Method for Two-phase Flows

***S. Stalikas**, E. Kontoleonos, K. Giannakoglou

Learning to Control PDEs with Differentiable Predictive Control and Neural Operators

***J. Drgona**

Balanced Active Subspaces for Optimal Control of High-Dimensional Fluid Flows via Trajectory Optimization.

E. Ameh, ***S. Otto**

Physics-Enhanced Reinforcement Learning for Real-time Optimal Control of Dynamical Systems

***M. Tomasetto**, N. Botteghi, G. Bruni, A. Manzoni

Gradient-enhanced control of turbulent flow with differentiable simulation

***S. Mokbel**, C. Lagemann, E. Lagemann, S. Brunton

Mon, 20/07/2026 17:00 - 18:30

ICM - 12b

MS012B - Verification, Validation and Uncertainty Quantification in Modeling and Simulation II

Main Organizer: Prof. Luís Eça (IST Lisbon)

Chaired by: Dr. Rui Lopes (Chalmers University of Technology), Dr. João Muralha (blueOASIS)

Code-Verification Techniques for Collisional Plasma Dynamics **Keynote**

***B. Freno**

A Specific Validation Framework for Composite Stiffened Panel Buckling Based on Non-Dimensional Parametrization of the Validation Domain

***V. Estavoyer**, N. Bartoli, C. Gogu, J. Navarro

Spatiotemporal Error-Scale Estimation for Solution Verification of Time-Domain Wave Simulations

***Y. Tachioka**

Uncertainty Quantification of Heterogeneous Materials: Characterization, Reconstruction and Simulation

X. Ge, B. Chen, L. Wang, L. Garcia, ***C. Li**

Ensemble Based Testing for Chaotic Weather and Climate Models and Investigations into Fused Multiply-Add Sensitivities.

***T. Price-Broncucia**, A. Baker, M. Duda

Mon, 20/07/2026 17:00 - 18:30

ICM - 13a

MS372D - Phase-field fracture modeling and computation IV

Main Organizer: Prof. Laura De Lorenzis (ETH Zurich)

Chaired by: Prof. Corrado Maurini (Sorbonne University)

Hyperbolic Eulerian Gradient Damage Modeling of Dynamic Brittle Fracture at Finite Strain

***F. Handa**, N. Favrie, A. Renaud, T. Heuzé

Dynamic Brittle Damage Modeling via Explicit Hydrodynamics and Phase-Field Coupling

***A. Chapy**, A. Nait-Ali, S. Guisset

Variational Phase-Field Modeling of Cohesive Fracture in Elastodynamics

***J. Heinzmann**, F. Vicentini, P. Carrara, L. De Lorenzis

Dynamic Quasi-Brittle Fracture: A Blended Approach

D. Bhattacharya, S. Coskun, D. Damircheli, ***R. Lipton**

Enhanced Modeling of the Micro-Crack Closure-Reopening Effect (MCR) in Phase Field Fracture at Finite Strains

***H. Lammen**, J. Mosler

Phase-field cohesive zone model for mixed-mode fracture with modified G-criterion based directional energy decomposition scheme

***P. Bian**, H. Qing, S. Schmauder, T. Yu

Mon, 20/07/2026 17:00 - 18:30

ICM - 13b

MS011D - Advances in Neural Network Approximations of Partial Differential Equations IV

Main Organizer: Dr. David Pardo Zubiaur (University of the Basque Country (UPV/EHU))

Chaired by: Dr. Simone Brugiapaglia (Concordia University), Mr. Nicolas Zamorano (Politécnico di Torino)

Neural Semi Lagrangian solver for convection-diffusion PDEs

***E. franck**, V. Michel Dansac, L. Navoret, V. Vigon

The LS-ReCoNN Method: A Hybrid AI and Finite Element Approach for Transmission Problems

***S. Baharlouei**, J. Taylor, D. Pardo Zubiaur

Physics Informed Neural Operators for Modelling Nonlinear Shear Waves

***C. Campbell**, B. Tripathi

Finite Cell-Based Physics-Informed Fourier Neural Operator for Nonlinear Elasticity in Complex Domains

***Y. Xiao**, S. Han, Q. Tian

Lifelong Physics-Informed Learning for Parametric Partial Differential Equations

***A. Chandra**, C. Rojas, L. Tjernberg

Structure-Preserving Data-Driven Finite Element Models for General Geometries

***B. Shaffer**, S. Koohy, B. Kinch, A. Hsieh, N. Trask

Mon, 20/07/2026 17:00 - 18:30

ICM - 14a

MS200C - Computational Design for Additive Manufacturing III

Main Organizer: Dr. Can Ayas (Delft University of Technology)

Chaired by: Dr. Jun Wu (Delft University of Technology)

Efficient simulation of shape memory alloy devices using physics-informed neural networks [Keynote](#)

R. Tang, Y. Mi, ***D. Rosen**

Multi-Field Dynamic Extrusion for Locally Optimized, Functionally Graded Performance in Large-Scale Additive Manufacturing

***A. Curth**, C. Mueller

Experimental Performance of Interlocking Beams with Varying Lengths and End Topologies

I. Ortea Varela, ***Z. Schemmer**, A. Koh, J. Carstensen

Coordinating Multi-Agent Large Language Models for Human-Centered Topology Optimization

***I. Stewart**, F. Ahmed

Mon, 20/07/2026 17:00 - 18:30

ICM - 14b

MS092C - Computational Scale Bridging in Materials and Structures III

Main Organizer: Prof. Jörg Schröder (University Duisburg-Essen)

Chaired by: Prof. Kenjiro Terada (Tohoku University), Prof. Jörg Schröder (University Duisburg-Essen)

Voxel-based homogenization of additively manufactured materials

***S. Hellebrand**, D. Brands, J. Schröder, B. Xu

Decoupled Computational Homogenization of Geometrically Exact Rods with Nonuniform Warping

***E. Montalto**, D. Konstantinidis

Finite-Size Effects in Nonequilibrium Molecular Dynamics Simulations of Solidification Kinetics

***T. Linke**, D. Sterbentz, J. Delplanque, J. Belof

Macroscopic Constitutive Modeling of Shape Memory Alloys Including Thermo-Mechanical Coupling and Anisotropy

***C. Erdogan**, T. Bode, P. Junker

Towards data driven microstructure design for dual phase steels considering material substitution

***D. Brands**, Y. Yang, R. Niekamp, J. Schröder

Mon, 20/07/2026 17:00 - 18:30

ICM - 14c

MS312C - Particle-based methods: advances and applications in DEM, PFEM, SPH, MPM, MPS and others III

Main Organizer: Prof. Eduardo de Moraes Barreto Campello (University of São Paulo)

Chaired by: Prof. Peter Wriggers (Leibniz University of Hannover), Prof. Eduardo de Moraes Barreto Campello (University of São Paulo)

An Enhanced Hourglass Control Scheme in Variationally Consistent Total Lagrangian SPH Solid Mechanics

***A. Khayyer**, C. Lee, D. Sakoda, T. Gotoh, A. Gil, H. Gotoh, J. Bonet

Numerical Investigation of Fresh Concrete Extrusion in 3D Concrete Printing Using an Enhanced DEM–DFC Framework

V. Avancini, O. Quintana-Ruiz, ***E. CAMPELLO**

MercuryDPM–SPH: An Open-Source Polydisperse SPH Framework with Viscoplastic Rheology

***C. Singh**, H. Askes, T. Weinhart

Comparative Assessment of Stabilization Techniques for Nodal Integration in an Implicit RKPM for Elastoplastic Materials

***T. Mader**, P. Gamnitzer, H. Gimperlein, A. Dummer, M. Neuner

Hybrid MPM–FEM with Multi-patch B-spline Basis Functions for Seepage and Piping Analysis

***Y. Suzuki**, R. Sugai, S. Hidano, R. Nomura, S. Moriguchi, K. Terada

Towards Grain-Scale Simulations of Thermomechanical Effects in Fault Gouges

***R. Rangel**, G. Barros, K. Thoeni, H. Cheng

MS014D - Advanced computational techniques for fracture IV**Main Organizer:** Prof. Sonia Marfia (Sonia Marfia, Full Professor, University of Roma Tre)**Chaired by:** Prof. Sven Klinkel (Sven Klinkel, Professor, RWTH Aachen University), Prof. Stefan Löhnert (TUD Dresden University of Technology)

Dynamic Crack Propagation with the Cohesive Lipschitz (CLIP) Approach

***S. Shetty**, B. Lé, N. Moës, N. Chevaugeon

Adaptive Insertion and Reorientation of Interface Elements for Improved Accuracy and Efficiency in Crack Prediction

***K. Daadouch**, V. Gudžuli?, G. Meschke

Potential-Based Cohesive Fracture Modeling with Multi-Linear Softening Formulations

***S. Jeon**, K. Park

A Shell-to-Shell Cohesive Line Element for Efficient Modeling of Interfacial Cracking in Overmolded Stiffened Panels

***S. Ferreira Cordeiro**, F. van der Meer, B. Chen

A spatially varying cohesive zone model for process-induced interfacial adhesion in thermoplastic overmolding

X. Li**, T. Liu, M. Tabib, J. Neumann, M. Giersberg Sola, M. Valsecchi, H. Çelik, C. Hopmann, S. Kumar, J. Fish, J. Simon**MS077B - Multiphase Microfluidics II*Main Organizer:** Phd. Mohammad R. Hashemi (Universitat Politècnica de Catalunya · Barcelona Tech - UPC)**Chaired by:** Dr. Mathis Fricke (Focused Energy GmbH), Phd. Mohammad R. Hashemi (Universitat Politècnica de Catalunya · Barcelona Tech - UPC)

Three-dimensional modelling of the filtration process in complex filter structures using a coupled Physics-Informed Neural Network and Smoothed Particle Hydrodynamics method

A. Zargarán, ***U. Janoske**

Nanodroplet condensation on solid surfaces

***M. Teodori**, D. Abbondanza, M. Gallo, C. Casciola

Hydrogen Bubble Nucleation in A Cylindrical Nanopore: A Coupled Model of 1D Mass Transport and Geometric Confinement

***M. Hosseini**, S. Chowdhury, R. Manica, P. Berg, T. Tang

A Fully Coupled Approach for Simulating Electrohydrodynamic Two-Phase Flows using an Extended Discontinuous Galerkin Method

X. Ye**Validation of a Multiphase RANS k- ϵ Turbulence ModelA. Aubert**, M. Varé, S. Popinet, C. Josserand**MS271B - Battery Modeling & Validation for Industrial Applications: Multi-Scale and Multi-Physics Approaches II****Main Organizer:** Prof. Andre Haufe (ANSYS Germany GmbH)**Chaired by:** Prof. Tim Ricken (University of Stuttgart), Mr. Harshwardhan Dhumal (Daimler Truck AG)

High-fidelity multiscale modeling of immersion cooling of lithium-ion batteries: a bidirectional CFD-electrochemical coupling framework

***M. MAMA**, E. SOLAI, T. CAPURSO, A. DANLOS, S. KHELLADI

Hybrid Continuum–Discrete Simulation of Granular Structure Evolution in Battery Electrodes During Calendaring

***A. Tabak Cevit**, Y. Jiang

Simulation-Driven Technology Transfer for Electrode Calendaring: From Academic Models to Industrial Application

***L. Kostetzer**, Q. Denoyelle

Multi-Physics Battery Modelling and Calibration for Electric Vehicles

***L. Wang**, C. Kan, R. Reichert

A Framework for Multi-Physics and Multi-Scale Modelling of Battery Cells under Mechanical Abuse Scenarios

***H. Dhumal**, F. Goekuezuem, T. Ricken

Mon, 20/07/2026 17:00 - 18:30

ICM - B21

MS222A - Polytopal Methods in Mechanics: bridging Mathematics and Engineering I

Main Organizer: Mr. Lourenco Beirao da Veiga (Università di Milano-Bicocca)

Chaired by: Prof. Peter Wriggers (Leibniz University of Hannover)

A self-stabilized virtual brick element with curved faces for 3D isotropic hyperelasticity

F. Bossi, M. Cremonesi, F. Dassi, C. Lovadina, ***U. Perego**, A. Russo

The Virtual Element Method for Arbitrarily Distorted 8-node Bricks

***F. Bossi**, M. Cremonesi, F. Dassi, C. Lovadina, U. Perego, A. Russo

On Numerical Efficiency of VEM Formulations

***J. Korelc**

Virtual element method and its application in hyperelastic contact problems

***B. Xu**, T. Xue, P. Wriggers

Mixed Virtual Element Methods for Contact Problems

C. Lovadina, ***L. Molinari**

A High-Order Virtual Element Method for the Analysis of Dynamic Crack Growth

***P. Wappler**, A. Ricoeur

Mon, 20/07/2026 17:00 - 18:30

ICM - B22

MS128B - Multiphysics Simulation Techniques for High Performance Computing II

Main Organizer: Dr. Tim Wegmann (AIA, RWTH Aachen University)

Chaired by: Dr. Matthias Meinke (RWTH Aachen University), Dr. Tim Wegmann (AIA, RWTH Aachen University)

GPU Accelerated Conservative Field Transfer for Multiscale and Multiphysics Workflows Without Mesh Intersections

***J. Merson**, A. Paudel, F. Hasan, J. Merson

Efficient Methods for Coupled Problems based on Cartesian Hierarchical Meshes

***T. Wegmann**, A. Niemöller, M. Meinke, D. Krug

High-Performance Multiphysics Simulations with Heterogeneous Models and Computing Architectures

***M. Schlottke-Lakemper**

Scalable Multiphysics Solvers for Simulating Electrokinetic Flows in Porous Geometries

***S. Dhakshinamoorthy**, M. Shadkhah, Z. Ahmed, R. Anand, B. Ganapathysubramanian

Mon, 20/07/2026 17:00 - 18:30

ICM - 21a

MS156A - Moving Mesh Schemes for Unsteady Compressible Flows I

Main Organizer: Dr. Barbara Re (Politecnico di Milano)

Chaired by: Dr. Barbara Re (Politecnico di Milano), Prof. Walter Boscheri (CNRS)

Thermodynamically compatible finite volume schemes for Lagrangian mechanics

***W. Boscheri**

High order ghost-FEM for incompressible Navier-Stokes equations on moving domains

H. Dilip, ***C. Astuto**, A. Coco, G. Russo

Entropy Conservative Moving Wall Boundary Conditions for the Compressible Navier–Stokes Equations

***L. Galimberti**, R. Nuca, L. Dalcin, A. Guardone, M. Parsani

High-Order DG Simulations with Moving Immersed Boundaries in HORSES3D

***P. Solé-Miró**, R. Salado, D. Huergo, O. Mariño, G. Rubio, E. Valero, E. Ferrer

High-Fidelity CFD Simulations of a Full Open-Fan Geometry with an Improved Overset Grid Method

***B. Constant**, C. Benoit, S. Péron

Graph-based automatic detection of deformations in FEM simulations

***E. Bizzotto**, J. Fender, L. Krischer, G. Kutyniok

Mon, 20/07/2026 17:00 - 18:30

ICM - 21b

MS073A - Model order reduction on non-linear and high-dimensional systems I

Main Organizer: Prof. Udo Nackenhorst (Leibniz University Hannover)

Chaired by: Prof. David Néron (Ecole normale supérieure Paris-Saclay), Prof. Udo Nackenhorst (Leibniz University Hannover)

Projection-Based Model Reduction for Nonlinear Structural Dynamics

***A. Benvenuti**, M. Girardi, C. Padovani, D. Pellegrini, L. Robol

DMD?Based Parametric Reduced?Order Modeling of Offshore Drill?String Dynamics

***L. Kort**, D. Castello, J. Brígido, R. Tobisawa, T. Ritto

Surrogate Element Analysis for Detailed Finite Element Models of Building Structures

***T. Yamashita**

Extending Craig-Bampton Substructuring to Geometrically-Nonlinear Structures

***A. Saccani**, P. Tiso

Computing Spectral Submanifolds of Multibody Systems Modeled with Geometrically-Exact Theories

***S. Holzinger**, T. Martins, D. Rixen

Mon, 20/07/2026 17:00 - 18:30

ICM - 22a

MS284A - Computational Biomechanics of Hard Tissues I

Main Organizer: Prof. ZOHAR YOSIBASH (Tel Aviv University)

Chaired by: Prof. ZOHAR YOSIBASH (Tel Aviv University), Dr. Michael Roland (Saarland University)

Replicating Daily-Life Loads: A Hexapod-Driven 6-DOF Experimental Setup for Bone–Implant Mechanics

Keynote

***M. Roland**, K. Wickert, D. Crepulja, S. Diebels

Verified and Validated FEA of Proximal Humerus Plate Fixations

***T. Segal**, Z. Yosibash

Modelling bone tissue mechanics with a viscoelastic-viscoplastic-damage framework

***P. Pirini**, G. Mazzucco, B. Pomaro, A. Berardo

Influence of Sagittal Curvature Geometry on Contact Mechanics and Translation in Patient-Specific TMJ Prostheses

M. Mejía Rodríguez, C. Amaris, ***O. González-Estrada**

Adaptive and Predictive Digital Twins in Orthopaedics: A Multimodal Patient-Specific Approach

***A. Andres**, M. Roland, K. Wickert, S. Diebels

Mon, 20/07/2026 17:00 - 18:30

ICM - 22b

MS067B - Optimal Design of Novel Materials and Structures Using Isogeometric Analysis II

Main Organizer: Prof. Leonardo Leonetti (UNICAL)

Chaired by: Prof. Leonardo Leonetti (UNICAL), Dr. Toan Le (Ho Chi Minh City University of Technology (HCMUT))

Reliability-based Shape Optimization of Weakly Coupled Thermoelastic Problems Using Isogeometric Analysis

***H. Jeong**, H. Kim, H. Cho, M. Kim, M. Yoon

Isogeometric neural networks for thin shells with complex geometries

***S. Luo**, X. Wei

Design of Elastostatic Cloak on Complex Shells Using an IGA-Based Explicit Topology Optimization Approach

***A. Huang**, Z. Du, X. Guo

Optimal Stiffener Layout for Laminated Composite Fuselage Shells Using Isogeometric Embedded Beams

***M. Friedrichs-Dachale**, M. Haupt, S. Heimbs

Isogeometric topology optimization of thin plate structures using a reaction-diffusion-based level-set approach

***T. Le**, L. Leonetti

Mon, 20/07/2026 17:00 - 18:30

ICM - 41 (Ostersee A)

MS029B - Advanced and Hardware-In-the-Loop Testing of Railway Vehicle Components II

Main Organizer: Dr. Gioele Isacchi (Politecnico di Milano)

Chaired by: Dr. Gioele Isacchi (Politecnico di Milano), Prof. Santiago Gregori (Universitat Politècnica de València)

Hardware-In-the-Loop testing of yaw damper components for rail vehicles

G. Isacchi, ***F. Ripamonti**

Testing of a lightweight innovative composite pantograph through open-loop Hardware-In-the-Loop methodology

***G. Isacchi**, L. Salvi, A. Facchinetti, P. Scognamiglio, G. Frattolillo, A. Bernasconi, A. Collina

Mon, 20/07/2026 17:00 - 18:30

ICM - 42 (Ostersee B+C)

MS353D - Emerging Topology and Shape Optimization Techniques in Computational Design of Materials and Structures IV

Main Organizer: Prof. Ahmad Najafi (Drexel University)

Chaired by: Mr. Jonathan Gorman (Drexel University), Prof. Ahmad Najafi (Drexel University)

Topology Optimization with Frequency Constraints using a Cut-Cell Galerkin Difference Method

***G. Kennedy**

High-Efficiency Topology Optimization via a Unified CutFEM-MMC Framework: From Standard Designs to Multi-Material Structures with Morphological Filtering

***Z. Guan**, Y. Mei, X. Guo

Optimizing Level Set–Based Topology Optimization: Application to 2D Electromagnetic Problems

D. Keller, G. Reales Gutiérrez, F. Maucher, ***A. Aragón**

Non-parametric Optimization for Structural Non-linear Stability Applications

***C. Pedersen**, A. Jurinic, J. Action, C. McElwain

Bio-Inspired Explicit Geometry Optimization for Cohesive Interfaces

***Q. Lai**, W. Zhang

Hybrid Conditioned Diffusion Transformers for Structural Topology Optimization

***A. Lutheran**, S. Das, A. Tabarraei

Mon, 20/07/2026 17:00 - 18:30

ICM - 43 (Eibsee)

MS034B - Advanced Solvers for Poromechanics II

Main Organizer: Prof. Markus Bause (Helmut Schmidt University)

Chaired by: Prof. Markus Bause (Helmut Schmidt University)

A Family of Mixed-mixed Fully Conservative Finite Element Methods for Biot's Model of Consolidation in Four-field Formulation

***J. Kraus**, Q. Hong

Material-Model Sensitivity of Convergence in Nonlinear Steady-State Seepage: Picard and Newton Methods with Step-Length Control

***J. Cho**, D. Kim, D. Lee

A Robust, Structure-Preserving Finite Element Solver for the Richards Equation using a Bounded Auxiliary Variable and Domain Decomposition.

***A. Benfanich**, Y. Bourgault, A. beljadid

A Mixed Poroelastic Finite Element Formulation for Modelling the Response of a Biphasic Medium

***L. Sierra Fisher**, A. Shvarts, C. Runcie, J. Noailly, L. Kaczmarczyk

Mon, 20/07/2026 17:00 - 18:30

ICM - 44 (Schliersee)

MS211B - Geomechanics of the Cryosphere II

Main Organizer: Dr. Kara Peterson (Sandia National Laboratories)

Chaired by: Dr. Devin O'Connor (Sandia National Laboratories)

Using the Material-Point Method in Earth System Modeling

***D. Sulsky**, C. Hammerquist, D. Nath, K. Peterson, O. Sahni, A. Turner

Advances in modeling high-dimensional uncertainty in ice-sheet dynamics

***M. Perego**, T. Hillebrand, M. Hoffman, J. Jakeman, D. Rodriguez, N. Urban

A finite strain viscoelastic Maxwell model for ice shelves incorporating Glen's flow law

***M. Koßler**, R. Müller, A. Humbert, J. Schröder

On the Well-Posedness of the Viscous-Plastic Rheology

***F. St-Denis**, B. Tremblay

Mon, 20/07/2026 17:00 - 18:30

ICM - 31 (Zugspitze)

MS187A - Structure-Preserving Scientific Machine Learning and Neural Networks I

Main Organizer: Mr. Benedikt Brantner (Max-Planck-Institute für Plasmaphysik)

Chaired by: Mr. Benedikt Brantner (Max-Planck-Institute für Plasmaphysik), Dr. Michael Kraus (Max-Planck-Institut für Plasmaphysik)

Kernel-based techniques for the learning of Poisson systems

***J. Hu**, J. Ortega, D. Yin

Neural Non-Canonical Hamiltonian Dynamics for Long-Time Simulations

C. Courtès, E. Franck, M. Kraus, L. Navoret, ***L. Tremant**

Learning Stable port-Hamiltonian Dynamics with Neural Networks

***F. Roth**, M. Kannapinn, D. Klein, J. Peters, O. Weeger

Mon, 20/07/2026 17:00 - 18:30

ICM - 32 (Watzmann)

MS217B - Computational Analysis of Advanced Materials and Structures II

Main Organizer: Prof. Efsthios Theotokoglou (NATIONAL TECHNICAL UNIVERSITY OF ATHENS)

Chaired by: Prof. Efsthios Theotokoglou (NATIONAL TECHNICAL UNIVERSITY OF ATHENS), Dr. Ilaylo Vladimirov (MTU Aero Engines AG)

Computational and experimental assessment of failure and impact in composite materials in aircraft engines

***I. Vladimirov**, S. Dölling, J. Wichmann, J. von Lautz

Analytical Solution for the Free Vibration of Short-Fiber-Reinforced Rayleigh Beams on an Orthotropic Pasternak Foundation

***M. Ermis**, A. Çağlayan, B. Uzun

Ratcheting Characteristics Study of C15 BaPt2 Compound Using a Parameterized Embedded-Atom Method Potential

***S. Mukhopadhyay**, S. Dinda, S. Pal

Machine Learning-Based Quantitative Prediction of Interface Strength in Pinhole Pull-Out Tests

***R. Yatsuda**, Y. Li, A. Nakakura, J. Koyanagi

Free Vibration Analysis of Sandwich Beams Resting on an Orthotropic Pasternak Foundation: An Analytical Approach

***B. Uzun**, M. Ermis, A. Çağlayan

From Brittle Calcite to Tough Protective Shell: The Role of Intracrystalline Architecture in Avian Eggshells

***J. Zhong**, P. Werner, S. Amini, Q. Wang, A. Vellwock, E. Raguin

Mon, 20/07/2026 17:00 - 18:30

BrainLab - Auditorium

MS234D - Quantum Scientific Computing IV

Main Organizer: Prof. Yan Wang (Georgia Institute of Technology)

Chaired by: Prof. Kenjiro Terada (Tohoku University), Dr. Norbert Hosters (RWTH Aachen University)

Quantum machine learning–assisted nonlinear topology optimization of continuum structures

***N. Sukulthanasorn**, R. Nomura, S. Moriguchi, K. Terada

Solving Nonlinear PDEs With Quantum Physics-informed Neural Networks and Trainable Embeddings

***N. Hosters**, M. Möller

Quantum Gradient Flow Algorithm for Reducing Circuit Complexity in Matrix Inverse Calculations of Finite Element Analysis

***Y. Terashima**, T. Kadowaki, Y. Suzuki, K. Endo

A Latent Quantum Surrogate Model for Bayesian Inverse Problem

***D. Alfarisy**, C. Higham, E. Febrianto

A Python Framework for Statevector Simulation with Hardware-Calibrated Noise Data from NISQ Devices

***S. Hegde**, O. Ahrend, J. Kowalski

Symbolic Analysis Enabling a Novel Quantum Approach for Training Gaussian Process Emulators

***O. Ahrend**, S. Hegde, J. Kowalski

Mon, 20/07/2026 17:00 - 18:30

NM - 1 (Multimedia Saal)

MS246D - Numerical Methods for Interface-Resolved Multiphase Flows IV

Main Organizer: Dr. Nicolas Valle (TU Delft)

Chaired by: Prof. F.Xavier Trias (Technical University of Catalonia)

An integral surface tension scheme for a three-dimensional front-tracking framework

***G. Gennari**, B. van Wachem

Accelerated Simulation of Surface-Tension-Dominated Incompressible Two-Phase Flows Using Subcycling

***S. Yamashita**, S. Matsushita, T. Suekane

A Three-dimensional Edge-Based Interface Tracking (EBIT) Method for Multiphase flow Simulations

***J. Pan**, S. Popinet, S. Zaleski

A Balanced Formulation for Surface Tension Force in XFEM

***S. Baldini**, G. Bornia, A. Cervone, F. Giangolini, S. Manservigi, D. Rimondini

Extension of the FIVER Method to Compressible Multiphase Flows with Surface Tension and Viscous Effects

***V. Cool**, C. Farhat

Mon, 20/07/2026 17:00 - 18:30

NM - 2 (Salzburg)

STS421B - Technological and Operational Roadmap for Greening of Aviation II

Main Organizer: Mr. Luis Campos (Universidade de Lisboa)

Chaired by: Mr. Luis Campos (Universidade de Lisboa), Ms. María Zamarreño Suárez (Universidad Politécnica de Madrid)

Advancing PEM fuel cell suitability for aviation

A. Graf von Schweinitz, G. Yang, B. Munjal, ***M. Heere**

Numerical Model and Parametric Analysis of a Liquid Hydrogen Injector at Diverse Inlet Conditions

D. Terlizzi, ***A. Bamoshmoosh**, G. Valenti

Analysis Of Ready And Sustainable Aviation Fuels And Their Production Cost Estimation

***R. Adami**, H. Parmar, P. Lamberti, M. Sarno, V. Tucci

Design Concept for a Hybrid Turbo-Electric Regional Aircraft

D. Berbenets, S. Fil, O. Urban, ***O. Bondarchuk**

Design Considerations for a Liquid Hydrogen-Powered Aircraft

***O. Urban**, S. Fil, D. Berbenets, O. Bondarchuk

Methodology for defining a roadmap for climate neutral aviation within the EFACA project framework

***R. Arnaldo Valdés**, M. Zamarreño Suarez, F. Gomez Comendador, R. Delgado Aguilera Jurado, F. Perez Moreno, C. Gomez Arnaldo

Mon, 20/07/2026 17:00 - 18:30

NM - 4 (Hamburg)

STS413B - eVTOL: Configuration, Simulation and Optimization II

Main Organizer: Prof. Ning Zhao (Nanjing University of Aeronautics and Astronautics)

Chaired by: Prof. Chunling Zhu (Nanjing University of Aeronautics and Astronautics), Prof. Ning Qin (University of Sheffield)

Aerodynamic and Hydrodynamic Optimization of a Seaplane: A CFD-Based Study

***Y. Wang**, J. Wang, B. Yin, R. Qiu

3D Hybrid Mesh Generation Method Based on Automatic Surface Meshes Generation

***X. Xu**, Y. Wang, N. Qin, N. Zhao

Icing Meteorological Parameters and Ice Thickness Prediction Algorithms

***Y. Xiao**, Y. Wang, N. Qin, C. Zhu, N. Zhao

An Artificial Neural Network-Based Approach for Flow Field in Urban Area

***K. Kan**, Y. Wang, C. Ma, N. Zhao

Influence of Turbulent Inflow with Different Atmospheric Stabilities on the Aerodynamic Characteristics of Lift-Cruise eVTOL Rotor System During Transition Phase

***Y. Song**, N. Zhao, Q. Wu, L. Tian

Hydrodynamic Takeoff Performance of a Seaplane: CFD Analysis and Optimization

***J. Wang**, Y. Wang, B. Yin, R. Qiu

Mon, 20/07/2026 17:00 - 18:30

NM - 5 (KK)

MS276D - Beyond classical schemes: Recent developments of high-order structure-preserving methods for compressible flows IV

Main Organizer: Prof. Philipp Öffner (TU Clausthal)

Chaired by: Ms. Anna Schwarz (University of Stuttgart), Dr. Florent Renac (ONERA)

Controlling Long-Time Error Growth in Residual Correction Discretizations

***Z. Worku**, D. Del Rey Fernandez

On the Practical Impact of Local Linear Instabilities in Entropy-Stable Summation-By-Parts Schemes

***A. Bercik**, D. Zingg

Entropy correction artificial viscosity method to the compressible Navier Stokes equations

***R. Park**, J. Chan

Entropy stable high-order schemes for the compressible Navier--Stokes equations with isothermal no-slip wall boundary conditions

***M. Sayyari**, N. Yamaleev

Port-Hamiltonian Structure-Preserving Discontinuous Galerkin Methods for the Compressible Euler Equations

***X. Cheng**

Mon, 20/07/2026 17:00 - 18:30

NM - 3 (BB)

MS101B - Isogeometric Analysis of Thin Structures II

Main Organizer: Prof. Josef Kiendl (University of the Bundeswehr Munich)

Chaired by: Prof. Wolfgang Dornisch (RPTU University Kaiserslautern-Landau), Prof. Roger Sauer (Ruhr University Bochum)

On the potential of isogeometric discretizations in stability analyses of thin-walled structures

T. Burgwedel, J. Priebe, ***B. Oesterle**

Ensuring Optimal Convergence Rates for Mixed Formulations with Lumping-Based Static Condensation in case of Limited Internal Continuities

***L. Stammen**, W. Dornisch

Topological Data Structure For T-meshes Supporting Arbitrary Degree AS T-splines For Adaptive Isogeometric Analysis

***Y. Akutagawa**, S. Ishida, Y. Imai

Isogeometric shells for muscular thin film modeling

***M. Torre**, S. Morganti, F. Pasqualini, A. Reali

Isogeometric path-following of biological growth in thin shells

***L. Leonetti**, G. Garcea, D. Magisano

A Hyperelastic Membrane Wrinkling Model Based on Spectral Decomposition of the Stress Tensor

***J. Kiendl**, D. Zhang

Mon, 20/07/2026 17:00 - 18:30

H4 - 1 (Ludwig)

MS053A - Innovative Finite Element Methods for Fluids I

Main Organizer: Mr. Frederic Valentin (LNCC)

Chaired by: Dr. Rodolfo Araya (Universidad de Concepcion), Dr. Miguel A. Fernández (Inria)

Space-time domain decomposition mixed finite element methods for flow in fractured porous media **Keynote**

***I. Yotov**, P. Hoang

Multiscale Finite Element Methods for Advection-Diffusion Problems

***F. Legoll**

An $H(\text{div}, \Omega)$ -conforming post-processing of the Cauchy stress tensor in Multiscale Hybrid-Mixed approximations of the Stokes--Brinkman problem

***R. Rebolledo**, L. Martins, F. Valentin

$H(\text{div})$ -Conforming MHM Methods for a Hydro-Mechanical Model with Weak and Strong Symmetry

G. Barrenechea, J. Barroso, L. Martins, W. Pereira, ***F. Valentin**

Mon, 20/07/2026 17:00 - 18:30

H4 - 2 (Leopold)

MS322A - Advances in Computational Mechanics for Wave Propagation, Multiscale and Multiphysics Simulations I

Main Organizer: Dr. Heedong Goh (Seoul National Univerity)

Chaired by: Dr. Heedong Goh (Seoul National Univerity), Prof. Jun Won Kang (Hongik University)

A Time-Domain Perfectly Matched Layer for Flexural Waves in Infinite Euler-Bernoulli Beams

***H. Kim**, S. Lee, J. Kang

HPC DG-SEM Modeling of Large PMUT Array Simulations

P. Antonietti, ***M. Garroni**, I. Mazziari, N. Parolini

Laminated Multiferroic Composites with Viscoelastic Interlayer

***H. Kuo**, N. Wu

Wavefield-Based Damage Characterization of 3D Printed Concrete Using PZT Excitation and Laser Doppler Vibrometry

***C. Qi**, Y. Wu, P. Zhi

On the influence of combined hardening on the acoustoelastic effect

***M. Ruetz**, T. Antretter, H. Gänser

On the stability of Perfectly-Matched-Layers for elastodynamics

H. Goh, S. Francois, J. Seo, ***L. Kallivokas**

Mon, 20/07/2026 17:00 - 18:30

H4 - 3 (Franz)

MS243D - Progress in Computational Multiphysics Using Open-Source Software IV

Main Organizer: Prof. Holger Marschall (Technische Universität Darmstadt)

Chaired by: Dr. Maximilian Kannapinn (Technical University of Darmstadt), Prof. Holger Marschall (Technische Universität Darmstadt)

Electrokinetic Solvers for Multi-component-mixture Thermophysical Transport in Nanoscale Pores

***T. Vo**, H. Marschall

OpenFOAM Analysis of Breath Aerosol Deposition in an Impaction Filter

***A. Hayes**, V. Malavé, J. Berry, T. Lovestead, K. Jeerage

A Hybrid Quantum--Classical Physics-Informed Neural Network for Multiphysics Equations in Mechanics

A. Mouratidou, N. Schetakis, ***G. Stavroulakis**

Robust Workflows for Uncertainty Quantification in Computational Science and Engineering: An Application to Bayesian Parameter Calibration in Blood Hemolysis Models

A. Correa, ***V. Kumar**, N. Dirkes, M. Behr, J. Kowalski

Multi-physics numerical simulation of the effects of climate change on heritage masonry structures

***C. Chisari**, P. Dhir, B. Pantò

Mon, 20/07/2026 17:00 - 18:30

H4 - 4 (Alois)

MS279D - AI for Computational Fluid Dynamics - Opportunities and Challenges IV

Main Organizer: Prof. Nils Thuerey (TUM)

Chaired by: Mr. Giacomo Baldan (Technical University of Munich), Prof. Nils Thuerey (TUM)

Reduced Subgrid Scale Terms in Three-Dimensional Turbulence

***R. Hoekstra**, W. Edeling

Implicit sub-grid scale turbulence modelling via automatic differentiation

***B. Font**, G. Weymouth

Symbolic Regression of RANS-Consistent Turbulence Model Corrections

***A. M. Qaragoz**, A. Lucantonio

AI-Accelerated CFD for Flash-Boiling Jets: End-to-End Emulation and Hybrid Turbulence Closures

***K. Lyras**, A. Kallianioti

A-Priori and A-Posteriori Analyses of Manifold-Based Modelling for Multi-Regime Hydrogen Combustion via Artificial Neural Networks

***S. Recio Balmaseda**, J. Karpowski, N. Eckel, A. Scholtissek, C. Hasse

Mon, 20/07/2026 17:00 - 18:30

H4 - 5 (Xaver)

MS043B - Fracture, Damage and Failure Mechanisms of Cementitious Materials II

Main Organizer: Dr. Rena C. Yu (Universidad de Castilla-La Mancha)

Chaired by: Dr. Petr Miarka (Institute of Physics of Materials, Czech Academy of Sciences), Eng. Olga Sinitsky (BGU)

Numerical Modeling of Shear-Critical Reinforced Concrete Members: A Comparison between a Multisurface Elastoplastic Framework and DIANA FEA

***A. Torabizadeh**, E. Erkmen

Modified Concrete Damage Plasticity Model II (CDPM2) for UHPC

H. Yang, ***L. Poh**

Three-Dimensional Mesoscale Modelling of Concrete for Fracture Simulation Using a Damage Model

***M. Kurumatani**, X. Huang

Mon, 20/07/2026 17:00 - 18:30

H4 - 6 (Sissi)

MS085B - Sharing Advances In Numerical Methods For The Transport, Boltzmann Equation II

Main Organizer: Dr. François Madiot (CEA)

Chaired by: Dr. François Madiot (CEA), Prof. Matthias Schlottbom (University of Twente)

High-order and Locally Refined Discretizations for Low-rank Proton Transport in Radiation Therapy

***P. Stammer**, D. Lathouwers

Recent Advances in Moment Equations for the Boltzmann Equation

***M. Torrilhon**, M. Geratz, D. Weniger, E. Yilmaz

A Variational Multiscale Extension to the Navier-Stokes-Fourier Equations for Rarefied Transport

F. Baidoo, T. Hughes, I. Gamba, ***M. Abdelmalik**

Low-Rank Tensor Product Approximations for the Radiative Transfer Equation in Plane-Parallel Geometry

M. Bachmayr, R. Bardin, ***M. Schlottbom**

Conservative Dynamical Low-Rank Approximation for Particle Transport in Electron Probe Microanalysis

***T. Claus**, G. Achuda, S. Richter, M. Torrilhon

Domain decomposition for the Boltzmann equation and its application in the context of rarefied flows

***R. Sharma**, T. Kessler, M. Abdelmalik, A. Frijns, H. van Brummelen

Mon, 20/07/2026 17:00 - 18:30

H4 - 7 (Maximilian)

MS349B - Topology, Shape And Parameter Optimisation For Time-Dependent Systems II

Main Organizer: Dr. Hao Li (University of Southern Denmark)

Chaired by: Dr. Hao Li (University of Southern Denmark), Phd. Joe Alexandersen (University of Southern Denmark)

Single-GPU Billion Parameter Dynamic Optimization

***L. Herrmann**, T. Büchner, L. Kudela, S. Kollmannsberger

Adjoint Methods Using POD State Reconstructions on Modern HPC Architectures

***H. Nobis**, A. Perez, T. Olsen, A. Mousavi, C. Andreasen, N. Aage, E. Wadbro, P. Schlatter, D. Henningson, M. Berggren

High-order Time-integration Schemes Suitable for Navier-Stokes Flow Using Brinkman Penalization

***M. Appel**, J. Alexandersen

Transient, Phase Dependent Temperature Constraints in Topology Optimization with Design-Driven Heat Source and One-Step Adjoint Sensitivity Calculation

***L. Bösser**, R. Bartz, T. Franke, M. Mackiewicz

Mon, 20/07/2026 17:00 - 18:30

H4 - 8 (Eventcenter)

MS110B - Computational Models for Cancer Research and Oncology II

Main Organizer: Dr. Guillermo Lorenzo (University of A Coruña)

Chaired by: Mr. Paolo Zunino (MOX, Department of Mathematics, Politecnico di Milano)

A Coupled 3D–1D Mathematical Model for Angiogenesis and Nutrient Exchange in Growing Tumours

***C. Givero**, D. Grappein, S. Scialò

Thermodynamically Consistent Finite Growth of N-Phase Mixtures with Application to Tumor Growth

***J. Stollberg**, M. ten Eikelder, D. Schillinger

A Computational Study of Adaptive Isogeometric Analysis for Phase-Field Modeling of Tumor Growth

***D. Bombarde**, A. Reali, C. Giannelli, G. Lorenzo

Nonlinear Backstepping Control for Tumor Growth Dynamics

***G. ?ahan**, H. Büyüktuncay, U. Has?rc?

Patient-specific organ-scale prediction of prostate cancer growth supported by imaging-based immersed isogeometric analysis

***F. Figueiras**, C. Wu, J. Yung, M. Abdelmalik, J. Ward, A. Venkatesan, T. Hughes, G. Lorenzo

Overcoming Computational Barriers to Simulation of Clinically Relevant Tumours

D. Goodin, ***H. Frieboes**

Mon, 20/07/2026 17:00 - 18:30

BrainLab - Training

MS223D - Projection-Based and Data-Driven Reduced Order Modeling: Bridging Accuracy and Efficiency IV

Main Organizer: Dr. Maria Strazzullo (Politecnico di Torino)

Chaired by: Dr. Federico Pichi (SISSA), Dr. Maria Strazzullo (Politecnico di Torino)

Non-intrusive model order reduction for solving inverse problems in the context of damage identification in structures

***S. Hijazi**, C. Gräßle

POD-Galerkin Reduction Model for Glioblastoma Cells Progression in Microfluidic Devices

***M. Dingle**, E. Sala-Lardies, J. Sarrate, N. Parés

Block Jacobi-like FSI analysis accelerated by hyper-reduced-order modeling

***S. KANEKO**

A HOSVD-Based Reduced-Order Modeling Approach for Airflow Prediction in Real Urban Environments and Its Applicability to Accelerate Numerical Simulations

***G. Barragan Montalvo**, S. Le Clainche, J. Garicano-Mena, Á. Manzano

Augmented predictor--corrector PINN for estimating root zone soil moisture from data at shallower depths

***M. Bruni**, M. Berardi, F. Difonzo

Reduced Order Modeling of Catalyst Degradation In PEM Fuel Cells

***H. Khaliq**, J. Gimpelj, M. Prijatelj, A. Kravos, P. Africa, R. Poeschl, T. Katrašnik, G. Rozza

Mon, 20/07/2026 17:00 - 18:30

NM - 6 (Munich)

MS225A - Digital Twins: Advancing Design and Diagnostics of Engineering Systems for Green Future I

Main Organizer: Dr. Hayriye Pehlivan Solak (Imperial College London)

Chaired by: Dr. Hayriye Pehlivan Solak (Imperial College London), Dr. Francesco Di Fiore (Imperial College London)

Unsteady Aerodynamics of Flettner Rotors in Waves: AI-Enhanced CFD Simulation

***K. Maki**, B. Di Paolo, P. Geremia

Ship Motion Digital Twinning of the R/V Gaia Blu: a Closer Look at the Gaia-Twin Campaign

***G. Palma**, R. Pellegrini, R. De Marco, M. Diez

AI-Assisted Structural Maintenance Framework for Serviceability Assessment Using LVDT-Based Displacement Monitoring and Machine Learning

***J. Bobadilla**

Sensors Network Digital Twin to Enable Reliable Sustainable Aviation Structural Health Monitoring

***F. Di Fiore**, S. Ariyaratnam, M. Ermacora, L. Mainini

Mon, 20/07/2026 17:00 - 18:30

NM - 7 (Venice)

MS122B - Data-Driven Models and Validation Methods for Aeronautical Design and Simulation II

Main Organizer: Dr. Gonzalo Rubio (UPM)

Chaired by: Dr. Gonzalo Rubio (UPM), Mr. Ángel Ladrón (Universidad Politécnica de Madrid)

Two-Dimensional Modeling of Unsteady Flow Dynamics through Deep-Learning

***P. Arbelo**, L. Lacasa, E. Valero

Low-Fidelity Simulation of Emergency Landing of Hydrogen-Powered Aircraft on Water

***P. Lin**, H. Schwarz, T. Rung

Forecasting ship motion responses in irregular waves by a data-driven model

***Y. Yang**, S. Qin

Mon, 20/07/2026 19:30 - 23:00

Löwenbräukeller in Munich

NGCE - Science Slam

Get ready for a night where science meets storytelling, and research takes center stage in a whole new light!

Tuesday, 21/07/2026

Tue, 21/07/2026 08:00 - 18:00		ICM - FOYER Ground floor
Registration Congress Registration - ICM FOYER Ground floor		
Tue, 21/07/2026 08:30 - 09:15		ICM - 1 Auditorium
PL01A - Plenary Lecture - George Karniadakis Chaired by: Prof. Gianluigi Rozza (SISSA) Agentic Scientific Machine Learning *G. Karniadakis		
Tue, 21/07/2026 08:30 - 09:15		ICM - 14b
PL01B - Plenary Lecture - Silvia Budday Chaired by: Prof. Kent-Andre Mardal (Simula Research Laboratory / University of Oslo) Computational brain mechanics *S. Budday		
Tue, 21/07/2026 08:30 - 09:15		ICM - 14a
PL01C - Plenary Lecture - Artem Korobenko Chaired by: Prof. Harald van Brummelen (Eindhoven University of Technology) Stabilized and Variational Multiscale Methods for Predictive Multiphysics Simulation: From Renewable Energy to Hypersonic Systems *A. Korobenko		
Tue, 21/07/2026 08:30 - 09:15		ICM - 14c
PL01D - Plenary Lecture - Sara Zahedi Chaired by: Dr. Marcela Cruchaga (Universidad de Santiago de Chile) Cut Finite Element Methods *S. Zahedi		
Tue, 21/07/2026 09:15 - 09:45 Coffee Break		
Tue, 21/07/2026 09:45 - 11:15		ICM - 1 Auditorium
MS120E - Recent Advances in Computational Methods for the Cardiovascular System V Main Organizer: Dr. Richard Schussnig (Ruhr University Bochum) Chaired by: Dr. Malte Rolf (Friedrich-Alexander-Universität Erlangen-Nürnberg), Dr. Gian Marco Melito (TU Graz) Virtual Deployment of Braided Flow Diverters in Patient-Specific Cerebral Aneurysms *M. Frank , I. Steinbrecher, M. Mayr, A. Popp Evaluation of Proximal Angulation Control for Endovascular Treatment of Type A Aortic Dissection *X. Kan , C. Nienaber, X. Xu A Parametric 3D Finite Element Model of Atherosclerotic Arteries for Balloon Angioplasty *S. Kwakman , S. Kogler, M. Terzano, M. Rolf, G. Holzapfel Computing Mechanocompatible Arterial Support Properties: Solving the Ross Procedure Paradigm *T. Vervenne , J. Moutinho Gonçalves, A. Hendrickx, F. Rega, A. Mignon, N. Famaey Hemodynamic remodeling of the carotid bifurcation after endarterectomy *B. Csippa , M. Németh, G. Paál, Z. Mihály Carotid Haemodynamics Analysis for Prediction of Major Adverse Cardiovascular Events using 3D Tomographic Ultrasound and Computational Fluid Dynamics *S. Sengupta , A. Revell, S. Rogers		

MS208E - Innovative Methods for Fluid-Structure Interaction V**Main Organizer:** Prof. Harald van Brummelen (Eindhoven University of Technology)**Chaired by:** Dr. Miguel A. Fernández (Inria), Prof. Joris Degroote (Ghent University)

Added-Mass-Partitioned Solvers: Robust and Accurate Methods for Fluid Structure Interaction

***J. Banks**, W. Henshaw, S. Donald

A Robust PFEM-LS/FEM Partitioned Coupling Framework for 3D Fluid-Structure Interaction

***M. Lacroix**, S. Février, E. Fernández, D. Bogucki, R. Boman, L. Papeleux, J. Ponthot

A Stable Dirichlet-Neumann Loosely-Coupled Scheme for Fluid-Structure Interaction with Large Added Mass

***F. Renzi**, C. Vergara

Numerical techniques for partitioned fluid-structure coupling addressing stability and robustness in relation with added mass effect

***V. Faucher**, M. Puscas, G. Ricciardi

Advanced Numerical Techniques for Effectively Solving Fluid-Structure Interaction Analyses

***K. Wu**

Dirichlet-Neumann coupling schemes for FSI with nearly closed domains

H. van Brummelen**, A. Aissa-Berraies, F. Auricchio**MS082C - Advances in Computational Models and Methods for Multiphase Flows with Phase Change III*Main Organizer:** Dr. Marica Pelanti (ENSTA - Institut Polytechnique de Paris)**Chaired by:** Dr. Alessio Roccon (University of Udine), Dr. Marica Pelanti (ENSTA - Institut Polytechnique de Paris)

A unified compressible two-phase, two-scale model with inter-scale mass transfer for separated-to-disperse transitions in atomizing flows

W. Haegeman, ***G. Orlando**, S. Kokh, M. Massot

Numerical investigation of the Navier-Stokes-Korteweg system: nonclassical waves and phase transition problems

***Q. Didierlaurent**, N. Favrie, B. Lombard

Physically Based Lagrangian-Eulerian Full Coupling Model for Multiphase Flows

***E. Doria**, F. Serafini, F. Battista, P. Gualtieri

A Parametric Characterization of Spurious Currents in Multiphase Lattice Boltzmann Models

***C. Albanese**, S. Meloni, A. Facci, S. Ubertini, P. Fanelli

Numerical simulation of liquid aerosol dispersion including evaporation with diffusion inertia model

***J. Miranda-Fuentes**, C. Friess, J. Jacob

Numerical Assessment of Celerity Scaling Laws for Ice Ripples in Turbulent Shear Flows

D. Perissutti**, C. Marchioli, A. Soldati**MS024E - Advanced Discretization Schemes for Computational Structural Dynamics V*Main Organizer:** Prof. Bastian Oesterle (Hamburg University of Technology)**Chaired by:** Dr. Lars Radtke (University of Rostock), Prof. Manfred Bischoff (University of Stuttgart)

Augmented Lagrangian Method for Transient Topology Optimization

***M. Xiao**, W. Kong, J. Sun, P. Breitenkopf

A Molecular Dynamics-Based Framework for Dynamic Response and Damage Assessment of Structural Systems

***A. Louhghalam**, E. Pourvaghar, M. Tootkaboni

Flexural Vibrations of Bimodular Tapered Beams

G. El Chabaan**, R. Heuer**MS040B - New Perspectives in Mechanical and Acoustic Metamaterials Science II*Main Organizer:** Prof. Giuseppe Failla (University of Reggio Calabria, Italy)**Chaired by:** Prof. Antonio Palermo (University of Bologna), Dr. Farhad Zeighami (University of Bologna)

Reverse Design of Band Gap for Elastic Metamaterials Based on Deep Learning

***K. Qiu**, P. Yue, J. Zhang, Y. Luo

Wave Dispersion Analysis of Periodic Rail Structures

P. Pan, J. Zhu, ***Z. Cheng**, L. Su, Z. Shi

Bio-Inspired Quasi-Zero-Stiffness Metamaterials for Vibration Attenuation, Battery Protection and Long-Term Durability

***S. Ravanbod**, K. Rahmani, M. Bodaghi

Sound Insulation Performance of a Novel Insulated Concrete Sandwich Panel

Z. Zhang, B. Liu, ***A. Chen**, J. Sun

A New Locally Resonant Multi-Beam System: Numerical and Experimental Investigation

***F. Lo Iacono**, A. Burlon, G. Navarra, G. Failla

Tue, 21/07/2026 09:45 - 11:15

ICM - 5

MS009E - Complex Fluid Flows in Engineering: Modeling, Simulation, and Optimization V

Main Organizer: Dr. Fabian Key (TU Wien)

Chaired by: Dr. Fabian Key (TU Wien), Prof. Stefanie Elgeti (TU Wien)

Experimental and computational investigation of operation of transcatheter aortic valve operation

***Z. Buliński**, S. Caban, M. Rojczyk, A. Ryfa, K. Bigaj, W. Adamczyk

Finite Element Computation of Blade Coating via a Partitioned Approach

***Y. Yang**, P. Antony, F. Gonzalez, B. Ferrer, N. Hosters, J. Nam

Adjoint-Based Shape Optimization using K-L Smith Turbulence Model

***R. Guillot**, A. Dumont, P. Raud, S. Aubert, C. Corre

Optimization of Turbulent Channels using Direct Numerical Simulation

***J. Bisbee**, B. Vermeire

Analysis of Equivalent Roughness in RANS Simulations of Airfoils

A. De Urza, J. Torres Zanardi, ***A. Scarabino**, F. Bacchi

Notchback sedan aerodynamics predictions with different turbulence modelling and ground effects

***K. He**, C. Duan, B. Liu, X. Li, Q. Huang

Tue, 21/07/2026 09:45 - 11:15

ICM - 11a

MS066A - Recent trends in model order reduction, model discovery, and surrogate models I

Main Organizer: Prof. Giovanni Stabile (Sant'Anna School of Advanced Studies)

Chaired by: Prof. Giovanni Stabile (Sant'Anna School of Advanced Studies), Prof. Alessandro Lucantonio (Aarhus University)

Physically-based data augmentation for POD reduced basis projection: generating plausible artificial snapshots

Keynote

***P. Díez**, A. Muixí, M. Giacomini, S. Zlotnik

Learning PDE Solution Operators with Variable Initial Conditions via Latent Dynamics Networks

***S. Pizzamiglio**, S. Pagani, F. Regazzoni

Projection-Based Reduced Order Models for Liquid-Jet Breakup Using POD–DEIM

***T. Hosaka**, E. Ishii, A. Kobayashi, Y. Sasaki, T. Nonomura

Model Order Reduction via Quadratic Manifold for Transient Dynamics of a Flexible Multi-body System

***Y. Wang**, K. Luo, Q. Tian, H. Hu

Tue, 21/07/2026 09:45 - 11:15

ICM - 11b

MS062A - Advances in numerical modeling strategies for static and dynamic analysis of masonry and historic structures I

Main Organizer: Prof. Daniela Addessi (Sapienza University of Rome)

Chaired by: Prof. Nicola A. Nodargi (University of Rome Tor Vergata)

High-fidelity numerical modeling of the dynamic behavior of 3D-printed masonry-like sub-structures under shake-table loading

***A. Ghezelbash**, A. A??ko?lu, A. Maria D'Altri, S. Sharma, F. Messali

A discrete element particle based hydromechanical model for dam masonry stability analysis

***N. Monteiro Azevedo**, I. Cismasiu, F. Pinho, M. Braga Farinha

A Detailed Micro-Modelling Approach for Masonry Walls of hollow concrete blocks

***N. SUN**, C. CHESNAIS, L. TRAN, L. MAKKI, F. SCHMIDT, P. REIFFSETCK

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ICM - 12a

MS248A - Near-Wall Reactive Flows: Experiments, Simulations and Modelling I

Main Organizer: Prof. Suad Jakirlic (Technical University of Darmstadt, Germany)

Chaired by: Prof. Suad Jakirlic (Technical University of Darmstadt, Germany)

Challenges in Flame–Wall Interaction of Hydrogen Combustion

Keynote

***M. Schneider**, B. Traut, F. Rong, V. Schuh, H. Nicolai, C. Hasse

Side-Wall Quenching in Ultra-lean Hydrogen Flames: Comparing Active and Passive Wall Designs

***M. Marburger**, C. Möller, A. Macfarlane, A. Dreizler

Modeling Premixed Methane-Air Flame Quenching with a Strain- and Heat-Loss-Sensitive Tabulated Chemistry Approach

***A. Haake**, M. Hiestermann, H. Müller

Numerical simulation of downward opposed flow flame spread over PMMA slab using finite rate chemistry

***R. Corrales Flores**, F. Ferraro, A. Scholtissek

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ICM - 12b

MS012C - Verification, Validation and Uncertainty Quantification in Modeling and Simulation III

Main Organizer: Prof. Luís Eça (IST Lisbon)

Chaired by: Prof. Luís Eça (IST Lisbon), Dr. Brian Freno (Sandia National Laboratories)

A Scientific Machine Learning Predictive Capability Maturity Model Framework for Data-Driven Turbulence Modeling

***U. Balakrishnan**, W. Rider

Verification and validation of dynamic fault rupture simulator using consistent fault stress induced by far-field loading

E. Nicolin, ***L. Maddegadara**

Assessment, Uncertainty and Sensitivity Analysis of the thermohydraulic loop UPTF with the code CATHARE

S. Baldini, A. Cervone, A. Ghione, F. Giangolini, S. Manservigi, ***D. Rimondini**, L. Sargentini

Vibration Analysis of Metris AC Extreme Gauge: Experiments and Modeling

***N. KAUTA**, N. Soen, J. Cozon

Numerical simulation of the PABLO-I near-field blast experiment using CTH and Viper Blast

***P. McDonald**, J. Wurster, P. Papados

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ICM - 13a

MS372E - Phase-field fracture modeling and computation V

Main Organizer: Prof. Laura De Lorenzis (ETH Zurich)

Chaired by: Prof. Robert Lipton (Louisiana State University)

Bridging crack nucleation and contact in variational phase-field models

***B. Li**, B. Yin, Y. Jiang, L. Chen

A phase field description for shear stress driven fracture: application to rocks and mining

***J. Ramírez-Ganga**, R. Estevez, E. Bonnetier, A. Jofré, J. Ortega, J. San Martín

Phase field approach to model fracture propagation in sea ice

***L. Drumare**, V. Skogvoll, V. Dansereau, L. Angheluta-Bauer, F. Renard

Phase field modeling of cracks at calving fronts

***R. Sondershaus**, A. Humbert, R. Müller

Phase Field Modelling of Indentation-Induced Crack Systems in Glass

***A. Gibb**, A. Tsakmakis, R. Müller, M. Weiß, M. Seel, A. Trauth

Interpreting Mixed-Mode Failure Initiation In V-Notched Structures Using the Complete Theory Of Fracture

***G. West**, J. Dolbow

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ICM - 13b

MS011E - Advances in Neural Network Approximations of Partial Differential Equations V

Main Organizer: Dr. David Pardo Zubiaur (University of the Basque Country (UPV/EHU))

Chaired by: Prof. John Evans (University of Colorado), Dr. M. Mahdi Abedi (University of the Basque Country (UPV/EHU))

Practical existence theorems for deep learning-based PDE solvers and reduced-order models [Keynote](#)

***S. Brugiapaglia**

An $\mathbb{H}^1$ -Adaptive Finite Element Method Using Neural Networks for Parametric Self-Adjoint Elliptic Problems

D. Aballay, F. Fuentes, V. Ilgaray, A. Omella, D. Pardo, ***M. Sanchez**, I. Tapia, C. Uriarte

Differentiable r-Adaptivity in Isogeometric Analysis via PINN Strong-Form Residual Minimisation

***E. Caru**, D. Pardo

Isogeometric Physics-Informed Operator Learning for Efficient 1D Modeling of Slender Thin-Walled Structures

***B. Tao**, K. Luo, Q. Tian, H. Hu

Generative Physical Neural Network Based On Wave Equation

***H. Zhang**, Z. Lin

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ICM - 14a

MS200D - Computational Design for Additive Manufacturing IV

Main Organizer: Dr. Can Ayas (Delft University of Technology)

Chaired by: Prof. Jikai Liu (Shandong University)

Additive Manufacturing of Fiber-Reinforced Composites: Combined Topology and Filament Path Optimization Including Manufacturability

***B. Musil**, V. Murugan, P. Höfer

Topology optimization with CFF considerations

***J. Postigo Martín**, A. Garaigordobil Jiménez, R. Ansola Loyola

Recent Advances in Space-Time Topology Optimization for Multi-Axis Additive Manufacturing

***J. Wu**, K. Wu, V. Mishra, W. Wang

Multimaterial Topology Optimisation of Eco-efficient Fibre-reinforced Composite Structures

***G. Asai**, M. Amani, A. Luijten, C. Jansari, F. Lachaud, J. Morlier, K. Masania

Topology Optimization of Structures 3D-Printed with Grayscale Masked Stereolithography

***F. Rutsch**, O. Weeger

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ICM - 14b

MS092D - Computational Scale Bridging in Materials and Structures IV

Main Organizer: Prof. Jörg Schröder (University Duisburg-Essen)

Chaired by: Dr. Varvara Kouznetsova (Eindhoven University of Technology), Dr. Dominik Brands (University of Duisburg-Essen)

Multiscale Hygro-mechanical Modelling of Paper and Paperboard

***R. Peerlings**, N. Dave, A. Tol, C. Rojas, M. Geers, T. Massart

Macroscale modeling of structured magnetorheological elastomers

***H. Roth**, P. Gebhart, K. Kalina, T. Wallmersperger, M. Kästner

Multi-Grid Two-Scale Modelling of Nonlinear Multiphysics Systems with Partial Scale Separation

***A. Armiti-Juber**, T. Ricken

Unraveling Thermoplastic Fracture: Bridging the Nano- and Microscale via Large-Scale MD Simulations

***E. Richter**, F. Weber, M. Ries, S. Pfaller

Piezo-Flexoelectricity Competition in Micro- to Nanoscale Metamaterials

***T. Pham-Phu**, S. Kozinov, D. Balzani

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ICM - 14c

MS312D - Particle-based methods: advances and applications in DEM, PFEM, SPH, MPM, MPS and others IV

Main Organizer: Prof. Eduardo de Moraes Barreto Campello (University of São Paulo)

Chaired by: Prof. Sergio Idelsohn (CIMNE), Prof. Eduardo de Moraes Barreto Campello (University of São Paulo)

Adaptive meshless simulations of fluid flow

***N. Bartwal**, J. Kuhnert, P. Suchde

A unified fluid-solid formulation for thermo-mechanical problems using the Particle Finite Element Method: application to fluid-structure interaction and metal additive manufacturing

***D. Bogucki**, S. Février, M. Lacroix, E. Fernandez, L. Papeleux, R. Boman, J. Ponthot

Full-Scale Conductor Installation Simulated with Axisymmetric MPM

***M. Tenório**, J. Santos, R. Dias

A Numerical Investigation on Road Collapse Problems with the Material Point Method and its Experimental Validations

***J. Li**, H. ISHIMORI, Z. SUN, P. XIN

Mechanics of Soil Plug Formation in Open-Ended Piles: Insights from DEM Modelling

***E. Mohamed**, V. Dimitriadis, J. Bernal-Sanchez, D. Barreto

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ICM - B11

MS014E - Advanced computational techniques for fracture V

Main Organizer: Prof. Sonia Marfia (Sonia Marfia, Full Professor, University of Roma Tre)

Chaired by: Prof. Daniel Balzani (Ruhr University Bochum), Prof. Sonia Marfia (Sonia Marfia, Full Professor, University of Roma Tre)

An Improved Extended Phase-Field Method (XPFM) Applicable to Fracture Processes: Part 1, General Framework

V. Curosu, ***S. Löhnert**

An Improved Extended Phase-Field Method (XPFM) Applicable to Fracture Processes: Part 2, the Sub-Problem

***V. Curosu**, S. Loehnert

Simulation of crack surface friction within the phase-field method

***L. Koch**, V. Curosu, S. Loehnert

Dynamic Fracture Prediction With Nonlocal Macro-Meso-Scale Consistent Damage Material Point Method(NMMD-MPM)

***Z. Zeng**, X. Zhuang

Peridynamic Modeling of Thin-Film Fracture on a Winkler Foundation

***E. Yousefimiab**, O. Salman, A. León Baldelli, A. Ahadi

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ICM - B12

MS027A - Current Trends and Advances in Enriched Finite Element Methods and Coupled Simulations I

Main Organizer: Prof. Nathan Shauer (Unicamp)

Chaired by: Prof. Nathan Shauer (Unicamp), Dr. Carlos Armando Duarte (University of Illinois at Urbana-Champaign)

On the use of SBFEM eigenfunctions as GFEM enrichment functions

***P. Devloo**, N. Shauer, C. Song, A. Duarte

Rational-adaptive tip element with implicit enrichment for efficient crack modeling

***Q. Wang**, H. Yu

A High-Order Generalized/eXtended FEM for Three-Dimensional Problems with Material Interfaces

***M. Bento**, H. Zanardi, P. O'Hara, S. Proença

Impedance Computation for a Biological Microsystem

***A. Gossard**, C. Poignard, A. Collin

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ICM - B13

MS271C - Battery Modeling & Validation for Industrial Applications: Multi-Scale and Multi-Physics Approaches III

Main Organizer: Prof. Andre Haufe (ANSYS Germany GmbH)

Chaired by: Dr. Florence ANDRIEUX (Fraunhofer IWM), Mr. Marian Bulla (Altair Inc.)

Advanced constitutive modelling of Lithium-ion batteries: from phenomenological strain-rate and temperature dependent hardening to mechanism-inspired gradient plasticity

***T. Tancogne-Dejean**, R. Jahn, V. Grolleau, D. Mohr

Electrochemical-Thermal Coupling for Battery Thermal Runaway Prediction Under Nail Penetration Abuse

M. MAMA, ***E. SOLAI**, T. CAPURSO, J. TISSOT, K. AZZOUZ, A. DANLOS, S. KHELLADI

Simulating the Rate Dependence of a Prismatic Cell under Crash Loading

***A. Steiert**, B. Schaufelberger, T. Kisters

Numerical Assessment of Step-Graded Phase Change Material Coupled with Liquid Cooling for High-Rate Lithium-Ion Batteries

***M. Faizan**, O. Munteshari

A Multi-Physics Framework for the Numerical Simulation of Electrochemical Loading and Fluid-Thermal Dynamics of Lithium-Ion Batteries from Cell to Pack Level

***T. Aubel**, R. Heiniger, R. Schützer, I. Çaldichoury

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ICM - B21

MS222B - Polytopal Methods in Mechanics: bridging Mathematics and Engineering II

Main Organizer: Mr. Lourenco Beirao da Veiga (Università di Milano-Bicocca)

Chaired by: Mr. Lourenco Beirao da Veiga (Università di Milano-Bicocca)

Basic Principles of axial-symmetric Virtual Element Method

***F. Dassi**, A. Fumagalli, I. Mazzi, G. Vacca

A Virtual Element Method on Polyhedra with Curved Faces

***D. Prada**, F. Brezzi, D. Marini

A semi-nonconforming Virtual Element Method for curved domains in three dimensions

***M. Trezzi**, L. Beirao Da Veiga, F. Dassi, A. Russo

A Mixed Virtual Element Method for the p-Laplace Equation

***K. Haile**, G. Vacca

Virtual Element methods for non-Newtonian shear-thickening fluid flow problems

P. Antonietti, L. Beirao da Veiga, M. Botti, ***A. Harnist**, G. Vacca, M. Verani

Efficient solution of discontinuous Galerkin approximation of the non-linear thermo-poroelastic problem

***S. Bonetti**, P. Antonietti, M. Botti

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ICM - B22

MS186A - Mathematical and Numerical Aspects of Computational Methods for Electromagnetic Field Problems I

Main Organizer: Dr. Daisuke TAGAMI (Kyushu University)

Chaired by: Dr. Daisuke TAGAMI (Kyushu University), Prof. Hiroshi Kawai (Toyo University)

Parallel Full-Wave FEM **Keynote**

***A. Takei**

A Study on the thermal conduction analysis method for the establishment of fertility preservation surgery

***R. Iwamoto**, S. Otomi, S. Katsuragi, A. Takei

Large-scale Electromagnetic Field - Heat Conduction Coupled Analysis by Integrated System

***S. Sugimoto**

Parallel processing approach to physics-informed machine learning for solving magnetostatic problems

***M. Ogino**, T. Muramatsu, S. Sugimoto

3D Electromagnetic Inverse Analysis based on PI-DeepONet

***T. Kurazono**, K. Ohnaka, Y. Wada, A. Takei

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ICM - 21a

MS156B - Moving Mesh Schemes for Unsteady Compressible Flows II

Main Organizer: Dr. Barbara Re (Politecnico di Milano)

Chaired by: Prof. Walter Boscheri (CNRS), Dr. Barbara Re (Politecnico di Milano)

Advanced Mesh Deformation Techniques for Large Displacements without Remeshing

***B. Re**

Physics-Informed Neural Networks for Mesh Deformation

***G. Marinaro**, L. Abergo, B. Re

Shock Dynamics under Non-conservative Finite Volume Discretizations in One Dimension

***R. Guglielmi**, A. Rausa, B. Re, A. Guardone

Remarks on Mesh Quality and Optimization

***T. Sorgente**

High-Order Hierarchical Dynamic Domain Decomposition Method for the Boltzmann Equation

***D. Caparello**, L. Pareschi, T. Rey, T. Tenna

Simulations of Transition Effect on the Free-Oscillation Past a Blunt Cone at Hypersonic Speed

***H. Zhang**, J. Liu, J. Zhao, S. Zhang, Z. Xiao

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ICM - 21b

MS073B - Model order reduction on non-linear and high-dimensional systems II

Main Organizer: Prof. Udo Nackenhorst (Leibniz University Hannover)

Chaired by: Prof. Thomas Wick (Leibniz Universität Hannover (LUH)), Prof. David Néron (Ecole normale supérieure Paris-Saclay)

Discrete Compression with Sampling and Weighting for Low-Memory Nonlinear Model Order Reduction

***A. El Hajj**, S. Rodriguez, C. Ghnatios, F. Chinesta

Bayesian Updating of Constitutive Parameters under Hybrid Uncertainty using a Reduced-Order Model for Bacterial Biofilms

***L. Fritsch**, H. Geisler, J. Grashorn, F. Klempt, M. Soleimani, M. Broggi, P. Junker, M. Beer

Two-level stochastic additive Schwarz preconditioners for parallel stochastic finite element analysis

***Z. Zheng**, M. Beer, U. Nackenhorst

Model Order Reduction of Nonlinear Hyperelastic Dynamics for Non-Parametric Geometry Variations via Neural Operator Subspace Regression

***T. Hisamitsu**, S. Rodriguez, B. Moya, F. Chinesta

Stochastic Multiscale Analysis of Porous Media Flow through Data-Driven Stochastic Upscaling

***P. Nguyen**, Z. Zheng, L. Chamoin, U. Nackenhorst, M. Beer

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ICM - 22a

MS284B - Computational Biomechanics of Hard Tissues II

Main Organizer: Prof. ZOHAR YOSIBASH (Tel Aviv University)

Chaired by: Dr. Michael Roland (Saarland University), Prof. ZOHAR YOSIBASH (Tel Aviv University)

A Comprehensive Triad Analysis of Biphasic Plate Mechanics: In Vivo, In Vitro, and In Silico Perspectives

***K. Wickert**, A. Andres, M. Roland, M. Orth, B. Braun, T. Histing, T. Pohlemann, S. Diebels

Predicting Fracture Load and Trajectory in Long Bones by Phase Field Models

M. Levy, ***Z. Yosibash**

Phase-field finite element modelling of fatigue-driven fracture in metastatic vertebral bone

***M. Ahmadi**, N. Ovenden

Towards Biomechanically Informed Topology Optimization of Mandibular Implants

***N. Kraus**, R. Callens, V. Cool, D. Moens

Investigation of Maxilla Central Incisor Mechanical Response to the Mimical One-Bite Masticatory Load using Finite Element Method

***N. Siroros**, P. Rungsiyakull, F. Yantarasri, T. Somboonchokephaisal, I. Thawon, P. Suttakul

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ICM - 22b

MS046A - Mixed-Dimensional Modeling: Advances in Modeling, Numerical Methods and Applications I

Main Organizer: Dr. Matthias Mayr (Universität der Bundeswehr München)

Chaired by: Dr. Matthias Mayr (Universität der Bundeswehr München), Mr. Paolo Zunino (MOX, Department of Mathematics, Politecnico di Milano)

Multiscale Modeling of the Human Brain and Neurodegeneration

***P. Antonietti**, F. Bonizzoni, M. Corti, I. Fumagalli, C. Leimer Saglio, S. Pagani

Modelling vascularized tissues: coupling 3D elastic matrix and 1D vascular tree

***C. Belponer**, A. Caiazzo, L. Heltai, L. Müller

A 3D-1D-0D Multiscale Model of the Neuro-Glial-Vascular Unit for Synaptic and Vascular Dynamics in the Dorsal Vagal Complex

***T. Koepl**, A. Hermann, A. Wagner, R. Miftahof, C. Cyron, B. Wohlmuth, A. Shojaei, R. Aydin

Effective Permeabilities for Flow through Anisotropic Microscopic Geometries

***L. Balazi**, F. Holzberger, S. Lunowa, M. Peter, D. Peterseim, B. Wohlmuth

A Unified Operator Splitting and Domain Decomposition Method for Mixed Dimensional Problems in Complex Domains with Applications to Geosciences and Biomedicine

F. Marcon, ***S. Scialò**

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ICM - 41 (Ostersee A)

MS052A - Treatment of Locking Across Discretization Techniques I

Main Organizer: Mr. Tarun Kumar Mitruka Vinod Kumar Mitruka (University of Stuttgart)

Chaired by: Prof. Manfred Bischoff (University of Stuttgart), Prof. Carlo Lovadina (Università degli Studi di Milano)

Locking-free Mixed Finite Element Methods for Thin-walled and Nearly Incompressible Nonlinear Continuum Mechanics

Keynote

***M. Neunteufel**, G. Fu, A. Pechstein, J. Schöberl, A. Zdunek

An efficient hybrid formulation for membrane-locking-free analysis of isogeometric thin shells

***L. Stöttelder**, R. Sauer

Aspects of a mixed least-squares finite element formulation for the theory of porous media under finite strains

***M. Hegde**, A. Schwarz, J. Bluhm, J. Schröder

On the Mixed Displacement Method for Nearly-Incompressible Elasticity

***T. Vinod Kumar Mitruka**, M. Bischoff

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ICM - 42 (Ostersee B+C)

MS353E - Emerging Topology and Shape Optimization Techniques in Computational Design of Materials and Structures V

Main Organizer: Prof. Ahmad Najafi (Drexel University)

Chaired by: Dr. Alejandro Aragón (Delft University of Technology), Prof. Ahmad Najafi (Drexel University)

AI-Based Multiscale Design of Nonlinear Materials Using a Signed-Distance-Function Representation of the Microstructure

Keynote

Q. Liu, S. Koric, D. Abueidda, H. Meidani, ***P. Geubelle**

Buckling-Resistant Multiscale Topology Optimization via Deep Neural Network Surrogates

S. Honarvar, N. Black, ***A. Najafi**

Neural Network Based Topology Optimization of Mechanical Metamaterial

***A. Singh**, R. Chowdhury

Generalization of Surrogate Models for Topology Optimization Trained on Random Density Fields

***H. Kamada**, S. Yamamoto, Y. Otake, M. Nishio

Micro-Macro optimization of porous structures using minimization-based phase-field models

***A. Krischok**, B. Yaraguntappa, M. Keip

Tue, 21/07/2026 09:45 - 11:15

ICM - 43 (Eibsee)

MS112A - Advances in Flexoelectricity I

Main Organizer: Dr. Prakhar Gupta (IIT Hyderabad)

Chaired by: Dr. Prakhar Gupta (IIT Hyderabad)

The Emergence of Surface Boundary Layers and Surface Effects in Flexoelectric Dielectrics

***D. Codony**, F. Greco, M. Dingle, H. Mohammadi, S. Fernández-Méndez, I. Arias

Growth induced flexoelectricity and buckling of dielectric materials

***P. Wang**, T. Morimoto

A Finite Element Formulation of Flexoelectric Rods

***P. Mishra**, P. Gupta

Flexoelectric Sensing of Laminated Composite Structures Considering Bonding Compliance

***S. Kumar Rout**, S. Kapuria

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ICM - 44 (Schliersee)

MS033A - Ice-Accretion by Immersed Boundary Methods I

Main Organizer: Prof. Eric Laurendeau (Polytechnique Montréal)

Chaired by: Prof. Eric Laurendeau (Polytechnique Montréal), Dr. Francesco Capizzano (Italian Aerospace Research Centre - CIRA Scpa)

Ice-Accretion by Immersed Boundaries and Level-Set

***F. Capizzano**, A. Conte

Scale-Resolving Simulations of Aerodynamic Degradation over Numerical and Experimental Ice Shapes

***A. Conte**, F. Capizzano, P. Catalano

Modelling and Simulation of In-flight Ice Accretion on Heated Bodies using a Moving Finite Element Method

***L. Bennani**, G. Blanchard, M. Bouyges

A Multi-Layer Icing Model Using a Viscous Immersed Boundary Method

***M. Blanchet**, M. Zayni, É. Laurendeau, Y. Hoarau

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ICM - 31 (Zugspitze)

MS187B - Structure-Preserving Scientific Machine Learning and Neural Networks II

Main Organizer: Mr. Benedikt Brantner (Max-Planck-Institute für Plasmaphysik)

Chaired by: Dr. Michael Kraus (Max-Planck-Institut für Plasmaphysik), Mr. Benedikt Brantner (Max-Planck-Institute für Plasmaphysik)

Symplectic Convolutional Neural Networks

S. Yildiz, ***K. Janik**, P. Benner

Symplectic Neural Operators for Partial Differential Equations

E. Franck, L. Navoret, ***C. Schnoebelen**

Operator Neural Networks With Spatial Translation Invariance For Simulating Charged Particles

***J. Liu**, A. Xue, C. Mou

Tue, 21/07/2026 09:45 - 11:15

ICM - 32 (Watzmann)

MS108A - Polytopal, Mixed and other Advanced Discretization Techniques for Structural Mechanics I

Main Organizer: Dr. Francesco Salvatore Liguori (University of Calabria)

Chaired by: Prof. N. Sukumar (UC Davis), Prof. Antonio Madeo (University of Calabria)

Developments in the a posteriori error analysis for VEM and Stabilization-free VEM

S. Berrone, A. Borio, C. Canuto, ***D. Fassino**, F. Marcon, F. Vicini

A Shear Deformable Shallow Shell Virtual Element

***L. Wyatt**, Z. Sharif Khodaei, F. Aliabadi

On the simultaneous analysis of Kirchhoff–Love shells with mixed-hybrid finite elements

***J. Neumeyer**, M. Kaiser, T. Fries

Stress-based Finite Element Analysis of the Reissner–Mindlin Plate with soft boundary conditions

***Z. Wi?ckowski**, P. ?wi?tkiewicz

Discontinuous Least-Squares Method on Curved Domains

***J. Ja?kowiec**, A. Krowiak

Tue, 21/07/2026 09:45 - 11:15

BrainLab - Auditorium

MS234E - Quantum Scientific Computing V

Main Organizer: Prof. Yan Wang (Georgia Institute of Technology)

Chaired by: Prof. Caglar Oskay (Vanderbilt University), Dr. Suvranu De (FAMU-FSU College of Engineering)

qRLS: Quantum Relaxation for Linear Systems

S. El-Halouy, ***S. De**

PHASE: Pauli Hierarchical Assembly on Subdivided Elements for Quantum-Compatible Operator Synthesis

T. Philo, ***C. Oskay**

Quantum Variational System Identification for Inference of Reaction–Transport PDEs

***S. Srivastava**, K. Garikipati

A Quantum Algorithmic Framework for the Finite Element Method

***A. Alkadri**, T. Kharazi, B. Whaley, K. Mandadapu

QAFE²: Quantum Accelerated Multiscale Finite-Element Analysis

***Y. Wang**, M. Ortiz, F. Cirak

Quantum Simulation of Axially Deformed Bar via Quantum Eigenvalue Transformation

***W. Sato**, K. Endo, S. Sasaki, M. Muramatsu

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NM - 1 (Multimedia Saal)

MS246E - Numerical Methods for Interface-Resolved Multiphase Flows V

Main Organizer: Dr. Nicolas Valle (TU Delft)

Chaired by: Prof. F.Xavier Trias (Technical University of Catalonia)

Development of a Multi-layer CLSVOF Method for Numerical Simulation of Dense Bubbly Flows

***T. Fukuda**, S. Yamashita, S. Uesawa

A three-dimensional subresolution technique to refine passive scalar transport around deformable inclusions

***M. GROSSO**, G. Bois, A. Toutant

A paraboloidal framework for the modelling of the thermal boundary layer around bubbles

***J. Poblador Ibanez**

Multiphase Flow Simulations Using a Weakly Compressible Scheme with an AMR Method for Foam Flows

***S. Matsushita**, S. Yamashita, T. Suekane

A Semi-Lagrangian Meshfree Lattice Boltzmann Method for Incompressible Two-Phase Flows

***H. Yu**, X. Wang, S. Yang

Tue, 21/07/2026 09:45 - 11:15

NM - 2 (Salzburg)

STS400A - CFD for ONERA, DLR and Airbus – Advanced Features of CODA for future CFD I

Main Organizer: Ms. Cornelia Grabe (DLR)

Chaired by: Ms. Cornelia Grabe (DLR), Dr. Stéphanie PERON (ONERA)

CODA technical overview and applications: Current status and future challenges

***J. Limbach**, S. Görtz, C. Grabe, S. Peron

Advances in high-order Discontinuous Galerkin methods in the CODA flow solver

***J. Chapelier**, M. Herrera, T. Marchal, R. Hartmann

Implementation of Non-Reflecting Boundary Conditions for Steady Blade Row Coupling in CODA

***H. Birliker**, G. Ashcroft, A. Bleh, L. López de Vega

Grid Adaptation in the Context of DG and FV

***M. Wegener**, A. Schotte, R. Hartmann, J. Chapelier, R. Laraufie, M. Höchel, X. Garnaud

Implementation of an Immersed Boundary Method in the CFD Software by ONERA, DLR and AIRBUS

B. CONSTANT, A. JOST, ***S. PERON**, J. Sanchez Gil, R. Sanchez Ortiz

Applications of the New CFD Software by ONERA, DLR, AIRBUS (CODA) and its Algorithmic Differentiation Framework in Aero-Structure Optimization: Status and Way Forward

***M. Widhalm**, F. Volle, A. Büchner, F. Kasielke

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NM - 4 (Hamburg)

STS397A - Hydrogen – Industrial Questions I

Main Organizer: Mr. Tero Tuovinen (JAMK University of Applied Sciences)

Chaired by: Mr. Tero Tuovinen (JAMK University of Applied Sciences), Prof. Matti Kurki (JAMK University of Applied Sciences)

Perspectives to the Value Chain and Hydrogen Price Creation Using Wind Power

***M. Kurki**

Modelling, simulation, optimisation and scaling of a (real) hydrogen production plant with hydrogen storage and distribution for (regional) sector coupling (mobility, electricity, heat)

***H. Jahanfar**, W. Czarnetzki

Mission-optimized multi-state hydrogen storage, transport and conditioning systems for aviation

D. Raso, B. Giovanardi, ***J. van Campen**

Modeling and Numerical Simulation of AEM Electrolyzer for Hydrogen Production and Performance Analysis

***Z. Kang**, M. Emmerich, T. Bäck, Y. Fan

Mission-aware thermomechanical modelling of multi-state hydrogen storage systems for aviation

***D. Raso**, B. Giovanardi, J. van Campen

Tue, 21/07/2026 09:45 - 11:15

NM - 5 (KK)

MS151A - Physics-Augmented Machine Learning Methods for Constitutive Modeling I

Main Organizer: Mr. Dominik K. Klein (TU Darmstadt)

Chaired by: Mr. Dominik K. Klein (TU Darmstadt), Dr. Karl Kalina (TU Dresden)

Validation Criteria for Data-driven Models of History-dependent Materials

Keynote

*L. Chamoin, P. Ladevèze

Complementing Neural Networks with Anisotropic Inelasticity at Finite Strains

*H. Holthusen, E. Kuhl

Symbolic Regression of Convex Dissipation Potentials for Viscoelastic Materials via a Grammar-Based Search Space

*F. Califano, J. Ciambella

Artificial Neural Network-Based Constitutive Modeling of Mullins-Type Stress Softening

*S. Kulkarni, M. Johlitz, A. Lion

Mechanism-Based Data-Driven Viscoplasticity of Glassy Polymers and LLM-Enabled Chat-Mechanics

*S. Tang, Z. Yu

Tue, 21/07/2026 09:45 - 11:15

NM - 3 (BB)

MS427A - Eco-Efficient Smart Manufacturing of Metallic Materials (ECOSMART-MM) I

Main Organizer: Eng. Roya Darabi (INEGI)

Chaired by: Prof. Jose Cesar de Sa (FEUP), Eng. Roya Darabi (INEGI)

Probabilistic Generative Machine Learning for Modelling Process-Structure Linkages

*T. Ramgopal, G. Nimmal Haribabu, C. Bos, S. Kumar

Efficient Phase-Field Fatigue Prediction for Metallic Materials via Toughness-Degradation Functions and a Practical Calibration Procedure

S. Yang, J. Gil, *R. Darabi, A. Reis, A. de Jesus

Analysis of Tool Wear Evolution in CNC Machining Using Multi-Sensor Data and Deep Learning

*J. Ferreira, T. Silva, J. Sousa, B. Guimarães, P. Tavares, D. Figueiredo, A. Sousa, A. Reis

Tue, 21/07/2026 09:45 - 11:15

H4 - 1 (Ludwig)

MS053B - Innovative Finite Element Methods for Fluids II

Main Organizer: Mr. Frederic Valentin (LNCC)

Chaired by: Mr. Frederic Valentin (LNCC), Dr. Miguel A. Fernández (Inria)

Pressure-robust Staggered DG Methods for the Navier-Stokes Equations

*E. Chung

A stabilized finite element method for a coupled problem

*R. Araya, C. Cárcamo, A. Poza

A Hierarchy-consistent Framework For SVE-based Multiscale Modeling Of Heterogeneous Materials

A. Anto, E. Caliskan, S. TerMaath, *R. Abedi

A Conservative Degree Adaptive HDG Method for Transient Incompressible Flows

*R. Sevilla, A. Felipe, O. Hassan

Subcell Limiting Strategies for Continuous Galerkin Spectral Element Methods for Compressible Flows

A. Rueda-Ramírez, *C. McDonnell, J. Muela, O. Lehmkuhl, E. Valero

Implementation and Efficiency Evaluation of a Thermodynamic p -FEM Model for Static Analyses of Radial Journal Bearings

*F. Schmidtchen, C. Strackeljan, S. Eisenträger, E. Woschke

Tue, 21/07/2026 09:45 - 11:15

H4 - 2 (Leopold)

MS322B - Advances in Computational Mechanics for Wave Propagation, Multiscale and Multiphysics Simulations II

Main Organizer: Dr. Heedong Goh (Seoul National University)

Chaired by: Prof. Jun Won Kang (Hongik University), Dr. Heedong Goh (Seoul National University)

An overview of a chemo-micromechanical modeling for cementitious material carbonation

Keynote

J. Bae, S. Moon, J. Park, *H. Lee

GPU-Accelerated Multi-Material FVM-SPH with Immersed Boundary Method for High-Fidelity Modeling of Shock-Structure Interactions

*J. Chen

Fluid-Structure Interaction Analysis for Low-Frequency Heavyweight Floor Impact Sound

*T. Lee, H. Kim, Y. Lee, S. Kim, J. Hong

Electrical Impedance Tomography for Early-Age Concrete Characterization

J. Jo, D. Kim, *J. Kang

Tue, 21/07/2026 09:45 - 11:15

H4 - 3 (Franz)

MS230A - Modeling and Simulation of Additive Manufacturing: Meso- and Microscale Approaches I

Main Organizer: Dr. Magdalena Schreter-Fleischhacker (Technical University of Munich)

Chaired by: Prof. Stefan Kollmannsberger (Bauhaus-Universität Weimar), Dr. Magdalena Schreter-Fleischhacker (Technical University of Munich)

High-fidelity non-equilibrium laser-plasma-material interaction and accelerating accurate full laser ray tracing [Keynote](#)

***S. Khairallah**, M. Stokes, R. Blake, Z. Lin, A. Volkov

It takes two (fluids) to make a keyhole: Assessing One- and Two-Fluid Approaches for Laser Melt Pool and Vaporization Modeling

***C. Zenz**, P. Cook, L. Vörös, T. Florian, M. Buttazzoni, A. Otto

Refined Formulations of Resolved Vapor Flow and Unresolved Recoil Pressure Models for Rapid Evaporation in Metal Additive Manufacturing under Elevated Pressure

***A. Koch**, P. Praegla, J. Brotz, M. Schreter-Fleischhacker, C. Meier

A Modeling Approach for Vaporization-Induced Powder Redistribution in Laser Powder Bed Fusion Additive Manufacturing

***J. Brotz**, A. Koch, M. Schreter-Fleischhacker, B. Blais, C. Meier

Quantitative Benchmark for Laser Powder Bed Fusion Melt Pool Scale Models

***H. Papillon-Laroche**, A. Alphonius, M. Schreter-Fleischhacker, N. Much, C. Meier, J. Harvey, B. Blais

Tue, 21/07/2026 09:45 - 11:15

H4 - 4 (Alois)

MS279E - AI for Computational Fluid Dynamics - Opportunities and Challenges V

Main Organizer: Prof. Nils Thuerey (TUM)

Chaired by: Dr. Nguyen Anh Khoa Doan (Imperial College London), Prof. Nils Thuerey (TUM)

Spectrally Constrained Fourier Neural Operators (SC-FNO) for Incompressible Vortex-Dominated Flows

***L. Achour**, S. Rodriguez Iturra, B. Moya Garcia, F. Chinesta

Physics-Aware Generative Modeling of Hypersonic Aerodynamics

***F. Sestak**, D. Rubini, D. Bezgin, A. Buhendwa, L. Serrano, R. Kurlé, F. Paischer, J. Brandstetter, S. Kaltenbach, N. Adams

Physics-Constrained Machine Learning For Compressor Speedline Prediction Across The Operating Range

***D. Singh**, M. Lockan, R. Schaffrath

Reliable, Fast and Stable Inverse Analysis of Incompressible Flow With PINN Enhanced With Normalized Distance and Unbiased Weights

***S. Deguchi**, N. Mitsume, M. Asai

3D PINN Models of Stirred Tank Reactors: What Works, What Doesn't, and at What Cost?

***V. Trávníková**, E. von Lieres, M. Behr

Tue, 21/07/2026 09:45 - 11:15

H4 - 5 (Xaver)

MS056A - Computational Multiphysics of fibrous materials I

Main Organizer: Prof. Catalin Picu (Rensselaer Polytechnic Institute)

Chaired by: Prof. Catalin Picu (Rensselaer Polytechnic Institute), Prof. Jaan Simon (University of Wuppertal)

Relations Between Structure and Mechanical Properties of Sub-isostatic Random Fibre Networks

S. Mauro, R. Jakob, E. Mazza, ***A. Ehret**

Failure Modes, Strength and Toughness of Network Materials

***C. Picu**, N. Parvez, N. Amjad

Non-Affine Framework for Non-Linear Elastic Anisotropy with Applications to Biological Tissue

***S. Skatulla**, C. Sansour, G. Limbert

Nonwoven Structure Generator with Resolved Contact Parameters and Simulation of the Effective Tension, Compression and Bending on Large Structures

***A. Keilmann**, M. Krier, J. Orlik, C. Redenbach, K. Schladitz

Tue, 21/07/2026 09:45 - 11:15

H4 - 6 (Sissi)

MS086A - Numerical Methods for Non-Newtonian Fluids I

Main Organizer: Dr. Philipp Knechtges (German Aerospace Center)

Chaired by: Mr. Florian Becker (German Aerospace Center), Dr. Philipp Knechtges (German Aerospace Center)

A GENERIC informed neural network methodology to learn thermodynamic structure-preserving constitutive relations

I. García-Beristain, D. Nieto Simavilla, ***M. Ellero**

An Eigenvalue-Free Log-Conformation Solver for Viscoelastic Simulations in OpenFOAM/rheoTool

***F. Becker**, K. Rauthmann, L. Pauli, P. Knechtges

Modelling viscoelastic flows with symmetric-hyperbolic PDEs

***S. Boyaval**

Industrial-Scale Viscoelastic Injection Molding Simulation with SIGMASOFT Virtual Molding

***A. Wagner**, L. Pauli

Eulerian and Lagrangian Statistics Of Homogeneous Polymeric Turbulence Using a Hybrid Eulerian Lagrangian Model

***L. Crespi**, F. Serafini, F. Battista, P. Gualtieri, C. Casciola

Tue, 21/07/2026 09:45 - 11:15

H4 - 7 (Maximilian)

MS390A - Moment-Based Methods for Non-Equilibrium Flow and Transport Across Scales I

Main Organizer: Dr. Lambert Theisen (RWTH Aachen University)

Chaired by: Dr. Lambert Theisen (RWTH Aachen University), Mr. Manuel Torrilhon (RWTH Aachen University)

Kinetic Collision Kernels for Polyatomic Gases Informed by Molecular Dynamics

***B. Gieling**, M. Abdelmalik, M. Shahine, T. Keßler, A. Frijns, H. van Brummelen

A Quadratic Fokker–Planck Model of Monatomic Rarefied Gas

***H. Zhang**, J. Zhang

Stability and Convergence of Mixed Finite Elements for Linear Regularized 13-moment Equations

***S. Hu**, H. Li, Z. Cai

Capturing Anisotropic Pressure Effects in Neutral Fluids and Plasmas Using a 10-Moment Model

***D. Kuldinov**, K. Hara

A rational extended thermodynamics model for bubble dynamics

***F. Brini**, L. Seccia

Galerkin Method for Asymmetrically-Weighted Hermite Approximations Applied to the Vlasov-Poisson System

***R. Dai**, B. Després

Tue, 21/07/2026 09:45 - 11:15

H4 - 8 (Eventcenter)

MS110C - Computational Models for Cancer Research and Oncology III

Main Organizer: Dr. Guillermo Lorenzo (University of A Coruña)

Chaired by: Mr. Paolo Zunino (MOX, Department of Mathematics, Politecnico di Milano)

Personalized, MRI-informed forecasting of breast cancer response to neoadjuvant therapy via immersed isogeometric analysis

***G. Lorenzo**, T. Gallagher-Romero, R. Patel, M. Abdelmalik, T. Yankeelov

A Multiphysics Computational Model for Ultrasound Assisted Therapeutic Strategies in Solid Tumors

***M. Koutsi**, F. Mpekris, T. Stylianopoulos

Hybrid poro-elastic modeling of tumor growth

***S. Lunowa**, B. Wohlmuth

A Finite Element Framework for Needle Insertion into Soft Biological Tissue: Application to Human Prostate

***C. Papanikas**, E. Sellountos, E. Ioannou, V. Vavourakis

Multiscale Modelling of Cancer Invasion and Metastasis: the Effects of Tumour Heterogeneity

***D. Katsaounis**, M. Chaplain, N. Sfakianakis

Image-informed model of low-grade glioma

***D. Baroli**, L. Gerardo-Giorda

Tue, 21/07/2026 09:45 - 11:15

BrainLab - Training

MS223E - Projection-Based and Data-Driven Reduced Order Modeling: Bridging Accuracy and Efficiency V

Main Organizer: Dr. Maria Strazzullo (Politecnico di Torino)

Chaired by: Dr. Maria Strazzullo (Politecnico di Torino), Dr. Federico Pichi (SISSA)

Contour Integral Methods and Model Order Reduction for Parametric Linear Control Systems **Keynote**

S. Gugercin, ***M. Manucci**

Reducing the Offline Cost of Parametric Surrogates: From Local ROMs to Data Augmentation

***M. Giacomini**, P. Díez, M. Discacciati, B. Evans, A. Muixí, S. Zlotnik

Data assimilation informed reduced order modeling

***A. Benaceur**

Towards an Arbitrary Lagrangian Eulerian MOR framework for advection dominated problems

***M. Nonino**, D. Torlo

Interpolation and Quasi-Interpolation Strategies in Data-Driven Reduced Order Models

***P. Siena**

Tue, 21/07/2026 09:45 - 11:15

NM - 6 (Munich)

MS035A - Towards Agent-based Digital Twins for Disaster Management I

Main Organizer: Dr. Tobias Koch (German Aerospace Center (DLR))

Chaired by: Dr. Tobias Koch (German Aerospace Center (DLR)), Dr. Martin Kühn (German Aerospace Center)

Coupled Epidemiological and Wastewater Modeling at the Urban Scale: A Case Study for Munich

***J. Bicker**, N. Tomza, K. Wallrafen-Sam, N. Schmid, A. Hofmann, S. Korf, A. Schengen, J. Javanmardi, A. Wieser, M. Kühn, J. Hasenauer

Scalable Agent-Based Simulations for SARS-COV-2: A Case Study for Testing Strategies in the City of Brunswick

***S. Korf**, D. Kerkmann, K. Nguyen, D. Abele, A. Schengen, C. Gerstein, J. Göbbert, A. Basermann, M. Kühn, M. Meyer-Hermann

A Grid-Based Approach for Modelling Aerosols and Fire Toxins in Pedestrian Simulations

***L. Reetz**, S. Wagner, G. Köster

Tue, 21/07/2026 09:45 - 11:15

NM - 7 (Venice)

MS081A - Computational Methods for Inverse Problems I

Main Organizer: Prof. Dan Givoli (Technion - Israel Institute of Technology)

Chaired by: Prof. Dan Givoli (Technion - Israel Institute of Technology), Prof. Haim Waisman (Columbia University)

Accelerating Full-Waveform Inversion with MOR-TL: A Taylor-Based Model Order Reduction Strategy

Keynote

H. Barucq, J. Besset, ***R. Djellouli**, S. Frambati, V. Martins-Gomes

Load Reconstruction for Nonlinear Structural Dynamics

***A. Aamodt Resell**, O. Hopperstad, V. Aune

Theoretical and numerical approaches of reaction coefficients identification in reaction-diffusion systems arising in epidemiology

***A. Coronel**, M. Sepulveda, F. Huancas

Shape Sensing of Sandwich Beams using the inverse FEM: Formulation, Numerical and Experimental Assessment

F. Pierri, M. Esposito, ***M. Gherlone**

Structural Health Monitoring of Thin-Walled Aerospace Structures using iFEM

I. Khalid, ***E. Oterkus**, S. Oterkus

Tue, 21/07/2026 09:45 - 11:15

ICM - 50 (Seeblick)

OLY001A - ECCOMAS Olympiads I

Main Organizer: Dr. Barbara Re (Politecnico di Milano)

Chaired by: Dr. Paulina Stempin (Poznan University of Technology)

A Finite-Temperature Atomistic Framework for Mass Transport in Metallic Alloys

***S. Saxena**, P. Gupta, D. Kochmann

Geometry-Agnostic Reduced-Order Modelling for Structural Dynamics Using Graph Neural Networks and PGD Enrichment

***V. Matray**, F. Amalani, F. Feyel, D. Néron

Spectral shape optimization and asymptotic analysis of metastability for accelerated molecular dynamics algorithms

***N. Blassel**

Micromechanical Modelling of Voided FCC and HCP Polycrystals in the Inelastic Regime

***S. Virupakshi**

Tue, 21/07/2026 11:15 - 11:30

Short Break

Tue, 21/07/2026 11:30 - 13:00

ICM - 1 Auditorium

MS120F - Recent Advances in Computational Methods for the Cardiovascular System VI

Main Organizer: Dr. Richard Schussnig (Ruhr University Bochum)

Chaired by: Mr. Ivo Steinbrecher (Universität der Bundeswehr München), Ms. Anna Ranno (RWTH Aachen University)

Effect of Aortic Valve Position on Turbulent Quantities in the Ascending Aorta: A CFD ANALYSIS

***I. Ibanez**, B. Azevedo, A. Nieckele

Enhancing TTVR Positioning: A Computational Framework for Pre-procedural Planning and Optimization

***L. Mata Quiñonez**, P. Yadav, L. Dasi

Comparison of fully coupled fluid structure interaction and pseudo-steady state modelling of aortic valve hemodynamics.

***S. Caban**, A. Janas, Z. Buliński, W. Adamczyk, J. Juszczak, K. Psiuk-Maksymowicz

Computational Hemodynamics in the Right Heart

***E. Xhelo**, F. Renzi, G. Puppini, G. Luciani, C. Vergara

In Silico Implications when Varying Implantation Depth on Regions Associated with Conduction Pathways during TAVI

***S. Zoni**, L. Mata Quinonez, S. Bhat, L. Dasi, S. Singh-Gryzbon

Effect of Outlet Curvature on Unsteady Flow Stability and Energy Dissipation in Idealized Cavopulmonary Junctions

***S. Niranjana**, V. Chivukula, K. Balakrishnan, B. Sudhir, P. B S V Patnaik

Tue, 21/07/2026 11:30 - 13:00

ICM – 3

MS268A - Numerical Modeling of Granular and Multiphase Flows I

Main Organizer: Prof. Mikio Sakai (The University of Tokyo)

Chaired by: Prof. Mikio Sakai (The University of Tokyo), Dr. Yuki Tsunazawa (National Institute of Advanced Industrial Science and Technology)

On the coarse-grained DEM for industrial powder and multi-phase flows **Keynote**

***M. Sakai**

On heat transfer modelling in large-scale solid-fluid flow systems

***T. Imatani**, K. Yunoki, Y. Shiraiwa, M. Sakai

Sedimentation of Spheroidal Particle Suspensions in Stokes Flow

***M. Rambosson**, C. Coreixas, J. Latt

Discrete Element Method In Agricultural Machinery Design: Applications, Validation Practices, and Implementation Challenges

G. de Melo, R. Magalhães, ***F. Elias de Melo Borges**

Sharp-Interface Cartesian Methods for Multiphase Flow Simulations

T. Kiwitt, J. Vorspohl, ***M. Meinke**, D. Krug

Tue, 21/07/2026 11:30 - 13:00

ICM – 3

MS082D - Advances in Computational Models and Methods for Multiphase Flows with Phase Change IV

Main Organizer: Dr. Marica Pelanti (ENSTA - Institut Polytechnique de Paris)

Chaired by: Phd. Giuseppe Orlando (École polytechnique), Dr. Alessio Roccon (Univeristy of Udine)

A low Mach Number Model for Multicomponent Two-Phase Flows with Phase Change

S. Zamani Salimi, A. Mukherjee, ***M. Pelanti**, L. Brandt

A Fully Eulerian Method for Melting/Solidification of Moving Particles

***C. Xu**, X. Jiang, K. Satheeshchandran, L. Brandt

Interface-Resolved Simulations of the Thermal Influence of a Suspending Fiber on Fuel Droplet Evaporation and Combustion

***E. Cipriano**, S. Zaleski

A coupled VOF/embedded boundary method to model two-phase flows on arbitrary solid surfaces

***C. Josserand**, M. Tavares, J. Lopez-Herrera, S. Popinet

Tue, 21/07/2026 11:30 - 13:00

ICM – 4a

MS015A - Stabilized and Variational-Multiscale Methods for Fluid Mechanics I

Main Organizer: Prof. Artem Korobenko (University of Calgary)

Chaired by: Prof. Ramon Codina (Universitat Politècnica de Catalunya)

Variational Multiscale Hydrodynamic Closures in Kinetic Theory: Reconsideration of the Chapman-Enskog Expansion **Keynote**

***T. Hughes**, F. Baidoo, M. Abdelmalek

Stabilized Finite Element Framework for Hypersonic Flows: Modeling Thermochemical Non-equilibrium and Ionization

J. Crebo, C. Johansen, ***A. Korobenko**

A Multiscale-Multiphysics Computational Method for Thermo-Fluid-Structure Interaction (TFSI) and Thermal Elastohydrodynamic Lubrication (TEHL)

***V. Gravemeier**

Variational Multiscale Formulation of the Compressible Navier–Stokes Equations for Weakly Compressible Flows

***S. Murugaiyan**, M. Hsu, B. Ganapathysubramanian

Pressure and convection robust finite elements for magnetohydrodynamics

L. Beirão da Veiga, F. Dassi, ***G. Vacca**

Tue, 21/07/2026 11:30 - 13:00

ICM – 4b

MS040C - New Perspectives in Mechanical and Acoustic Metamaterials Science III

Main Organizer: Prof. Giuseppe Failla (University of Reggio Calabria, Italy)

Chaired by: Prof. Giuseppe Failla (University of Reggio Calabria, Italy), Prof. Antonio Palermo (University of Bologna)

Metastructures for mechanical signal processing **Keynote**

R. Ardito, M. Cazzola, C. Gazzola, J. De Ponti, M. Miniaci, P. Viviani, ***A. Corigliano**

Exceptional Points Detection for Biosensing

***F. Aloschi**, M. Pindrys, M. Ruzzene

Inversed Design of Curved Acoustic Metasurface for OAM-based Information Storage and Reconstruction

X. Du, ***A. Chen**, Y. Wang

Metasurface-Enhanced Frequency-Steerable Acoustic Transducers for Guided-Wave Inspection

M. Mohammadgholiha, ***A. Palermo**, L. De Marchi

Tue, 21/07/2026 11:30 - 13:00

ICM - 5

MS009F - Complex Fluid Flows in Engineering: Modeling, Simulation, and Optimization VI

Main Organizer: Dr. Fabian Key (TU Wien)

Chaired by: Prof. Stefanie Elgeti (TU Wien), Dr. Fabian Key (TU Wien)

A Streamfunction-Based Approach to Boundary Vortex Identification

***S. Oh**, G. Kim, J. Nam

Numerical modelling of the Ranque-Hilsch effect with experimental validation

***M. Majchrzyk**, P. Bargiel, M. Barzantny, D. Chiappini, W. Kostowski

Effects of wing trailing-edge devices on the low-speed high-lift characteristics for a supersonic civil transport

***X. Zheng**, S. Cheng, J. Zhai, Y. Leng, Z. Qian

CFD model for oxycombustion of biomass in laminar regime

A. Ryfa, ***A. Klimanek**, P. G?adysz, T. Krysi?ski, S. Sobek, A. Korus, W. Adamczyk, A. Szl?k

On the Effects of Ethanol-Gasoline Blending on Combustion, Performance and Emissions of a Spark Ignition Engine: An Experimental and Detailed Chemistry-based Numerical Study

***A. Khedr**, M. Habib

Tue, 21/07/2026 11:30 - 13:00

ICM - 11a

MS066B - Recent trends in model order reduction, model discovery, and surrogate models II

Main Organizer: Prof. Giovanni Stabile (Sant'Anna School of Advanced Studies)

Chaired by: Prof. Alessandro Lucantonio (Aarhus University), Prof. Giovanni Stabile (Sant'Anna School of Advanced Studies)

POD-DL-ROM for multiphase flow with radiative heat transfer

***A. Hase?i?**, H. Kleikamp, M. Ohlberger

Data-driven acceleration of shape programming in Active Materials

***R. Ortigosa**, J. Marr?nnez-Frutos, A. P?rez-Escolar, A. Gil, N. Ellmer, A. Garc?a-Gonz?lez

Data Driven TFA-based Homogenization of Nonlinear Composites

G. Alaimo, F. Auricchio, ***S. Marfia**, E. Monaldo, E. Sacco

On Parametric Model Order Reduction of Flexible Multibody Systems Modelled with the Floating Frame of Reference Formulation

***A. Zw?lfer**, B. Schell

Tue, 21/07/2026 11:30 - 13:00

ICM - 11b

MS062B - Advances in numerical modeling strategies for static and dynamic analysis of masonry and historic structures II

Main Organizer: Prof. Daniela Addessi (Sapienza University of Rome)

Chaired by: Prof. Francesca Nerilli (University Niccol? Cusano, Rome), Mr. Amirhossein Ghezelbash (Delft University of Technology)

Automated Framework for Meshing of 3D Realistic Masonry Multi-Leaf Volumes from Wall Images

***Y. Hermans**, K. Ehab Moustafa Kamel, G. Milani, T. Massart

Dynamic Analysis of Masonry Structures Modeled as an Assembly of Rocking Rigid Blocks: Some New Results

***P. Pagni**, R. Barsotti, F. Barsi, N. Mendes, P. Louren?o

Impact of Diagnostic Data Uncertainty on the Numerical Modelling of Spatially Variable Masonry Properties

***A. Vuoto**, M. Funari, P. Louren?o

Static Pushover Analysis of Three-Dimensional Historical Masonry Structures: An Extended Variational Non-Smooth Contact Dynamics Framework

***N. Nodargi**, C. Colucci, P. Bisegna

M.A.S.O.N. - Masonry building Assessment of Seismic vulnerability based on Observed damage and Neural networks

***G. Vittiglio**, A. Barontini, P. Louren?o, C. Casapulla

Tue, 21/07/2026 11:30 - 13:00

ICM - 12a

MS248B - Near-Wall Reactive Flows: Experiments, Simulations and Modelling II

Main Organizer: Prof. Suad Jakirlic (Technical University of Darmstadt, Germany)

Chaired by: Prof. Suad Jakirlic (Technical University of Darmstadt, Germany)

Experimental and Numerical Investigation of Film Formation in a Generic SCR Channel

***R. Lange**, M. Bonarens, L. Schuhmann, S. Wagner, C. Hasse

A reduced model for urea-water-solution film decomposition in SCR-systems

H. Shlomo, ***V. Bykov**, U. Maas

Numerical Investigation of Laser Ablation of a Blunt Wedge under High-Speed Flow Conditions

***G. Sun**, J. Lei

High-fidelity simulation of ablating materials subjected to high-enthalpy flows

***J. Klauner**, D. Martins, M. Borbouse, D. Henneaux, P. Schrooyen, T. Magin, K. Hillewaert, P. Chatelain

Tue, 21/07/2026 11:30 - 13:00

ICM - 12b

MS175A - Nonlocality and Machine Learning I

Main Organizer: Dr. Olena Burkovska (Oak Ridge National Laboratory)

Chaired by: Dr. Olena Burkovska (Oak Ridge National Laboratory), Prof. Yue Yu (Lehigh University)

Heterogeneity and Boundary Interactions in Nonlocal Models

***P. Radu**

Nonlocal Boundary Value Problems with Local Boundary Conditions

***J. Scott**

Geometric Rigidity in Nonlocal Models: The Ordered Mean Curvature Problem with Integrable Kernels

A. Biswas, ***M. Foss**, P. Radu

Reduced-Order Modeling via Peridynamics with Two-Level Grid Discretization

***E. Madenci**, A. Barut

Tue, 21/07/2026 11:30 - 13:00

ICM - 13a

MS372F - Phase-field fracture modeling and computation VI

Main Organizer: Prof. Laura De Lorenzis (ETH Zurich)

Chaired by: Dr. Ye Feng (Northwestern Polytechnical University)

A new gradient-enhanced damage model with regularization based on ERVE

***F. Liu**, D. Jantos, P. Junker

Evaluating Ductile Fracture Behavior in Metals Using Crystal Plasticity Coupled Phase-Field Damage Modeling

***A. Rezwan**, H. Lim

Fully coupled multiphysics modelling of fracture behaviour in silicon particles during lithiation–delithiation using the phase-field method

***J. Yang**, W. Tan

Phase-Field Fracture Modeling of Solid State Cathodes

***T. Zhang**

Thermo–Hydro–Mechanical Phase-Field Modelling of Fracture in Non-Isothermal Multiphase Geomaterials

***Z. Chen**, L. De Lorenzis, L. Sanavia

Predicting Telluride Precipitate Microstructures in Ni-Cr Alloys for Molten Salt Reactors Using Phase-Field Modeling

J. Lee, ***K. Chang**

Tue, 21/07/2026 11:30 - 13:00

ICM - 13b

MS011F - Advances in Neural Network Approximations of Partial Differential Equations VI

Main Organizer: Dr. David Pardo Zubiaur (University of the Basque Country (UPV/EHU))

Chaired by: Dr. Alexandre Magueresse (RWTH Aachen University), Mr. Elias Caru (Basque Center for Applied Mathematics)

Optimizing the spectral bias in Fourier feature physics-informed neural networks

***F. Sahli Costabal**, M. Petrache, M. Courdurier, J. Molina

High-Frequency PINN Solutions of the Helmholtz Equation via Joint Architectural and Optimization Design

***M. Abedi**, D. Pardo, T. Alkhalifah

From Vanishing Viscosity Method to Neural Network Solvers for Eikonal Equations

E. Kim, Y. Park, J. Han, M. Choi, ***J. Hahn**

Exploring Architectural and Physics-Based Enhancements to Improve PINN learning of Adsorption CO₂ Capture Processes

S. Holm, ***S. Blakseth**, S. Subraveti

Molecular Dynamics Analysis of Twin Boundary Migration in Mn-Cu-Ni-Fe Damping Alloys Using Neural Network Potential

T. Furukawa, ***A. Tomoda**

Approximating the History Term in the Maxey-Riley-Gatignol Equations by Universal Differential Equations

***F. Sommer**, V. Rath, S. Götschel, D. Ruprecht

Tue, 21/07/2026 11:30 - 13:00

ICM - 14a

MS216A - High-Fidelity and Surrogate Modeling for Advanced Manufacturing Processes I

Main Organizer: Dr. Mamzi Afrasiabi (ETH Zurich)

Chaired by: Dr. Mamzi Afrasiabi (ETH Zurich), Dr. Ehsan Hosseini (Empa)

Multiphysics and Surrogate Modeling of Metal Additive Manufacturing Process Keynote

***Z. Zhang**, M. Bambach, S. Gaudez, M. Afrasiabi

A Hybrid Sharp-Diffuse Interface Approach to Accurately Model Melt Pool Dynamics with Rapid Evaporation in Metal Additive Manufacturing

N. Much, A. Koch, C. Meier, ***M. Schreter-Fleischhacker**

Surrogate Modelling of 3D Concrete Printing with NeuralPFEM

***F. Lanteri**, G. Rizzieri, M. Cremonesi

Efficiency of Physics-informed Machine Learning Surrogate for Thermal Histories of the Wire-arc Additive Manufacturing Process

***M. Ryan**, M. Baqershahi, H. Moshayedi, E. Ghafoori

Tue, 21/07/2026 11:30 - 13:00

ICM - 14b

MS026A - Contact and Interface Mechanics: Modeling and Computation I

Main Organizer: Prof. Michel Raous (Laboratoire de Mécanique et d'Acoustique - CNRS - France)

Chaired by: Prof. Peter Wriggers (Leibniz University of Hannover)

A new incremental variational formulation of Coulomb's friction law **Keynote**

*M. Thbaut, L. De Lorenzis

Fast Parallel Solvers for Frictional Contact

*R. Krause

Predictive Asymptotic Models of Damage Evolution in Thin Adhesives With Tension–Compression Asymmetry and Unilateral Effects

*M. Serpilli, R. Rizzoni, F. Lebon

A Surface Design Strategy Based on Bayesian Optimization and the Boundary Element Method

*P. Ferreira Rocha, A. Couto Carneiro, F. Andrade Pires

Proximal Galerkin for Contact Mechanics

B. Keith, *N. Reyes Rivas

Tue, 21/07/2026 11:30 - 13:00

ICM - 14c

MS312E - Particle-based methods: advances and applications in DEM, PFEM, SPH, MPM, MPS and others V

Main Organizer: Prof. Eduardo de Morais Barreto Campello (University of São Paulo)

Chaired by: Prof. Sergio Idelsohn (CIMNE), Prof. Eduardo de Morais Barreto Campello (University of São Paulo)

SPH-Based Thermo-Mechanical Modeling of Aluminum Alloy Friction Stir Additive Manufacturing with Pinless and Standard Tools

S. Russo, *G. BUFFA, L. Fratini

A Metal 3D Printing Simulation Framework Based on the Particle Finite Element Method

*J. Olatunbosun, M. Schewe, T. Bartel, A. Menzel

Symmetrisation and Hyperbolicity of First-Order Conservation Laws in Large Strain Viscoelasticity

*A. Gil, C. Lee, T. Jaugielavicius, T. Richardson, J. Bonet

A Coupled DEM-FEM Simulation of Particle Dampers Using a Heterogeneous Computing Solution

*H. Sakai Idagawa

Simulation of Fluids Containing Small Immiscible Particles

*S. Idelsohn, J. Gimenez, E. Oñate

Probabilistic Large-Deformation Analysis of Retrogressive Failures in Sensitive Clays Using FOSM and PEM (Rosenblueth)

*G. Souza, N. Locatelli, A. Silva, M. Neto, R. Borges

Tue, 21/07/2026 11:30 - 13:00

ICM - B11

MS014F - Advanced computational techniques for fracture VI

Main Organizer: Prof. Sonia Marfia (Sonia Marfia, Full Professor, University of Roma Tre)

Chaired by: Prof. Stefan Löhnert (TUD Dresden University of Technology), Prof. Sonia Marfia (Sonia Marfia, Full Professor, University of Roma Tre)

Iterative convergence in phase-field brittle fracture computations: exact line search is all you need **Keynote**

J. Heinzmann, F. Vicentini, *P. Carrara, L. De Lorenzis

A global–local adaptive mesh generation method for three-dimensional phase-field fracture simulations

*F. Cheng, H. Yu

A rate-constrained damage model based on evolving homogenized microstructures for the description of strain-softening

*M. Köhler, D. Balzani

Tue, 21/07/2026 11:30 - 13:00

ICM - B12

MS027B - Current Trends and Advances in Enriched Finite Element Methods and Coupled Simulations II

Main Organizer: Prof. Nathan Shauer (Unicamp)

Chaired by: Dr. Alejandro Aragón (Delft University of Technology), Prof. Philippe Devloo (UNICAMP/Civil Engineering, Brazil)

A Three-Scale Generalized FEM for the Simulation of 3-D Crack Propagation

J. Avecillas-Leon, M. Bento, *C. Duarte

A 3D Generalized Finite Element Method for Fracture Propagation in Media with Non-Isotropic Fracture Toughness

*N. Shauer, C. Duarte

Improved XFEM (IXFEM): An Accurate and Efficient Approach for Arbitrary Multiple Crack Analyses under Static and Cyclic Loading

*L. Wang, L. Wen, R. Tian, C. Feng

Numerical Investigation on the Response of a Swaged-Autofrettaged Cylinder under Combined Thermal and Pressure Loading

*F. Benattalah, B. Bounab

Tue, 21/07/2026 11:30 - 13:00

ICM - B13

MS220A - Damage Modelling: Bridging Physics-Based and Data-Driven Approaches I

Main Organizer: Dr. Emmanouil Kakouris (University of Warwick)

Chaired by: Dr. Emmanouil Kakouris (University of Warwick), Prof. Lampros Svolos (University of Vermont)

An improved Material Point Method for Dynamic Ductile Fracture

***B. Zyto**, L. Svolos, E. Kakouris

A Hybrid Neural Operator Framework for Accelerating Phase-Field Fracture Simulations

***A. Ani**, S. Anusuya Ponnusami

A deep learning framework for phase-field modelling of brittle fracture in anisotropic media

***N. Plung?**, P. Brommer, R. S. Edwards, E. G. Kakouris

Damage Identification Using Sparsity-Promoting Priors

***D. Tyagi**, P. Winkler, V. Zabel, M. Weiser, P. Koutsourelakis, J. Unger

Tue, 21/07/2026 11:30 - 13:00

ICM - B21

MS222C - Polytopal Methods in Mechanics: bridging Mathematics and Engineering III

Main Organizer: Mr. Lourenco Beirao da Veiga (Università di Milano-Bicocca)

Chaired by: Prof. Paola F. Antonietti (Politecnico di Milano)

Polytopal discontinuous Galerkin methods for misfolded protein spreading models

***M. Corti**, P. Antonietti

A Numerical Scheme for the Kirchhoff–Love Problem on Polygonal Meshes Based on a BGG Complex

D. Di Pietro, J. Droniou, ***A. Leroy**

Dual Adaptivity in Nonlocal Macro-meso-scale Consistent Damage model: SFVEM Discretization and Nonlocal Damage Quadrature

***W. Lyu**, B. Xu, X. Xia, Q. Zhang

A MLMC-VE method for uncertainty quantification of elliptic PDEs

P. Antonietti, ***F. Bonizzoni**, I. Perugia, M. Verani

Recent Advances in Stabilization-Free Polygonal Methods

S. Berrone, ***A. Borio**, K. Cascavita Mellado, M. Cicuttin, D. Fassino, F. Marcon

Theoretical Considerations for Stabilization-Free Virtual Elements for 3D problems

S. Berrone, A. Borio, ***F. Marcon**, F. Vicini

Tue, 21/07/2026 11:30 - 13:00

ICM - B22

MS186B - Mathematical and Numerical Aspects of Computational Methods for Electromagnetic Field Problems II

Main Organizer: Dr. Daisuke TAGAMI (Kyushu University)

Chaired by: Dr. Masao Ogino (Daido University), Dr. Shin-ichiro Sugimoto (Hachinohe Institute of Technology)

Introduction of Numerical Homogenization, and its Application to Electromagnetic Field Problems

***D. TAGAMI**

Investigation of large-scale wave sound analysis for evaluation of old violin's sounds

***S. Kuwano**, A. Takei

Large-Scale Electromagnetic Wave Analysis for EMC Consideration inside Operating Room using Microwave Scalpel

***R. Kikuta**, S. Katsuragi, A. Takei

Adaptive Mixed-Precision Iterative Methods for Large-Scale Complex Symmetric Systems

***K. Masui**, F. Ino

On Improving the Convergence of a Hierarchical Domain Decomposition Method for High-Frequency Electromagnetic Fields by Using Partial Multiple-Precision Arithmetic

***M. Nomura**, A. Takei

Mesh Generation for Microwave Analysis of Print Circuit Board

***H. Kawai**

Tue, 21/07/2026 11:30 - 13:00

ICM - 21a

MS264A - Toward Predictive Digital Twins for Large-Scale Complex Systems I

Main Organizer: Dr. Stefan Henneking (The University of Texas at Austin)

Chaired by: Dr. Stefan Henneking (The University of Texas at Austin), Prof. Omar Ghattas (The University of Texas at Austin)

Forecasting Climate-Compounded Geohazards with AI-accelerated Digital Twins

***M. Denolle**, A. Anderson-Frey, Y. Bao, P. Beukema, S. Chen, N. Cristea, M. Hemmett, G. Hakim, S. Henderson, A. Hutko, E. Istanbuluoglu, P. Johnson, B. Kerns, A. Kharita, M. Kopefli, B. Maurer, J. Kutz, B. Lipovsky, A. Mehedi, D. Montgomery, Y. Ni, H. Sablon, M. Sanger, N. Stevens, A. Swann, R. Zhuang

Physics-Informed Deep Operator Learning for Real-Time Bridge Digital Twins with Integrated Damage Identification

***B. Ahmed**, D. Abueidda, M. Mobasher

A preliminary investigation of the Inverse Finite Element Method applied to a scaled suspension bridge model under seismic loading

J. Bardiani, ***H. Wu Chen**, L. Mastrorillo, M. Giglio, A. Manes, C. Sbarufatti

Contribution Analysis of Equipment-Induced Underwater Radiated Noise with Non-synchronous Operational Measurements

***D. Lee**, S. Lee

Tue, 21/07/2026 11:30 - 13:00

ICM - 21b

MS073C - Model order reduction on non-linear and high-dimensional systems III

Main Organizer: Prof. Udo Nackenhorst (Leibniz University Hannover)

Chaired by: Prof. Udo Nackenhorst (Leibniz University Hannover), Prof. Thomas Wick (Leibniz Universität Hannover (LUH))

A model order reduction framework for efficient modelling and simulation of visco-hyperelastic systems

***S. Zhang**, B. Vergouwen, F. Naets

M-Tensor Format for High-Dimensional Regression for Nonlinear Models from Scarce Data

***R. Cloarec**, S. Rodriguez, X. Kestelyn, F. Chinesta

Advancing Industrial Finite Element Software through Model Order Reduction for Nonlinear Transient Thermal Problems

P. Malleva, R. Scanff, ***D. Néron**

Reduced Order Modeling for TELEMAT-2D with Positivity Preserving Constraints

***A. Moussaddak**, A. Decoene, C. Goeury, A. Ponçot, T. Taddei

Efficient Bridging of Temporal Scales for Fatigue Damage Simulations via the Compressive Sensing Approach

***J. Jarms**, D. Néron, U. Nackenhorst

Tue, 21/07/2026 11:30 - 13:00

ICM - 22a

MS363A - Advances in UQ and Data-driven Methods for Scale-resolving Turbulence Simulations I

Main Organizer: Dr. Saleh Rezaeiravesh (The University of Manchester)

Chaired by: Dr. Saleh Rezaeiravesh (The University of Manchester), Prof. Philipp Schlatter (FAU Erlangen-Nürnberg)

LVM-GP: Uncertainty-Aware PDE Solver via coupling latent variable model and Gaussian process

***L. Guo**

In-situ Monitoring of Modal Flow Structures Based on Uncertainty Estimates

***C. Gscheidle**, J. Garcke

Turbulent Boundary Layers Analysed Using Causally Coherent Structures

D. Massaro, S. Rezaeiravesh, ***P. Schlatter**

Stochastic Sensitivity Analysis of the Effect of Exchange Location Height in Wall-Modeled LES

M. Rosellini, P. Munoz Hoyos, A. Mariotti, O. Lehmkuhl, ***M. Salvetti**

Multi-fidelity Surrogate Modelling of an Engine Intake Duct

***M. Mays**, S. Rezaeiravesh, J. He, J. Wang, Y. Mahmoudi Larimi, A. Revell

Tue, 21/07/2026 11:30 - 13:00

ICM - 22b

MS046B - Mixed-Dimensional Modeling: Advances in Modeling, Numerical Methods and Applications II

Main Organizer: Dr. Matthias Mayr (Universität der Bundeswehr München)

Chaired by: Prof. Kent-Andre Mardal (Simula Research Laboratory / University of Oslo), Mr. Paolo Zunino (MOX, Department of Mathematics, Politecnico di Milano)

A modified augmented Lagrangian preconditioner for mixed-dimensional beam-solid coupling

***M. Firmbach**, I. Steinbrecher, A. Popp, M. Mayr

Neural Preconditioner for Mixed-Dimensional PDEs: A Dynamic Training Strategy via Krylov Subspace Geometry

***N. Dimola**, A. Coclite, P. Zunino

Neural Model Order Reduction with Domain Decomposition for Multiscale Problems

N. Dimola, ***P. Vitullo**, P. Zunino

Investigation of the Lagrange Multiplier Field for Mixed-Dimensional Beam-Solid Interaction

***D. Balachandran**, I. Steinbrecher, A. Popp, M. Mayr

Efficient Polyhedral Refinement Strategies for Coupled Mixed-Dimensional Problems

S. Berrone, D. Grappein, S. Scialò, T. Sorgente, ***F. Vicini**

Tue, 21/07/2026 11:30 - 13:00

ICM - 41 (Ostersee A)

MS052B - Treatment of Locking Across Discretization Techniques II

Main Organizer: Mr. Tarun Kumar Mitruka Vinod Kumar Mitruka (University of Stuttgart)

Chaired by: Mr. Tarun Kumar Mitruka Vinod Kumar Mitruka (University of Stuttgart), Prof. Manfred Bischoff (University of Stuttgart)

Stabilization-free mixed virtual element methods

A. Borio, ***C. Lovadina**, F. Marcon, M. Visinoni

A Locking-free and Pressure-checker-free Smoothed Finite Element Method for Nearly Incompressible Solids using Tetrahedral Meshing

***Y. ONISHI**

A General Strategy to Alleviate Volumetric Locking in 3D Finite Elements

***T. Usta**, M. von Scheven, M. Bischoff

Locking-free energy-based physics-informed neural networks for shear deformable beams and plates

***T. Weithoff**, L. Striefler, B. Oesterle, J. Kiendl

Locking-Free Strong-Form-Based Physics-Informed Neural Networks for Shear Deformable Beams and Plates

***L. Striefler**, T. Weithoff, J. Kiendl, B. Oesterle

Tue, 21/07/2026 11:30 - 13:00

ICM - 42 (Ostersee B+C)

MS341A - Imaging-Based Mathematical and Computational Modeling in Biomechanics I

Main Organizer: Prof. Xiao-Chuan Cai (University of Macau)

Chaired by: Prof. Xiao-Chuan Cai (University of Macau)

A Multi-Scale, Imaging-Based, Digital Twin of Right Ventricular Remodeling in the Mouse

Keynote

*V. Kheyfets, M. Zhang, H. Turton, T. Zhang, F. Zhang, K. Stenmark, S. Gu, E. Spiekerkoetter

A Comparative Study of Linear Solver Performance in Cardiovascular Fluid–Structure Interaction Simulations

Z. Chu, *C. Zhu

An Integrated Modal Decomposition and Vision Transformer framework for Human Cardiac Diagnosis using Limited Echocardiographic Data

*Z. Zhao, A. Bell-Navas, S. Le Clairche

Tue, 21/07/2026 11:30 - 13:00

ICM - 43 (Eibsee)

MS112B - Advances in Flexoelectricity II

Main Organizer: Dr. Prakhar Gupta (IIT Hyderabad)

Chaired by: Dr. David Codony (Universitat Politècnica de Catalunya)

Flexible Flexoelectric Rods

P. Mishra, V. Yadav, S. Koneti, *P. Gupta

Flexoelectric Metamaterials with Non-Orthogonal Generalized Periodicity

*A. Burón, S. Fernández-Méndez, D. Codony

Finite Element computational modeling of the flexo-photovoltaic effect

*S. Pérez-Escudero, D. Codony, S. Fernández-Méndez, I. Arias

Tue, 21/07/2026 11:30 - 13:00

ICM - 44 (Schliersee)

MS033B - Ice-Accretion by Immersed Boundary Methods II

Main Organizer: Prof. Eric Laurendeau (Polytechnique Montréal)

Chaired by: Dr. Francesco Capizzano (Italian Aerospace Research Centre - CIRA Scpa), Prof. Eric Laurendeau (Polytechnique Montréal)

Full Potential Solver with Immersed Boundary Method for Aero-icing Applications

*H. Tran, G. Auger, S. Peron, E. Laurendeau

Numerical Simulation Study of Mixed-Phase Icing on Airfoil NACA0012

*H. Zhao, H. Dai, Y. Wu, D. Zhu

Predicting the Aerodynamic Performances of 3D Wings in Glaze Ice Conditions Via a Stochastic Accretion Model and a Hybrid RANS-LES Method

*M. Freschi, F. Capizzano, A. Donizetti, T. Bellosta, A. Guardone

Extended Validation of an Immersed Boundary Method in the CODA/Cassiopee CFD Environnement for Unstructured Cell-based AMR grids

*A. JOST, B. CONSTANT, S. PERON, J. SANCHEZ GIL, R. SANCHEZ ORTIZ

Tue, 21/07/2026 11:30 - 13:00

ICM - 31 (Zugspitze)

MS270A - Bridging Scales in Solid Materials: Multiscale Methods and Machine Learning I

Main Organizer: Dr. Yangshuai Wang (National University of Singapore)

Physics-Informed Multiscale Machine Learning of Heat Transfer in Composite Materials for Correlating Microstructural Features Using MS-PINN and FD-U-Net

*H. Zhao, C. Shen

Closed-Loop Multiscale Bayesian Design of Defect-Engineered Monolayer Graphene

*J. Bo, X. Lei, T. Lu, T. Fujii

Stochastic Reconfiguration with Warm-Started SVD

*D. Zhou, H. Chen, C. Ho, X. Liu, C. Ortner

Investigating amorphization as a deformation mechanism using a novel phase field model at the mesoscale

Y. Huang, *S. Dai, C. Chen, Y. Xiang

Automated learning of multiscale models

*M. Hodapp, G. Anciaux

Tue, 21/07/2026 11:30 - 13:00

ICM - 32 (Watzmann)

MS108B - Polytopal, Mixed and other Advanced Discretization Techniques for Structural Mechanics II

Main Organizer: Dr. Francesco Salvatore Liguori (University of Calabria)

Chaired by: Prof. Massimiliano Cremonesi (Politecnico di Milano, ITALY), Prof. Sonia Marfia (Sonia Marfia, Full Professor, University of Roma Tre)

Implementation of a Self-Stabilized Virtual Element Approach in Abaqus

***L. Martinelli**, O. Bettinotti, V. Oancea, M. Cremonesi, U. Perego

Drilling rotations in polygonal shell virtual elements

***F. Liguori**, A. Madeo, S. Marfia, E. Sacco

Cut-PVEM: Explicit Mesh Cutting and Virtual Elements for Boundary Interaction in PFEM

***O. Firari**, M. Cremonesi, A. Franci, U. Perego

A mixed Finite Element formulation for 3D large strain elasticity with weakly imposed symmetry

***C. Runcie**, A. Bijaya, K. Lewandowski, A. Shvarts, L. Kaczmarczyk, C. Pearce

On the Efficiency of the Spectral Element Method and Possible Speed-Up in Comparison to the Finite Element Method

***W. Dornisch**, S. Affan

Tue, 21/07/2026 11:30 - 13:00

BrainLab - Auditorium

MS297A - Phase Field Modeling and Computation I

Main Organizer: Dr. Marco ten Eikelder (TU Darmstadt)

Chaired by: Dr. Marco ten Eikelder (TU Darmstadt), Prof. Makrand Khanwale (Technische Universität München)

Development and Analysis of Contact Line Models for the Conservative Diffuse Interface Two-Phase Flow Method

R. Brown, S. Mirjalili, M. Khanwale, ***A. Mani**

Drop-Laden Rayleigh-Bénard Convection

***A. Roccon**

Modeling electrokinetics in multiphase flows using coupled Cahn-Hilliard Navier-Stokes and Poisson Nernst Planck equations

***M. Khanwale**, E. Lucas, A. Mani

On variational modeling of Phase-Field-Reaction dynamics

***A. Kirshtein**, C. Liu, Y. Wang

Tue, 21/07/2026 11:30 - 13:00

NM - 1 (Multimedia Saal)

MS246F - Numerical Methods for Interface-Resolved Multiphase Flows VI

Main Organizer: Dr. Nicolas Valle (TU Delft)

Chaired by: Prof. Arthur Veldman (University of Groningen)

A geometric interpolation scheme for dynamic wetting in 3D VOF simulations

***Y. Han**, G. Mutschke, K. Eckert

Thermodynamics of Diffuse-Interface Models for Binary-Fluid Surfactant Systems

***T. van Sluijs**, S. Stoter, M. ten Eikelder, H. van Brummelen

Adjoint-based Lattice Boltzmann Method for the Optimization of Wettability Distributions in Droplet Transport

***M. Assaf**, G. Koyeerath, C. Josset, Y. Favenne

Surfactant-laden interfacial flow: dynamics of contact-line within a straight capillary tube

***M. Shams**, D. Panda, O. Matar

Towards a Conservative and Structure-Preserving Computational Model of Morphogenesis Under Flow

N. Trujillo Albert, A. Brunaccini, S. Mousavi, ***F. Capuano**

Tue, 21/07/2026 11:30 - 13:00

NM - 2 (Salzburg)

STS103A - Multifunctional moveables for high-aspect ratio laminar wing I

Main Organizer: Prof. Jochen Wild (DLR German Aerospace Center)

Chaired by: Prof. Jochen Wild (DLR German Aerospace Center), Dr. Jos VANKAN (NLR)

Challenges of High-Lift System Integration into Laminar Wings – a Review

***J. Wild**, B. Schlipf

Aerodynamic Aspects of Krüger Flap Operations

***A. Hasabnis**, J. Wild

Pretension Control Concept for Raised Krueger Flaps on Laminar Airfoils

***M. Thevagt**, K. Krall, O. Krawehl, F. Thielecke

Multi-Fidelity Gust Loads Analyses of a High Aspect Ratio Jet Transport with Laminar Wings

M. Ritter, ***H. Hwang**, M. Fehrs

Tue, 21/07/2026 11:30 - 13:00

NM - 4 (Hamburg)

STS397B - Hydrogen – Industrial Questions II

Main Organizer: Mr. Tero Tuovinen (JAMK University of Applied Sciences)

Chaired by: Prof. Matti Kurki (JAMK University of Applied Sciences), Mr. Tero Tuovinen (JAMK University of Applied Sciences)

Advancing Green Hydrogen Technologies for Sustainable Industrial Applications: Insights from the gH2ADDVA Project

***K. Valpe-Ojala**

Power-to-X-to-Power Energy Systems for Renewable Energy Storage and Conversion

***T. Franken**, R. Asgarzade, M. VadiVala, F. Mauss

Transient Thermo-Mechanical Stress during Cryogenic Tank Filling

***J. Arjona Rodriguez**, C. Eder, J. Thaler

Optimization of a Monolithic Membrane Reactor with Coupled Reforming and Diffusive Hydrogen Combustion

***K. Elserfy**, M. Nemitallah

Tue, 21/07/2026 11:30 - 13:00

NM - 5 (KK)

MS151B - Physics-Augmented Machine Learning Methods for Constitutive Modeling II

Main Organizer: Mr. Dominik K. Klein (TU Darmstadt)

Chaired by: Dr. Knut Andreas Meyer (Chalmers University of Technology), Prof. Markus Kästner (TU Dresden)

Machine Learning-Accelerated Cyclic Plasticity Simulations

***N. Talebi**, M. Ekh, K. Meyer

Learning Elastoplastic Material Behavior via Physics-informed Neural Networks and Neural Operators

***R. Arora**, L. Scheunemann, S. Rezaei, T. Brepols

Energy-driven Neural Constitutive Modeling: Thermodynamically Admissible Framework for Multiaxial Plasticity

***A. Fallahnejad**, E. Perdahcioglu, T. van den Boogaard

Mullins softening with parametrized neural network constitutive models

***D. Klein**, J. Fey, M. Kannapinn, O. Weeger

Physics-Encoded Neural Network Modeling of Ductile Fracture in Pearlitic Steel

***J. Gunnarsson**, F. Larsson, K. Meyer

Tue, 21/07/2026 11:30 - 13:00

NM - 3 (BB)

MS427B - Eco-Efficient Smart Manufacturing of Metallic Materials (ECOSMART-MM) II

Main Organizer: Eng. Roya Darabi (INEGI)

Chaired by: Prof. Jose Cesar de Sa (FEUP), Prof. Rui Amaral (Faculty of Engineering of the University of Porto)

Numerical Prediction of Part Distortions in Laser-Powder Bed Fusion Using the Inherent Strain Method: Capabilities and Limitations

***D. Neto**, B. Marques, A. Pereira, M. Oliveira, L. Menezes

Use-Phase Carbon Emissions in Milling of Stainless Steel Using Carbide and Ceramic Tools

***B. Rodrigues**, J. Ferreira, M. Silva, C. Fernandes, D. Figueiredo, T. Silva, A. Reis

Identifying State Variables from Video for Predicting Physical Processes

***F. Metschies**, J. Brugger, R. Hemschik, M. Riede, M. Mezini

Numerical-Experimental Analysis of Spring-Back in Rotary Draw Bending for Industrial Process Optimization

***C. Souto**, R. Amaral, D. Cruz, P. Oliveira, A. Reis

Tue, 21/07/2026 11:30 - 13:00

H4 - 1 (Ludwig)

MS053C - Innovative Finite Element Methods for Fluids III

Main Organizer: Mr. Frederic Valentin (LNCC)

Chaired by: Dr. Rodolfo Araya (Universidad de Concepcion), Mr. Frederic Valentin (LNCC)

Divergence-Free Finite Elements for Stokes Equations with an Immersed Interface

G. Delay, ***D. Duva**, M. Fernández Varela

Recent advances in γ -FEM: An immersed finite element method for domains defined by level sets

R. Bulle, ***M. Duprez**, V. Lleras, A. Lozinski, V. Vigon, K. Vuillemot

Stabilized Quantum Amplitude Estimation for Structural Reliability under Spatially Correlated Random Fields

***A. Tabarraei**, S. Bhuiyan

A Particle Based Semi-Lagrangian Scheme for Landslide Simulation

***C. de Falco**, L. Formaggia, A. Fumagalli, D. Grappein, A. Scotti

Tue, 21/07/2026 11:30 - 13:00

H4 - 2 (Leopold)

MS322C - Advances in Computational Mechanics for Wave Propagation, Multiscale and Multiphysics Simulations III

Main Organizer: Dr. Heedong Goh (Seoul National Univerity)

Chaired by: Prof. Jung-Wuk Hong (Korea Advanced Institute of Science and Technology), Dr. Heedong Goh (Seoul National Univerity)

Vibroacoustic Analysis of an ABH-Embedded CFRP Plate Using a Gaussian Expansion Method

***C. Singepogu**, D. Harursampath

A Comparative Study of Numerical and Analytical Investigation of Flexural Wave Propagation in Asymmetric Periodic Beams with Periodic Elastic Support

***I. Ahmed**, M. Sunny

On the effects of phase transition on sloshing-induced impact pressures

***O. el Moctar**, A. Peters

Inverse Design of Periodic Media Using Complex Band Structure

***H. Goh**, M. Khazi, L. Kallivokas

Numerical Investigation about the Propagation of Elastic Waves in an Isotropic Centro-Symmetric Micro-Polar Metamaterial.

***L. Rainone**, G. Uva, S. Casolo

On Surface Radiation Conditions for Acoustic Transmission

***T. Khajah**, S. Acosta

Tue, 21/07/2026 11:30 - 13:00

H4 - 3 (Franz)

MS230B - Modeling and Simulation of Additive Manufacturing: Meso- and Microscale Approaches II

Main Organizer: Dr. Magdalena Schreter-Fleischhacker (Technical University of Munich)

Chaired by: Prof. Christoph Meier (Technical University of Munich), Dr. Magdalena Schreter-Fleischhacker (Technical University of Munich)

High Fidelity Meltpool Prediction of Laser Powder Bed Fusion Process Through Calibrated Heat Sources: Success and Limitation from NIST AM-Bench Challenges

***A. Amin**, B. Kumar, R. Kanak, N. Sultana, R. Rathun

On the Role of Level-Set Reinitialization in Contact Line Modelling for Powder-Based Additive Manufacturing

***A. Alphonius**, H. Papillon-Laroche, M. Schreter-Fleischhacker, C. Meier, B. Blais

Temperature Control in Powder Bed Fusion of Metals via Inverse-Designed Laser Beam Shapes

***V. Holla**, J. Grünewald, R. Off, R. Dai, P. Kopp, K. Wudy, S. Kollmannsberger

A Numerical Investigation of the Effect of Processing Conditions on the Melt Pool and Temperature Field in Laser Powder Bed Fusion of Tungsten

***A. Srivastava**, H. van Dommelen, M. Geers

Algorithmically Accelerated Multi-Phase-Field Simulation for Systematic Microstructure Prediction under Multiple Scan Strategies in Metal Additive Manufacturing

***Y. Takahashi**, T. Takaki

Towards Reliable Qualification of Metal Additive Manufacturing via Experiment–Simulation–Surrogate Modelling Integration

***K. Joshi**, H. Tan, M. Jhon, S. Quek

Tue, 21/07/2026 11:30 - 13:00

H4 - 4 (Alois)

MS303A - Datasets for Science: Large and Small I

Main Organizer: Dr. Jonas Actor (Sandia National Laboratories)

Chaired by: Dr. Jonas Actor (Sandia National Laboratories), Dr. Andreas Robertson (Sandia National Laboratories)

SIMSHIFT: Evaluating Distribution Shifts in Neural Surrogates

***P. Setinek**, G. Galletti, T. Gross, D. Schnürer, J. Brandstetter, W. Zellinger

Battery Imaging, Battery Insights? The Challenges of the Low-Data Regime

***R. Docherty**, A. Vamvakeros, S. Cooper

BatteryPass-12K and Technical Language Processing (TLP) Framework for Battery Predictions

***T. Adewumi**, M. Karlsson, M. Liwicki

Tradeoffs for Expedited Data Generation for Learning Interatomic Potentials

***J. Actor**, A. Johansson, M. McCarthy, A. Higgins, N. Modine, M. Barry, J. Goff

Tue, 21/07/2026 11:30 - 13:00

H4 - 5 (Xaver)

MS056B - Computational Multiphysics of fibrous materials II

Main Organizer: Prof. Catalin Picu (Rensselaer Polytechnic Institute)

Chaired by: Prof. Jaan Simon (University of Wuppertal), Prof. Catalin Picu (Rensselaer Polytechnic Institute)

Computational modelling of moisture-induced swelling and mechanical response in paper

***C. Rojas Vega**, M. Geers, R. Peerlings

Pore-Resolved Modeling of Fluid Dynamics in Press Felts: 3D Reconstruction from ?CT Scans

***M. Estrada**, S. Flaischlen, R. Kleinert, F. Miletzky, P. Bekaert, J. Lunewski

Micro-Mechanical Modelling and Out-Of-Plane Simulation of Paperboard

***M. Görtz**, G. Kettil, R. Mårtensson, E. Borgqvist, F. Edelvik

A Novel Model for Anisotropic Curved Membranes with Continuously Embedded Fibers

***M. Kaiser**, T. Fries

Tue, 21/07/2026 11:30 - 13:00

H4 - 6 (Sissi)

MS086B - Numerical Methods for Non-Newtonian Fluids II

Main Organizer: Dr. Philipp Knechtges (German Aerospace Center)

Chaired by: Dr. Lutz Pauli (MAGMA Gießereitechnologie GmbH), Mr. Florian Becker (German Aerospace Center)

A Numerical Framework for non-newtonian Hemadynamics in compliant vessels

***J. Le Gouez**

Evaluating the use of Eulerian-Eulerian models for microfluidic blood plasma separation junctions

***P. Vrionis**

Gravity-Dependent Rate Sensitivity in Granular Intrusion: A Constitutive Model and Adaptive Finite Element Analysis

***W. Qi**, Y. Wang, X. Cheng, M. Hou, S. Yuan

Tue, 21/07/2026 11:30 - 13:00

H4 - 7 (Maximilian)

MS390B - Moment-Based Methods for Non-Equilibrium Flow and Transport Across Scales II

Main Organizer: Dr. Lambert Theisen (RWTH Aachen University)

Chaired by: Mr. Manuel Torrilhon (RWTH Aachen University), Dr. Lambert Theisen (RWTH Aachen University)

A Multi-level Scheme for the Discrete Velocity Method in Solving Kinetic Model Equations

***K. Guan**, T. Yamada

A DUGKS-Based Solver in OpenFOAM for Magnetohydrodynamic Plasma Flows across All Knudsen Regimes - mhdDUGKSFoam

***J. de Lima Costa Salazar**, D. Nardelli Siebert, L. Emerich dos Santos, G. Marconcini Fernandes Roberto, L. Calvoso Habi, P. Gessini

The effect of large scale turbulence on the dynamics of non-equilibrium cold atmospheric pressure plasma micro-jets

***G. Vafakos**, E. Karvelas, A. Iosif, C. Anastassiou, V. Vavourakis

An Improved Linear Quadrature Method of Moments for LES-PDF Modeling of Turbulent Combustion

***L. Yuan**, Y. Wang

Tue, 21/07/2026 11:30 - 13:00

H4 - 8 (Eventcenter)

MS110D - Computational Models for Cancer Research and Oncology IV

Main Organizer: Dr. Guillermo Lorenzo (University of A Coruña)

Chaired by: Dr. Guillermo Lorenzo (University of A Coruña)

Non-linear Biphasic Models of Glioblastoma: From Animal Models to Human Patients

Keynote

***M. Sarntinoranont**, J. Ewing, I. Rivera Santiago, P. Acharya, S. Brown

Towards Patient-specific Prediction of Brain Metastasis Response to Stereotactic Radiotherapy using In Silico Modelling

E. Ioannou, C. Papanikas, D. Flouri, L. Siakallis, E. Papageorgiou, M. Theodorou, ***V. Vavourakis**

Modelling Intratumoral Hypoxia from ADC to Personalize Tumour Control Probability in Head-and-Neck Cancer

***T. Rancati**, E. Longhi, E. Gioscio, N. Iacovelli, M. Franceschini, G. Calareso, A. Cavallo, M. Dassie, E. Orlandi

Model-Informed Radiotherapy Schedule Selection Under Hypoxia: A Phenotype-Structured PDE Approach

***F. Albanese**, G. Chiari, M. Delitala

Computational Modelling of Cell Cycle Dynamics and Innate Immune Signalling in Different Radiation Environments

***L. Lonati**, F. Barbato, F. Berardinelli, V. Conte, V. Dini, I. Guardamagna, J. Marinaccio, P. Morciano, C. Riani, R. Semerano, A. Sgura, G. Baiocco

Tue, 21/07/2026 11:30 - 13:00

BrainLab - Training

MS267A - Deep and Machine Learning Methodology in the Context of Application to Computational Mechanics I

Main Organizer: Prof. Yoshitaka Wada (Kindai University)

Chaired by: Prof. Yasushi Nakabayashi (Toyo University)

Application of Convolutional Neural Networks for the Surrogate Modelling of Microstructural Evolution Under Non-Linear Deformations

***Q. Bui-Le**, J. Lengiewicz, Z. Figiel

Application of Graph Neural Networks to Accelerate Finite Element Simulations

***K. Shinde**, J. Alves

Operation Scenario Generation utilizing Deep Learning Architecture

***K. Mitsufuji**

High-Precision Estimation of a Hyperelastic Constitutive Model Using Machine Learning

***N. Harasaka**, K. Arai, H. Watanabe, Y. Wada

Application of Machine Learning to Pipe Blockage Diagnosis Using Digital Hammering Inspection

***S. NAKAHARA**, Y. WADA

Tue, 21/07/2026 11:30 - 13:00

NM - 6 (Munich)

MS035B - Towards Agent-based Digital Twins for Disaster Management II

Main Organizer: Dr. Tobias Koch (German Aerospace Center (DLR))

Chaired by: Dr. Tobias Koch (German Aerospace Center (DLR)), Dr. Martin Kühn (German Aerospace Center)

Following each other's lead: social influence and adaptive decision-making in a pathogen exposure model

***S. Wagner**, A. Templeton, G. Köster

Assisted Evacuation using an Agent-Based crowd simulation model

***J. Scholl**, S. Simon, A. Kneidl

Leveraging Scalability in Pedestrian Flow Simulations via Geometry Splitting

***C. Nellinger**, T. Koch

3D Human Pose Reconstruction From Monocular Images for Emergency Management in Digital Twins

***K. Franke**, T. Lenhard, J. Lehmgrübner, T. Koch

Tue, 21/07/2026 11:30 - 13:00

NM - 7 (Venice)

MS081B - Computational Methods for Inverse Problems II

Main Organizer: Prof. Dan Givoli (Technion - Israel Institute of Technology)

Chaired by: Prof. Haim Waisman (Columbia University), Prof. Marco Gherlone (Politecnico di Torino)

Damage Identification on Thin-Walled Structures Using the inverse Finite Element Method and Data-Driven Approaches

***V. Biscotti**, M. Esposito, R. Das, M. Gherlone

Inverse Design of Metamaterial Hetero-assembly with Arbitrary Nonlinearity

***R. Kundu**, Z. Zhao, O. Sigmund, X. Zhang

Bridging Experiments and Simulations: A Virtual Laboratory Framework for DIC-Based FEM

E. Fagerholt, D. Morin, ***V. Aune**, T. Berstad, L. Dæhli, T. Børvik, O. Hopperstad

Inverse identification of railway track geometry defects using onboard sensors

M. Chihaoui, ***C. FUNFSCHILLING**, D. Duhamel, G. Perrin

Mixed Strain-Displacement Sensing with Inverse Spectral Chebyshev for Robust Plate Shape Reconstruction under Extreme Sparsity

***H. Yousefimiab**, S. Lotfan, B. Bediz

Adjoint-Based Inverse Identification of Material Defects for Nondestructive Evaluation

***A. Sheidaei**, F. Delzendehrooy, R. Eghbalpoor

Tue, 21/07/2026 11:30 - 13:00

ICM - 50 (Seeblick)

OLY001B - ECCOMAS Olympiads II

Main Organizer: Dr. Barbara Re (Politecnico di Milano)

Chaired by: Dr. Paulina Stempin (Poznan University of Technology), Dr. Barbara Re (Politecnico di Milano)

Dancing with the flow: Numerical modelling of non-ideal micro-particles in fluids

***J. Wedel**, P. Steinmann, M. Hriberšek, J. Ravnik

Mathematical and Computational Modeling of the Active Mechanics of Multicellular Systems: from Cell–Cell Adhesion to Tissue Reshaping

***P. BAL**, M. ARROYO

Spatiotemporal Tidal Analysis and Prediction Using Physics-Informed Machine Learning

***T. Monahan**, T. Tang, S. Roberts, T. Adcock

Virtual prototyping of Wet Granulation Processes

***T. Plath**

5-axis Computer Numerically Controlled (CNC) Flank Milling of Free-form Surfaces Using Straight and Custom-shaped tools

***K. Rajain**

Tue, 21/07/2026 13:00 - 14:00

Lunch Break

Tue, 21/07/2026 14:00 - 14:45

ICM - 1 Auditorium

PL02A - Plenary Lecture - Petros Koumoutsakos

Chaired by: Prof. Stefanie Elgeti (TU Wien)

AI for Science: learn, model, optimize and ... learn

***P. Koumoutsakos**

Tue, 21/07/2026 14:00 - 14:45

ICM - 14b

PL02B - Plenary Lecture - Kent-Andre Mardal

Chaired by: Prof. Silvia Budday (Friedrich-Alexander-Universität Erlangen-Nürnberg)

Why do we sleep? -- Computational models of brain clearance

***K. Mardal**

Tue, 21/07/2026 14:00 - 14:45

ICM - 14a

PL02C - Plenary Lecture - Jessica Zhang

Chaired by: Prof. Junji Kato (Nagoya University)

From neurological disorders to additive manufacturing: integrating isogeometric analysis with deep learning and digital twins

***J. Zhang**

Tue, 21/07/2026 14:00 - 14:45

ICM - 14c

PL02D - Plenary Lecture - Maria Strazzullo

Chaired by: Prof. Arif Masud (University of Illinois Urbana-Champaign)

Reduced Order Models for Regularized Convection-Dominated Flows: Stabilization, Sensitivity, and Control

***M. Strazzullo**

Tue, 21/07/2026 14:45 - 15:00

Short Break

Tue, 21/07/2026 15:00 - 16:30

ICM - 1 Auditorium

MS120G - Recent Advances in Computational Methods for the Cardiovascular System VII

Main Organizer: Dr. Richard Schussnig (Ruhr University Bochum)

Chaired by: Dr. Gian Marco Melito (TU Graz), Dr. Malte Rolf (Friedrich-Alexander-Universität Erlangen-Nürnberg)

Estimation of Active Stress Parameters in Cardiac Models Using Physics-Informed Neural Networks

M. Höfler, F. Regazzoni, S. Pagani, C. Augustin, E. Karabelas, G. Haase, G. Plank, ***F. Caforio**

Projection-based model order reduction accounting for variability in geometry applied to cardiac mechanics

L. Wagnmüller, M. Gee, M. Wibmer, ***M. Gitterle**

Reduced-Order Fluid-Structure-Growth Modelling in the Context of Endogenous Tissue Restoration

***L. Maes**, N. Famaey, S. Consortium

High Speed Acute Cardiac Infarction Simulations Using the Neural Network Finite Element Method

***B. Thomas**, M. Sacks

Evaluation of Local Carotid Arterial Wall Stiffness Using Ultrasound and Applanation Tonometry

W. Adamczyk, M. Mesek, M. Rojczyk, A. Golda, J. Juszczak, L. Hellevik, ***R. Bia?ecki**

Registration-based biaxial strain assessments in aortic geometries

S. Parikh, P. Wijnjtes, E. van Bavel, S. Pirola, ***P. van Ooij**, S. Saitta

Tue, 21/07/2026 15:00 - 16:30

ICM – 2

MS268B - Numerical Modeling of Granular and Multiphase Flows II

Main Organizer: Prof. Mikio Sakai (The University of Tokyo)

Chaired by: Dr. Toshiki Imatani (The University of Tokyo), Prof. Dimitrios Papavassiliou (University of Oklahoma)

Applicability of Coarse-Grained DEM-CFD to Industrial Multiphase Particle Processes

***Y. Tsunazawa**, M. Sakai

Advanced DEM Modeling for Industrial Applications: Numerical Methods, HPC Strategies, and Computational Mechanics

J. Khinast, ***S. Irmforfer**

Validation study on large-scale gas–solid–liquid flow simulation in a rotational vessel

***R. Mitani**, T. Imatani, T. Tano, K. Yunoki, S. Nezu, Y. Shiraiwa, M. Sakai

Lagrangian Modeling of Nanoparticle Aggregation in Porous Media Using LBM

***D. Papavassiliou**, R. Pathinarage, V. Nguyen

Geometry-Informed Latent Representation Learning for Predicting Drag Coefficients of Irregular Particles

***Z. Li**, S. Chen, M. Asai, N. Mitsume

Sensitivity Analysis of Interfacial Force Models in Gas–Liquid CFD Simulations for UASB Reactor Design

***C. D'Bastiani**, D. Kennedy, A. Reynolds

Tue, 21/07/2026 15:00 - 16:30

ICM – 3

MS082E - Advances in Computational Models and Methods for Multiphase Flows with Phase Change V

Main Organizer: Dr. Marica Pelanti (ENSTA - Institut Polytechnique de Paris)

Chaired by: Dr. Marica Pelanti (ENSTA - Institut Polytechnique de Paris), Dr. Alessio Roccon (Univeristy of Udine)

Direct Numerical Simulation of Hydrogen Boiling Using a Compressible Diffuse Interface Method with an Accurate Equation of State

***J. Espelund**, A. Mukherjee, S. Munkejord, Å. Ervik, L. Brandt, C. Schulze-Netzer

A pressure non-equilibrium two-phase model for simulating bubble clusters in heterogeneous cavitation

M. SAINI, F. Denner, ***K. Schmidmayer**

Predicting the Degree of Non-Equilibrium Reached During Rapid Depressurization of Liquids

***A. Log**

Three Phase Drift-Flux Model for the Depressurization of a CO₂ Vessel

***E. Høydaalsvik**, E. Fyhn, A. Austegard, H. Deng, A. Hafner, S. Munkejord

A Path-Conservative Method for Boiling Flow Simulations using Weakly Compressible Model

***A. Melvin P A**, J. Mandal

Tue, 21/07/2026 15:00 - 16:30

ICM – 4a

MS015B - Stabilized and Variational-Multiscale Methods for Fluid Mechanics II

Main Organizer: Prof. Artem Korobenko (University of Calgary)

Chaired by: Prof. Guillermo Hauke (Escuela de Ingenieria y Arquitectura)

Mixed finite element methods in Elasticity and Flow Problems---Is the continuous inf-sup stability a practical option?

***R. Codina**

What are C and h in IGA?

***I. Akkerman**

STABOP: a data-driven stabilization operator for reduced order modeling

***P. Tsai**, A. Ivagnes, A. Quaini, T. Iliescu, G. Rozza

B-spline Based Superimposing-Version of Finite Element Method for Fluid Boundary Value Problems

***N. Magome**, M. Hsu, N. Morita, S. Kaneko, N. Mitsume

Recent Advancements in a Posteriori Error Estimation for Algebraic Stabilizations

N. Ahmed, ***A. Jha**

An Efficient Variational Multiscale Fractional-Step Method for Incompressible Flow with Consistent Boundary Conditions

***P. Wu**, C. Zhu

Tue, 21/07/2026 15:00 - 16:30

ICM – 4b

MS040D - New Perspectives in Mechanical and Acoustic Metamaterials Science IV

Main Organizer: Prof. Giuseppe Failla (University of Reggio Calabria, Italy)

Chaired by: Dr. Farhad Zeighami (University of Bologna), Prof. Giuseppe Failla (University of Reggio Calabria, Italy)

Computational Homogenization Based Approach to Efficient Wave Analysis in Multi-layered Locally Resonant Metamaterials

***V. Kouznetsova**, X. Kuci, M. Geers

Critical behavior of finitely deformed periodic layered metamaterials featuring cohesive and contact interfaces

D. Gaetano, ***F. Greco**, L. Leonetti, P. Lonetti

Mechanical Metastructures for Analog Computing and Inference Tasks

***P. Peralta-Braz**, C. Vincenot, E. Atroshchenko, S. Bordas

Two-Dimensional Numerical Simulations of Ultrasound in Soft Media with Gas Bubbles: Locally Resonant Acoustic Metamaterials

***E. Carreras-Casanova**, M. Tejedor-Sastre, C. Vanhille

Tue, 21/07/2026 15:00 - 16:30

ICM - 5

MS018A - Immersed Boundary Variational Methods: Theory, Data Structures, and Applications I

Main Organizer: Prof. Alexander Düster (Hamburg University of Technology)

Chaired by: Prof. Alexander Düster (Hamburg University of Technology)

FIVER++ with Model Reduction: Fast, Differentiable Embedded Boundary Methods for Design Optimization Keynote

***C. Farhat**, J. Ho, N. Youkilis

Stabilized Isogeometric Topology Optimization on Trimmed Geometries

***X. Wei**, H. Su

CABA: A Computational Framework for Large-Scale Parallel Adaptive Cartesian Grid Immersed Boundary Methods at High Reynolds Numbers

***J. Liu**, H. Chen, Z. Yang, Z. Wang, L. Tian, N. Zhao

TraceFEM method for shell-based lattice structures

***G. Guarino**, A. Buffa, P. Antolin

Using unfitted high-order spectral elements for wave-structure interaction with a polynomial-corrected shifted boundary approach

***J. Visbeck**, A. Engsig-Karup, H. Bingham, M. Ricchiuto

Tue, 21/07/2026 15:00 - 16:30

ICM - 11a

MS066C - Recent trends in model order reduction, model discovery, and surrogate models III

Main Organizer: Prof. Giovanni Stabile (Sant'Anna School of Advanced Studies)

Chaired by: Prof. Giovanni Stabile (Sant'Anna School of Advanced Studies), Prof. Alessandro Lucantonio (Aarhus University)

Data-Driven ROM for Fluid-Structure Interaction: Application to Vortex-Induced Vibrations

***M. Shehzad**, A. Mola

Hybrid Reduced Order Modeling for the Inverse Design of Dielectric Elastomer Actuators

***M. Barillas**, R. Ortigosa, J. Matinez-Frutos, J. Hernandez, S. Ares de Parga, J. Bonet, A. García-Gonzalez

Accelerated Surrogates for Discrete Particle Simulations utilising Model Order Reduction and Machine Learning

***D. Tunuguntla**, T. Plath, T. Weinhart, S. Rave, A. Thornton

Reduced-order model for the solid-liquid phase change heat transfer in porous media

***L. Wu**, C. Allery, E. Liberge

Tue, 21/07/2026 15:00 - 16:30

ICM - 11b

MS062C - Advances in numerical modeling strategies for static and dynamic analysis of masonry and historic structures III

Main Organizer: Prof. Daniela Addressi (Sapienza University of Rome)

Chaired by: Prof. Daniela Addressi (Sapienza University of Rome)

Image-Based Identification of Orthotropic Masonry Textures

***A. Montanino**, M. Betti, D. Bru Orts, L. Facchini, M. Fagone, S. Ivorra Chorro

A Frictional Cohesive Interface Model with a Plastic-damage Cap to Describe the Cyclic Response of Masonry

***G. Cera**, J. Rots, A. Slobbe, F. Messali

Hybrid Finite Element for Masonry Arches and Axial-Symmetric Domes

***F. Nerilli**, D. Addressi, E. Sacco

AI-assisted crack segmentation and geometric feature extraction for masonry structures under complex backgrounds

***J. Hu**, G. Lu, Y. Dong

Tue, 21/07/2026 15:00 - 16:30

ICM - 12a

MS248C - Near-Wall Reactive Flows: Experiments, Simulations and Modelling III

Main Organizer: Prof. Suad Jakirlic (Technical University of Darmstadt, Germany)

Chaired by: Prof. Suad Jakirlic (Technical University of Darmstadt, Germany)

Direct Numerical Simulations of Incompressible Turbulent Boundary Layers with Partial Heating and Blowing

***J. Schmitt**, A. Stroh, D. Gatti, B. Frohnäpfel

Sensitized Turbulence Modeling of Twin-Jet Impingement-Driven Mixing Processes

***S. Kiefer-Gröninger**, S. Jakirlic

Heat Transfer and Pressure Loss by Dimpled-Surface at High Mach and Reynolds Numbers: Comparison of Turbulence and Heat Flux Models

***M. Blanke**, C. Bode

Stall-Cell Formation and Effects on Near-Stall Aerodynamics of the DU 91-W2-250 Airfoil

***H. Lin**, S. Fu

Numerical study of drop impingement on a heated film

***X. Wang**, C. Habes, M. Wörner, H. Marschall

Tue, 21/07/2026 15:00 - 16:30

ICM - 12b

MS175B - Nonlocality and Machine Learning II

Main Organizer: Dr. Olena Burkovska (Oak Ridge National Laboratory)

Chaired by: Prof. Yue Yu (Lehigh University), Dr. Olena Burkovska (Oak Ridge National Laboratory)

Markovian approximation for nonlinear overdamped Langevin systems

***X. Li**, T. Hudson

Data-Driven Particle Method for Multiscale Multiphase Flows

***M. Win**, C. Palathinkal, Q. Hernandez, N. Trask

Multifidelity Operator Learning for Local and Nonlocal PDEs

J. Hauck, ***Y. Zhang**

End-to-end deep learning method for solving nonlocal phase-field models

Y. Geng, ***O. Burkovska**, L. Ju, G. Zhang, M. Gunzburger

Tue, 21/07/2026 15:00 - 16:30

ICM - 13a

MS372G - Phase-field fracture modeling and computation VII

Main Organizer: Prof. Laura De Lorenzis (ETH Zurich)

Chaired by: Prof. Laura De Lorenzis (ETH Zurich), Prof. Blaise Bourdin (McMaster University)

Fully staggered, Partially staggered, and Monolithic Schemes for Multiphysics Phase-field Crack Simulations

***T. Jin**, L. Svolos

Finite element solvers using one or two meshes for Lip-Field and Phase-Field damage formulations

***A. Marlot**, G. Rastello, N. Moës

Accelerating Multi-Field Coupled Simulations: A Schur Complement-Based Approach to Overcome Staggered Scheme Limitations

***Y. Shen**

Development of Robust Nonlinear Solvers for Phase-Field Fracture Modeling at Finite Strains

***P. Kumar**, P. Steinmann

Tue, 21/07/2026 15:00 - 16:30

ICM - 13b

MS426A - Data-driven Approaches in Mechanics I

Main Organizer: Prof. Kostas Karapiperis (EPFL)

Chaired by: Prof. Kostas Karapiperis (EPFL), Prof. Yue Yu (Lehigh University)

IAGO: Implicit Adaptive Generative design Optimization **Keynote**

***M. D'Elia**, L. Ferreira Guilhoto, O. Pinti, S. Venturi

Parametric GFEM Generation and Surrogate-Based Optimization for Early-Stage Composite Airframe Design

***N. Ziakos**, A. Cini

Designing Inflatable Structures With Controlled Deformation Trajectories Using Latent Space Generative AI

S. Karimi, ***N. Viassis**

Reinforcement Learning for Hanger Rod Systems

***M. Wojtala**, J. Tabin, M. Pr?cik, ?. ?acny

Tue, 21/07/2026 15:00 - 16:30

ICM - 14a

MS216B - High-Fidelity and Surrogate Modeling for Advanced Manufacturing Processes II

Main Organizer: Dr. Mamzi Afrasiabi (ETH Zurich)

Chaired by: Prof. Christian Weißenfels (University of Augsburg), Prof. Zhilang Zhang (Peking University)

Scientific Machine Learning for Accelerating High-Fidelity Simulations of Laser Powder Bed Fusion

E. Hosseini, ***M. Afrasiabi**

Heat Source Reconstruction for Additive Friction Stir Deposition Preheating Based on Multilayer Perceptron

***J. Gao**, L. Zhang, W. Dou, Z. Zhou, Q. Wen

Spatio-temporal Beam Shaping Effects on the Melt Pool in Laser Powder Bed Fusion of 316L Stainless Steel

***B. Zhou**, J. Barode, J. Hattel, M. Bayat

Robust Design of Mixing Elements for Plastic Extruders

***N. Wunsch**, S. Elgeti

Thermal Analysis in Metal Additive Manufacturing with Neural Operators

***L. Brock**, M. Chiumenti, E. Hosseini, L. De Lorenzis

Tue, 21/07/2026 15:00 - 16:30

ICM - 14b

MS026B - Contact and Interface Mechanics: Modeling and Computation II

Main Organizer: Prof. Michel Raous (Laboratoire de Mécanique et d'Acoustique - CNRS - France)

Chaired by: Prof. Michel Raous (Laboratoire de Mécanique et d'Acoustique - CNRS - France)

Third Medium Contact using Finite and Virtual Elements

***P. Wriggers**, B. Xu, J. Korelc

A scalable two-level preconditioner for large-scale contact mechanics

***M. Puso**, S. Petrides, T. Hartland, T. Kolev, C. Lee, J. Solberg, C. Petra, V. Paludetto, N. Castelletto

A unified semi-smooth Newton framework for large-strain SMA contact: application to stent deployment

M. Barboteu, ***F. Bonaldi**, S. Dumont, F. Jourdan, R. Mansour, T. Nguyen, V. Nguyen

An Accelerated Non-Intrusive Flexibility Method for Contact Mechanics

Y. Boye, J. Bleyer, S. Chaillat, ***V. Yastrebov**

Tue, 21/07/2026 15:00 - 16:30

ICM - 14c

MS312F - Particle-based methods: advances and applications in DEM, PFEM, SPH, MPM, MPS and others VI

Main Organizer: Prof. Eduardo de Moraes Barreto Campello (University of São Paulo)

Chaired by: Prof. Eduardo de Moraes Barreto Campello (University of São Paulo), Prof. Peter Wriggers (Leibniz University of Hannover)

Modeling contact using the displacement field in the material point method

***P. Barclay**, D. Zhang

Particle simulation of molten metal droplet transfer with flux column in gas metal arc welding using flux cored wire

***H. Komen**, M. Tanaka

Particle-Based Simulation of Rigid Bodies for Real-Time Applications

D. Solanillas Francés, ***J. Kóvecses**

Simulation-Based Investigation of a Granular Vacuum Gripper

***N. Dierks**, M. Hakimiy, H. Zetzener, C. Schilde, K. Dröder, A. Kwade

Coupled Discrete Element–Finite Element Method for Simulating Particle Dampers

***Y. Chung**

Tue, 21/07/2026 15:00 - 16:30

ICM - B11

MS132A - Machine Learning and AI in Constitutive Modeling of Complex Materials I

Main Organizer: Dr. Francisco Sahli Costabal (Pontificia Universidad Católica de Chile)

Chaired by: Dr. Francisco Sahli Costabal (Pontificia Universidad Católica de Chile), Prof. Mathias Peirlinck (Delft University of Technology)

Automating constitutive modeling with LLMs

***M. Tacke**, M. Busch, K. Abdolazizi, J. Eichinger, K. Linka, C. Cyron, R. Aydin

Hetero-EUCLID: Interpretable Model Discovery for Heterogeneous Hyperelastic Materials Using Stress-Unsupervised Learning

***K. Chaurasiya**, S. Dutta, S. Kumar, A. Joshi

Material Fingerprinting for ultra-fast material model discovery without solving optimization problems

***M. Flaschel**, M. Denisa, M. Moreno-Mateos, S. Wiesheier, C. Veil, P. Steinmann, E. Kuhl

Constitutive Kolmogorov–Arnold Networks (CKANs): Combining Accuracy and Interpretability in Data-Driven Material Modeling

***K. Abdolazizi**, C. Cyron, K. Linka

Inelastic Constitutive Kolmogorov-Arnold Networks: A Generalized Framework for Automated Discovery of Interpretable Inelastic Material Models

***C. Ji**, K. Abdolazizi, H. Holthusen, C. Cyron, K. Linka

Data-Rich or Data-Right? Investigating Training Data Requirements for Constitutive Artificial Neural Networks

***M. Knipper**, M. Brand, K. Linka

Tue, 21/07/2026 15:00 - 16:30

ICM - B12

MS141A - Advanced Constitutive Models for Failure and Fracture in Systems and Components Including Anchoring, Fastening, and Bonding Applications I

Main Organizer: Prof. Matthias Neuner (BOKU Vienna)

Chaired by: Prof. Matthias Neuner (BOKU Vienna), Dr. Peter Gamnitzer (Universität Innsbruck)

Discrete Modeling of Cohesive-Frictional Fracture Processes in Reinforced and Fiber-Reinforced Concrete Keynote

***V. Gudžulī?**, K. Daadouch, G. Meschke, R. Sauer

A Gradient-Enhanced Microplane M7 Model with Application to Mixed-Mode Failure

***K. Basche**, A. Dummer, P. Hofer, G. Hofstetter, M. Neuner

Numerical Investigation of Scaling Effects and Failure Mechanisms in Adhesively Bonded Composite Single Strap Joints

***L. Monajati**, A. Vadean, R. Boukhili

Mesoscale Modelling of Concrete Edge Breakout

***Y. Wang**, L. Sinn, K. Nincevic, M. marcon, J. Vorel, R. Wan-Wendner

Numerical aided product development of bonded fasteners and bonded expansion fasteners

***I. Boumakis**, F. Zhu

Tue, 21/07/2026 15:00 - 16:30

ICM - B13

MS220B - Damage Modelling: Bridging Physics-Based and Data-Driven Approaches II

Main Organizer: Dr. Emmanouil Kakouris (University of Warwick)

Chaired by: Dr. Emmanouil Kakouris (University of Warwick), Prof. Lampros Svolos (University of Vermont)

Efficient Physics-Based Phase-Field Modeling of Fracture in Orthotropic Materials

***L. Svolos**, B. Koirala

Predicting brittle failure based on a regularized gradient damage method

L. Yin, ***G. Lin**

Physics-Based Acceleration of Full-Order Mixed-Mode Delamination Simulations in Composite Laminates

***E. Gultekin**, K. Agathos

An Adaptive Dynamic Mode Decomposition Strategy for Efficient Fatigue Crack Growth Simulation

S. Yang, A. Reis, ***J. Cesar de Sa**, R. Darabi, A. Jesus

Tue, 21/07/2026 15:00 - 16:30

ICM - B21

MS222D - Polytopal Methods in Mechanics: bridging Mathematics and Engineering IV

Main Organizer: Mr. Lourenco Beirao da Veiga (Università di Milano-Bicocca)

Chaired by: Mr. Lourenco Beirao da Veiga (Università di Milano-Bicocca), Dr. Franco Dassi (University Milano Bicocca)

A New Look at the hp Version of the Virtual Element Method

***S. Bertoluzza**, F. Credali

A Reynolds- and Hartmann-semirobust hybrid method for magnetohydrodynamics

D. Di Pietro, J. Droniou, ***V. Patierno**

A low-order hybrid method for the variable-density incompressible Navier--Stokes equations

M. Dauphin, D. Di Pietro, J. Droniou, ***A. Skouras**

An interface-fitted virtual element method for Stokes moving interface problem

***G. Wang**, Y. He

GNE-VEM: Graph Neural Network Enhanced Virtual Element Method for Improved Stability

***R. Zhou**, Z. Zeng, X. Zhang

Tue, 21/07/2026 15:00 - 16:30

ICM - B22

MS051A - Anisotropic Meshes and Adaptive Refinement for Simulations of PDEs Within Complex Anisotropic Materials I

Main Organizer: Dr. Nils Margenberg (Otto von Guericke University Magdeburg)

Chaired by: Mr. Philipp Zilk (University of the Bundeswehr Munich), Mr. Max Firmbach (University of the Bundeswehr Munich)

From Data Structures to Automatic Anisotropic hp-Adaptivity **Keynote**

***L. Demkowicz**

Anisotropic Mesh Adaptation for Unsteady Two-Phase Flow Simulation With a Cahn-Hilliard Navier-Stokes Model

***A. Bawin**, S. Étienne, C. Béguin

Anisotropic Goal-Oriented Mesh Adaptivity in Space and Time for Convection-Dominated Problems

***M. Bruchhäuser**, M. Bause, B. Endtmayer, N. Margenberg, I. Touloupoulos, T. Wick

Anisotropic HP Space-Time Adaptivity and Goal-Oriented Error Control for Convection-Dominated Problems

***N. Margenberg**, M. Bruchhäuser, B. Endtmayer

Anisotropic mesh adaptation for periodic 3D domains: application to material design

***N. Ferro**, G. Speroni, S. Perotto

Tue, 21/07/2026 15:00 - 16:30

ICM - 21a

MS264B - Toward Predictive Digital Twins for Large-Scale Complex Systems II

Main Organizer: Dr. Stefan Henneking (The University of Texas at Austin)

Chaired by: Prof. Omar Ghattas (The University of Texas at Austin), Dr. Stefan Henneking (The University of Texas at Austin)

A multisolver numerical relativity code with on-the-fly data assessment and comparisons of different numerical schemes

T. Stokes, ***T. Weinzierl**, H. Zhang

Investigating Forecast Skill of Compound Flooding With a Discontinuous Galerkin Shallow Water Equation Solver: A Case Study of Hurricane Beryl (2024)

***M. Scarborough**, E. Valseth

Digital Twins for Tsunami Early Warning in the Cascadia Subduction Zone and the Japan Trench

***S. Henneking**, S. Venkat, F. Kutschera, J. Wong, A. Gabriel, O. Ghattas

Toward a Digital Twin Framework for Forecasting Future Earthquake Ruptures of the Alto Tiberina Low-Angle Normal Fault System (Italy)

***M. Marchandon**, I. Christadler, N. Schliwa, A. Gabriel

Decoding Earthquake and Tsunami Physics with Supercomputing, Surrogates, and Inverse Modeling

***A. Gabriel**

Tue, 21/07/2026 15:00 - 16:30

ICM - 21b

MS165A - Methods and Applications of Model Order Reduction I

Main Organizer: Dr. Lei Zhang (Institute of Mechanics, Chinese Academy of Sciences)

Chaired by: Prof. Shaoqiang Tang (Peking university)

MultiLevel Variational MultiScale (ML-VMS) framework for large-scale simulation **Keynote**

***L. Zhang**, J. Guo, S. Tang, T. Hughes, W. Liu

Numerical Separation of Variables for Partial Differential Equations: Theory and Applications

J. Jo, ***D. Kim**

Hybrid Green's Function Learning With Axial Reduction for Multi-Dimensional Elliptic Problems

***J. Jo**, T. Ha, C. Lee

Reduced Order Models based on Tensor Rank Decomposition: mathematical foundations and practical examples

***V. Zambrano**, S. Izquierdo, R. Rodríguez, I. Viejo, R. Teruel

Tensor Decomposition-Based Reduced-Order Modeling for Single-Scale and Multiscale topology optimization

***J. Hu**, S. Tang, W. Zhang

Tue, 21/07/2026 15:00 - 16:30

ICM - 22a

MS363B - Advances in UQ and Data-driven Methods for Scale-resolving Turbulence Simulations II

Main Organizer: Dr. Saleh Rezaeiravesh (The University of Manchester)

Chaired by: Prof. Phillipp Schlatter (FAU Erlangen-Nürnberg), Prof. Maria Vittoria Salvetti (University of Pisa)

A naive elliptic blending explicit algebraic Reynolds-Stress model for wall-bounded flows

F. Duval, ***C. Friess**

Wall Modelled Large Eddy Simulation with a Fluctuating Velocity Boundary Condition

***L. Bauer**, J. Sebal, T. Indinger

DNS of Hypersonic Impinging Shock-Wave/Turbulent Boundary Layer Interaction at $Ma=5$

***J. Fang**, J. Sun, X. Li

Interaction Measures for Assessing Turbulence Time Series Models

***S. Rezaeiravesh**, D. Massaro, P. Schlatter

Tue, 21/07/2026 15:00 - 16:30

ICM - 22b

MS046C - Mixed-Dimensional Modeling: Advances in Modeling, Numerical Methods and Applications III

Main Organizer: Dr. Matthias Mayr (Universität der Bundeswehr München)

Chaired by: Mr. Paolo Zunino (MOX, Department of Mathematics, Politecnico di Milano), Dr. Matthias Mayr (Universität der Bundeswehr München)

Mixed dimensional modeling of partial discharges in electrical treeing

B. Crippa, A. Villa, ***A. Scotti**

Coupled 1D/2D Modeling of Coastal Ocean Circulation with the Discontinuous Galerkin Method

***V. Riedl**, V. Aizinger

Fractures and thin heterogeneities as Robin-Wentzell interface conditions

***M. Favino**

Enabling mixed-Dimensional hemodynamics: Vascular Reconstruction Via optimal transport

***E. Facca**, J. Nordbotten, E. Hodneland

Tue, 21/07/2026 15:00 - 16:30

ICM - 41 (Ostersee A)

MS052C - Treatment of Locking Across Discretization Techniques III

Main Organizer: Mr. Tarun Kumar Mitruka Vinod Kumar Mitruka (University of Stuttgart)

Chaired by: Prof. Carlo Lovadina (Università degli Studi di Milano), Mr. Tarun Kumar Mitruka Vinod Kumar Mitruka (University of Stuttgart)

Structure-preserving discretisation of $\mathrm{SO}(3)$ rotations for Cosserat continua

***L. Schek**, A. Sky

Locking-free Exact Finite Element for Beams with Bond-slip

***J. Sousa Jr.**

Simplistic Kirchhoff Plate Element

***J. Freund**

Performance assessment of locking-free finite elements for ductile fracture

***K. Horita**, Y. Shintaku, K. Terada

Development of Locking-Free FE2 Scheme Using Hybrid Elements

***S. Kumar**, M. Agrawal, N. Kumar

Tue, 21/07/2026 15:00 - 16:30

ICM - 42 (Ostersee B+C)

MS341B - Imaging-Based Mathematical and Computational Modeling in Biomechanics II

Main Organizer: Prof. Xiao-Chuan Cai (University of Macau)

Chaired by: Prof. Luca Franco Pavarino (PAVARINO LUCA FRANCO)

Machine Learning-Based Assessment of Liver Fibrosis Staging Using MRI in Animal Models

***F. Hwang**, Y. Su, D. Hwang

Scientific Machine Learning for Forward and Inverse Problems in Cardiac Electrophysiology

***E. Centofanti**

Spatial Remodeling of Myolysis and Troponin C Buffering Couples Subcellular Ca^{2+} Dynamics to Contractile Function in Atrial Fibrillation

***Z. Zhou**, C. Lei

A Critical Exploration of Tracer Kinetic Models from Origin to Operational Limits

***J. Kowalski**, L. Sala, D. Drasdo, I. Vignon-Clementel

Numerical Study of Nebulizer Vibration Frequency Effects on Drug Droplet Deposition in the Maxillary Sinus Using Multiphase CFD Analysis

***T. Kanemoto**, M. Miwa, S. Fujimura, L. Haoren, F. Matsumoto, M. Nakamura, M. Yamamoto

Tue, 21/07/2026 15:00 - 16:30

ICM - 43 (Eibsee)

MS277A - Advanced Numerical Modeling of Slope Disasters I

Main Organizer: Prof. Shuji Moriguchi (Tohoku University)

Chaired by: Prof. Shuji Moriguchi (Tohoku University), Prof. Yoshihito YAMAMOTO (Hosei University)

Automatic Differentiation-Aided Regional-Scale 3D Limit Equilibrium Slope Stability Analysis

***W. Jitchaijaroen**, D. Sugo, R. Nomura, K. Terada, N. Dolojan, N. Sukulthanasorn, S. Moriguchi

Shallow Water SPH Framework for Regional-Scale Debris Flows with Erosion and Entrainment

***N. Dolojan**, K. Tsuji, R. Nomura, K. Terada, S. Moriguchi

A Surrogate Modeling Framework for Rapid Prediction of Rainfall-Induced Slope Hazards Using Slope Stability Analysis

***K. Tozato**, S. Takase, K. Kaneko

An Eulerian Finite Element Framework for Extreme-Deformation Modeling of Subaqueous Landslides

***P. Trapper**, T. Phuor

Dynamic Collapse Simulation of Rock Slope Model Tests Using Extended RBSM Based on a Hierarchical Validation Approach

***K. Yamada**, Y. Yamamoto

Optimization Strategies for Critical Slip Surface Identification in Regional-Scale Limit Equilibrium Slope Stability Analyses

***D. Sugo**, J. Choe, N. Dolojan, R. Nomura, K. Terada, K. Watanabe, S. Moriguchi

Tue, 21/07/2026 15:00 - 16:30

ICM - 44 (Schliersee)

MS331A - Advances in Computational Methods for Moving Boundaries and Interfaces in Multiphysics I

Main Organizer: Dr. Navid Valizadeh (Leibniz Universität Hannover)

Chaired by: Dr. Navid Valizadeh (Leibniz Universität Hannover), Eng. Mohammad Sadegh Eshaghi Khanghah (Chair of Computational Science and Simulation Technology, Institute of Photonics)

Transformation front kinetics in deformable ferromagnets

***M. Poluektov**

Numerical Modeling of Large Deformations in Deposition Processes: an Eulerian Approach

***P. Tesini**, M. Serpelloni, M. Tonni, A. Salvadori

A Level Set model for anode consumption in aluminium electrolysis

***M. Barucca**, M. Picasso

I-EMM: Energy-based Method for Solving Phase Field Fracture Problems

***M. Thombre**, A. Alankar

Tue, 21/07/2026 15:00 - 16:30

ICM - 31 (Zugspitze)

MS280A - Fluid-Structure Interaction: Advanced Modeling, Multi-Scale Strategies, and Validation I

Main Organizer: Prof. Vincent Faucher (CEA)

Chaired by: Prof. Vincent Faucher (CEA), Phd. Guillaume Ricciardi (Cea)

Instabilities in Collapsible Channel Flows

***D. Wang**, P. Stewart

Arbitrary Order Sub-Cycling Strategy Applied to Finite-Volume Updated-Lagrangian Second Order Method for Fluid-Structure Interaction

T. Chantrait, N. Chevaugeon, ***A. Gangloff**, E. Labourasse

Leakage flow modelling in pressurized water reactor core

***G. Ricciardi**, V. Faucher

Stabilization of Loosely Coupled Fluid Rigid-Body for Incompressible Smoothed Particle Hydrodynamics

***D. Clément**, C. Hermange, V. Degand, D. Le Touzé, J. Michel, G. Oger

Nonlinear Mode Transition Control of a Piezoelectric Beam with Unidirectional Circuits under Strong Fluid-Structure-Electro Coupling

***S. Liu**, Y. Qu, G. Meng

High-Performance LBM-Based Partitioned Coupling for Fast Transient Fluid-Structure Interaction

***H. Lerogeron**, V. Faucher, T. Børvik, F. Casadei, V. Aune

Tue, 21/07/2026 15:00 - 16:30

ICM - 32 (Watzmann)

MS330A - Heterogeneous Computing and Algorithmic Advances for Large-Scale and Scale-Resolving Simulations I

Main Organizer: Dr. Henrik Wüstenberg (Imperial College London)

Chaired by: Dr. Henrik Wüstenberg (Imperial College London), Prof. Spencer Sherwin (Imperial Collage London, UK)

A Story of CPUs and GPUs: Performance Portability and Scaling Results for Nektar++

***H. Wüstenberg**, J. Xing, J. Ye, D. Renner, B. Xia, S. Sherwin, D. Moxey, C. Cantwell

Performance and Scalability of GPU-Initiated Communication Backends for High-Fidelity CFD

***N. Jansson**

NektarIR: A Domain-Specific Compiler for High-Order Finite Element Operations on Heterogeneous Hardware

***D. Moxey**, E. Erasmie-Jones, G. Castiglioni

A Matrix-Free Algebraic Multigrid Method Targeting Large-Scale GPU Architectures

***P. Ohm**, G. Harper, N. Janson

Tue, 21/07/2026 15:00 - 16:30

BrainLab - Auditorium

MS297B - Phase Field Modeling and Computation II

Main Organizer: Dr. Marco ten Eikelder (TU Darmstadt)

Chaired by: Prof. Harald van Brummelen (Eindhoven University of Technology)

Embedding microstructures in constitutive relations via the phase-field method: application to hydrogen transport in metals

***A. Hussein**

A phase field model for quantifying failure-mode contributions in polymer nanocomposites

***W. Ryu**, H. Lim, S. Kovacevic, E. Martínez-Pañeda

Solid-Liquid Interfacial Properties of Al-Si Alloys in Irregular-Eutectic Microstructure Formation Estimated by Data Assimilation

***K. Wakabayashi**, M. Okugawa, S. Nomoto, A. Yamanaka, Y. Koizumi

Hybrid phase-field modelling of blast-induced fracture in laminated glass

***J. Schmidt**, M. Šejnoha

A Modified Phase Field Model with Machine Learning-Corrected Order Parameter Gradient for Scalable Simulation of Martensitic

***C. Wei**, Y. Li

Tue, 21/07/2026 15:00 - 16:30

NM - 1 (Multimedia Saal)

MS244A - Advanced Numerical Methods for Scale-Resolving Simulations I

Main Organizer: Prof. F.Xavier Trias (Technical University of Catalonia)

Chaired by: Prof. F.Xavier Trias (Technical University of Catalonia), Prof. Francesco Capuano (Universitat Politècnica de Catalunya)

Large Eddy Simulation as a Coherent Methodology Integrating Filtering, Modeling and Discretization

***R. Verstappen**

Do Explicit Subgrid-Scale Models Improve Implicit LES? A GPU-Oriented High-Order DG Perspective

***G. Rubio**, G. Ntoukas, M. Chávez-Módena, O. Mariño, B. Font, O. Lehmkuhl, E. Valero, E. Ferrer

A LES closure for the viscous Burgers equation aware of local discontinuous Galerkin discretization

***P. Valvo**, A. Abbà, G. Gibertini

Towards Backscatter-Enhanced Subgrid Models for Scale-Resolving Simulations in Unstructured Flow Solvers

***P. Catalano**, A. Passariello, R. Tognaccini

Large eddy simulations of the Prandtl number dependence of flow topology in Rayleigh–Bénard convection

***J. Sun**, F. Trias, R. Verstappen, S. Huang, X. Feng

Assessment of Large Eddy Simulation for Flow Dynamics in Urban-Like Environments

***D. Folch**, À. Alsalti-Baldellou, G. Colomer, F. Trias, A. Oliva

Tue, 21/07/2026 15:00 - 16:30

NM - 2 (Salzburg)

STS103B-STS420A - Joint Session: Multifunctional moveables for high-aspect ratio laminar wing II and Ultra-Performing Wing Project (UP Wing) on HAR Wing Design and Development for SMR Aircraft II

Main Organizer: Prof. Jochen Wild (DLR German Aerospace Center)

Chaired by: Prof. Jochen Wild (DLR German Aerospace Center), Dr. Jos VANKAN (NLR)

Flight Simulator Investigation of Static Load Alleviation for Transport Aircraft

***W. Unkelbach**, F. Silvestre

Aerodynamic Design of an HLFC Wing for a Long-Range Transport Aircraft

***D. San**, S. Kakkar, M. Hillebrand, A. Bauknecht, T. Lutz

Design and Optimisation of a Multifunctional Aircraft Wing Leading Edge System: Aerostructural Layout for combined High Lift, Load Alleviation and Hybrid Laminar Flow Control

***T. Brack**, D. San, M. Haupt, A. Bauknecht, S. Heimbs

Introduction to the Ultra-Performing Wing project (UP Wing) STS420 - Ultra-Performing Wing project (UP Wing) on HAR wing design and development for SMR aircraft

***J. VANKAN**, B. Stefes

Multidisciplinary design of a commercial LH2 aircraft with advanced technologies

***C. Julien**, D. Losada Costoso, C. Mollet, E. Nguyen Van, G. STARCK, E. Stragiotti, L. Vertonghen, S. de Boer

Tue, 21/07/2026 15:00 - 16:30

NM - 4 (Hamburg)

STS397C - Hydrogen – Industrial Questions III

Main Organizer: Mr. Tero Tuovinen (JAMK University of Applied Sciences)

Chaired by: Mr. Tero Tuovinen (JAMK University of Applied Sciences), Prof. Matti Kurki (JAMK University of Applied Sciences)

Raven: A Local AI System for Navigating Scientific Literature, Applied to Hydrogen Production Research

***J. Jeronen**

Parametric design of cryogenic tanks and heat exchangers using CFD simulations

***E. Schillaci**, M. Mosqueda-Otero, C. Olier

From Low Reactivity to Stable Flames: A Numerical Study of Hydrogen-Enhanced Ammonia Combustion in Swirl Burners

***M. El Adawy**, M. Nemitallah

Experimental and Numerical Investigation of Hydrogen-Enriched Gasoline Combustion in an Optical Constant-Volume Combustion Chamber

***M. Harroun**, A. M. Khedr, M. El-Adawy, M. Nemitallah

Probabilistic Fatigue Crack Growth Assessment of Hydrogen Pipelines

***E. Hosseini**, S. Marelli

Tue, 21/07/2026 15:00 - 16:30

NM - 5 (KK)

MS151C - Physics-Augmented Machine Learning Methods for Constitutive Modeling III

Main Organizer: Mr. Dominik K. Klein (TU Darmstadt)

Chaired by: Dr. Karl Kalina (TU Dresden), Prof. WaiChing Sun (Columbia University)

Unsupervised CANNs for robust and interpretable soft tissue mechanics discovery

Keynote

B. Alheit, S. Kumar, ***M. Peirlinck**

Traceable Unsupervised Constitutive Model Discovery from Sparse and Noisy Data

***J. Urrea-Quintero**, A. Morini, D. Anton, V. Narouie, H. Wessels

A calibration strategy for mechanical constitutive laws based on neural networks

***L. Mabileau**, C. Jailin, E. Baranger

Data-Driven Material Characterisation via Scratch Testing

***P. Möllmann**, A. Lucantonio, R. Aghababaei

Robust Calibration of Constitutive Models from Full-Field Data Using Data-Driven Identification and Neural Networks

***L. Linden**, K. Kalina, J. Brummund, B. Riemer, M. Kästner

Tue, 21/07/2026 15:00 - 16:30

NM - 3 (BB)

MS338A - Data-driven Modelling of the Human Cardiovascular System for Understanding, Diagnosis, Treatment and Management I

Main Organizer: Dr. Neeraj Kavan Chakshu (Swansea University)

Chaired by: Prof. Perumal Nithiarasu (Swansea University)

Data-Driven Generation of Personalized Healthy Aortic Flow References for Aortic Valve Stenosis Patients

***T. Wang**, C. Danker, C. Quast, T. Zeus, T. Lemainque, M. Neidlin

A Closed-Loop Lumped-Parameter Cardiovascular Model of the Supine-to-Stand Manoeuvre and Its Association with Falls

***J. van de Sande**, L. van Loon, E. van Poelgeest, N. van der Velde, M. Klop, J. Claassen, V. Krzhizhanovskaya, A. Hoekstra

Physics-Based Discriminant Modeling of Doppler Hemodynamics for Cerebral Occlusion Localization

***A. Argilaga**, A. Sen, S. Avril, D. Vicente, M. Aguirre

Data-Driven Cardiovascular Digital Twins for Early Sepsis Detection and Management of Systemic Dysfunction

N. Chakshu, ***P. Nithiarasu**

Mesh-Independent Neural Networks with Adaptive Sampling for Accelerated Cardiovascular Flow Simulation

W. Xu, C. McComb, ***N. Grande Gutiérrez**

Integrating Isogeometric Analysis and Kolmogorov–Arnold Networks for Efficient Cardiac Simulation

***H. Pham**, C. Ha-Minh, T. Nguyen, E. Budyn

Tue, 21/07/2026 15:00 - 16:30

H4 - 1 (Ludwig)

MS053D - Innovative Finite Element Methods for Fluids IV

Main Organizer: Mr. Frederic Valentin (LNCC)

Chaired by: Dr. Miguel A. Fernández (Inria), Mr. Frederic Valentin (LNCC)

The spectral domain decomposition method GenEO as a robust preconditioner for single-phase flow in fractured porous media

Keynote

P. Jolivet, M. Kern, F. Nataf, *G. Pichot, R. Zanella, D. Zegarra Vasquez

Implementation of Fracture in Mixed Finite Element

*L. Kaczmarczyk, A. Shvarts, C. Runcie, A. Bijaya, C. Pearce

A Study of Error Estimation Strategies for Adaptive Refinement in Mixed Finite Element Formulations

*G. Taraschi, G. Avancini, N. Shauer, T. dos Santos, P. Devloo

Fully Discrete Numerical Methods for Flow in Deformable Porous Media

V. Girault, *M. González Taboada, F. Hecht, K. Rajagopal

A finite element method for an optimal control problem on Navier-Stokes-Brinkman equations

*J. Aguayo, J. Merten

Tue, 21/07/2026 15:00 - 16:30

H4 - 2 (Leopold)

MS004A - Data-Driven innovations and machine learning In aerodynamic analysis, optimization and uncertainty quantification I

Main Organizer: Dr. Esther Andrés Pérez (INTA)

Chaired by: Dr. Esther Andrés Pérez (INTA), Dr. Domenico Quagliarella (CIRA)

Multisource Scientific Machine Learning For Aerodynamic Design: Methods And Relevance To Sustainable Digital Twins

*L. Mainini

Aerothermal Shape Optimization Using Multi-Objective Surrogate-Based Optimizers

*E. Demiral, K. Özden, K. Arslan

Data-Driven and Interpretable Sensitivity Analysis of Compressor Blade Performance Under Manufacturing-Induced Uncertainty

*K. Ouchi, A. Sato, K. Matsui, M. Yamagami

Sample-wise Interpolation of Fluid Simulations using Physics-informed Neural Networks

*R. Sakamoto, M. Horie

Hybrid CFD-Machine Learning Framework for Three-Dimensional Flow Quantification in Twin-Slot Jet Impingement

*H. Kim, S. Kim, T. Lee, J. Hong

Tue, 21/07/2026 15:00 - 16:30

H4 - 3 (Franz)

MS230C - Modeling and Simulation of Additive Manufacturing: Meso- and Microscale Approaches III

Main Organizer: Dr. Magdalena Schreter-Fleischhacker (Technical University of Munich)

Chaired by: Dr. Magdalena Schreter-Fleischhacker (Technical University of Munich), Prof. Christoph Meier (Technical University of Munich)

Microstructure-Aware Generative AI Model for Long-Term Spatiotemporally Consistent Prediction of Corrosion and Crack Evolution

Y. Liu, Y. Fu, *L. Cheng

Crystal Plasticity Simulation of Microstructure-Sensitive Deformation in an AlSi10Mg Deposit Produced by Helium Cold Spraying

*J. Qi, R. RAOELISON, J. Li, M. RACHIK

Atomistic Analysis of the High-Speed Impact in Cold Spraying: Molecular Dynamics Computation of an Aluminium Impact Case

J. Qi, J. Li, *M. RACHIK, R. RAOELISON

Numerical Study of the Printing Force of Individual Strands in FDM 4D Printing

*F. González, F. Cerbe, M. Sinapius, S. Elgeti, M. Behr

Multiscale Prediction of Mechanical Behaviour in FDM Polymers via a Process-Driven Mesoscale Model

*X. Zhang, L. Sluys, M. Lesueur

Phase-Field Light Transport and Material Curing on Shared Finite Element Meshes for Vat Photopolymerization

*M. Aarab, M. Geers, J. Remmers

Tue, 21/07/2026 15:00 - 16:30

H4 - 4 (Alois)

MS125A - Reliability Analysis and Rare Event Simulation I

Main Organizer: Dr. Iason Papaioannou (Technical University of Munich)

Chaired by: Dr. Iason Papaioannou (Technical University of Munich), Dr. Kai Cheng (Technical University of Munich)

Reliability analysis on dynamical systems using manifold-autoregressive surrogate models

Keynote

*S. Marelli, S. Schär, C. Nardin, B. Sudret

Structural reliability analysis for rare events and its application in aerospace equipment

*C. Luo, S. Zhu, T. Zhang, T. Rabczuk

Diagnostic-driven selection of rare-event reliability methods for expensive multidisciplinary design workflows

*T. Ahmed, M. Alder

Tue, 21/07/2026 15:00 - 16:30

H4 - 5 (Xaver)

MS265A - Numerical Advances in the Solution of Saddle-Point System Arising from Fluid Flow Problems I

Main Organizer: Ms. Rachel Yovel (Ben-Gurion University of the Negev)

Chaired by: Ms. Rachel Yovel (Ben-Gurion University of the Negev)

The Immersed Boundary Method: A Preconditioned SIMPLE Approach for Moving Bodies

***R. Yovel**, E. Treisted, Y. Feldman

Parallel-in-Time Preconditioned Iterative Solvers for Stokes and Oseen Control Problems

***J. Pearson**, B. Heinzelreiter

Neural Approximate Inverse Preconditioners

***Y. Xi**, T. Xu, R. Li

Tue, 21/07/2026 15:00 - 16:30

H4 - 6 (Sissi)

MS019A - Advanced Discretization Techniques for the Simulation of Fluid Flow in Porous Media I

Main Organizer: Mr. Paulo R. M. Lyra (Universidade Federal de Pernambuco)

Chaired by: Mr. Paulo R. M. Lyra (Universidade Federal de Pernambuco), Prof. Maicon Correa (University of São Paulo)

Approximation of Degenerate Parabolic Problems Using WENO Reconstructions **Keynote**

***T. Arbogast**, C. Huang

Central-Upwind Scheme on Triangular Meshes for Hyperbolic Conservation Laws with Heterogeneous Storage Coefficient

***A. dos Santos**, M. Correa, D. Rodrigues

A Primal Hybrid Finite Element Method for Poroelasticity

***M. Correa**, G. Taraschi

A Stabilized Explicit Material Point Method for Hydro-Mechanical Coupling in Porous Media

***Z. Cheng**, S. Zhao, H. Chen, J. Zhao

An Algebraic Dynamic Non-Uniform Multilevel Preconditioner for CPR Pressure Systems in Reservoir Simulation

***P. Lyra**, J. Santos, R. Willmersdorf, A. Antunes, J. Rodrigues, D. Carvalho

Tue, 21/07/2026 15:00 - 16:30

H4 - 7 (Maximilian)

MS049A - Quo Vadis, Human Body Models? Development, Validation and Application in the Age of AI I

Main Organizer: Prof. Andre Haufe (ANSYS Germany GmbH)

Chaired by: Prof. Andre Haufe (ANSYS Germany GmbH), Phd. Oleksandr Martynenko (University of Stuttgart)

Mandibular Musculoskeletal Dynamics Simulation Based on Central Pattern Generator and Muscle Synergy Sensitivity Modulation

***X. Wang**, J. Guo, Q. Tian

Least-squares Algorithm for Tracking Topology in Computational Elements of Human Body Models in Settling

S. Mischo, H. Lu, B. Koya, W. Von Kleeck, ***A. Kalmar-Gonzalo**, S. Gayzik

Integration of Subject-Specific Rib Cages in Human Body Models for Injury Analysis

***A. Robinson**, A. Wills, A. Kalmar-Gonzalo, S. Gayzik

From Musculoskeletal Modeling to Neural Surrogates: Towards Fast Image-Based Prediction of Spinal Loading

***T. Lerchl**, K. Budkiewicz, J. Weidner, K. Nispel, B. Wiestler, J. Kirschke

Tue, 21/07/2026 15:00 - 16:30

H4 - 8 (Eventcenter)

MS110E - Computational Models for Cancer Research and Oncology V

Main Organizer: Dr. Guillermo Lorenzo (University of A Coruña)

Chaired by: Dr. Vasileios Vavourakis (University of Cyprus)

Tensor-Based Surrogate Models for Parametric Brain Tumor Growth Dynamics

A. Ilsam, M. Mizan, M. Olshanskii, ***A. Mang**

Patient-specific Prediction of Glioblastoma Growth via Reduced Order Modeling and Neural Networks

***S. Gazzoni**, D. Cerrone, D. Riccobelli, P. Vitullo, F. Ballarin, J. Falco, F. Acerbi, A. Manzoni, P. Zunino, P. Ciarletta

From Model Discovery to Prognosis: Bridging dynamic MRI and clinical outcomes in brain cancer with LCFR

***R. Woodall**, J. Hibbard, M. Gutova, B. Badie, C. Brown, R. Rockne

Modeling Mass Effect: A Neural Operator Approach to Patient-Specific Tumor Growth

***J. Weidner**, L. Zimmer, M. Wittrich, B. Wiestler

Topological learning for spatial data

***B. Stolz**

A new metric of response dynamics: Mechanistic Drug Response Modeling in pediatric diffuse midline glioma

A. Castor Marquez, B. Kritzer, S. Laternser, M. Freitas, J. Kelm, J. Nazarian, ***S. Brünink**

Tue, 21/07/2026 15:00 - 16:30

BrainLab - Training

MS267B - Deep and Machine Learning Methodology in the Context of Application to Computational Mechanics II

Main Organizer: Prof. Yoshitaka Wada (Kindai University)

Chaired by: Prof. Yoshitaka Wada (Kindai University)

Detection and Diagnosis of Anomalies in Civil Engineering Structures Using Machine Learning Techniques

***M. Diallo**, D. Geoffey, G. Folzan, L. Jason

Multiscale Finite Element Method Based on Deep Learning for Arbitrary Composite Material Structure

J. Li, ***W. Yao**

3D Field Prediction on Parameterized Geometry via Sparse Convolution-Based Model

***D. Suh**, G. Noh

Development of a Surrogate Model for Predicting Deformation of Offshore Wind Turbine Blades

***T. Endo**, Y. Wada, S. Nakamura, A. Miyoshi, S. Yoshimura

Optimizing AI-generated motion pictograms through AI-based evaluation and regeneration

***N. Okatani**, R. Shioya, Y. Nakabayashi

Recurrent Neural Network Architectures for Predicting Thermal Conditions and Microstructure Evolution in Laser-Based Additive Manufacturing

***S. Basterrech**, A. Yuksel, S. Mohanty

Tue, 21/07/2026 15:00 - 16:30

NM - 6 (Munich)

MS381A - Phase-Field Modeling: Analytics, Benchmarks, and Discussions I

Main Organizer: Dr. Andreas Prahs (Karlsruhe Institute of Technology (KIT))

Chaired by: Dr. Andreas Prahs (Karlsruhe Institute of Technology (KIT)), Dr. Daniel Schneider (Karlsruhe Institute of Technology (KIT))

The Case for Phase-Field Crystal Simulations of Grain Boundary Migration **Keynote**

M. Punke, ***M. Salvalaglio**

Three-dimensional Phase-field Modelling of Droplet Evolution on Patterned Substrates

***A. Krishnan**, R. Kumar, S. Bandyopadhyay, R. Mukherjee

A Phase-Field Approach to Stress-Driven Diffusion and Diffusion-Induced Stresses

***T. Kannenberg**, A. Prahs, B. Nestler, D. Schneider

Energy-Consistent Phase-Field Modeling of Sintering: Numerical Stiffness, Time-Scale Separation, and Benchmark-Oriented Insights

***Q. Yang**, C. He, B. Qian, A. Kirshtein

Benchmarking diffuse interface approaches for fluid–solid interaction problems

M. Reder, ***M. Weichel**, B. Nestler, D. Schneider

Tue, 21/07/2026 15:00 - 16:30

NM - 7 (Venice)

MS081C - Computational Methods for Inverse Problems III

Main Organizer: Prof. Dan Givoli (Technion - Israel Institute of Technology)

Chaired by: Prof. Marco Gherlone (Politecnico di Torino), Prof. Haim Waisman (Columbia University)

Identifying scatterers of arbitrary geometries within complex-shaped 3D structures using machine learning and elastic wave measurements

B. Kim, L. Lasceski, ***C. Jeong**

Graph Neural Networks for Full Waveform Inversion

***D. Singh**, L. Herrmann, T. Burchner, F. Dietrich, S. Kollmannsberger

Gaussian Mixture Approximations for Nonlinear Confidence Regions in Uncertainty Quantification

***A. Chauhan**

AI-Driven Inverse Identification Method for Heterogeneous Materials

***H. Liu**, Y. Mei

Inverse PINN Identification of Viscosity Ratio in Buckley–Leverett Transport

T. Imankulov, Y. Kenzhebek, S. Bekele, ***D. Akhmed-Zaki**

Tue, 21/07/2026 15:00 - 16:30

ICM - 50 (Seeblick)

OLY001C - ECCOMAS Olympiads III

Main Organizer: Dr. Barbara Re (Politecnico di Milano)

Chaired by: Dr. Paulina Stempin (Poznan University of Technology), Dr. Barbara Re (Politecnico di Milano)

A Micropolar Material Point Method for Evolving Shear Bands in Geomaterials

***T. O'Hare**

Composite Bayesian Optimisation for Data-Driven Design and Analysis of Polycrystalline Materials

***R. Cardoso Coelho**

Isogeometric Methods For The Study Of Fracture Mechanics Via Phase-Field Modeling

***L. Greco**, A. Patton, M. Negri, A. Reali

Space-Time Adaptive Methods for Poroviscoelastic Flow Models

***S. Boisserée**, M. Bachmayr, E. Moulas

Mathematical models and numerical methods for neurodegenerative diseases

***M. Corti**

Tue, 21/07/2026 16:30 - 17:00

Coffee Break

Tue, 21/07/2026 17:00 - 18:30

ICM - 1 Auditorium

MS120H - Recent Advances in Computational Methods for the Cardiovascular System VIII

Main Organizer: Dr. Richard Schussnig (Ruhr University Bochum)

Chaired by: Dr. Richard Schussnig (Ruhr University Bochum), Mr. Ivo Steinbrecher (Universität der Bundeswehr München)

Some recent high-order solvers with minimal numerical pollution errors for hemodynamic wave propagation & transport in the cardiovascular system

***F. Amlani**, N. Pahlevan

An Integrated 1D-0D Model of the Cardiorespiratory System With Short-Term Cardiopulmonary Control Mechanisms

***C. Dalmaso**, P. Blanco, L. Müller

Comparison of Zero- and One-Dimensional Models for Stiff and Compliant Vessels in the Airways and the Pulmonary Circulation

***L. Engstler**, B. Goderbauer, L. Köglmeier, W. Wall

Multiscale Transport Modeling in Biological Tissue

***H. Song**, H. Kim

High-speed Simulations of Mitral Valve Repair using the JAX Framework

***K. Meyer**, U. Akyuz, M. Sacks

Tue, 21/07/2026 17:00 - 18:30

ICM – 2

MS268C - Numerical Modeling of Granular and Multiphase Flows III

Main Organizer: Prof. Mikio Sakai (The University of Tokyo)

Chaired by: Dr. Ryosuke Mitani (The University of Tokyo), Dr. Stefan Irndorfer (RCPE GmbH)

Viscous-inertial transition in dense sedimentary flows using particle-resolved Direct Numerical Simulations

***A. Khodabakhshi**, F. Tapia, H. Koshan, B. Vowinckel

A Robust, Simple and Efficient Time-stepping Scheme for Two-phase Dense Granular Flows with Pressure-dependent Rheology

***N. Espinoza Contreras**, D. Pacheco

Efficient Tracking of Soft Particles in Complex Flows

***J. Wedel**, P. Steinmann, M. Hriberšek, J. Ravnik

Surrogate Modelling of Stokesian Dynamics

***N. Vovk**, J. Ravnik

Dynamics of Janus magnetic particles in a confined shear flow

***T. Kang**

Fractional-Step in Time for Dispersed Multiphase Flows

***I. Martínez Suárez**, R. Codina Rovira, J. Baiges Aznar

MS162A - Computational Modelling and Optimization of Metamaterials and Phononic Structures I**Main Organizer:** Prof. Juan Carlos Cante (CIMNE / UPC)**Chaired by:** Dr. David Roca (CIMNE / UPC), Dr. Christophe Droz (Inria)

Computational Modeling and ML-Based Optimization of Tesla Valve-Inspired Metamaterials for Low-Frequency Railway Noise Mitigation

K. Moges, N. Yi, Y. Bae, C. Lee, ***S. Pyo**

An acoustic metasurface for noise mitigation

M. Morell, ***E. Gourdon**, E. De Bono, M. Collet, A. Ture Savadkoobi

Reduced Algebraic Formalism for Rapid Analysis of Periodic Waveguide Networks

***B. Senard**, C. Droz

Surrogate modeling of nonlinear mechanical metamaterials using Gaussian Process

***D. Yago**, D. Abad, O. Lloberas-Valls, J. Oliver, J. Cante

Variational Formulation for Channel Flow Stability Interacting with Metamaterial-Based Surfaces

D. Roca**, B. Fuentes, S. González-Horcas, J. Cante**MS015C - Stabilized and Variational-Multiscale Methods for Fluid Mechanics III*Main Organizer:** Prof. Artem Korobenko (University of Calgary)**Chaired by:** Prof. Artem Korobenko (University of Calgary)

Constructing Qualitatively Correct Higher-Order Finite Element Schemes for Two-Phase Flows in Porous And Granular Materials

***C. Kees**, A. Barua

An explicit enrichment fractional-step scheme for adaptive incompressible two-phase flows using a levelset approach

***J. Baiges**, H. Venghaus, R. Codina

The Discontinuity Capturing Petrov-Galerkin (DCPG) / Pressure Stabilising Taylor-Galerkin (PSTG) Method: Application to Incompressible Flow and Heat Transfer

***P. Berquo de Sampaio**

Multiscale Multicontinuum Homogenization for Coupled Flow and Transport in Heterogeneous Media

***W. Leung**

Adaptive Richards Modeling of Sharp Groundwater Fronts

***J. Giraldo Avila**, T. Poulet, V. Calo

From Stokes to Viscoelastic Rheology: A Unified Theoretical and Numerical Framework

N. hertel**, A. Iarcher, R. valette, A. RBAH**MS117A - Scalable Computational Methods For Industrial Digital Twins I*Main Organizer:** Dr. Diana Manvelyan (Siemens AG)**Chaired by:** Dr. Diana Manvelyan (Siemens AG), Dr. Dimitrios Loukrezis (Centrum Wiskunde & Informatica)Digital Twins: From Hype to Industrial Reality ... and Why Applied Mathematics Plays a Key Role **Keynote*****D. Hartmann**

Multi-Fidelity Data Generation for Reliable Imitation Learning of Robot Control Policies

***D. Chatzis**

A Multi-Physical Digital Twin for the Control of a Slot-Die Coating Process

A. Jarones, ***C. Czech**, A. Emiroglu, S. Boschert

Learning Substructured Reduced-Order Models for Dynamic Contact using Contact-Free Training Data

***Y. Filanova**, D. Manvelyan-Stroot, I. Pontes Duff, P. Benner

A Variational Inverse Digital Twin for Territorial-Scale PV-PCM Screening under Climate Variability and Change Scenarios

***F. Díaz**, E. Castillo, F. Galarce, D. Martínez Álvarez

Tue, 21/07/2026 17:00 - 18:30

ICM - 5

MS018B - Immersed Boundary Variational Methods: Theory, Data Structures, and Applications II

Main Organizer: Prof. Alexander Düster (Hamburg University of Technology)

Chaired by: Prof. Ernst Rank (Technical University of Munich)

A Robust Solver for Space-Time Finite Element Approximations to the Navier-Stokes Equations on Evolving Domains

Keynote

M. Anselmann, ***M. Bause**, P. Shamko

A variational front-tracking method for multiphase flow with triple junctions

H. Garcke, ***R. Nürnberg**, Q. Zhao

Integrating Machine-Learning Photogrammetry with Nitsche-Based Parallel Finite Element Flow Simulation

***T. Nemoto**, N. Magome, A. Tsukamoto, N. Morita, M. Hsu, N. Mitsume

An Unfitted HDG Method for Transient Incompressible Flows with Exact NURBS Geometries

***A. Felipe**, M. Giacomini, A. Huerta

An Immersed Boundary Method Based on Penalized Direct Forcing with Immersed Wall Functions using RANS k- ϵ SST Modeling: Assessment on a Staggered Grid and application to Nuclear Safety Devices

***J. Pierrat**, M. Belliard, P. Sagaut

Tue, 21/07/2026 17:00 - 18:30

ICM - 11a

MS334A - Advances in Numerical Structural Optimization Methods for Sustainable Engineering Design I

Main Organizer: Ms. Daniela Masarczyk (University of Kassel)

Chaired by: Dr. Georgia Kikis (Institute of Structural Analysis, University of Duisburg-Essen), Ms. Daniela Masarczyk (University of Kassel)

Structural optimization of elastic adhesive joints

***A. My?li?ski**

Optimization Strategies for Connections of Reused Concrete Elements

***J. Fründt**, G. Meschke, R. Sauer

On the Form Finding of Resilient and Sustainable Reinforced Concrete Structures

***D. Masarczyk**, M. Tran, D. Kuhl

Differentiable Shape Optimization of Reinforced Concrete Slab-Beam Systems via Automatic Differentiation

***S. Peter**, C. Mueller

Tue, 21/07/2026 17:00 - 18:30

ICM - 11b

MS337A - Modelling and Simulations of Structural Responses Under Extreme Conditions I

Main Organizer: Prof. Dongdong Wang (Xiamen University)

Chaired by: Prof. Dongdong Wang (Xiamen University)

A Finite Element Particle Method for Modelling Extreme Deformation Problems

J. Li, ***X. Zhang**

An Eulerian Peridynamic Differential Operator Approach for Large Eddy Simulations of Turbulent Flows in Weakly Compressible Fluids

***M. Yan**, X. Zhai, S. Li, L. Liu, X. Liu, X. Lai

Data-informed, Mechanism-Based Creep Modeling in Zirconium: From Thermal Creep to Irradiation Creep

***Y. Cui**, A. Cui, Y. Li, G. Po, N. Ghoniem

Large Deformation Analysis of Near-incompressible Material Using Unified Exact Quadrature B-Spline Material Point Method

***Z. Sun**, X. Zhou

Length-scale-insensitive phase-field material point method for spall fracture and adiabatic shear bands in ductile metals

***W. Sun**, S. Zhang, W. Yang, Y. Qiu, Y. Zheng

Prediction Model of Environmental Fatigue Life for Austenitic Stainless Steel Considering the Effect of Roughness

***X. Shao**, H. Li, X. Mi

Tue, 21/07/2026 17:00 - 18:30

ICM - 12a

MS215A - Advancements in Scientific Machine Learning techniques for time-dependent problems and applications I

Main Organizer: Dr. Giovanni Ziarelli (Politecnico di Milano)

Chaired by: Dr. Federica Caforio (University of Graz), Dr. Giovanni Ziarelli (Politecnico di Milano)

Transformer-Based Surrogate Model for Nonlinear Response of Steel and Steel-Fiber Reinforced Concrete Structures

***S. Schoen**, V. Gudzulic, B. Cao, S. Freitag, G. Meschke, R. Sauer

Shape uncertainty quantification and surrogate modeling for time-dependent biomedical simulations via conditional LDDMM flow matching

***F. Romor**, S. Katz, J. Zhu, A. Caiazzo

Neural Methods with Natural Gradient Acceleration for Plasma Simulations

***N. Pailliez**, E. Franck, V. Michel-Dansac, L. Navoret, S. Pamela

Physics-Informed Residual Learning for High-Péclet Geothermal Transport: Overcoming Spectral Bias in Neural Operators

***A. Ortiz-Romero**, J. Hidalgo, S. De Simone

Neural Network-Based Motion-Aware Reconstruction of Dynamic MRI Data

M. Holler, ***M. Höfler**, H. Kleikamp, M. Uecker

Physics-Informed Neural Networks for Two-Dimensional Discontinuous Shallow Water Problems

***N. Tuan Nguyen**, S. Deguchi, M. Asai

Tue, 21/07/2026 17:00 - 18:30

ICM - 12b

MS075A - Advances in Natural Hazard Simulation I

Main Organizer: Prof. Massimiliano Cremonesi (Politecnico di Milano, ITALY)

Chaired by: Prof. Massimiliano Cremonesi (Politecnico di Milano, ITALY), Prof. Antonia Larese (University of Padua)

A high-order solver for simulating tsunami genesis and propagation induced by highly time-dependent earthquake ground motion

***T. Melkior**, H. S. Bhat, F. Amlani

Evaluation of Tsunami Loads Considering Surrounding Buildings Using Three-Dimensional Tsunami Analysis with Real Topography and Tsunami Input

***T. Imadegawa**, T. Koyama

Open-Boundary ?R?-SPH for Multiphase Landslide River Blockage: Deposition-Hydrodynamic Feedback Under Large Property Contrasts

***Y. Ma**, M. Asai

DEM Analyses of Three-Dimensional Effects on Dry Granular Flow Impact Forces against Rigid Obstacles

***M. Zerbi**, F. Calvetti, C. di Prisco

Development of a Dynamically Coupled Wind-Wave Model for Improved Modelling of Coastal Flooding

***G. Albrecht**, C. Eskilsson, T. Lykke Andersen, M. Kazolea

Tue, 21/07/2026 17:00 - 18:30

ICM - 13a

MS090A - Machine Learning For Computational Mechanics Across Scales I

Main Organizer: Prof. Fadi Aldakheel (Leibniz Universität Hannover)

Chaired by: Prof. Fadi Aldakheel (Leibniz Universität Hannover), Prof. WaiChing Sun (Columbia University)

COMMET: Orders-of-Magnitude Speed-Up in Finite Element Method Via Batch-Vectorized Neural Constitutive Updates

Keynote

B. Alheit, M. Peirlinck, ***S. Kumar**

Neural-Network-Assisted Approach for Accelerating Continuum-Kinematics-Inspired Peridynamics Simulations

***A. Sharma**, P. Steinmann, A. Javili

Deep-Learned Material Patches for Finite Element Solutions

***R. Barreira**, B. Ferreira, D. Mohr, M. Bessa

Using machine learning (ML) to accelerate multi-time-step (MTS) coupling methods for generalized Runge-Kutta-Nyström (GRKN) schemes in structural dynamics

S. Kwon, ***A. Prakash**

Neural-network-assisted Newton-Raphson Method for Elastoplastic Problems in Implicit MPM

***M. Suzuki**, R. Sugai, K. Terada, M. Muramatsu

Tue, 21/07/2026 17:00 - 18:30

ICM - 13b

MS426B - Data-driven Approaches in Mechanics II

Main Organizer: Prof. Kostas Karapiperis (EPFL)

Chaired by: Prof. WaiChing Sun (Columbia University), Dr. Joaquin Garcia-Suarez (EPFL)

Handling Unilateral Constraints in (Model-Free) Data-Driven Computational Mechanics: application to contact mechanics

***F. Rocha**, L. Stainier

Hybrid CPU–GPU Phase-Space Iterative Solvers for Non-Linear Mechanics

***G. Cortes**, J. Garcia-Suarez

A data-driven solving strategy based on greedy optimization for geometrically exact beams

***T. Nguyen**, B. Rocca, C. Gebhardt

A Wachspress-Based Transfinite Formulation For Exactly Enforcing Dirichlet Boundary Conditions On Convex Polygonal Domains In Physics-Informed Neural Network

***N. Sukumar**, R. Roy

A New Set of Test Functions for Variational Physics-Informed Neural Networks in Solid Mechanics

***N. Radin**, S. Klinkel

Finite Element Approximations for Data-Driven Diffusion–Reaction Problems: a Comparative Study

***R. AUSAS**, P. Balbão Bazon, C. Gebhardt, R. Codina

Tue, 21/07/2026 17:00 - 18:30

ICM - 14a

MS216C - High-Fidelity and Surrogate Modeling for Advanced Manufacturing Processes III

Main Organizer: Dr. Mamzi Afrasiabi (ETH Zurich)

Chaired by: Prof. Zhilang Zhang (Peking University), Dr. Mohamad Bayat (Technical University of Denmark - DTU)

A Phase Field Description of Anodic Dissolution in Electrochemical Machining Keynote

A. Schmidt, ***J. Waimann**

An Eulerian Framework for Embedded, CAD-Driven Forging Simulations Using Explicit Contact

***H. Venghaus**, J. Baiges, R. Codina, M. Chiumenti

A Unified Multi-physics Framework for the Integrated Modeling of Spray Dynamics and Deposit Evolution in Metal Alloy Spray Forming

***A. Mostafazade Abolmaali**, J. Hattel

Design-Space-Guided Data Augmentation for Inter-Part-Class Drawability Prediction

***P. Stocker**, M. Wagner

A validated finite element model for designing a multistage forming process to enhance annealing-induced shape change in AISI 420 sheet

***K. Lu**, Y. Zhou, G. Klaseboer, R. van Tijing, S. Solhjoo, M. Naghinejad, Y. Pei, J. Poat

Tue, 21/07/2026 17:00 - 18:30

ICM - 14b

MS026C - Contact and Interface Mechanics: Modeling and Computation III

Main Organizer: Prof. Michel Raous (Laboratoire de Mécanique et d'Acoustique - CNRS - France)

Chaired by: Dr. Michael Puso (Lawrence Livermore Nat'l Lab)

Non-conforming Contact Solver Based on Mortar Algorithms in Geomechanical Simulations

***A. Franceschini**, D. Moretto, M. Ferronato

Computational Modeling of Wear in the Presence of Third-Body Using a Mortar-Based Discretisation

***T. Silva Sabino**, A. Couto Carneiro, F. Andrade Pires

Mortar-Type Contact-Friction Formulation for Industrial Applications Using an Augmented Lagrangian Approach Based on Ray-Tracing

***M. Abbas**, E. AGOUZAL, N. Tardieu

Two-way, Non-conforming Stabilized Penalty Contact for Explicit Material Point Method

***L. Zambrano-Cruzatty**, A. Flores, W. Davids

A Parameter-Unconstrained Iterative Framework for Efficient Frictionless Contact Simulation

***D. Koliesnikova**, I. Ramière

Tue, 21/07/2026 17:00 - 18:30

ICM - 14c

MS312G - Particle-based methods: advances and applications in DEM, PFEM, SPH, MPM, MPS and others VII

Main Organizer: Prof. Eduardo de Moraes Barreto Campello (University of São Paulo)

Chaired by: Prof. Eduardo de Moraes Barreto Campello (University of São Paulo), Prof. Sergio Idelsohn (CIMNE)

A Schwarz Domain Decomposition Framework for the Material Point Method

Z. Luo, M. Li, *Y. Jiang

Propeller Noise Prediction using a Vortex Particle-Mesh Method with Immersed Lifting Lines

*M. Duponcheel, P. Chatelain, G. Winckelmans

A Monolithic Position-Based PFEM–FEM Formulation for the Simulation of Fluid–Structure Interaction with Multiphase Flows

*T. Rodrigues Carvalho, R. André Kuche Sanches

Stable and efficient Semi-Implicit Solid-Fluid Coupled Double-Point Material Point Method

*M. Hamoud, S. Luding, V. Magnanimo, H. Cheng

High-fidelity MPM Simulation of Landslide Impact Forces on Protective Structures

*A. Katili, R. Wüchner, A. Laresse

Fully Coupled Fluid–Structure Interaction Simulation of Bridge Deck Wash-Off under Tsunami Loading

*C. Pignanelli, M. Zhu, M. Scott, P. Franchin

Tue, 21/07/2026 17:00 - 18:30

ICM - B11

MS132B - Machine Learning and AI in Constitutive Modeling of Complex Materials II

Main Organizer: Dr. Francisco Sahli Costabal (Pontificia Universidad Católica de Chile)

Chaired by: Prof. Mathias Peirlinck (Delft University of Technology), Dr. Siddhant Kumar (Delft University of Technology)

A framework for training DNN-based surrogate constitutive equations for thin-walled rods: incorporating local effects into global rod behavior

*M. P. Kassab, E. M. B. Campello, A. Ibrahimbegovic

A Gaussian Process Framework with Expectation Propagation for Physics-Constrained Creep Constitutive Modeling

*T. Lee, S. Kim, M. Kim

Unsupervised full-field Bayesian inference of orthotropic hyperelasticity from a single biaxial test: a myocardial case study

*R. Krijnen, A. Joshi, S. Kumar, M. Peirlinck

Data-Driven Modeling of Hyperelastic Material Families

*S. Yang, G. Anantha Padmanabha, N. Bouklas

Efficient 2-D and 3-D Elastography of Hyperelastic Functionally Graded Materials using Inverse Finite Element Method

K. Chaurasiya, P. Patil, V. Halder, *A. Joshi

Uncertainty Quantification in Model Discovery by Distilling Interpretable Material Constitutive Models from Gaussian Process Posteriors

*D. Anton, H. Wessels, U. Römer, A. Henkes, J. Urrea-Quintero

Tue, 21/07/2026 17:00 - 18:30

ICM - B12

MS141B - Advanced Constitutive Models for Failure and Fracture in Systems and Components Including Anchoring, Fastening, and Bonding Applications II

Main Organizer: Prof. Matthias Neuner (BOKU Vienna)

Chaired by: Dr. Peter Gamnitzer (Universität Innsbruck), Prof. Matthias Neuner (BOKU Vienna)

Crack Propagation Simulation of 3D Concrete Printing (3DCP) Specimens using Mixed-mode Phase-field Fracture Model

D. Eum, C. Linder, *T. Han

Modeling the Visco-Elastoplasticity and Failure of Semi-Structural Adhesive Joints

*V. Dötschel, G. Possart, J. Mergheim

Extention of the generalized interface model to bonding applications

*A. Stathas, M. Neuner

A Topology and Geometry Sensitive Surrogate Model for Explicit Mechanics with Fracture

*W. Piat

Discrete Lattice Modelling of Interlayer Fracture in 3D-Printed Concrete

*B. Werner, R. Peerlings, O. Rokoš

A Hyperelastic-Viscoplastic Constitutive Model with Gradient-Enhanced Damage for Rubber-Toughened Adhesives

*L. Mitrovic, A. Dummer, M. Neuner

Tue, 21/07/2026 17:00 - 18:30

ICM - B13

MS242A - Computational Methods in Battery Research and Engineering I

Main Organizer: Dr. Christoph Schmidt (Technical University of Munich)

Chaired by: Dr. Christoph Schmidt (Technical University of Munich), Dr. Timo Danner (German Aerospace Center (DLR))

Scaling Phase-Field Methods for Battery Simulation: Image-Based Modelling, GPU Acceleration, and Microstructure Design

Keynote

*S. Daubner, A. Cohen, B. Dörich, S. Cooper

Investigation of SEI Transport and Fracture in Early-Stage Lithium Dendrite Formation

*C. Chen, C. Tai, C. Ko, K. Chen

Investigation of Solid-State Battery Cathode Lithiation Dynamics by Combining Operando Measurements with Simulation

*J. Hörmann, H. Nguyen, S. Hein, T. Danner, D. Rettenwander, A. Latz

A coupled electro-chemo-mechanical framework for Interfacial Degradation in Structural Composite Batteries cathode

*P. KUMAR, P. K. AGNIHOTRI

Tue, 21/07/2026 17:00 - 18:30

ICM - B21

MS222E - Polytopal Methods in Mechanics: bridging Mathematics and Engineering V

Main Organizer: Mr. Lourenco Beirao da Veiga (Università di Milano-Bicocca)

Chaired by: Prof. Paola F. Antonietti (Politecnico di Milano), Prof. Ilario Mazzieri (Politecnico di Milano)

Benchmarking stabilized and self-stabilized p-virtual element methods with variable coefficients

*F. Credali, P. Foligno, D. Boffi, R. Vescovini

\$P\$-multigrid for the Poisson problem in HHO

D. Di Pietro, *E. Hössjer

hr-Adaptive Polytopal Meshing through Simulation-driven Centroidal Voronoï Tesselation

*N. Rechatin-Noël, M. Badri, C. Bourcier, P. Omnes

Virtual Element Method for Multi-physics Coupling Analysis of High-temperature Dynamic Seals

*Y. Zheng

Tue, 21/07/2026 17:00 - 18:30

ICM - B22

MS051B - Anisotropic Meshes and Adaptive Refinement for Simulations of PDEs Within Complex Anisotropic Materials II

Main Organizer: Dr. Nils Margenberg (Otto von Guericke University Magdeburg)

Chaired by: Dr. Marius Paul Bruchhäuser (Helmut Schmidt University Hamburg), Dr. Nils Margenberg (Otto von Guericke University Magdeburg)

Anisotropic Material: Anisotropic Solution? Anisotropic Meshes?

*T. Apel

Anisotropic mesh refinement in isogeometric analysis and the influence of the geometry mapping

*P. Zilk

Two-level preconditioning Technique Specialized for PDEs assembled over Highly Anisotropic Meshes

*J. Vicente Porres, A. Quintanas-Corominas, G. Hozeaux

Complex Mesh Motion With Automated Global Remeshing Approach With Mesh Clustering

*P. Srinivasa Murthy, A. Lippert, T. Tolle, A. Beck, T. Maric

Enhancements to a Topological Anisotropic Meshing Algorithm with Application to the Multiphysics Modelling of a Welding Torch

*S. GOUNAND, M. Guilbert

Efficient Cross-Field Generation on Demand for Quadrilateral Meshing

*N. Bourgeois, K. Dotse, V. Mouysset

Tue, 21/07/2026 17:00 - 18:30

ICM - 21a

MS079A - Computational Mechanics for Sustainable Development I

Main Organizer: Prof. Josue Labaki (University of Campinas)

Chaired by: Prof. Josue Labaki (University of Campinas), Dr. Renato Picelli Sanches (University of São Paulo)

A Finite Element Framework for Multi-Hazard Fragility Analysis of Buried Pipelines under Seismic and Swelling Loads

A. Shojaeian, *M. Muraleetharan

Topology Optimization of Floating Structures Subject to Design-dependent Hydrostatic Loads Using the TOBS-GT Method

I. Barros Baraçal, A. Grammatikopoulos, J. Jovanova, *R. Picelli

Structural Design of 3D Wind Turbine Foundations via Topology Optimization

*K. Santos Silva, R. Picelli

Topology Optimization of Structural Foundations: A Comparative Study of Binary Versus a Continuous Approach

*K. Silva, A. Siqueira, R. Picelli, J. Labaki

RITTER-KRIŽAI? iteration method of carve truss constructions

*V. Križai?, T. Rodiger, D. Hranj, J. Križai?

Tue, 21/07/2026 17:00 - 18:30

ICM - 21b

MS165B - Methods and Applications of Model Order Reduction II

Main Organizer: Dr. Lei Zhang (Institute of Mechanics, Chinese Academy of Sciences)

Chaired by: Prof. Do Wan Kim (Inha University)

Mode selection in proper generalized decomposition methods

K. Wang, ***S. Tang**

Non-Intrusive PGD Model for Flexible Mechanisms with Adaptive Sampling Strategy

***M. Yang**, K. Luo, Q. Tian

Parametrized Geometry Transformation with Rigid Constraints for Model Order Reduction

A. Razavi, M. Ebrahimi, A. Humphry, ***A. Butscher**, N. Morris

Reducing the Computational Burden of Large-Scale Geophysical Simulations via Domain Decomposition and Model Order Reduction: A 3D Magnetotelluric Application

***L. Tao**, A. Muixí, S. Zlotnik, F. Zyserman, J. Afonso

A PGD-Nitsche Framework for Efficient Solution of Elliptic Problems on Non-Separable L-Shaped Domains

***J. Qian**, S. Tang

Tue, 21/07/2026 17:00 - 18:30

ICM - 22a

MS263A - Numerical Methods for Cell Migration: Modeling, Simulation, and Applications I

Main Organizer: Prof. Luoding Zhu (Indiana University Indianapolis)

Chaired by: Prof. Luoding Zhu (Indiana University Indianapolis), Dr. Jared Barber (Indiana University Indianapolis)

Modelling cell plasma membrane and nuclear envelope mechanics using GS-PDEs Keynote

***A. Madzvamuse**, F. Ballatore, D. Hernandez-Aristizabal, R. Allena

How cells choose direction: Simulations of active cell surfaces uncover mechanical guidance in cell migration

H. Gertack, ***S. Aland**

Modelling, Analysis and Simulation of Mechanotransduction

***C. Venkataraman**

Continuum Chemo-Mechanics of Cell Motility

***A. Salvadori**

A viscoelastic model of focal adhesions and cell migration across a flat substrate

Y. Xu, L. Zhu, J. Liu, ***J. Barber**

Tue, 21/07/2026 17:00 - 18:30

ICM - 22b

MS252A - Artificial Intelligence and Uncertainty Quantification in Metal Forming I

Main Organizer: Prof. Pedro Prates (University of Aveiro)

Chaired by: Prof. Pedro Prates (University of Aveiro)

Identification of Yield Functions of Steel Sheets on Hourglass-Shaped Tensile Specimens Using Machine Learning

***T. Nishiwaki**, H. Tsutamori

Machine Learning Challenges in the Calibration of the CPB'06 Yield Criterion

A. Silva, D. Cruz, D. Mitreiro, A. Pereira, ***P. Prates**

Deep Learning-Based Surrogate Modeling for Sheet Metal Forming With POD-Enabled Full-Field Reconstruction

***A. Kheirandish**, M. Jonsson, M. Tarkian, E. Ghane

Hierarchical Surrogate Modeling and Uncertainty Quantification for Aluminum Profile Process Chain

***W. Zheng**, O. Schulz, M. Valdebenito, J. Gebhard, Y. Korkolis, M. Faes

Reference-Free AI-Based Strain Assessment for Pre-Deformed Metallic Components

***M. Rossi**, G. Tanoni, M. Anedda, M. Fioretti, E. Principi

An Agent-Based Multi-Source Framework for Manufacturing Time Estimation in Sheet Metal Processes

***H. Pourrasoul Ouzi**, M. Jonsson, M. Tarkian

Tue, 21/07/2026 17:00 - 18:30

ICM - 41 (Ostersee A)

MS003A - Computational Nanomechanics and Nanoscale Thermal Transport I

Main Organizer: Dr. Haifei Zhan (Zhejiang University)

Chaired by: Prof. YuanTong Gu (Queensland University of Technology), Prof. Seonho Cho (Seoul National University)

Stochastic Design Sensitivity Analysis and Optimization of Graphene based on Linear Response Theory

W. Park, S. Cha, M. Oh, Y. Park, ***S. Cho**

Reactive Molecular Dynamics Study of Silicon Carbide under Atomic Oxygen Exposure: Structural Dependence of Oxidation and Erosion Resistance

***Y. Pan**, Y. Zheng, H. Ren, Y. Qiu

System-Size Effects and Scaling Laws in Nanoscale Droplet Wetting: A Molecular Dynamics Study

***N. Subramanian**, N. Savva, V. Harmandaris

Tue, 21/07/2026 17:00 - 18:30

ICM - 42 (Ostersee B+C)

MS341C - Imaging-Based Mathematical and Computational Modeling in Biomechanics III

Main Organizer: Prof. Xiao-Chuan Cai (University of Macau)

Chaired by: Prof. Rongliang Chen (Shenzhen Institutes of Advanced Technology Chinese Academy of Sciences)

HaTT: Hadamard avoiding TT recompression and its applications in nonlinear problems

***J. Huang**

How to Generate and Exploit Virtual Cardiac Cohorts for Multiphysics Simulations

***F. Viola**, F. Fabbri, M. Scarpolini

Liquid Crystal Models for Cardiac Fibers

***N. Barnafi**, A. Osses

Chemo-Mechanical Transport Modeling: A Second-Order, Structure-Preserving Scheme for the Keller–Segel–Navier–Stokes System

R. Wang, C. Wang, ***Y. Qin**, Z. Zhang

Patient-Specific 1D–0D Simulation of Cerebral Circulation Incorporating Collateral Flow

***M. Oshima**, Y. Kotani, T. Hang

Tue, 21/07/2026 17:00 - 18:30

ICM - 43 (Eibsee)

MS142A - Modeling, Simulations, and Experiments to Study Ocular Fluid Mechanics, Biomechanics, and Drug Delivery I

Main Organizer: Dr. Lucia Carichino (Rochester Institute of technology)

Chaired by: Dr. Lorenzo Sala (INRAE), Dr. Lucia Carichino (Rochester Institute of technology)

Mechanical Interactions Between a Contact Lens and the Eye

***L. Carichino**, K. Maki, R. Supple

Towards a biomechanical description of atrophic lesions in Age-related Macular Degeneration

***L. Alasio**, N. Cresson, C. Choukroun, M. Szopos, M. Paques

Impact of Extraocular Muscle Geometry on Neural Saccadic Commands: an Inverse Neuromechanical Modeling Study

***E. Harsigny**, P. Alvarez, M. Duprez, S. Cotin

Fluid–Structure Interaction Modeling of Vitreous Dynamics and Retinal Tear Propagation Risk Assessment

***C. De Michele**, J. Pralits, A. Govetto, R. Repetto, F. Viola

Tue, 21/07/2026 17:00 - 18:30

ICM - 44 (Schliersee)

MS185A - Multiscale Computational Modeling in Porous Media I

Main Organizer: Prof. Maira Lima (Federal University of Rio de Janeiro)

Macro and Micro Analysis of Porous Ductile Materials by Hierarchical Models

L. Oliveira, ***J. Pituba**

Classification and Quantification of Openness and Closeness of Foams Using Topological Descriptors

***M. Bogdan**, P. D?otko

CFD Modeling of Lignin Extraction in Flow-Through Organosolv Reactors

P. Herrera, A. Appiah, P. Deuss, ***P. Druetta**

Homogenization-Based Phase-Field Fracture in Porous Materials: Idealized vs. Realistic Morphologies

***P. Newell**, R. Nielsen

Tue, 21/07/2026 17:00 - 18:30

ICM - 31 (Zugspitze)

MS280B - Fluid-Structure Interaction: Advanced Modeling, Multi-Scale Strategies, and Validation II

Main Organizer: Prof. Vincent Faucher (CEA)

Chaired by: Phd. Guillaume Ricciardi (Cea), Prof. Vincent Faucher (CEA)

A Numerical Analysis Method for Evaluating Uplift Pressure Force Considering Water Infiltration Process

***H. Kamiya**

Stability and Performance Analysis of Partitioned Coupling Schemes for Fluid–Structure Interaction

***J. ALHAJJ SLEIMAN**, V. FAUCHER, M. PUSCAS, G. RICCIARDI

Transient fluid-structure interaction via exascale-oriented partitioned coupling between SPH and finite element solvers

***M. Goron**, V. Faucher, T. Carrard, J. Perlat, N. Lelong

Wake Dynamics of Bio-Inspired Cylinders Using a Lattice Boltzmann–Immersed Boundary Approach

***A. Trotta**, S. Meloni, G. Falcucci, C. Biscarini, A. Colagrossi, S. Marrone, A. Facci, S. Ubertini

Validation of FSTraceInterface for Aeroelastic Simulations

***R. Jain**, F. Roß, C. Berthold, I. Huisman

Tue, 21/07/2026 17:00 - 18:30

ICM - 32 (Watzmann)

MS330B - Heterogeneous Computing and Algorithmic Advances for Large-Scale and Scale-Resolving Simulations II

Main Organizer: Dr. Henrik Wüstenberg (Imperial College London)

Chaired by: Mr. Kaloyan S Kirilov (King's College London), Prof. David Moxey (King's College London)

High-Order Finite Elements for Exascale Applications

***T. Kolev**

A portable compressible spectral?element solver with entropy?viscosity shock capturing in Neko

***T. Dao**, N. Jansson, M. Nazarov

Multi-backend Xcompact3D for Heterogeneous Architectures

***I. Ahmed**, S. Akkurt, P. Bartholomew, C. Flageul, S. Lemaire, J. Xing, K. Olgu, C. Moulinec, S. Rolfo, S. Laizet

Tue, 21/07/2026 17:00 - 18:30

BrainLab - Auditorium

MS297C - Phase Field Modeling and Computation III

Main Organizer: Dr. Marco ten Eikelder (TU Darmstadt)

Chaired by: Dr. Yu Leng (Los Alamos National Laboratory)

Quantifying the impact of lattice strain on the shape and nucleation rate of precipitates forming in steels heat treated in a high magnetic field using a phase field model

S. Bandyopadhyay, V. Yadav, ***M. Tonks**

A variationally consistent and asymptotically convergent phase-field model for solute precipitation and dissolution

***A. Lamperti**, L. De Lorenzis

Numerical Modelling of Coupled Cahn–Hilliard Diffusion and Mindlin Strain Gradient Elasticity

***O. Kranzsch**, S. Khakalo, A. Morozov

Phase-field Modeling of Microstructure Formation in Phase-Change Materials for Memory Applications

R. Miquel, T. Cabout, O. Cueto, B. Sklenard, ***M. Plapp**

A 3D Multi-Layer Cahn-Hilliard Model for Lithium Intercalation in Graphite

***L. Eon**, R. Le Tellier, H. Manzanarez, E. Saikali, M. Chandesis

Modeling Discontinuous Dynamic Recrystallization Through Coupled Phase-Field and Crystal Plasticity

***H. Nanayakkara**, R. Chafle, B. Klusemann

Tue, 21/07/2026 17:00 - 18:30

NM - 1 (Multimedia Saal)

MS244B - Advanced Numerical Methods for Scale-Resolving Simulations II

Main Organizer: Prof. F.Xavier Trias (Technical University of Catalonia)

Chaired by: Dr. Artur Palha (Delft University of Technology), Dr. Nicolas Valle (TU Delft)

Discontinuous Galerkin Scale-Resolving Simulations of Shock-Induced Turbulent Boundary-Layer Separation in a Fully Computational Configuration

F. Mangini, D. Regener Roig, A. Colombo, ***F. Massa**

Novel Subcell Limiting Strategy to Stabilize Discontinuous Galerkin Methods

***T. Winter**, P. Schrooyen, D. Henneaux, K. Hillewaert

Suppressing Non-physical Oscillations at Element Interfaces in the Spectral-Element Method via Residual Kinetic Energy Spectral Vanishing Viscosity

***S. Du**, N. Jansson, P. Schlatter

Assessment of stabilization strategies for high-order discontinuous Galerkin methods

***M. Borbouse**, G. Perrucci, T. Winter, A. Bilocq, D. Henneaux, P. Schrooyen, P. Chatelain, T. Magin, K. Hillewaert

Extending entropy-stable discontinuous Galerkin formulation to non-equilibrium flows

***A. Bilocq**, M. Borbouse, D. Henneaux, P. Schrooyen, T. Magin, K. Hillewaert

Tue, 21/07/2026 17:00 - 18:30

NM - 2 (Salzburg)

STS420B - STS: Ultra-Performing Wing project (UP Wing) on HAR wing design and development for SMR aircraft II

Main Organizer: Dr. Jos VANKAN (NLR)

Chaired by: Dr. Jos VANKAN (NLR), Dr. Bruno Stefes (Airbus Operations GmbH)

Aerodynamic Design of a Strut-Braced Wing for Overall Aircraft Design in an MDO Strategy

***D. Losada Costoso**, O. Atinault, M. Meheut, G. Starck, E. Stragiotti, E. Nguyen Van

Aerodynamic design of an advanced droop nose device for a high aspect ratio wing

***J. Wild**, M. Minervino, N. Bier, G. Mingione

Innovative lightweight design through non-conventional composite laminates

***F. Martin de la Escalera**, G. Rodriguez

Numerical Simulation of Droplet Impact Experiments on Structural Surfaces

***D. Danzeisen**, M. Sauer, C. Herrles, S. Grünke, O. Rohr

Development of a Highly Flexible Wind Tunnel Model with Active Control System for High-Speed Gust Load Alleviation (GLA) Testing

***R. Creemers**, C. van der Post

Tue, 21/07/2026 17:00 - 18:30

NM - 4 (Hamburg)

STS414A - AI for Low-Altitude Economy & UAV I

Main Organizer: Prof. Song Fu (Tsinghua University)

Chaired by: Prof. Song Fu (Tsinghua University), Prof. Hui Li (Harbin Institute of Technology)

AI Enabled Psychoacoustic Analysis of Drone Noise for Low-Altitude Economy

***X. Huang**

Bridging the Fidelity Gap: Euler to RANS Flow Reconstruction via Physics-Aware Transformers

***Z. Xing**, W. Tang, Y. Zhang

Resilient Low-Altitude Logistics: A Multi-Objective Evolutionary Approach for UAV Network Topology Optimization

***B. Wang**, Z. Song, Z. Ma, H. Yao, Q. Yuan

Towards a unified data-driven turbulence model through multi-objective learning

***Z. Liu**, H. Wang, Z. Zhao, H. Xiao

Scenario-Based Risk Modelling for Urban UAV Traffic Management with Bayesian Networks

***L. Pan**, L. Wang

Tue, 21/07/2026 17:00 - 18:30

NM - 5 (KK)

MS151D - Physics-Augmented Machine Learning Methods for Constitutive Modeling IV

Main Organizer: Mr. Dominik K. Klein (TU Darmstadt)

Chaired by: Dr. Rogelio Ortigosa (Technical University of Cartagena, Spain), Mr. Dominik K. Klein (TU Darmstadt)

A Unified Physics-Augmented Neural Network Framework for Compressible and Nearly Incompressible Hyperelastic Materials

***L. Maurer**, S. Eisenträger, F. Dammaß, K. Kalina, D. Juhre

Data Based Constitutive Modelling of Cables under Bending

***M. Stavole**, D. Manfredi, T. Zhao, F. Schneider-Jung, J. Linn

Physics-augmented neural networks for hyperelastic shell constitutive modeling

***J. Schommartz**, D. Klein, F. Gruttmann, O. Weeger

Automated Discovery of Heat Conduction Constitutive Laws

***G. Torelli**, F. Fathi

An approach to encode divergence-free stress fields in neural approximations based on stress potentials

M. Khorrami, P. Goyal, S. Motahari, ***D. Oexle**, J. Mianroodi, B. Svendsen, P. Benner, D. Raabe

Tue, 21/07/2026 17:00 - 18:30

NM - 3 (BB)

MS339A - Multiscale and ML-based Material Modeling I

Main Organizer: Prof. Sandra Klinge (Technische Universität Berlin)

Chaired by: Prof. Sandra Klinge (Technische Universität Berlin), Prof. Yue Fan (University of Michigan, Ann Arbor)

Machine Learning-Augmented Modeling on the Formation of Non-Conventional Nano-Precipitates in Fast Solidified Al Alloys

***Y. Fan**

ANN Surrogate Model for Statistical Descriptors of Geometric Features in Heterogeneous Composite Materials

***L. Schmollack**, S. Klinge

Modelling the viscoelastic behaviour of Alginate-Gelatine Hydrogels

***M. Graham**, S. Klinge

Data-Efficient Machine Learning Approaches for Constitutive Modeling of Plasticity

S. Hildebrand, T. Beerhues, ***S. Klinge**

Mesh-based neural energy methods (M-NEM) for heterogeneous composites and crack propagation

***S. Hildebrand**, P. Wichmann, M. Toncelli, S. Klinge

ML-based Crude Oil Mud Contamination Detection Using EIS Technology

***I. Corona Acosta**, O. Otayf, S. Maity, V. Britton

Tue, 21/07/2026 17:00 - 18:30

H4 - 1 (Ludwig)

MS041A - Advances and Applications in Meshfree, Particle, and Peridynamic Methods I

Main Organizer: Prof. Jiun-Shyan Chen (University of California, San Diego)

Chaired by: Prof. Jiun-Shyan Chen (University of California, San Diego), Prof. Tsung-Hui (Alex) Huang (National Taiwan University)

Finding the True Minimum: Optimal Best-Approximation Meshfree Methods [Keynote](#)

***M. Hillman**, J. Chen, Y. Wang, J. Magallanes

A Lagrangian Reproducing Kernel Kirchhoff--Love Shell Formulation with Damage-Enhanced Kernel Update

***J. Wang**, K. Ma, Y. Bazilevs

Particle Method Enhanced by Gated Attention Neural Network for Hall Thruster Simulation

***Y. Chen**, T. Guan, Y. Liu

A Nodal Integration with Non-Confirming Cells for Galerkin Methods

***S. Chi**, M. Atif

Neural Network Enriched-RKPM, Variational Integrators, and Least Action

***S. Casebolt**, Y. Wang, J. Chen

Tue, 21/07/2026 17:00 - 18:30

H4 - 2 (Leopold)

MS004B - Data-Driven innovations and machine learning In aerodynamic analysis, optimization and uncertainty quantification II

Main Organizer: Dr. Esther Andrés Pérez (INTA)

Chaired by: Dr. Esther Andrés Pérez (INTA), Dr. Domenico Quagliarella (CIRA)

Sparse Adaptive Multi-Fidelity Design of Experiments for data fusion in aerodynamics

***M. Castaño Aguirre**, A. López Lopera, N. Bartoli, F. Massa, T. Lefebvre

Geometric Parameter Based Machine Learning for Pressure Distribution Prediction on Aerodynamic Surfaces

***A. Rampurawala**

Towards a Digital Twin of Incompressible Fluid Flows Based on Physics-Informed Gaussian Processes

***A. Padilla-Segarra**, H. Owthadi, E. Savin

An Autoencoder Framework for Multi-Fidelity Aerodynamic Data

***J. Nieto-Centenero**, E. Andrés, R. Castellanos

A Generative Approach To Transonic Wing Pressure Prediction

***V. Francés-Belda**, C. Sanmiguel Vila, R. Castellanos

Multi-fidelity neural network surrogates for efficient multi-objective optimization of composite shell dynamics

***B. Miller**, L. Ziemia?ski

Tue, 21/07/2026 17:00 - 18:30

H4 - 3 (Franz)

MS227A - Modeling and Simulation of Additive Manufacturing: Part-Scale Approaches I

Main Organizer: Prof. Christoph Meier (Technical University of Munich)

Chaired by: Prof. Stefan Kollmannsberger (Bauhaus-Universität Weimar), Dr. Magdalena Schreter-Fleischhacker (Technical University of Munich)

A Comprehensive Computational Modeling Framework for the Simulation-Based Exploration of Novel LPBF Process Strategies

***C. Meier**

Towards Increased Computational Throughput of Scan-Resolved Thermo-Mechanical Simulations in Laser Powder Bed Fusion

***T. Schmid**, C. Meier

Differentiable Thermo-Mechanical Simulation of Laser Powder Bed Fusion for Uncertainty Quantification and Digital Twins

***B. Christiernson**, B. Yao, O. Ghattas, N. Alger

Distortion Compensation for Additive Manufacturing Development, Validation, and Pitfalls

***M. Stender**, C. Crandall, J. Foulk, B. Hejnal, C. Herriott, S. Lin, D. Moser, D. Noble, M. Staten

Balancing Accuracy and Simulation Time: A Numerical Investigation of the Scaling Effect on Developed Residual Stress in Ti6Al4V Additively Manufactured Parts via Laser Powder Bed Fusion

K. Abdelgawad, P. Li, ***M. Malekan**

Tue, 21/07/2026 17:00 - 18:30

H4 - 4 (Alois)

MS125B - Reliability Analysis and Rare Event Simulation II

Main Organizer: Dr. Iason Papaioannou (Technical University of Munich)

Chaired by: Dr. Kai Cheng (Technical University of Munich), Prof. Daniel Straub (Technische Universität München)

Mathematical Analysis of Variance-Based Reliability Sensitivity Indices

***E. Ullmann**, I. Papaioannou

Direct Probability Integral Method for Rare Failure Probability Estimation and Global Sensitivity Analysis of Engineering Structures

***H. Li**, D. Yang, G. Chen

Unified theory framework and method for stochastic mechanics and structural reliability

***D. Yang**, G. Chen, H. Li

A Continuous Markov-Chain Perspective on Joint Seismic Reliability and Resilience Assessment

***C. Nardin**, S. Marelli, M. Broccardo, B. Sudret

Redundancy factors for structural systems via Hamiltonian Monte Carlo-based subset simulation

***D. Lee**, M. Broccardo

Tue, 21/07/2026 17:00 - 18:30

H4 - 5 (Xaver)

MS265B - Numerical Advances in the Solution of Saddle-Point System Arising from Fluid Flow Problems II

Main Organizer: Ms. Rachel Yovel (Ben-Gurion University of the Negev)

Chaired by: Ms. Rachel Yovel (Ben-Gurion University of the Negev)

Implicit Immersed Boundary Method Integrated into a Vanka 'big box' smoother

***Y. Feldman**, K. Goncharuk, M. Kumar, O. Oshri

Augmented Lagrangian Preconditioners for Fictitious Domain Problems with Distributed Lagrange Multipliers

M. Benzi, M. Feder, L. Heltai, ***F. Mugnaioni**

A Mixed Precision Preconditioner for a Runge--Kutta Discretization of Instationary Incompressible Viscous Fluid Flow Problems

***S. Leveque**, E. Carson

Big Box Vanka Smoother for Implicit Two-Phase Flow via Algebraic VOF

***K. Goncharuk**, M. Kumar, O. Oshri, Y. Feldman

Tue, 21/07/2026 17:00 - 18:30

H4 - 6 (Sissi)

MS019B - Advanced Discretization Techniques for the Simulation of Fluid Flow in Porous Media II

Main Organizer: Mr. Paulo R. M. Lyra (Universidade Federal de Pernambuco)

Chaired by: Prof. Darlan Carvalho (Federal University of Pernambuco (UFPE)), Prof. Maicon Correa (University of São Paulo)

A Comparative Study of Neural Networks and Classical Preconditioners for Krylov Solvers in the Simulation of Elliptic Darcy Problems

***D. Almeida**, I. Souza, S. Silva, D. Carvalho, A. Antunes, P. Lyra, R. Willmersdorf

Modular LLMs for Process Engineering

***C. Thon**, T. Xu, C. Schilde

Thermal Behavior and Stratification in High-Temperature Rock Thermal Energy Storage Systems: Experimental and Numerical Study

***L. Amiri**, H. Ermagan, J. Hoffmann, M. Shadloo Safdari, A. Sasmito

A New CpEDFM-FCT Formulation to Model 2D Single-Phase Flows in Heterogeneous, Anisotropic and Naturally Fractured Porous Media Using Unstructured Meshes

***D. Carvalho**, P. Silva, P. Albuquerque, P. Lyra

Tue, 21/07/2026 17:00 - 18:30

H4 - 7 (Maximilian)

MS049B - Quo Vadis, Human Body Models? Development, Validation and Application in the Age of AI II

Main Organizer: Prof. Andre Haufe (ANSYS Germany GmbH)

On the Challenges to Incorporate Active Muscles in Human Body Models to Simulate Motion

***O. Martynenko**, M. Thirugnanasambanthar, M. Ditthardt, C. Kleinbach, A. Gromer, A. Haufe, S. Schmitt

Applications of Active Human Multibody Models in Automotive Engineering

***M. Harant**, S. Björkenstam, J. Linn

Quo Vadis, Musculoskeletal Optimal Control Simulations in the Age of AI?

***M. Gambietz**, T. Balougias, A. Koelewijn

Tue, 21/07/2026 17:00 - 18:30

H4 - 8 (Eventcenter)

MS110F - Computational Models for Cancer Research and Oncology VI

Main Organizer: Dr. Guillermo Lorenzo (University of A Coruña)

Chaired by: Dr. Vasileios Vavourakis (University of Cyprus)

The role of clinical and genomic characteristics in lung tumor dynamics

***N. Dimitriou**, J. Willmann, E. Dee, K. Pichotta, W. Fu, S. Salehi, K. Boehm, L. Schwartz, P. Iyengar, F. Sanchez-Vega, S. Shah, N. Schultz, J. Carrot-Zhang

Stochastic Dynamics of Prostate Cancer under Phytocannabinoid Therapy

***M. Cerasuolo**, M. Jensen, A. Ligresti, R. Ronca

Qualitative Optimization of Oncolytic Virotherapy and Immune Therapy Combination Treatments

***T. Hillen**, N. Mohammadnejad

Starving Tumours through Intermittent Fasting: Metabolic Allee Effect Leads to Growth Control

***J. Jiménez-Sánchez**, A. Méndiz-Fernández, B. Ocaña-Tienda, J. Pérez-Beteta, A. Erolés-Simó, E. Arana, P. Maini, G. Fernández-Calvo, V. Pérez-García

Impacts of Genetic and Phenotypic Heterogeneity on Tumor Evolution and Therapy Response

***S. Syga**, J. Nava-Sedeno, A. Deutsch

Age-Structured Modelling of Therapy-Induced Damage in Cancer Cell Populations

***P. Guerrero**

Tue, 21/07/2026 17:00 - 18:30

BrainLab - Training

MS267C - Deep and Machine Learning Methodology in the Context of Application to Computational Mechanics III

Main Organizer: Prof. Yoshitaka Wada (Kindai University)

Chaired by: Prof. Yasushi Nakabayashi (Toyo University)

Using Machine Learning Interatomic Potentials to Investigate the Nanoscale Frictional Behavior of 2D-Material Heterostructures

***M. Valderrama**, J. Ewen, D. Dini

Comparative Study of Prediction of Incompressible Flow Using Machine Learning

***Y. Tamura**, M. Masuda

Operator learning of microstructure-induced random elasticity fields using Neural Operators

***Y. Arai**

Study of XAI in Metabolome Estimation

***A. Mashimo**, H. Nishi, D. Yamanaka, T. Miyamoto, F. Hakuno, S. Takahashi, Y. Tamura, M. Masuda

Proposal of data augmentation method for small-sample quantitative data

***R. Sakamoto**, H. Nishi, D. Yamanaka, F. Hakuno, T. Miyamoto, S. Takahashi, Y. Tamura, M. Masuda

A Novel Decoupled Framework to Solve Truss Problems Using GNNs

***P. Yadav**, G. Bridhani, S. Umakanthan

Tue, 21/07/2026 17:00 - 18:30

NM - 6 (Munich)

MS381B - Phase-Field Modeling: Analytics, Benchmarks, and Discussions II

Main Organizer: Dr. Andreas Prahs (Karlsruhe Institute of Technology (KIT))

Chaired by: Dr. Daniel Schneider (Karlsruhe Institute of Technology (KIT)), Dr. Andreas Prahs (Karlsruhe Institute of Technology (KIT))

Development of verifiable and application-relevant benchmarks of morphology evolution for anisotropic inclusion problems

***R. Nizinkovskyi**, M. Krüger

A Slip Gradient Plasticity Model Incorporating a Diffuse Interface Grain Boundary

***E. Schneider**, L. Schöller, T. Kannenberg, D. Schneider, A. Prahs, B. Nestler

Effect of Rigid-Body Motion on Neck Growth During Phase-Field Sintering

***Y. Yangyiwei**, J. Ma, B. Xu

A Thermomechanically Coupled Multiphase-Field Model Including Latent Heat

***B. Hu**, A. Prahs, M. Reder, D. Schneider, B. Nestler

An Impulse-Based Collision Approach for Rigid Bodies with Arbitrary Shape in the Phase-Field Model

***T. Li**, M. Reder, D. Schneider, B. Nestler

High-Throughput Computational Homogenization of Porous Materials Produced by Selective Laser Sintering: a Diffuse-Interface-Based Workflow

***J. Ma**, Y. Yang, B. Xu

Tue, 21/07/2026 17:00 - 18:30

NM - 7 (Venice)

MS081D - Computational Methods for Inverse Problems IV

Main Organizer: Prof. Dan Givoli (Technion - Israel Institute of Technology)

Chaired by: Prof. Marco Gherlone (Politecnico di Torino), Prof. Dan Givoli (Technion - Israel Institute of Technology)

Topology Optimization and Design Robustness **Keynote**

***O. Sigmund**

Multi-dimensional topology optimization of beams considering sectional-longitudinal coupling

C. Kostopoulos, A. Marzok, ***H. Waisman**

Material Identification of Spatially Heterogeneous Isogeometric Thin Shells in Contact

***B. ?azarczyk**, R. Sauer

Aeroelastic Optimization of Bi-Material Thin Panels

***A. Marzok**

Nonlinear Level-Set Topology Optimization of Hyperelastic Soft Robots with Design-Dependent Pressure Loads

R. Zhuang, C. Sadasivan, X. Gu, ***S. Chen**

Tue, 21/07/2026 17:00 - 18:30

ICM - 50 (Seeblick)

MTL001 - Meet the Legends Event

Main Organizer: Prof. Wolfgang A. Wall (Technical University of Munich)

Wednesday, 22/07/2026

Wed, 22/07/2026 08:00 - 18:00	ICM - FOYER Ground floor
Registration Congress Registration - ICM FOYER Ground floor	
Wed, 22/07/2026 08:30 - 09:15	ICM - 1 Auditorium
PL03A - Plenary Lecture - Charbel Farhat Chaired by: Prof. Antonio Huerta (Universitat Politècnica de Catalunya) Physics-Based Probabilistic Digital Twins: From Computational Models to Flight-Tested Reality *C. Farhat	
Wed, 22/07/2026 08:30 - 09:15	ICM - 14b
PL03B - Plenary Lecture - Filippo Coletti Chaired by: Prof. Pedro Diez (CIMNE/UPC) Free-surface turbulence *F. Coletti	
Wed, 22/07/2026 08:30 - 09:15	ICM - 14a
PL03C - Plenary Lecture - Toshio Nagashima Chaired by: Prof. Bernhard Schrefler (University of Padua, Italy) Application of the Extended Finite Element Method to Engineering Fracture Problems of Metallic and CFRP Materials *T. Nagashima	
Wed, 22/07/2026 08:30 - 09:15	ICM - 14c
PL03D - Plenary Lecture - Thomas Wick Chaired by: Prof. Jörg Schröder (University Duisburg-Essen) Scientific Computing in Computational Mechanics: Some Recent Developments *T. Wick	
Wed, 22/07/2026 09:15 - 09:45 Coffee Break	
Wed, 22/07/2026 09:45 - 11:15	ICM - 1 Auditorium
MS283A - Recent Progress in Topology Optimization and Its Applications I Main Organizer: Prof. Junji Kato (Nagoya University) Chaired by: Dr. Oded Amir (Technion - Israel Institute of Technology), Prof. Yue-Sheng Wang (Tianjin University) 3D multi-material level-set topology optimization considering finite deformation contact with friction Keynote *K. Maute , L. Rinderer, M. Gee Supercavities supporting optical bound states in the continuum via topology optimization *W. Li Thermal-mechanical design of hybrid solid-lattice structures using multi-material topology optimization *L. Xia Concurrent Multi-Scale and Multi-Material Variable Stiffness Design Optimization of Fiber-Reinforced Composite Laminates under Stress-Related Constraints *Z. Duan , Y. Liu, P. Cui, J. Yan, J. Zhu Design Optimization of Composite Thin-Shell Structures under Automated Fiber Placement Constraints *Y. Tian , Q. Xia, L. Xia	

MS268D - Numerical Modeling of Granular and Multiphase Flows IV**Main Organizer:** Prof. Mikio Sakai (The University of Tokyo)**Chaired by:** Dr. Masahiro Kondo (National Institute of Advanced Industrial Science and Technology (AIST)), Prof. Mitsuteru Asai (Kyushu university)

Stability and Convergence properties of the Multi-Kernel Smoothed Particle Hydrodynamics (MK-SPH) method

***M. Kondo**, K. Matsumoto, K. Shibata, J. Matsumoto

Particle-Displacement Effects on the Exhaust Jet in Thermal Spray Applications

***B. Biller**, A. Bußmann, N. Adams

Improvement of Heat Transfer Model for Die Casting Simulation Using MPH Method

***K. Akasaki**, M. Kondo, K. Shibata, K. Shiga

Fluid–Rigid Body Coupled Simulation of Block Seawall Damage Under High Water Level and Wave Overtopping Using the MPH Method

***Y. He**, K. Haneda, K. Shibata, R. Yokoyama, T. Mizuno, T. Nishihata, H. Deguchi

Improvement of Restoring Force in MPS-Based Upending Simulations of a Spar-Type Floating Offshore Wind Turbine

T. Yamaguchi**, M. Li, K. Shibata, H. Yanagisawa, T. Mizuno, H. Deguchi, T. Nishihata**MS162B - Computational Modelling and Optimization of Metamaterials and Phononic Structures II*Main Organizer:** Prof. Juan Carlos Cante (CIMNE / UPC)**Chaired by:** Dr. Oriol Lloberas-Valls (International Centre for Numerical Methods in Engineering), Phd. Daniel Yago (Universitat Politècnica de Catalunya - BarcelonaTech (UPC))

Shock-Absorbing Hyper-Elastic Metamaterials: Recent Findings from Multiscale Modelling

***J. Cante**, O. Lloberas-Valls, D. Yago, D. Abad, J. Oliver

Customized Design of Topological Interface and Corner States in Two-Dimensional Phononic Crystals via Deep Learning

X. Zhang, ***T. Ma**, Y. Wang, V. Romero-García

Data-Driven Exploration of Quasicrystal Architectures for High-Q Nanomechanical Resonators

K. Li, H. Cho, R. Norte, ***D. Shin**

Automated Design of Elastic Metasurfaces via Direct Wave-Shaping and Parametric Topology Optimization

C. Li, ***W. Ye**

Enriched Continua for Finite-sized Metamaterials

J. Voss**, F. Erel-Demore, P. Demetriou, M. Sarhil, T. Ahlburg, A. Madeo**MS015D - Stabilized and Variational-Multiscale Methods for Fluid Mechanics IV*Main Organizer:** Prof. Artem Korobenko (University of Calgary)**Chaired by:** Prof. Artem Korobenko (University of Calgary)

A Stable Entropy Producing Formulation of the k-epsilon Turbulence Model

***G. Hauke**, T. Hughes

New results on turbulence generation and the effects for stabilized methods in turbulence simulation

***J. Hoffman**

Space–Time Variational Multiscale Methods for Medium- and High-Fidelity Simulation of Rotating Machinery

***A. Castorriani**

Streamline-Upwind Finite Volume Stabilization via Residual-Based Subgrid-scale Modeling

***A. Perez**, A. Tejada-Martinez

VMS-Stabilized Reduced-Order Modeling for High-Fidelity Wind Field Prediction Around Wind Turbines in Complex Terrains

***C. Bayona-Roa**, S. Vega-Sánchez, J. Aparicio-Zarate

Embedded Boundary Space-Time Finite Element Method for Moving Structures in Compressible Flow

***R. Karunaratne**, P. Antony, N. Hosters

MS117B - Scalable Computational Methods For Industrial Digital Twins II**Main Organizer:** Dr. Diana Manvelyan (Siemens AG)**Chaired by:** Dr. Dimitrios Loukrezis (Centrum Wiskunde & Informatica)

From Pore Geometry to Effective Properties: A Multiphysics Modelling Approach for AM Porous Structures

***U. Soellner**

Accelerating Finite Cell Simulations through Model Order Reduction Techniques

***J. Vargas-Fajardo**, P. Weißinger, E. Gündoğan, F. Duddeck

A Bayesian data-driven thermal predictive model of an office building using lumped network

***Z. Wang**, I. Garcia, S. Stoter, C. Verhoosel

Projection-Based Reduced Order Modeling for Solid Mechanics: A PyTorch Framework for Geometrically Parametrized 3D Optimization

***M. Staggi**, S. Posch

Model Reduction and Surrogating in Multiphysics Simulation Model: A Case Study on Digital Twins for Cryo-Exploration

***D. Bhattacharya**, J. Kowalski

Assessment of three methods to train deep learning models with hybrid data in the context of forging processes

M. Pasquelin**, C. Durand, C. Baudouin, R. Bigot**MS018C - Immersed Boundary Variational Methods: Theory, Data Structures, and Applications III*Main Organizer:** Prof. Alexander Düster (Hamburg University of Technology)**Chaired by:** Prof. Mats G. Larson (Umea University)

The Generalized Shifted Boundary Method for geometry-parametric PDEs and time-dependent domains

Keynote***O. Colomés**, J. Modderman, G. Scovazzi

A Shifted Boundary Method using Extension Operators for Navier-Slip Flows Around Thin Shapes

***F. Wahl**, R. Zorrilla, G. Scovazzi, R. Wüchner

A Shifted Boundary Approach for Simulating Coupled Thermal-Hydrologic Signatures of Buried Objects

***C. Shelton**, O. Cecil, M. Farthing, M. Bray, A. Trautz

Neumann Boundary Conditions with the Shifted Boundary Method

***J. Collins**, A. Lozinski, G. Scovazzi

Multipatch Coupling via a Gap-Based Shifted Boundary Method: Applications to Isogeometric Analysis

R. Zorrilla**, N. Antonelli, A. Gorgi, R. Rossi, G. Scovazzi**MS334B - Advances in Numerical Structural Optimization Methods for Sustainable Engineering Design II*Main Organizer:** Ms. Daniela Masarczyk (University of Kassel)**Chaired by:** Ms. Daniela Masarczyk (University of Kassel), Dr. Georgia Kikis (Institute of Structural Analysis, University of Duisburg-Essen)

Formulating Continuous Geometric Constraints from Extrusion Design Rules for Cross-Section Optimisation of Double-Skin Aluminium Extrusions

***X. Qi**, L. ZHANG, W. DOU

Large-Scale Aerostructural Optimisation with Modal and Nonlinear Buckling Constraints Assisted by Algorithmic Differentiation

***L. Scalia**, R. Cavallaro, A. Cini

Design and Evaluation of Quadrotor Landing Gear With a 1-DOF Mechanism

A. Arreola Nepomuceno, E. Hernández Martínez, S. Valdez Peña, M. Ceccarelli, ***A. Peidró**

Topology optimization of isogeometric Reissner-Mindlin shells for brittle fracture resistance

***G. Kikis**

An Iterative Surrogate Based Optimization for Dimensional Accuracy in Nonlinear Forging Simulations

***C. Jaramillo Echeverry**, J. Sánchez Tapia, J. Rodríguez Prieto, D. Mejía Parra

Multi-Objective Gradient-Based Optimization of Double Control Laws for Active Mass Dampers Considering Multi-Hazard Life-Cycle Cost

***S. Kleingesinds**

Wed, 22/07/2026 09:45 - 11:15

ICM - 11b

MS337B - Modelling and Simulations of Structural Responses Under Extreme Conditions II

Main Organizer: Prof. Dongdong Wang (Xiamen University)

Chaired by: Dr. Yinan Cui (Tsinghua University)

Reconstruction of Downstream States in ALE-Based Control Volume Models for Manufacturing Processes

***A. Nemetz**

Loosening Behavior of Bolt Jolts Subjected to Mechanical Loading and Thermal Loading in PWRs

***X. Mi**, H. Li, X. Shao, J. Liu

Point-cloud Transformer Autoencoder to incorporate crystal microstructure of coarse-grained particles for metallic material

***T. Guan**, Y. Liu

Prediction of the Stress Corrosion Cracking Behavior of 690 Weld Joints Under Primary Water Environment

***H. Li**, X. Shao, X. Mi

Wed, 22/07/2026 09:45 - 11:15

ICM - 12a

MS215B - Advancements in Scientific Machine Learning techniques for time-dependent problems and applications II

Main Organizer: Dr. Giovanni Ziarelli (Politecnico di Milano)

Chaired by: Prof. Francesco Regazzoni (Politecnico di Milano), Dr. Federica Caforio (University of Graz)

Data-Aware Model Correction and Parameter Estimation

M. Boulakia, ***C. James**, D. Lombardi

Neural Green's Operators for Parametric Partial Differential Equations

***J. Prins**, H. Melchers, M. Abdelmalik

Symbolic Regression of Control Lyapunov Functions

A. Qaragoz, R. Wisniewski, ***A. Lucantonio**

Reduced Order Modeling of History-Dependent Plasticity via Neural Networks with Physically-Encoded Latent Spaces

***A. Börst**, P. Díez, S. Zlotnik, F. Cavaliere, G. Curtosi, X. Larráyo

Conditioned Message Passing for Model Order Reduction and Operator Learning

***L. Tomada**, F. Pichi, G. Rozza

Wed, 22/07/2026 09:45 - 11:15

ICM - 12b

MS075B - Advances in Natural Hazard Simulation II

Main Organizer: Prof. Massimiliano Cremonesi (Politecnico di Milano, ITALY)

Chaired by: Prof. Massimiliano Cremonesi (Politecnico di Milano, ITALY), Prof. Mitsuteru Asai (Kyushu university)

MPM formulations for granular flow simulation: from solid to fluid dynamics approaches for impact assessment on structures

***A. Larese**, L. Moreno Martinez, N. Crescenzo, A. Katili

Application of Material Point Method to Dynamic Analysis: From Liquefaction- to Earthquake-Induced Large-Deformation Problems

***J. Kurima**, B. Chandra, C. Geudeker, K. Soga

Strain rate dependent shear resistance model for debris flow simulations in 2D steep slope shallow water equation

***R. Nomura**, S. Fujisawa, N. Dolojan, A. Larese, S. Moriguchi, K. Terada

A Particle Finite Element Approach For Modeling Granular Flows With Phase Transition

***S. Martini**, G. Rizzieri, M. Cremonesi

OpenACC-Accelerated MPM for Slope Failure Simulation with Single-Codebase MPI and OpenMP Benchmarking

***S. Hidano**, K. Terada

Wed, 22/07/2026 09:45 - 11:15

ICM - 13a

MS090B - Machine Learning For Computational Mechanics Across Scales II

Main Organizer: Prof. Fadi Aldakheel (Leibniz Universität Hannover)

Chaired by: Prof. Elias Cueto (Universidad de Zaragoza), Prof. Miguel Bessa (Brown University)

Microstructure-Conditioned Surrogates For Multiscale Material Optimization

***J. Storm**, I. Rocha, F. van der Meer

Machine Learning for Bone Growth and Hip Implant Stability

***F. Aldakheel**, M. Haertlé, B. Ayouch, A. Tragoudas, A. Antonini

Efficient physics-informed operator learning for three-dimensional microstructures

***H. Eivazi**, J. Tröger, S. Hartmann, H. Wessels

Learning Microstructure Descriptors and Latent Dynamics for Scale-Bridging Crystal Plasticity

***A. Demirci**, S. Sandfeld

Multi-Modal Spatial-Temporal Deep Learning for Multi-scale Modelling of Hierarchical Materials

***B. El Said**, A. Kumar, A. Hii

Predicting Void Closure in Hot Rolling via Machine Learning: A Data-Driven Multiscale Strategy

***M. Chalhoub**, J. Colombeau, D. Pino Munoz, P. Bouchard

MS426C - Data-driven Approaches in Mechanics III**Main Organizer:** Prof. Kostas Karapiperis (EPFL)**Chaired by:** Dr. Nikolaos Napoleon Vlassis (Rutgers University), Prof. Nikolaos Bouklas (Cornell University & Pasteur Labs)

Diffusion Models for Predicting Uncertainty in Full-field Material Response

***P. Kota**, L. Graham-Brady

Trustworthy Crack Propagation Prediction under Fretting Fatigue via Physics-Informed Diffusion and Probabilistic Reasoning

***Y. Wu**, W. Magd Abdel

Molecular Dynamics informed Continuum Modelling of Graphene Deposition on Metal Substrates via Mechanics-Guided Machine Learning

***Y. GUO**, Y. Chou, W. Lee, C. Lee, C. Pao, T. Huang

Physics-Augmented Neural Network for Constitutive Modeling of Articular Cartilage with Regularized Meshfree Knee Joint Contact Simulation

***Y. CHOU**, R. Radioff, T. Huang

Neuro-symbolic automated discovery of novel deformation behaviors in multi-material 4D-printed structures using graph neural surrogates and novelty-driven search

O. Bougzime**, S. Bommisetty, C. Cruz, F. Demoly**MS216D - High-Fidelity and Surrogate Modeling for Advanced Manufacturing Processes IV*Main Organizer:** Dr. Mamzi Afrasiabi (ETH Zurich)**Chaired by:** Dr. Ehsan Hosseini (Empa), Prof. Christian Weißenfels (University of Augsburg)

Differentiable Latent-Space Neural Surrogates for 3D Melt-Pool Optimization in Laser Powder Bed Fusion

***Y. Yan**, M. Bambach, M. Afrasiabi

Laser beam shaping in additive manufacturing: multiphysics simulations and experimental investigations

***M. Bayat**, J. Barode, E. Porsbjerg

Surrogate Modeling of Friction Stir Welding Based on High-Fidelity Finite Element Simulations

G. Lorenz**, N. Dialami, H. Venghaus, I. Castañar Perez, M. Chiumenti*ForgeNet: A Deep Learning-Based Surrogate Model for Cold Forging Simulation with Adaptive Remeshing****S. Saud, T. Shrestha, R. Kunwar, B. Shrestha, S. Chhetri, R. Rijal, B. Yadav, S. Kafley, R. Acharaya, S. Adhikari, K. Igeta, R. Gosai, ***A. Regmi**, A. Tanaka

PID-Controlled Meshfree Simulation of Force-Controlled Friction Extrusion

***A. Elbossily**, Z. Kallien, L. Rath, R. Chaffle, M. Afrasiabi, B. Klusemann

A Geometry-Aware Self-Supervised Surrogate for Explainable Design Feedback in Deep Drawing

M. Guru**, C. Heinzl, F. Bock, N. Ben Khalifa**MS026D - Contact and Interface Mechanics: Modeling and Computation IV*Main Organizer:** Prof. Michel Raous (Laboratoire de Mécanique et d'Acoustique - CNRS - France)**Chaired by:** Prof. Peter Wriggers (Leibniz University of Hannover)Proximal Galerkin: A Unified Framework for Variational Problems with Inequality Constraints **Keynote*****B. Keith**

Numerical Simulation of Vibrations Induced by Rough Sliding Contact

***N. Assemien**, A. Le Bot

Frequency-Time Weighted Residuals: A Discontinuous Formulation for Unilateral Contact Events

***S. McDonald**, M. Legrand

Investigation of Self-Excited Vibrations in Turbine Blades: The Role of Under-Platform Damper Geometry and Centrifugal Force in Stability Envelopes

***F. Tavakolian**, F. Mashayekhi, C. Firrone, S. Zucca

An Impulse-Based Contact Framework for Dynamic Simulation of Slender Rods

***S. Kusuma Chandrashekhara**, M. Roller, F. Schneider-Jung, J. Linn

MS312H - Particle-based methods: advances and applications in DEM, PFEM, SPH, MPM, MPS and others VIII**Main Organizer:** Prof. Eduardo de Morais Barreto Campello (University of São Paulo)**Chaired by:** Prof. Eduardo de Morais Barreto Campello (University of São Paulo)

CFD-DEM simulation of lunar regolith particle motion during spacecraft landing using a supersonic multiphase solver

***T. Lamping**, S. Wolf, J. Petersen, M. Propst, T. Heutling, C. Bach, B. Craig, K. Kontis, S. Linke, E. Stoll, J. Hijlkema, J. Van den Eynde, A. Makaya, C. Schilde

A Bi-Directional FEM–DEM Coupling Framework for Simulating Particle-Based Vibration Damping

***H. Westphal**, B. Prasad, H. Rottengruber, E. Woschke

The Conundrum of Integrating Kinematics over Time in the Material Point Method (MPM)

***J. Duriez**, S. Duverger, S. Bonelli, P. Philippe

Imposition of Nonconforming Neumann Boundary Conditions in the High-Order Material Point Method with the Virtual Stress Boundary Method

***Y. Liang**, J. Given, X. Zhang, K. Soga

Development of an Extended Wall Potential Particle Model for Projection-based SPH Simulations

T. Gotoh**, N. Tsuruta, A. Khayyer, D. Liang, H. Gotoh**MS132C - Machine Learning and AI in Constitutive Modeling of Complex Materials III*Main Organizer:** Dr. Francisco Sahli Costabal (Pontificia Universidad Católica de Chile)**Chaired by:** Dr. Siddhant Kumar (Delft University of Technology), Prof. WaiChing Sun (Columbia University)Viscoelasticity with Physics-Augmented Neural Networks: Model Formulation and Training Strategies **Keynote*****K. Kalina**, B. Riemer, J. Brummund, M. Kästner

RNN based Surrogate Model Representing Path-Dependent Plasticity of Truss-, Shell- and Plate Lattice Metamaterials

***P. Meyer**, T. Tancogne-Dejean, D. Mohr

Neural Generalized Standard Material for Viscoelasticity: Partially Input Convex Neural Network Homogenization

***M. Duvillard**, R. Masson, T. Helfer

Implicit Learning of Elastoplastic Behaviors

***J. Bleyer**

A Framework for Data-driven Constitutive Modelling with Internal Variables and its Integration in the Finite Element Method

W. Dettmer**, E. Alhayki, E. Muttio, D. Peri?**MS093A - Novel Coupling Techniques to Enable Efficient and Robust Simulation of Digital Twins I*Main Organizer:** Dr. Paul Kuberry (Sandia National Laboratories)**Chaired by:** Dr. Paul Kuberry (Sandia National Laboratories), Dr. Ivan Prusak (Ruhr-Universität Bochum)Robust Coupling of I/O Systems for Digital Twins **Keynote*****P. Benner**

Adaptive Multi-Fidelity Hierarchies: From Reduced Basis Greedy Theory to ML-Augmented Surrogates

***H. Kleikamp**

Surrogate-assisted Partitioned Modeling of Fractures in Glacier Ice

***J. Chen**, J. Sartorius, R. Kohlhaas, H. Steeb, M. Schulte

Model Order Reduction of Hyperbolic PDE Combining Domain Decomposition and Hyper-Reduction

***E. Declerck**, M. Carlini, A. Iollo, D. Sipp

Analysis and Simulation of a Stokes-Plate FSI System via Domain Decomposition

L. Besabe, ***H. Lee****MS242B - Computational Methods in Battery Research and Engineering II****Main Organizer:** Dr. Christoph Schmidt (Technical University of Munich)**Chaired by:** Dr. Edwin Knobbe (BMW AG), Dr. Timo Danner (German Aerospace Center (DLR))

Modeling surface transport for structure resolved battery simulations

***P. Maidl**, S. Hein, T. Danner, A. Latz

Magnetically Stabilized Solid-state Batteries: Electromagnetic-chemical-thermomechanical Theory and Simulation

***T. Carlson**, S. Govindjee

Modeling Plating/Stripping-induced Interface Evolution and Lithium Anode Viscoplasticity in Solid-State Batteries

***D. Ana**, C. Schmidt, W. Wall

Quantification of the Influence of Electro-Chemo-Mechanical Interface Effects on the Performance of Solid-State Battery Cells

***C. Schmidt**, D. Ana, G. Robalo Rei, W. Wall

MS091A - The Lattice Boltzmann method as a general-purpose tool in Computational Mechanics I**Main Organizer:** Prof. Ignacio Romero Ollerros (Universidad Politécnica de Madrid)**Chaired by:** Prof. Ignacio Romero Ollerros (Universidad Politécnica de Madrid), Prof. Ferdinando Auricchio (Università di Pavia)

Lattice Boltzmann for Solids: Boundary Conditions, Stability and Extensions

***O. Boolakee**, J. Weverbergh, M. Geier, L. De Lorenzis

Development of a New Adaptive Mesh Refinement HPC Framework for the Simulation of Single-component Two-phase Flows using a Finite-difference Lattice Boltzmann Method

***H. Keraudren**, P. Kestener, A. Genty, A. Cartalade

Lattice Boltzmann Method for solids: high-performance 3D elastodynamics solver using NVIDIA Warp

***J. Weverbergh**, O. Boolakee, M. Geier, L. De Lorenzis

Reinforcement learning-based tuning of lattice Boltzmann methods

***R. Fernández Matilla**, D. Ramos Archilla, E. Valero Sánchez, G. Rubio Calzado

Fast-Forward Lattice Boltzmann Methods via Physics-Informed Neural Operators

***X. Xue**, M. ten Eikelder, M. Gao, P. Coveney

An Isogeometric Formulation of the Lattice Boltzmann Method on CAD-Exact Geometries

Y. Ji**, M. Lacatus, M. Möller**MS155A - Space-Time Finite Element Discretizations and Implicit High-Order Time Integration: Efficient Algorithms and Scalable Solvers I*Main Organizer:** Dr. Nils Margenberg (Otto von Guericke University Magdeburg)**Chaired by:** Dr. Nils Margenberg (Otto von Guericke University Magdeburg)

Irksome: automated implicit time stepping and fast solvers for finite elements

***R. Kirby**

Stage-Parallel Implicit Runge-Kutta Methods Via Low-Rank Matrix Equation Corrections

F. Durastante, ***M. Mazza**

Multilevel Preconditioners for Space-Time FEM with Application to Heat and Stokes equations

***P. Munch**, N. Margenberg

Scalable High-Order Consistent Splitting Methods for the Incompressible Navier-Stokes Equations using Discontinuous Galerkin Discretizations

***D. Still**, N. Nebulishvili, R. Schussnig, K. Kormann, W. Wall, M. Kronbichler

High-order implicit Runge-Kutta time integrators for component-based model reduction of FSI problems

L. Zhang**, T. Taddei, X. Xu**MS079B - Computational Mechanics for Sustainable Development II*Main Organizer:** Prof. Josue Labaki (University of Campinas)**Chaired by:** Dr. Renato Picelli Sanches (University of São Paulo), Prof. Josue Labaki (University of Campinas)

Numerical Validation of a Standardized Bamboo Structural Design Procedure using Material Parameters of Taiwanese Species

C. Chen, ***Y. Yang**, L. Ou

Refined Assessment of Wind Farm Power Generation Considering Atmospheric Stability

***P. Xiao**, L. Tian, Y. Song, Z. Wang, N. Zhao

A Co-Simulation Approach for Simulating the Global Dynamics of FOWTs When Employing a Higher Fidelity Blade Model Using Abaqus and OpenFAST

***J. Schäffner**, B. Leira, M. Mokhtari

Reactive Throughflow Model of a Shockwave Turboreactor for Steam Cracking

***D. Castellanos Proanos**, S. Van Driessche, M. Bonheure, Y. Ouyang, K. Van Geem

Closed-form Analytical Modelling of the Cylinder-dome Junction to Determine Discontinuity Stresses in Thick-walled Cylindrical Composite Pressure Vessels

***P. Sachdeva**, C. Mittelstedt

A Differentiable Simulator for Methane and VOC Emissions in Coupled Liquid–Gas Tank Systems

***A. Brostrøm**, H. Holm, M. Føre, O. Oldervik, O. Møyner

MS165C - Methods and Applications of Model Order Reduction III**Main Organizer:** Dr. Lei Zhang (Institute of Mechanics, Chinese Academy of Sciences)**Chaired by:** Dr. Lei Zhang (Institute of Mechanics, Chinese Academy of Sciences)

A concurrent multiscale FE–FCA method for the elastoplastic mechanical behaviour prediction of large-scale composite structures

***Y. Nie**, G. Cheng, Z. Liu, J. Yan

Mechanically Consistent Equivariant Machine Learning for Substructural Analysis

***C. Jiang**, C. Liu, X. Guo

A Reduced-Order Digital Twin Approach for Real-Time Structural Response Prediction of a Container Ship with Model Test Validation

***K. Sim**, K. Lee, B. Kim, M. Ki

A data-driven Truss FEM-Cluster based Analysis (TFCA) method for effective elastoplastic property prediction of large-scale lattice materials

***H. Liu**

Virtual Clustering Analysis for Reproducing Kernel Particle Method with Applications

S. Tang, ***C. Nan****MS263B - Numerical Methods for Cell Migration: Modeling, Simulation, and Applications II****Main Organizer:** Prof. Luoding Zhu (Indiana University Indianapolis)**Chaired by:** Dr. Jared Barber (Indiana University Indianapolis), Prof. Luoding Zhu (Indiana University Indianapolis)

A Mathematical Model for Cell Forces and Cell Migration

***F. Vermolen**, S. Asghar, Q. Peng

A Mechanical Model for Tissue Engulfment: Competition Between Degradation and Indentation

***G. Reho**, P. Blanco Dorca, E. Benvenuti, M. Arroyo Balaguer

Modeling differential cell motion in the Dictyostelium discoideum slug

***J. Dallon**, J. Song, E. Flowerday, E. Evans

Bayesian Inference for an Agent-Based Model of Zebrafish Pigment Cell Migration Using Topological Data Analysis

***Y. Liu**, A. Volkening

An implicit lattice Boltzmann - immersed boundary method for cell migration

L. Zhu**, S. Ojha, J. Gill, J. Barber**MS366A - Advancements in High-Fidelity and Data-Driven Approaches For computational wind engineering I*Main Organizer:** Mr. Anoop Kodakkal (Technical university of Munich)**Chaired by:** Prof. Roland Wüchner (Technical University of Munich (TUM)), Mr. Anoop Kodakkal (Technical university of Munich)

High-fidelity and data-driven approach to evaluate wind effects on structures

***A. Kodakkal**, S. Warnakulasuriya, R. Wüchner

Wind-resistant design of long-span bridges via deep learning emulation of flow fields

O. Mures, J. García-Tizón, ***M. Cid Montoya**

CFD Analysis of Critical Wind Zones Affecting Street Vegetation in Extreme Weather Conditions: A Madrid Case Study

***M. Suárez-Vázquez**, S. Varela Ballesta, A. Otero Cacho, A. Pérez Muñuzuri, J. Mira Pérez

From Turbulent Inflow to Farm-Scale Performance: Wake Dynamics in Horizontally Staggered Wind Farms

***O. M'hamdi**, A. Bouaziz, R. Boukharfane

Analysis of NREL-5MW Floating offshore wind turbine under different incoming turbulent characteristic

***A. Nabhani**, J. Bergada

Wed, 22/07/2026 09:45 - 11:15

ICM - 41 (Ostersee A)

MS003B - Computational Nanomechanics and Nanoscale Thermal Transport II

Main Organizer: Dr. Haifei Zhan (Zhejiang University)

Chaired by: Dr. Yongchao Wu (Aalto University), Phd. Pegah Ghanizadeh (Lund university)

Mechanisms and modeling of shock-induced helium bubble evolution in metals

***W. Wu**, J. Shao, Y. Zhang

Molecular Dynamics Investigation of Transport and Mechanical Properties of SOFC Components

L. Galindo, P. Florez, P. Raulino, T. Lopes, ***D. Damasceno**

General-Purpose Machine-Learned Potential for CrCoNi Alloys Enabling Large-Scale Atomistic Simulations with First-Principles Accuracy

***Y. Wu**, T. Mäkinen, M. Alava, A. Esfandiarpour

First-Principles Study of Phonon Transport Under Biaxial Tensile Strain and Flexoelectricity in α -Ga₂O₃

***P. Ghanizadeh**, N. Eom, A. Ahadi

Re-understanding and Application of Quasi-Coarse-Grained Dynamics

D. Jiang, ***J. Shao**

Phase Transitions of Poly (vinylidene fluoride) under Coupled Electric Strain Field

***T. Liu**, H. Zhan, Y. Gu

Wed, 22/07/2026 09:45 - 11:15

ICM - 42 (Ostersee B+C)

MS074A - Modelling of the Degradation of Fuel Cell and Electrolyzer Materials I

Main Organizer: Prof. Thomas Lauer (Vienna University of Technology)

Chaired by: Prof. Thomas Lauer (Vienna University of Technology), Prof. Christoph Hametner (TU Wien)

Multi-dimensional Investigation of Performance Decay in Low-Temperature PEM Fuel Cells Under Real Driving Conditions

Keynote

C. Marra, ***A. d'Adamo**

Advanced 3D Modeling of Degradation Effects for PEM Fuel Cells

***C. Fink**, A. Diemath

Multi-Physics Modeling of Membrane Failure Mechanisms in Electrolytic Cells

***M. Hirschvogel**, J. Gerakis, E. Esche

CFD Analysis of Ageing-Relevant PEM Fuel Cell Flow Field Designs

***A. Diemath**, M. Reiter, R. Tatschl

Modelling of PEM Fuel Cell Degradation – From Accelerated Stress Tests to Real-Life Stress Conditions

***R. Keržíř**, L. Eisenberger, I. Prah

Wed, 22/07/2026 09:45 - 11:15

ICM - 43 (Eibsee)

MS142B - Modeling, Simulations, and Experiments to Study Ocular Fluid Mechanics, Biomechanics, and Drug Delivery II

Main Organizer: Dr. Lucia Carichino (Rochester Institute of technology)

Chaired by: Dr. Lucia Carichino (Rochester Institute of technology), Dr. Lorenzo Sala (INRAE)

A Multi-Timescale PK/PD Framework for Chronic Benzalkonium Chloride (BAK) Ocular-Surface Toxicity in Glaucoma Therapy

***S. Srinivas**, X. Zheng, M. Nishiyama, A. Ibrahim

Modeling and Design of Multi-layered Cylindrical Microcapsules for Intravitreal Drug Delivery

E. Chacin Ruiz, K. Swindle-Reilly, ***A. Ford Versypt**

Mathematical Models of Contact Lens Drug Delivery: Blinking and Lens Design

***R. Luke**, D. Anderson

Wed, 22/07/2026 09:45 - 11:15

ICM - 44 (Schliersee)

MS306A - Computational Approaches To Fatigue Crack Growth I

Main Organizer: Mr. Luigi Greco (University of Pavia)

Chaired by: Mr. Luigi Greco (University of Pavia), Dr. Lars Radtke (University of Rostock)

Effect of Cure-Induced Residual Stresses on the Fatigue Life of UV-Cured Scarf Patch Repairs

***A. Varshney**, N. Kuthe, P. Mahajan, L. Mishnaevsky Jr.

Assessment of the Finite Cell Method for Stress Concentration Problems

***S. Poepfel**, L. Radtke

Thermo-Mechanical Fatigue Life Assessment of IGBT Power Modules Using a Unified Creep Plasticity Damage Approach

***M. Ignatev**, L. Radtke, C. Benz, A. Novikov, R. Fink, P. Mutschler, T. Heise, H. Eckel

A Comparative Study to Fatigue Crack Growth Analysis: Insights from Numerical and Analytical Approaches

***C. Schreiber**, S. Keller, S. Dölling, H. Erdle

Wed, 22/07/2026 09:45 - 11:15

ICM - 31 (Zugspitze)

MS290A - Recent Advances in AI-powered and Large-scale Computational Mechanics for Digital Twins I

Main Organizer: Prof. Haeseong Cho (Jeonbuk National University)

Chaired by: Prof. Seung-Hoon Kang (Sejong University)

Failure load Prediction of Single and Multi-Bolted Composite Joints: Similar and Dissimilar Material Combinations

***H. Song**, J. Seo, K. Kim, H. Chun

Mechanics-Guided Training of Digital Twins via Simplified Finite Element Rim Simulations

***M. Stipsitz**, C. Gei, P. Priller

Unassembled Implicit-Explicit Framework for an Efficient Transient Analysis of a Multiply-Connected Structural Object

***M. Hwang**, S. Kang, S. Shin, K. Park

Wed, 22/07/2026 09:45 - 11:15

ICM - 32 (Watzmann)

MS172A - Advanced Modelling for Petro- and Bio-based Polymers and Composites I

Main Organizer: Dr. Fabrice Detrez (University Gustave Eiffel)

Chaired by: Dr. Sebastian Pfaller (Friedrich-Alexander-Universität Erlangen-Nürnberg)

Novel Mechanisms for Tunable Actuation in Shape Memory Polymers: Theoretical and Computational Aspects

Keynote

***G. Scalet**

A Thermodynamically Consistent Multiphysics Framework for Free-Radical Photopolymerization

***C. Bozdo?an**, H. van Brummelen, C. Verhoosel, L. Van Der Velden

Numerical modeling and nondimensional analysis of spherulitic morphology under isothermal crystallization of semi-crystalline polymers

***F. Detrez**

Environmental Aging Effects on the Thermoviscoelastic Response of Polyamide 6

***L. Kehrer**, V. Hirschberg, J. Keursten, T. Böhlke

Simulation of damage in a polymer blend for recycling of WEEE

***A. Navailles**, F. Detrez, M. Gervais, S. Roland

Wed, 22/07/2026 09:45 - 11:15

BrainLab - Auditorium

MS297D - Phase Field Modeling and Computation IV

Main Organizer: Dr. Marco ten Eikelder (TU Darmstadt)

Chaired by: Prof. Laura De Lorenzis (ETH Zurich)

Grain Size Impact on Energy Storage Properties of Polycrystalline Antiferroelectrics: A Phase-Field Study

***D. Durdiev**, B. Xu

Modeling and Simulation of the Two-Phase Lithiation of Amorphous Silicon

***X. Bruant**, A. Le, F. Ozanam, M. Rosso, L. Guin, M. Jabbour

Multi-Phase-Field Lattice Boltzmann Simulation Framework for Vane Rheometer Evaluation of Semi-Solid Materials

***N. Yamanaka**, T. Takaki

Bayesian Data Assimilation-Integrated Phase-Field Modeling of Widmanstätten Ferrite Formation

***T. Suzuki**, A. Yamanaka

Scale Bridging Creep: On the Usage of Phase-Field to Model the Carbide Growth in 30CrMoNiV5-11 Alloy During Heat Treatment

***R. Eloudhri**, G. Bryndza, H. Sepulveda, C. Rojas Ulloa, F. Chen, A. Habraken, L. Duchêne

Transport-Coupled Multiphase Phase-Field Modelling of Polycrystalline CVD Graphene Growth

***P. Goswami**, R. Singh, A. Alankar

Wed, 22/07/2026 09:45 - 11:15

NM - 1 (Multimedia Saal)

MS244C - Advanced Numerical Methods for Scale-Resolving Simulations III

Main Organizer: Prof. F.Xavier Trias (Technical University of Catalonia)

Chaired by: Prof. Roel Verstappen (University of Groningen), Dr. Alessandro Colombo (University of Bergamo)

The Influence of Supraconservative Discretization on Bifurcating Flow in a Driven Cavity

***A. Veldman**

Consistent energy-exchange discretizations for multiphysics flows

***F. Trias Miquel**, S. Šehovi?, A. Gorobets, A. Oliva

On the Evaluation of Spatial and Temporal Numerical Dissipation in Incompressible Flows

***S. Šehovi?**, J. Plana-Riu, F. Trias, A. Oliva

Revisiting the commonalities of FEEC, Finite Volumes, and Finite Differences

***A. Palha**

A Structure-Preserving Strategy for Kinetic Energy and Entropy in a Modal DG Framework

***E. Carnevali**, A. Crivellini, L. Alberti, A. Colombo

On the Combined Effect of Mesh Anisotropy and Scheme Accuracy in the Periodic Hills Case

J. Ruano, ***A. Oliva**, V. Sapozhnikov, A. Duben, F. Trias

Wed, 22/07/2026 09:45 - 11:15

NM - 2 (Salzburg)

STS422A - Advanced Numerical Methods for Simulation, Optimisation and Validation for Applications in Aeronautics and Industry I - Aviation Applications

Main Organizer: Dr. Dietrich Knoerzer (Aeronautics Consultant)

Chaired by: Dr. Dietrich Knoerzer (Aeronautics Consultant), Prof. Jacques Periaux (cimne)

Vortex Evolution on Hybrid-Delta-Wing Configurations at Transonic Flow Conditions

***Y. Özdemir**, C. Breitsamter

Initial Steps Towards a Multi-Fidelity Surrogate Model to Evaluate Occupant Safety in the Aeronautic Preliminary Design

***L. Marconi**, D. Kohlgrueber, M. Petsch

Development, calibration and validation of low fidelity full platform FE models of existing flying platforms

***J. Vroon**, M. Moghadasi, H. van Tongeren

Autonomous Airside Bus Operations: A Case Study at Cluj-Napoca International Airport

I. Oarg?, ***B. Varga**, H. C?r?u?an, G. Prunean, B. Gal, A. Bara, D. Moldovanu

Validation of Momentum-Source Strip-Gust Injection and Analysis of Gust-Induced Heave--Pitch Response of a Rigid Airfoil

***R. Wang**, L. Qiao, L. Li, J. Bai

Sound Insulation of Reconfigurable Intelligent Acoustic Metasurfaces in Complex Low-Altitude Noise Environments

***Z. He**

Wed, 22/07/2026 09:45 - 11:15

NM - 4 (Hamburg)

STS415A - Toward The New Materials Science Integrating with Computational and Deep Learning Technologies I

Main Organizer: Mr. Tohru Hirano (Daikin Industries, Ltd.)

Chaired by: Mr. Tohru Hirano (Daikin Industries, Ltd.), Dr. Susumu Minami (Kyoto University)

Modeling and Design of Micro- and Nanostructures: Focusing on Several New Materials Concepts and Machine Learning

***T. Hirano**

Online Learning-Accelerated 3D Monte Carlo Simulation for Gate-All-Around Transistors

***Y. Otsuki**, N. Mori

Development of a Model Bridging Finite Element Analysis and Infrared Stress Measurement for Spatial Defect Estimation in Complex-Shaped CFRP

***Y. Kojima**, J. Yvonnet, Y. Harada, M. Muramatsu, D. Okumura

First-principles Study of Strain Engineering for Anomalous Nernst Effect in Iron-based Binary Ferromagnets

***S. Minami**, S. Nishihara, S. Hogaki, T. Shimada

Analysis of Low-Energy Localized Phonon Mode in SiGe Alloys and its impact on Lattice Thermal Conductivity: A Molecular Dynamics Study

***T. Miyagi**, Y. Nishimura, D. Namiki, T. Watanabe, R. Yokogawa, A. Ogura

Design of Tensor Prediction Models Based on Deep Learning: 2D Case

***A. NACRO**

Wed, 22/07/2026 09:45 - 11:15

NM - 5 (KK)

MS214A - Recent Trends in Scientific Computing for Computational Fluid Dynamics and Solid Mechanics in the Exascale Range I

Main Organizer: Prof. Stefan Turek (TU Dortmund University)

Chaired by: Prof. Axel Klawonn (Universität zu Köln), Prof. Stefan Turek (TU Dortmund University)

Massively Parallel & Lower Precision Accelerator Hardware as Trends in HPC and its Application to CFD

Keynote

***S. Turek**

Prehandling and Related Hardware-Oriented Finite Element PDE Solvers Enabling Lower Precision and Tensor Core Computations

***D. Ruda**, S. Turek

Automation and Scaling of GPU-Accelerated Simulations of Steady-State Flows through Polymer Extrusion Dies

***M. Esser**

Temporal Parallelization of Multigrid Waveform Relaxation Smoothers in a Navier-Stokes Solver

***J. Dünnebacke**, S. Turek

A parallel-in-time Navier-Stokes solver using discretely divergence-free finite elements in 3D

***C. Lohmann**, S. Turek

Wed, 22/07/2026 09:45 - 11:15

NM - 3 (BB)

MS347A - Advanced iterative solvers and preconditioners for multi-physics problems I

Main Organizer: Dr. Prüger Stefan (Technische Universität Bergakademie Freiberg)

Chaired by: Dr. Mauro Perego (Sandia National Laboratories), Ms. Géraldine PICHOT (Inria)

A Monolithic Parallel FROSch Solver Framework for Chemo-Mechanical Problems

*A. Balachandran Jeeja, B. Kiefer, S. Prüger, O. Rheinbach, F. Röver

A parallel FFT-based iterative solver for non-periodic boundary conditions: application to thermo-mechanical problems

*Y. AMOUZOU-ADOUN, L. GÉLÉBART, C. FLAGEUL, Y. WANG

A Semi-Algebraic Polynomial Multi-Grid Preconditioner Approach For Multi-Field Regularized Fracture Models With Higher-Order Finite Elements

*N. Alkmim, P. Gamnitzer, M. Neuner, G. Hofstetter

Wed, 22/07/2026 09:45 - 11:15

H4 - 1 (Ludwig)

MS041B - Advances and Applications in Meshfree, Particle, and Peridynamic Methods II

Main Organizer: Prof. Jiun-Shyan Chen (University of California, San Diego)

Chaired by: Prof. Zhen Chen (University of Missouri), Dr. Pablo Seleson (Oak Ridge National Laboratory)

Consistency Issues and Their Resolution in Material Point Methods [Keynote](#)

*D. Zhang, K. Perez, J. Waters, P. Barlcay

Explicit material point method for fracture analysis of nearly incompressible materials involving large deformation

*S. Zhang, W. Yang, W. Sun, Y. Qiu, Y. Zheng

Extended B-spline-based Mixed Implicit Material Point Method in Solid Dynamics

*R. Sugai, K. Terada

Dynamic topology optimization of hyperelastic materials based on an adaptive total Lagrangian material point method

*W. Yang, S. Zhang, W. Sun, Y. Qiu, Y. Zheng

On Various Formulations of the Meshless Finite Difference Method

*I. Jaworska

Wed, 22/07/2026 09:45 - 11:15

H4 - 2 (Leopold)

MS004C - Data-Driven innovations and machine learning In aerodynamic analysis, optimization and uncertainty quantification III

Main Organizer: Dr. Esther Andrés Pérez (INTA)

Chaired by: Dr. Domenico Quagliarella (CIRA), Dr. Esther Andrés Pérez (INTA)

Multi-fidelity and Multi-condition airfoil shape optimisation

*I. Robledo Martín, A. Vilariño, A. Miró, O. Lehmkuhl, C. Sanmiguel Vila, R. Castellanos

Comparison of Machine Learning Algorithms for the Approximation of Constraint Surface Fields About a Realistic Aircraft Configuration

*J. PETER, S. HEIB, Q. BENNEHARD, J. HANTRAIS-GERVOIS

Parametric Turbomachinery Blade Optimization via Proper Orthogonal Decomposition

*C. Belpietro, A. Ghidoni, G. Noventa, D. Pasquale, M. Ronzoni

SVM Surrogate Model for Aerodynamic Prediction of the NASA/Boeing Common Research Model Wing-Body-Pylon-Nacelle Configuration

*A. Carrillo Padrón, E. Andrés Perez, J. Pérez Aracil

Differentiable sensor placement optimisation for aerodynamic wing pressure field reconstruction

*J. Alfaro Moreno, R. Castellanos García de Blas, C. Sanmiguel Vila

Wed, 22/07/2026 09:45 - 11:15

H4 - 3 (Franz)

MS227B - Modeling and Simulation of Additive Manufacturing: Part-Scale Approaches II

Main Organizer: Prof. Christoph Meier (Technical University of Munich)

Chaired by: Prof. Christoph Meier (Technical University of Munich), Prof. Stefan Kollmannsberger (Bauhaus-Universität Weimar)

A Phase-Transformation Based Thermo-Mechanical Finite-Element Framework for Part-Scale Laser Powder Bed Fusion Simulations

*I. Noll, J. Remmers, A. Menzel

Calibration and Validation of an Inherent Strain Method for Predicting Distortion in Thin-Wall Metal Additive Manufactured Parts

*B. Phung, C. Herriott, A. Wilson-Heid, K. Karlson, C. Crandall, M. Stender

A multi-grain thermo-mechanical framework for part-scale modeling of laser powder bed fusion

*Y. Zhang, T. Vo, M. Bellet, C. Gandin

Homogenising Material Properties in Laser Powder Bed Fusion: Validation of a Model-Based Variable Parameter Generation Method

*T. Koenis, A. Wiegink, M. Montero-Sistiaga, M. De Smit

Thermal Part-Scale Modeling for Process Stability in Electron Beam Powder Bed Fusion

*D. Leidel, J. Böhm, T. Kupfer, M. Markl, C. Körner

Wed, 22/07/2026 09:45 - 11:15

H4 - 4 (Alois)

MS125C - Reliability Analysis and Rare Event Simulation III

Main Organizer: Dr. Iason Papaioannou (Technical University of Munich)

Chaired by: Prof. Elisabeth Ullmann (Technical University of Munich), Dr. Iason Papaioannou (Technical University of Munich)

Deep Polynomial Chaos Expansion

J. Exenberger, ***S. Ranftl**, R. Peharz

Niching Importance Sampling

***A. Diaz**

Time-Dependent Reliability of Well Tubulars with Bayesian Updating of Corrosion from Inspection Logs

J. Nunes, L. Almeida, E. Lima Junior, ***L. Gouveia**, A. Abrego, C. Cisneiros, D. Colombo

Theoretical Understanding of the Generalization of Neural Oscillators

***Z. Huang**, M. Beer

Reliability based design optimization under multiaxial fatigue constraints using frequency domain approach

N. LYAGOUBI, ***Y. AOUES**, L. KHALIJ

Wed, 22/07/2026 09:45 - 11:15

H4 - 5 (Xaver)

MS126A - Bifurcations, Branches, and Beyond: Modern Continuation Techniques in Computational Mechanics I

Main Organizer: Dr. Loic Salles (University of Liege)

Chaired by: Dr. Adrien Mélot (Inria), Dr. Loic Salles (University of Liege)

Harmonic Balance with Subsequent Stability Analysis: Combatting Aliasing

Keynote

***F. Bayer**, R. Leine

Computing NNMs and Forced Response of Strain-Objective Local SE(3) Lie Group Beams Using the Harmonic Balance Method

***S. Amornchat**, Z. Zhang, A. Bagheri, L. Renson

Weighted-residual based arclength continuation method

***V. MAHE**, M. Legrand

Parallelizing Continuation of Nonlinear Solution Curves

***J. Gross**, M. Pitzal, M. Krack

Parallel Harmonic Balance for Nonlinear Frequency Response and Modal Analysis in Multiphysics Systems

V. Renkin, A. Halbach, ***L. Salles**

Wed, 22/07/2026 09:45 - 11:15

H4 - 6 (Sissi)

MS057A - Modeling of Glaciers and Ice Sheets I

Main Organizer: Dr. Anjali Sandip (University of North Dakota)

Chaired by: Dr. Anjali Sandip (University of North Dakota), Dr. Irina Tezaur (Sandia National Laboratories)

Phase-field fracture modeling of crevasse propagation, lake drainage events, and cliff collapse in glaciers

Keynote

***R. Duddu**, A. Gupta, T. Hageman, E. Martinez-Paneda

3D Hydro-fractures in floating ice-shelves subject to limited meltwater inflows

***T. Hageman**

Quantifying Rift Propagation in Antarctic Ice Shelves Using the C* Integral

***B. Lipovsky**, D. Shapero, C. Walker

Logarithmic Strain-Rate-Based Finite-Strain Hyper-Viscoelastic Framework for Antarctic Ice Shelves

***M. Nutte**, S. Skatulla, C. Sansour

Building a finite volume code similar to BISICLES based on the numerical computation library JAX

***T. Surawy-Stepney**, S. Cornford

Wed, 22/07/2026 09:45 - 11:15

H4 - 7 (Maximilian)

MS068A - Advanced Numerical Methods for Multiphysics and Multiscale Couplings I

Main Organizer: Dr. Isabelle RAMIERE (CEA Cadarache)

Chaired by: Dr. Isabelle RAMIERE (CEA Cadarache)

Dimensional analysis of multiphysics algebra

***C. Nahed**, P. Omnes

Overcoming Divergence of Fixed-point Iterations with Advanced Vector Acceleration Techniques

***I. RAMIERE**

High-order Adaptive Multistep Coupling Scheme for Multiphysics Applications

***A. Simon**, L. François, M. Massot

An a Priori Error Analysis of a Thermoelastic Problem with History Dependence on the Mechanical and Thermal Components

***N. Bazarra**, J. Fernández, R. Quintanilla

Partitioned thermoelastic coupling based on effective conductivity dependent on displacement: application in an HPC framework

***P. Dubois**, I. Ramière, R. Prat, H. Barucq, S. Gounand

Wed, 22/07/2026 09:45 - 11:15

H4 - 8 (Eventcenter)

MS110G - Computational Models for Cancer Research and Oncology VII

Main Organizer: Dr. Guillermo Lorenzo (University of A Coruña)

Chaired by: Dr. Guillermo Lorenzo (University of A Coruña)

Stress-modulated surface accretion in solid tumors

***F. Magni**, G. Noselli, D. Riccobelli

A Mathematical and Computational Model for Self-organised Collective Invasion of Breast Cancer Organoids

***P. Blanco**, G. Cicconofri, G. Vilanova, P. Saez, M. Arroyo

Discrete-Continuous Modelling and Data-Driven Calibration of In Vitro Cancer Spheroid Growth

***E. Braun**, G. Bretti, M. Menci, M. Semplice, S. Preda

Levy-Driven Single Cell Omics Regulatory Dynamics (Levy-scORD) Model

***S. Hiremath**, M. Hess

Pancreatic Cancer Dynamics and Therapy using the BioDynaMo Platform

***S. Portokalidis**, E. Wulff, M. Girone, R. Bauer, V. Vavourakis

Hybrid Agent-Based and Continuum Modelling of In Vitro Cancer Microenvironments

A. Iosif, R. Ferraro, S. Caserta, ***V. Vavourakis**

Wed, 22/07/2026 09:45 - 11:15

BrainLab - Training

MS266A - Recent Advances in Computational Fracture Mechanics and Failure Analysis I

Main Organizer: Prof. Yoshitaka Wada (Kindai University)

Chaired by: Prof. Hiroshi Okada (Tokyo University of Science)

S-IGA with Consistent Jacobian-Based Formulation for Finite Strain Elastoplasticity

***Y. Tsuchiyama**, H. Okada

Crack Propagation Criteria Based on Cumulative Equivalent Plastic Strain for Extremely Low Cycle Fatigue

***S. Kamei**, Y. Wada

A gradient-aggregated energy variational XFEM for multi-fracture growth in layered heterogeneous media

***Y. Zhong**

Using Recurrent Neural Networks to Enhance Edge Damage Initiation Accuracy of Shell Element Forming Simulations

***R. Perot**, D. Mohr

Improving S-IGA Analysis for Fracture Mechanics Analysis (Generation of Local IGA Model in Natural Coordinates of Global Model and Use of Singular Patch Method)

***S. Oishi**, H. Okada

Prediction of Delamination at a Jointed 3D corner under Thermal Cyclic Loading using 3D corner SIFs

***T. Ikeda**, D. Muramatsu, S. Tanaka, M. Koganemaru

Wed, 22/07/2026 09:45 - 11:15

NM - 6 (Munich)

MS377A - Analytical Models for Nonlinear Analysis in Engineering Sciences I

Main Organizer: Dr. Ricardo Tomás Ferreyra (Universidad Nacional de Córdoba)

Chaired by: Prof. Damien Violeau (EDF), Dr. Alexander Prokopenya (Warsaw University of Life Sciences)

Modeling non-linear, weakly dispersive water waves: beyond the Serre-Green-Naghdi equations

***D. Violeau**

Breather solutions of a quadratic nonlinear beam equation

***Y. Cho**

Material heat transfer properties estimation under fluctuating heat source with thermal camera

***K. Lertdumronglak**, S. Makita, S. Zhu

Wed, 22/07/2026 09:45 - 11:15

NM - 7 (Venice)

MS081E - Computational Methods for Inverse Problems V

Main Organizer: Prof. Dan Givoli (Technion - Israel Institute of Technology)

Chaired by: Prof. Haim Waisman (Columbia University), Prof. Dan Givoli (Technion - Israel Institute of Technology)

Compute the Mode; Get the Variance Free

D. Gendin, ***P. Barbone**

Bayesian Calibration of a Concrete Model for the Interface Transition Zone via PDMP Sampling

***L. Riccius**, I. Rocha, E. Schlangen, F. van der Meer

Efficient Bayesian Inference for Large-Scale Inverse Problems Using Reduced-Order Models

***M. Shahzaib**, P. Diez, S. Zlotnik, A. muixi, M. amaya

Estimation of Material Model Parameter using Bayesian Data Assimilation and Biaxial Tensile Test

***S. Shimaoka**, A. Yamanaka

Subsurface Imaging using Full Waveform Inversion with Gibbs Sampling

***H. Nguyen Van**, A. Nguyen Mau Nhat, P. Truong My, J. Lee

Identification of Thermal Characteristics of Building Walls using Bayesian Inverse Methods, Multi-Fidelity Physical Models and Time-Series Sensor Data

***J. Waeytens**, H. Nasser, G. Perrin, R. Chakir, S. Demeyer

Wed, 22/07/2026 11:15 - 11:30

Short Break

Wed, 22/07/2026 11:30 - 13:00

ICM - 1 Auditorium

MS283B - Recent Progress in Topology Optimization and Its Applications II

Main Organizer: Prof. Junji Kato (Nagoya University)

Chaired by: Prof. Liang Xia (Huazhong University of Science and Technology), Prof. Kurt Maute (University of Colorado Boulder)

Recent advances in one-shot multigrid preconditioning in topology optimization

***O. Amir**

Free Orthotropic Material Optimization Problems and their Realization by Microstructures

***M. S.**, M. Tyburec

Design Optimization of Thin-Walled Structures with Buckling Constraint

***B. Niu**, B. Zou

Topology Optimization of Subtractive-Additive Designs by Two Phase Minimum Length Scale Control

***J. Rieser**, M. Zimmermann

A Robust Multiscale Topology Optimization for Fracture Resistance Based on Phase Field Method and Interval Model

***W. Zhao**, J. Fan

Improvements for Crashworthiness Optimization Formulation and Application in Liquid Hydrogen Aircraft

***L. Scherz**, B. Kriegesmann

Wed, 22/07/2026 11:30 - 13:00

ICM – 2

MS268E - Numerical Modeling of Granular and Multiphase Flows V

Main Organizer: Prof. Mikio Sakai (The University of Tokyo)

Chaired by: Prof. Kazuya SHIBATA (The University of Tokyo), Dr. Matthias Meinke (RWTH Aachen University)

Simulation of Ceramic Granule Compaction Using the MPH Method

***M. Wakutani**, K. Shibata, K. Matsumoto, M. Kondo, J. Matsumoto, N. Kondo, N. Miyakawa, K. Takanami, S. Baba

Numerical Modeling of Shape-Driven Hydrodynamics in Two-Phase Flows with Generalized Cross-Section Particles

***W. Zhang**, X. Wang

Turbulent hotspots in channel flows

Y. Lee, Y. Nam, ***S. Lee**

Development and Validation of a Gap Model Accounting for Gas Backflow and Turbulence Modeling with Improved Wall Treatment for Particle-Based Analysis of Liquid Ring Pumps

***Z. Yang**, K. Shibata, T. Takanashi, N. Yasuda

Morphology-Adaptive Euler–Euler Modeling of Bubbly Multiphase Flows

***B. Krull**, E. Tagliabue, R. Meller, R. Lehnigk, M. Tekavc, N. Varallo, G. Besagni, F. Schlegel

MS162C - Computational Modelling and Optimization of Metamaterials and Phononic Structures III**Main Organizer:** Prof. Juan Carlos Cante (CIMNE / UPC)**Chaired by:** Dr. Sergio Gonzalez Horcas (Universitat Politècnica de Catalunya), Prof. Juan Carlos Cante (CIMNE / UPC)

Phononic lattice design with non-local interactions for coupling optimization

***L. Rouhi**, C. Droz

Preliminary investigation of metamaterials for aeroelastic instability mitigation in wind energy

***S. Horcas**, J. Cante, D. Roca, E. Ortega

Inverse Design of Phononic Sandwich Composites Using a 3D Spectral Element Model and Physics-Aware Surrogates

***A. Abi**, S. Soltanabadi Farshi, S. Lotfan, B. Bediz

Bragg Rainbow Reflection in Functionally Graded TPMS Metamaterial Plates

***L. Lomazzi**, N. Patino, A. Manes

Iga-Based Computational Homogenization for Transient Analysis of Locally Resonant Metamaterials

***A. Kuloglu**, M. Geers, V. Kouznetsova

Inverse-designed Disordered Nonlinear Metamaterial Chains for Robust Impact Mitigation

C. Tamur**, M. Brandy, N. Boechler, H. Kim**MS136A - Rethinking AI: Energy Efficiency and the Future of Computation I*Main Organizer:** Dr. Massimiliano Datres (Ludwig Maximilian University Munich)**Chaired by:** Dr. Massimiliano Datres (Ludwig Maximilian University Munich)

Reliable and Sustainable AI: from Mathematical Foundations to Next Generation AI Computing

***G. Kutyniok**, M. Datres

Physical analogy computing

***L. Wetzel**, S. Rezwan, S. Roy, D. Thürk, C. Jung, B. Ulmann, J. Cabrera, F. Fitzek

An algorithm for the hardware adaptation of machine learning models

***M. Spallanzani**

SNN-Based Indoor Localization with 5G signal and Neuromorphic Hardware

***Y. Li**

Industrial applications of neuromorphic computing in a research transfer context

***A. von Arnim**, M. Neumeier, P. Kannan

Investigation and Optimization of Multi-Objective Reinforcement Learning Algorithms for Resource Management in Smart Buildings

S. Aibagarov**, A. Mukhanbet, N. Izmailov, T. Imankulov**MS117C - Scalable Computational Methods For Industrial Digital Twins III*Main Organizer:** Dr. Diana Manvelyan (Siemens AG)**Chaired by:** Dr. Catharina Czech (Siemens AG)

Model Order Reduction for Efficient Gas Dispersion Simulations in Digital Twins

***L. Kühn**, J. Bonari, R. Becker, M. von Danwitz, A. Popp

Gradient-Enhanced Surrogate Modeling for Industrial Digital Twins

***P. Horvath**, M. Staggli, S. Posch

Physics-based digital twins for viscoelastic materials

***G. Budihala**

Sequential Joint Angle Calculation of Robotic Manipulator using Basic Jacobian Matrix in Virtual Motion Tracking

T. Kogo, ***S. Makita**

Wed, 22/07/2026 11:30 - 13:00

ICM - 5

MS018D - Immersed Boundary Variational Methods: Theory, Data Structures, and Applications IV

Main Organizer: Prof. Alexander Düster (Hamburg University of Technology)

Chaired by: Prof. Guglielmo Scovazzi (Duke University)

Image-Based Analysis of Microstructured Materials with Interfaces and Crack Propagation Using the Finite Cell Method

***A. Düster**, M. Gorji

Structural Analysis of Vertebral Microstructure Using the Finite Cell Method

***J. Hoffmann**, A. Düster

Third Medium Contact in the Finite Cell Method

***R. Sartori**, A. Düster

Efficient quadrature on immersed voxel geometries

***M. Christmann**, P. Kopp, S. Kollmannsberger

On the Modeling Error of the Finite Cell Method

***T. Burchner**, E. Rank

DFCM: A Discontinuous Finite Cell Method for Complex Domains

***J. Parvizian**, N. Niknejadi, E. Rank, A. Düster, S. Kollmannsberger

Wed, 22/07/2026 11:30 - 13:00

ICM - 11a

MS300A - Bayesian Analysis and Model Calibration I

Main Organizer: Dr. Lea Friedli (Technical University of Munich)

Chaired by: Dr. Iason Papaioannou (Technical University of Munich), Dr. Xinyu Jia (Technical University of Munich)

Bayesian calibration of dynamic nonlinear systems under partially observed controls

***G. Perrin**, R. Jorge Do Marco, C. Funtschilling, C. Soize

Calibration of Wideband Frequency-Domain Data using Bayesian Model Calibration

***P. Gsoels**, M. Flicker, J. Hansen

Bayesian Calibration and Validation of Displacement Damage Models

***K. Maupin**, L. Musson, J. Ray, K. Nguyen, X. Gao

Robust Calibration of an Air–Carbon Ablation Model Employing Plasmatron and Molecular Beam Data

***V. Piro**, M. Capriati, F. Bariselli, J. El Rassi, B. Helber, P. Congedo, T. Magin

Wed, 22/07/2026 11:30 - 13:00

ICM - 11b

MS337C - Modelling and Simulations of Structural Responses Under Extreme Conditions III

Main Organizer: Prof. Dongdong Wang (Xiamen University)

Chaired by: Dr. Jun FUJIWARA (National Research Institute for Earth Science and Disaster Resilience)

Numerical Investigation of Water Overflow of a Rectangular Pool atop a Building Under Earthquake Excitations

***A. Yamamuro**, S. Lee, T. Itoi, T. Koyama

The thermo-mechanical coupling simulation of ECC and concrete damage under high-temperature loading based on peridynamics

***Z. Cheng**

A Coupled Thermo–Hydrogen–Mechanical Peridynamic Model for Hydrogen Embrittlement in Metals

***X. Chen**, X. Gu, X. Xia, Q. Zhang

Wed, 22/07/2026 11:30 - 13:00

ICM - 12a

MS324A - Engineering and Mathematics for Environmental Care and Sustainability I

Main Organizer: Prof. Simona Perotto (Politecnico di Milano)

Chaired by: Prof. Simona Perotto (Politecnico di Milano), Dr. Marianna Cerasuolo (University of Sussex)

Adapted Numerical Methods for Reaction-Diffusion PDEs in Sustainability Keynote

***D. Conte**, J. Montijano, G. Pagano, B. Paternoster, L. Randez

Efficient Numerical Methods for Multidimensional Parabolic PDEs

D. Conte, S. González-Pinto, D. Hernández-Abreu, ***S. Iscaro**, G. Pagano

Stochastic Numerics for Sustainability

***R. D'Ambrosio**

Nonlinear wave interactions in Rotating Shallow Water Equations on the Sphere: Theory and Implications

M. Dourado, B. Raphaldini, A. Teruya, ***P. Peixoto**

MS224A - Machine Learning Frontiers in Multiscale and Materials Modeling I**Main Organizer:** Prof. Chuin-Shan (David) CHEN (National Taiwan University)**Chaired by:** Prof. Chuin-Shan (David) CHEN (National Taiwan University), Prof. Seunghwa Ryu (KAIST)

Closing the Reality Gap: Evolving Deep Material Networks into Robust, Multi-Physics Materials Digital Twins

***R. Dingreville**, D. Shin, A. Robertson, N. Francis, A. Lenau, R. Lebensohn

Does Iterated Lamination Cure a Degenerate Core?

***J. Lendvai**, M. Schneider

Rotation-Free Parametric Deep Material Network for Efficient Multiscale Simulation of Fiber-Reinforced Composite Structures

***T. Li**, H. Ji

Recent Progress in AI-enabled Material Multiscale Modeling within LS-DYNA Framework

***T. Su**, H. Wei, C. Wu

Machine-Learned Adaptive Multiscale Coupling for Efficient Simulation of Membrane Fabrication

***M. Busch**, G. Häfner, J. Xi, M. Tacke, M. Müller, C. Cyron, R. Aydin

Transformers versus Recurrent Neural Networks for Path-Dependent Composites

P. Uvdal**, M. Mirkhalaf**MS090C - Machine Learning For Computational Mechanics Across Scales III*Main Organizer:** Prof. Fadi Aldakheel (Leibniz Universität Hannover)**Chaired by:** Prof. Miguel Bessa (Brown University), Prof. Fadi Aldakheel (Leibniz Universität Hannover)

Physics-Informed Neural Networks for Computational (Contact) Mechanics: From Collocation to Energy-Based and Variational Formulations

***D. Wolff**, S. Völkl, T. Sahin, A. Popp

Physics based machine learning framework for cyclic damage evolution and fatigue lifetime-scale homogenization

***E. Elsayed**, A. Baktheer, F. Aldakheel

Predicting the Thermo-Mechanical Behavior of Periodic Microstructures Through Spectral-Based Physics-Informed Finite Operator Learning (SPiFOL)

***C. Gierden**, A. Harandi, S. Rezaei, J. Waimann

Embedding a Physics-Constrained ML Constitutive Model Into the Finite Element Framework via an Abaqus UMAT

***Y. He**, Y. Heider

Finite Element-Guided Physics-Informed Operator Learning for Multiphysics Problems

***Y. Yamazaki**, R. Asl, M. Apel, M. Muramatsu, S. Rezaei

SPLIT-PINN: Separable Probability Learning Technique via Physics-Informed Neural Networks for High-Dimensional Probabilistic Modeling

W. Pan*MS426D - Data-driven Approaches in Mechanics IV****Main Organizer:** Prof. Kostas Karapiperis (EPFL)**Chaired by:** Dr. Qizhi He (University of Minnesota), Prof. Cristian Gebhardt (University of Bergen)

What a Digital Twin Can Learn from Data, Thermodynamics, and Action Principles for Damage Assessment in Complex Materials

Keynote***J. Chen**, Y. Wang, S. Casebolt

Architecture Optimization to Stabilize and Accelerate Latent Neural Solvers for Mesoscale Materials Modeling

***A. Robertson**, A. Lenau, V. Oommen, J. Shimanek, R. Dingreville

Probabilistic Diffusion-based Surrogate Model Representing Large Elasto-Plastic Deformation of Shell Structures

***J. Heidenreich**, P. Meyer, D. Mohr

Learning based multi-scale modeling with recurrent neural operator

***B. Liu**

Geometry-Enriched Token Representations for Scalable Neural Surrogates in Computational Mechanics

***B. Alves Ribeiro**, G. Broggi, J. Alves Ribeiro, M. A. Bessa

Wed, 22/07/2026 11:30 - 13:00

ICM - 14a

MS216E - High-Fidelity and Surrogate Modeling for Advanced Manufacturing Processes V

Main Organizer: Dr. Mamzi Afrasiabi (ETH Zurich)

Chaired by: Dr. Mohamad Bayat (Technical University of Denmark - DTU), Dr. Mamzi Afrasiabi (ETH Zurich)

Physics-Informed Hybrid Modeling of Aluminum Resistance Spot Welding Using Transformer-Based State Extraction

*C. Weißenfels, J. Zak

From compression to coating: FEM and DEM simulations for continuous tablet manufacturing

*L. Naranjo Gomez

Hybrid Modeling for Materials Processing by Combining Physics-Based and Data-Driven Models

*F. Bock, P. Campos, A. Hashemzadeh, Z. Kallien, A. Elbossily, A. Cometa, C. Soyarslan, T. van den Boogaard, B. Klusemann

Wed, 22/07/2026 11:30 - 13:00

ICM - 14b

MS026E - Contact and Interface Mechanics: Modeling and Computation V

Main Organizer: Prof. Michel Raous (Laboratoire de Mécanique et d'Acoustique - CNRS - France)

Chaired by: Dr. Michael Puso (Lawrence Livermore Nat'l Lab)

The Shifted Boundary Method for Contact Problems **Keynote**

K. Li, A. Gorgi, R. Rossi, *G. Scovazzi

Unfitted Contact Mechanics in Isogeometric Analysis via the Shifted Boundary Method

*A. Gorgi, K. Li, N. Antonelli, A. Cornejo, R. Rossi, G. Scovazzi

Numerical Assessment of Reduced-precision Storage of Prony History Variables in Finite-strain Viscoelasticity

*H. Yang, G. Marchi, P. Zulian

Machine-Learning Dynamic Friction Models

G. Cortes, M. Salz, *J. Garcia Suarez

Finite Element Analysis of Liquid Droplet Stamp Contact Mechanics for Thin-Film Integration

*C. Shi, J. Yu

Wed, 22/07/2026 11:30 - 13:00

ICM - 14c

MS083A - Multiscale Computational Homogenization for bridging scales in the mechanics and physics of complex materials I

Main Organizer: Prof. Julien Yvonnet (Universite Gustave Eiffel)

Chaired by: Prof. Julien Yvonnet (Universite Gustave Eiffel)

Introducing PINNs in multi-scale computational homogenization with microstructures and unilateral contact **Keynote**

*G. Drosopoulos, A. Muratidou, G. Stavroulakis

Physics-informed Machine Learning and Higher-order Multi-scale Modelling of Advanced Materials in Large Structures

*A. Hii, Z. Conti, A. Pirrera, S. Hallett, O. Thomsen, B. El Said

Accuracy and Intrinsic Limitations of Spectral-Based Reduced-Order Clustering Models for Nonlinear Crystal Plasticity

*S. Torres Olivares, R. Peerlings, M. Geers

An adaptive pPROM method and its application in computational homogenization

*S. Wulfinghoff, J. Hauck, H. Goldbeck, A. Aliyeva

Data-Driven Plastic Return-Mapping based on homogenization using FFT and FE2

*A. Daneshyar, L. herrmann, S. Kollmannsberger

Wed, 22/07/2026 11:30 - 13:00

ICM - B11

MS132D - Machine Learning and AI in Constitutive Modeling of Complex Materials IV

Main Organizer: Dr. Francisco Sahli Costabal (Pontificia Universidad Católica de Chile)

Chaired by: Prof. WaiChing Sun (Columbia University), Prof. Jan Fuhg (The University of Texas at Austin)

Data-Driven Modelling of Path-Dependent Materials for Compiling in Full-Scale Earthquake Engineering Simulations

*A. Younesian, S. Alam

Hypre-Homogenization Via Hypernetworks

*B. Alheit, X. Xu, S. Kumar, M. Peirlinck

AI-Driven Surrogate Modeling for Composites: Industrial Integration and a Practical Path to Affordable FE² and FE-FFT

S. Derebail Muralidhar, *G. Lemoine

Physics-Augmented Neural Modeling of Multiscale Frictional Contact

*J. Fuhg, S. Kumar

Hybrid Data-Driven Constitutive Modeling Framework for Shape Memory Alloys

*H. Tian, D. Lagoudas

MS093B - Novel Coupling Techniques to Enable Efficient and Robust Simulation of Digital Twins II**Main Organizer:** Dr. Paul Kuberry (Sandia National Laboratories)**Chaired by:** Dr. Irina Tezaur (Sandia National Laboratories), Prof. Hyesuk Lee (Clemson University)

Efficient Partition-of-Unity Radial-Basis-Function Interpolation for Coupled Problems

D. Schneider, ***B. Uekermann**

AI-Accelerated Numerical Solver: Time-Marching Point-Neural Operator–FE Coupling

***W. Wang**, S. Goswami

Partitioned Coupling Strategies in Earth System Modelling and Multiphysics

***B. Rodenberg**

Non-intrusive, variationally-consistent Hamiltonian model reduction with optimal projection operators

***F. Cutolo**, A. Gruber, I. Tezaur, A. Padovan

Randomized Local Model Order Reduction Methods for Heterogeneous Nonlinear Partial Differential Equations

C. Beall, ***K. Smetana****MS242C - Computational Methods in Battery Research and Engineering III****Main Organizer:** Dr. Christoph Schmidt (Technical University of Munich)**Chaired by:** Dr. Timo Danner (German Aerospace Center (DLR)), Dr. Christoph Schmidt (Technical University of Munich)

Simulation of Li-Ion Pouch Cell Venting During Thermal Runaway

L. Cortes Magalhaes, D. Di Modica, ***B. Schaufelberger**, T. Kisters, S. Berk Kartop, A. van Megern

Electrolyte Motion Induced Salt Inhomogeneity and Its Role in Li-Ion Battery Degradation – Insights from Three Dimensional, Poromechanical, Electrochemical Coupled Simulation

***M. Zielonka**

Numerically Stable Finite Element Modeling of Thermal Runaway and Venting in Lithium-Ion Batteries

***F. Lacombe**, K. Yu, F. Ilinca

Simulation of Li-Ion Pouch Cell Venting during Thermal Runaway

***L. Cortes Magalhaes**, D. Di Modica, B. Schaufelberger, T. Kisters, S. Barkop, A. an Megern

Simulating Realistic and Application Specific Battery Operation: Virtual testing for Battery Electric Vehicle Development

***F. Schneider**, J. Lammel, J. Zausch, C. Wu, K. Schmidt, M. Burger

Remaining Useful Life Prediction of Lithium-Ion Batteries Using Artificial intelligence

***J. Hur**, C. Park, C. Kim

Bridging Density Functional Theory and Finite Element Modelling for Corrosion Prediction in Al-Fe-Zn Alloys

S. Piccardo**, M. Morgan, E. De Freitas Martins, P. Ordejón, I. Cole**MS091B - The Lattice Boltzmann method as a general-purpose tool in Computational Mechanics II*Main Organizer:** Prof. Ignacio Romero Olleros (Universidad Politecnica de Madrid)**Chaired by:** Prof. Ferdinando Auricchio (Universita' di Pavia), Prof. Ignacio Romero Olleros (Universidad Politecnica de Madrid)

A Lattice Boltzmann Method for Elastodynamics with Extensions to Nonlinear Solids and Applications in Fracture Mechanics

***H. Müller**, R. Müller

Unification of the lattice Boltzmann method and finite volume method

***J. Lu**, S. Zhao, P. Boivin

Traction-Consistent Wall Boundary Formulation for Turbulent Lattice–Boltzmann Simulations

***I. Tsetoglou**, J. Lu, W. Bessem, H. Merley, S. Zhao, E. Serre, P. Boivin

A total energy formulation for lattice boltzmann method with overset grids

***A. Koubemba**, S. Zhao, P. Boivin, J. Favier

Lattice Boltzmann Method (LBM) for the Simulation of Large-Scale H2 Industrial Burners

***U. Chikkabikkodu Krishna Murthy**, I. Tsetoglou, S. Zhao, J. Consalvi, P. Boivin

Wed, 22/07/2026 11:30 - 13:00

ICM - B22

MS155B - Space-Time Finite Element Discretizations and Implicit High-Order Time Integration: Efficient Algorithms and Scalable Solvers II

Main Organizer: Dr. Nils Margenberg (Otto von Guericke University Magdeburg)

Chaired by: Dr. Peter Munch (Technical University of Berlin)

On the unmapped tent pitching for the heterogeneous wave equation

***I. Mazziari**, M. Bonazzoli, G. Ciaramella

Enforcing conservation laws numerically via auxiliary variables and space-time finite elements

***B. Andrews**, P. Farrell

Coupling LibPFASST and AMReX: a Space-Time2 Parallel Framework

***F. Bense**

Parallel-in-Time Preconditioning for Time-Dependent Variational Mean Field Games

***H. Ljosheim**, D. Kalise, J. Pearson, F. Silva

High-order space-time topology optimization for transient heat conduction

***S. Nataj**, M. Appel, J. Alexandersen

Wed, 22/07/2026 11:30 - 13:00

ICM - 21a

MS130A - Advances in discretization techniques, element technology, mesh adaptivity, and solution strategies for inelasticity, contact, localization, and failure I

Main Organizer: Dr. James Foulk III (Sandia National Laboratories)

Chaired by: Dr. Alejandro Mota (Sandia National Laboratories), Dr. James Foulk III (Sandia National Laboratories)

Multifield Finite Strain Thermoplasticity: Theory And Numerics **Keynote**

***A. McBride**, R. Williams, L. Kaczmarczyk, P. Steinmann, C. Pearce

Multifield Thermoplasticity and its Application to Linear Friction Welding

***R. Williams**, C. Runcie, A. Shvarts, C. Pretty, A. McBride, L. Kaczmarczyk

A Mixed Finite Element Approach for Large-Deformation Inelasticity with Reduced Remeshing-Induced Internal Variable Diffusion

***N. Rossi**, I. Romero

Finite Element Simulation of Metal Spinning: Influence of Rotational Speed on Stress, Forming Forces, and Product Quality.

***S. Farooq**, J. Albinmousa, F. Al-Badour

Wed, 22/07/2026 11:30 - 13:00

ICM - 21b

MS196A - Deployable, Adaptive and Intelligent Structures in Engineering and Soft Robotics I

Main Organizer: Dr. Malte von Scheven (University of Stuttgart)

Chaired by: Dr. Renate Sachse (Max Planck Institute for Intelligent Systems), Prof. Ann Sychterz (University of Illinois Urbana-Champaign)

Buckled Elastic Strips Structures: Converging Mechanical Intelligence, Resilience, and Lightweight Design

***G. Maquignaz**, L. Girardi, S. Mintchev

An Inflatable Soft Clutch Based on Bistable Mechanical Metamaterials

***H. De Souza Oliveira**, E. Milana

Sensorless Position Control of a Soft Robot Driven by Rolled Dielectric Elastomer Actuators

***G. Soletti**, G. Rizzello

Geometry-Driven Snapping Mechanisms for Soft Robotic Actuation: A Double-Spiral-Based Metabeam Approach

***M. Jafarpour**, A. Yükses, E. Milana

Bird-like tail and wing joints for aerial robots

***M. Ruggia**

Design of freeform jamming structures using computational simulations

***R. Patil**, G. Serhat, B. Akta?

Wed, 22/07/2026 11:30 - 13:00

ICM - 22a

MS332A - thrombus mechanics I

Main Organizer: Prof. Frank Gijzen (TU Delft)

Thrombolytic Dissolution Effects on Thrombus Mechanics

C. Kubicki, J. Monclova, Z. Irechukwu, L. Wu, S. Weatherwax, ***K. Manning**

In Silico Thrombectomy: A Validation with In Vitro Data

***V. Fregona**, G. Luraghi, C. Gillespie, S. Horie, R. McCarthy, J. Rodriguez Matas, F. Migliavacca

Mechanical Modification of Thrombi During Thrombolysis: Experimental Insights and Implications for Efficient Computational Modelling

***A. Dwivedi**, L. Morris, F. Raynoud, B. Chopard

A Coupled SPH-FSI Framework for Modelling Device-Induced Thrombus Formation

***S. Laha**, G. Fourtakas, P. Das, A. Keshmiri

Thrombosis Assessment of a blood pump designed for low flow rates

***M. Specklin**, A. Nassif, F. Bakir, P. Daniai

Wed, 22/07/2026 11:30 - 13:00

ICM - 22b

MS366B - Advancements in High-Fidelity and Data-Driven Approaches For computational wind engineering II

Main Organizer: Mr. Anoop Kodakkal (Technical university of Munich)

Chaired by: Mr. Anoop Kodakkal (Technical university of Munich), Prof. Roland Wüchner (Technical University of Munich (TUM))

Toward data-driven surrogate models of wind turbine response for digital twin applications

***B. Malbois Le Borgne**, F. Gatti, M. Capaldo, R. Desmorat

Gurney Flap Effects on Savonius Turbine Performance: Aerodynamic and Structural Insights from Integrated CFD and Wind Tunnel Analysis

***I. Marinic Kragic**, T. ?olovi?, M. Neki?, D. Buli?

Wed, 22/07/2026 11:30 - 13:00

ICM - 41 (Ostersee A)

MS044A - Advances on Structure-Preserving Numerical Methods for Nonlinear PDEs I

Main Organizer: Prof. Marvin Fritz (University of Vienna)

Chaired by: Prof. Marvin Fritz (University of Vienna)

A structure-preserving scheme and its error analysis for a diffuse-interface tumor growth model

***P. Lin**

Structure-Preserving Exponential Time Integrating Method for Nonlinear PDEs

***S. Sarwar**

A spatially high-order accurate structure-preserving scheme for the Allen--Cahn equation with dynamic boundary conditions

***M. Okumura**

An Asymptotic-Preserving and Exactly Mass-Conservative Semi-Implicit Scheme for Weakly Compressible Flows Based on Compatible Finite Elements

***E. Zampa**, M. Dumbser

On H^2 -Conforming Finite Elements for the Cahn–Hilliard Equation

***M. Fritz**, A. Brunk

Wed, 22/07/2026 11:30 - 13:00

ICM - 42 (Ostersee B+C)

MS074B - Modelling of the Degradation of Fuel Cell and Electrolyzer Materials II

Main Organizer: Prof. Thomas Lauer (Vienna University of Technology)

Chaired by: Prof. Christoph Hametner (TU Wien), Prof. Alessandro d'Adamo (Università degli Studi di Modena e Reggio Emilia)

Online Parameter Identification for Degradation Monitoring in PEM Fuel Cells

***J. Bartlechner**, M. Kozek, S. Jakubek, C. Hametner

Advanced Model-Based Framework for State-of-X Diagnostics in Proton Exchange Membrane Electrolysers

***A. Kravos**, T. Kutrašnik

Virtual Thermal Sensing Based on Inverse Heat Conduction for Internal Temperature Estimation in Polymer Electrolyte Membrane Fuel Cell

***T. Huynh**, C. Ahn, K. Hong, Y. Kwon, J. Lee, W. Yu, G. Cho, J. Kim

Identification of PEMFC Degradation Mechanisms in an Accelerated Stress Test using Equivalent Circuit Models

***T. Lauer**, D. Wuketich, S. Pollak

Simulative and Experimental Investigation of Electrochemical Pressure Impedance Spectroscopy

***C. Markler**, D. Wuketich, S. Jakubek, C. Hametner

Wed, 22/07/2026 11:30 - 13:00

ICM - 43 (Eibsee)

MS273A - Modern Approaches to Enabling Mutual Enrichment of Computational and Experimental Methods I

Main Organizer: Dr. Steffen Gerke (Universität der Bundeswehr München)

Chaired by: Prof. Bjoern Kiefer (TU Bergakademie Freiberg)

A hybrid data-driven approach for 3D elasto-plasticity problems

K. Karaca, R. Peerlings, ***M. Geers**

A hybrid data-driven approach for 3D elasto-plasticity problems part 2

***M. Geers**

Linking Pore-Scale Surface Phenomena to Field Behavior: Design and Interpretation of Subsurface Experiments with Uncertainty-Aware Numerical Simulations of Coupled Geo-Processes

***T. Nagel**, F. Kiszurno, S. Kaiser, J. Buchwald

Numerical Surrogate-Based Selection of Identifiability-Optimal Mechanical Testing Specimen Designs

***N. Serrurier-Replumaz**, P. Bouda, S. Feld-Payet, T. Fourest, J. Rethore

Ray tracing and rasterisation to generate speckle pattern images for digital image correlation uncertainty quantification

***W. Bielajewa**, J. Hirst, L. Sibson, A. Tayeb, M. Sampson, M. Atkinson, A. Marsh, R. Spencer, R. Hamill, C. Hamelin, A. Harte, L. Fletcher

Inelastic Behavior of Sheet Metals: Phenomenological Modeling, Experiments, Material Characterization and Numerical Simulations

***S. Gerke**, Z. Wei, S. Koirala, M. Brünig

Wed, 22/07/2026 11:30 - 13:00

ICM - 44 (Schliersee)

MS145A - Advances in Boundary Elements and Coupling with other Numerical Methods I

Main Organizer: Prof. EUCLIDES DE MESQUITA NETO (UNIVERSITY OF CAMPINAS (UNICAMP) - BRAZIL)

Chaired by: Prof. EUCLIDES DE MESQUITA NETO (UNIVERSITY OF CAMPINAS (UNICAMP) - BRAZIL), Prof. Jure Ravnik (University of Maribor, Faculty of Mechanical Engineering)

Coupled Boundary Element Method Stokes Solver with OpenFoam for Particle Laden Flow Simulations

***J. Ravnik**, M. Štraki, N. Vovk

Hope: A High-Order 3D Panel Method

***K. Bock**

Coupling the Boundary Element Method with Volume Discretizations for Acoustic and Elastic Wave Propagation

D. Aballay, A. Almuna-Morales, V. Ilgaray, I. Labarca-Figueroa, ***E. van 't Wout**

An Isogeometric Boundary Element Formulation for Electrokinetic Particle Manipulation in Microfluidics

E. Erdogan, O. Sarbakhshian, ***B. Cetin**

A verified Nyström method for boundary integral equations in two dimensions

***K. Matsushima**

On a Strategy to Synthesize Transient Response of Dynamic Soil-Structure Systems Based on a 3D BEM Formulation in the Frequency Domain

***E. Mesquita**, A. Ferraz, L. Agatti Pacheco, W. Lucio

Wed, 22/07/2026 11:30 - 13:00

ICM - 31 (Zugspitze)

MS290B - Recent Advances in AI-powered and Large-scale Computational Mechanics for Digital Twins II

Main Organizer: Prof. Haeseong Cho (Jeonbuk National University)

Chaired by: Prof. Haeseong Cho (Jeonbuk National University)

Convergence Enhancement of the AFETI-DO Parallel Domain Decomposition Method

***S. Kang**, M. Hwang, S. Shin, K. Park

Domain Decomposition Approach for Interfacial Failure in Fiber-Reinforced Composites by the Beam-Solid Coupling Idea

***S. Lee**, J. González, S. Kang, S. Shin

Multi-Fidelity Digital Twin for Real-Time Pressure Field Estimation Based on VAEs and Kolmogorov–Arnold Networks

***V. Nguyen**, H. Cho

Development of a FE² Multiscale Framework for Aeroelastic Analysis of Composite Rotor Blades Using Three-dimensional Solid Elements

***S. Cheon**, H. Cho, Y. Kee

Wed, 22/07/2026 11:30 - 13:00

ICM - 32 (Watzmann)

MS172B - Advanced Modelling for Petro- and Bio-based Polymers and Composites II

Main Organizer: Dr. Fabrice Detrez (University Gustave Eiffel)

Chaired by: Dr. Fabrice Detrez (University Gustave Eiffel)

Scale-Bridging Simulations of Polymers: What Can We Learn for Fracture and Interphases?

***S. Pfaller**, E. Richter, L. Laubert, F. Weber

Molecular Dynamics Simulations for Tensile Failure of Thermosetting Resins Considering Bond Break

***H. Yamada**, Y. Oya, S. Yuan, J. Koyanagi

Molecular Softening as a Key Driver of Thermomechanical and Topological Properties of Bio-based Polymer Network: Insights from Topological study

***M. Lamamra**, F. Detrez

Prediction of Young's Modulus of Crystalline Polyethylene Using Molecular Dynamics Simulations

***N. Watanabe**, R. Hiraiwa, Y. Oya, J. Koyanagi

A Strain-Invariant-Based Numerical Model for Processing-Induced Strengthening of Poly (L-lactic acid)

***J. TSUNODA**, C. Nara, T. Sakai, A. Fujimori, J. koyanagi

Wed, 22/07/2026 11:30 - 13:00

BrainLab - Auditorium

MS297E - Phase Field Modeling and Computation V

Main Organizer: Dr. Marco ten Eikelder (TU Darmstadt)

Chaired by: Prof. Makrand Khanwale (Technische Universität München), Dr. Marco ten Eikelder (TU Darmstadt)

A Phase-Field Variational Approach to 3D Frictional Sliding Contact in Multiphase Fluid-Structure Interaction Systems

***B. Rath**, R. Jaiman

Towards the Prediction of the Underwater Acoustic Footprint of Offshore Wind Turbines

***E. ferrer**, L. Botero-Bolívar, O. mariño, M. de Frutos, D. huerger, A. Ballout, G. rubio

Reduction-Consistent Thermodynamic Computation of Compressible and Incompressible Mixture Flows

***M. ten Eikelder**, D. Schillinger

GPU Algorithm for Efficient Runtime Detection of Coalescence and Breakup Events in Phase-Field Multiphase Flows

***L. Enzenberger**, D. Perissutti, D. Zaza, A. Roccon, A. Soldati

Progress in modeling complex multiphase flows using the conservative Allen-Cahn phase field model

***S. Mirjalili**, E. Sieburgh, A. Mani

Recent Advances and Future Directions Of OPStudio

***M. Ali**, O. Team

Wed, 22/07/2026 11:30 - 13:00

NM - 1 (Multimedia Saal)

MS244D - Advanced Numerical Methods for Scale-Resolving Simulations IV

Main Organizer: Prof. F.Xavier Trias (Technical University of Catalonia)

Chaired by: Dr. Nicolas Valle (TU Delft), Prof. Arthur Veldman (University of Groningen)

Towards Positivity-Preserving Non-SSP Time Integrators for Scale-Resolving Simulations

***M. Najafian**, B. Vermeire

Towards Improved Stability in a High-Order Finite Volume Scheme on Unstructured Grids

***J. Pfaff**, P. Ess, A. Huber

An Adaptive Time Integration Method Driven by Entropic Evolution

***A. Aiello**, G. Coppola, F. Capuano

Implicit Time-Stepping for High-Fidelity Simulation of Moving Bodies with Spectral/hp Element Method

***H. Dunn**, H. Wustenberg, M. Lahooti

Pseudo-Direct Numerical Simulation of Turbulent Flows: Multiscale Formulation and Recent Advances

***J. Gimenez**, E. Oñate, S. Idelsohn

A turbulence generator based on synthetic eddy method and momentum source term

***J. He**, A. Revell, A. Skillen, C. Moulinec

Wed, 22/07/2026 11:30 - 13:00

NM - 2 (Salzburg)

STS422B - Advanced Numerical Methods for Simulation, Optimisation and Validation for Applications in Aeronautics and Industry II - Optimisation Methods

Main Organizer: Dr. Dietrich Knoerzer (Aeronautics Consultant)

Chaired by: Prof. Jacques Periaux (cimne), Dr. Dietrich Knoerzer (Aeronautics Consultant)

An Automated Multi-Fidelity RANS–SRS (LES) Optimization Framework for Turbomachinery Flows

***S. Satcunanathan**, G. Goinis, M. Bergmann

Back to the Future: Fast and Robust MDO with Implicit Modelling and Direct Simulation

***J. Vandenbrande**, G. Allen, B. Rothenberg

Multi-Fidelity Aerodynamic Shape Optimization via Deep Reinforcement Learning and Flow Solution Mapping

***G. Sal Anglada**, S. Gomez Gonzalez, B. Yagiz, A. Gargallo-Peiró, O. Lehmkuhl

On the Usage of Aerodynamic Shape Optimization Tools for Quick Design-to-Market of Fixed-Wing Drones

V. Vaz, L. Pinheiro, P. Cardoso, N. Matos, ***A. Marta**, J. Martins

A Transition-Model-Based Discrete-Adjoint Aerodynamic Optimization Method for Aircraft Design

***Y. MU**, J. XU, L. QIAO, J. BAI

Wed, 22/07/2026 11:30 - 13:00

NM - 4 (Hamburg)

STS424A - Integrating AI and Fluid Dynamics I

Main Organizer: Prof. Yao Zheng (Zhejiang University)

Chaired by: Prof. Yao Zheng (Zhejiang University)

Learning Multiphase Flow Evolution via Latent Neural Operators

***H. Liu**, H. Men, X. Li, Y. Mao, V. Tagarielli

A Fast Transition Prediction Method for High-Speed Boundary Layers Based on Neural Network

***X. JIANG**, L. LI, J. XU, L. QIAO, J. BAI

Data-driven Intelligent Simulation Technology for the Aerodynamic Drag of the High-speed Train

***L. Jiali**, Y. Shuanbao, C. Dawei, S. Yongda, D. Jian, D. Sansan

Wed, 22/07/2026 11:30 - 13:00

NM - 5 (KK)

MS214B - Recent Trends in Scientific Computing for Computational Fluid Dynamics and Solid Mechanics in the Exascale Range II

Main Organizer: Prof. Stefan Turek (TU Dortmund University)

Chaired by: Prof. Stefan Turek (TU Dortmund University), Prof. Axel Klawonn (Universität zu Köln)

Monolithic and Block Overlapping Schwarz Preconditioners for the Incompressible Navier-Stokes Equations

A. Heinlein, A. Klawonn, J. Knepper, ***L. Saßmannshausen**

Scalable H(div) Consistent Splitting Method for the Incompressible Navier-Stokes Equations

***N. Nebulishvili**, D. Still, M. Kronbichler, K. Kormann, W. Wall, R. Schussnig

Solving Phase-Field Fracture with LBFGS and Matrix-Free Geometric Multigrid Preconditioning on Locally Refined Meshes

L. Kolditz, ***V. Kosin**, T. Wick

Adaptive Spectral Block Floating-Point for Discontinuous Galerkin Methods

***S. Sundriyal**, V. Aizinger

ROM-Accelerated Block Gauss-Seidel with Error Estimates for the Solution of Coupled PDEs

***P. Luneau**, J. Deteix

A Graph-Based Hierarchical Domain Decomposition Framework for Deflation Preconditioning

***N. Morita**, R. Shimizu, K. Shintate, S. Kaneko, N. Mitsume

Wed, 22/07/2026 11:30 - 13:00

NM - 3 (BB)

MS351A - Atomistic Modeling and Simulations on Nuclear Fusion Materials I

Main Organizer: Prof. Keonwook Kang (Yonsei University)

Chaired by: Prof. Keonwook Kang (Yonsei University)

H permeation in irradiated polycrystalline W from atomistic calculations

Y. Shin, K. Kang, ***B. Lee**

Graph-Theoretical Point-Defect Analysis in Polycrystalline Tungsten in Primary Knock-on Atom Simulation

***Y. Shin**, V. Moul, K. Kang, B. Lee

Atomistic Study of Damage Accumulation in Irradiated BCC Tungsten under Cascade Overlap

***H. Lee**, B. Lee, K. Kang

Atomistic fracture modeling of impurity-inhabited tungsten grain boundaries

P. Hiremath, S. Melin, ***P. Olsson**

Atomistically-Informed Traction-Separation Model for Studying Fracture of a Helium-Covered Tungsten Grain Boundary

***S. Hall**, M. Johnson, M. Fisk, M. Ristinmaa, P. Olsson

Wed, 22/07/2026 11:30 - 13:00

H4 - 1 (Ludwig)

MS041C - Advances and Applications in Meshfree, Particle, and Peridynamic Methods III

Main Organizer: Prof. Jiun-Shyan Chen (University of California, San Diego)

Chaired by: Dr. Pablo Seleson (Oak Ridge National Laboratory), Prof. Zhen Chen (University of Missouri)

Adaptive Coupling of Peridynamics and Finite Element Method for Crack Propagation

***S. Jin**, S. Kim, J. Hong

Ablative-Thermo-Mechanical Multiphysics Analysis for Failure Mechanisms in Charring Composites based on Peridynamics

***Y. Hu**, Y. Yu, Y. Huang

Modeling Deformation and Fracture in Soft Biological Tissues: Particle- and Peridynamics-Based Approaches with Digital Twin Applicability

***H. Hansen**, J. Heczko, M. Hajžman

A Coupling Scheme of Dual-Horizon Non-ordinary State-based Peridynamics and FEM for Plates

V. Vu, Z. Aung, T. Bui, J. Rungamornrat, P. Suttakul, ***D. Vo**

Peridynamic investigation of compaction-driven failure in porous rocks

***S. Butt**, J. Renner, G. Meschke

A meshfree arbitrary Lagrangian-Eulerian method for the Boltzmann BGK model with moving boundaries

***K. Willems**, G. Russo, G. Samaey, A. Klar

Wed, 22/07/2026 11:30 - 13:00

H4 - 2 (Leopold)

MS004D - Data-Driven innovations and machine learning In aerodynamic analysis, optimization and uncertainty quantification IV

Main Organizer: Dr. Esther Andrés Pérez (INTA)

Chaired by: Dr. Domenico Quagliarella (CIRA), Phd. Rodrigo Castellanos (Universidad Carlos III de Madrid)

Field-Inversion-Guided Gene Expression Programming for RANS

***V. Delnegro**, L. Stumpo, R. Vallino, A. Ferrero, F. Masseni, D. Pastrone, F. Bertini, V. Rossano, T. Di Fabbio, J. Guerrero

A SCIML-Based Efficiency Enhancement for Multi-Fidelity Aerodynamic Shape Design Problems

D. Quagliarella, ***N. Montella**, A. Conte, F. Capizzano

Rapid Prediction of Run-Back Ice Formation via Neural Network Surrogate Modeling

***N. Pathiyil**, M. Gallia

Data-Driven Augmentation of the Spalart-Allmaras Turbulence Model for High-Lift Configurations

***M. Semercioglu**, A. Krumbein, C. Grabe

A method for reducing the design variable space in numerical optimization problems of compressors

D. Cinquegrana, N. Montella, ***D. Quagliarella**, N. Conza, N. Natale

Wed, 22/07/2026 11:30 - 13:00

H4 - 3 (Franz)

MS227C - Modeling and Simulation of Additive Manufacturing: Part-Scale Approaches III

Main Organizer: Prof. Christoph Meier (Technical University of Munich)

Chaired by: Dr. Michael Stender (Sandia National Laboratories), Prof. Christoph Meier (Technical University of Munich)

Thermal Modeling of Metal Additive Manufacturing with Semi-analytical Isogeometric Analysis

Y. Yang, Y. Ji, M. Möller, ***C. Ayas**

Efficient thermal simulation of additive manufacturing processes using QuadWire: an extended one-dimensional model.

***L. Brencklé**, R. Viano, D. Weisz-Patrault

An Active Learning Framework for Process Parameter Optimization in Additive Manufacturing of Inconel 718/Copper

***G. Li**, Y. Chueh, C. Chen

LTS-DeepONet: A State-Evolution Operator Learning Approach for LPBF Thermal Histories of Arbitrary Geometries and Scan Strategies

***F. Tieleman**, C. Ayas, H. Akay, M. Langelaar, R. Maas, T. Koenis

Towards Physics-Informed Neural Networks for Part-Scale Overheating Prediction in PBF-LB/M

***K. Beuerlein**, H. Haas, L. Melzig, F. Riegger, M. Zaeh

Wed, 22/07/2026 11:30 - 13:00

H4 - 4 (Alois)

MS017A - Topology Optimization for Multidisciplinary Design I

Main Organizer: Dr. Shun Ogawa (The university of Tokyo)

Chaired by: Dr. Shun Ogawa (The university of Tokyo), Dr. Jan Oellerich (The University of Tokyo)

Topology Optimization of Manufacturable Rib-Type Structures for Casting and Molding Keynote

***J. Plocher**, S. Stahn, M. Gargani, H. Moghaddam, O. Exler, A. Faure, T. Meunier, G. Michailidis

Nonlinear Isogeometric Topology Optimization of Hyperelastic Shells

Z. Xing, ***Y. Mi**, D. Rosen

Topology Optimization of Porous Electrodes for Optimized Mass Transport and Reaction Kinetics

***Q. Zhang**, B. Yi, R. Liu, X. Peng

Multi-Objective Level Set Topology Optimization Using a Unified Variational and Dynamic Framework

***J. Oellerich**, T. Yamada

Design of acoustic metasurfaces with openings via topology optimization using wavenumber as the objective function

***H. Emoto**, T. Yamada

Wed, 22/07/2026 11:30 - 13:00

H4 - 5 (Xaver)

MS126B - Bifurcations, Branches, and Beyond: Modern Continuation Techniques in Computational Mechanics II

Main Organizer: Dr. Loic Salles (University of Liege)

Chaired by: Dr. Johann Gross (University of Stuttgart), Dr. Loic Salles (University of Liege)

Solving Finite Deformation Hyperelastic Contact Problems with a Moore-Penrose Continuation Algorithm

***A. Pepin**, J. Deteix, S. Léger

Continuation-Based Programming of Mechanical Switches for Structural Monitoring

***A. Mélot**

Nonlinear Computation Featuring Non-Smooth Effects Using the Harmonic Balance Method

***M. Poulet-Duprey**, J. De Cazenove, Q. Mercier, L. Salles

Parametric investigation of aeronautical clutch dynamics through nonlinear modal analysis

***F. Mashayekhi**, R. Alcorta, S. Zucca, C. Firrone

Stability analysis for harmonic balance solutions of mechanical multibody systems with Coulomb friction

***A. Schütz**, F. Bayer, R. Leine

Wed, 22/07/2026 11:30 - 13:00

H4 - 6 (Sissi)

MS057B - Modeling of Glaciers and Ice Sheets II

Main Organizer: Dr. Anjali Sandip (University of North Dakota)

Chaired by: Dr. Irina Tezaur (Sandia National Laboratories), Dr. Anjali Sandip (University of North Dakota)

Coupling of processes in ice-sheet and glacier simulations

***T. Zwinger**, J. Kataja, M. Malinen, J. Ruokolainen, P. Råback

Subglacial hydrology modelling: achievements and challenges in simulating entire ice sheets

***A. Humbert**, T. Kleiner, D. Abele, L. Höyns, Y. Fischler, B. Uekermann

Inversion-Based Pan-Antarctic Basal Drag Dataset Constrained by Subglacial Hydrology Simulations

L. Höyns, T. Kleiner, A. Rademacher, M. Rückamp, ***A. Humbert**

A Numerical Stabilisation Scheme for the Shallow Shelf Approximation

***C. Henry**, T. Westling Dolling, J. Ahlkrona

FE-AI framework for fast and accurate multiscale simulation of anisotropic ice-sheet dynamics

***M. El Fallaki Idrissi**, M. Tannous, O. Castelnaud, A. Mangeney, M. Montagnat, O. Gagliardini, C. Ghnatios, P. Ponte Castañeda, F. Chinesta

Estimation of the Basal Sliding Parameter in Ice Sheet Models in the Presence of Errors and Uncertainties

***R. Nicholson**, O. Babaniyi, U. Villa, P. Mrad, N. Petra

Wed, 22/07/2026 11:30 - 13:00

H4 - 7 (Maximilian)

MS068B - Advanced Numerical Methods for Multiphysics and Multiscale Couplings II

Main Organizer: Dr. Isabelle RAMIERE (CEA Cadarache)

Chaired by: Dr. Isabelle RAMIERE (CEA Cadarache)

Hybrid Data and Model Coupling for Non-Linear Multiphysics Problems: Application to Thermo-Poroelasticity

***E. Foulatier**, P. Boucard, F. Louf, D. Néron

Domain Decomposition Method for non conforming coupling

***L. Spies**, V. Faucher, F. Nataf, P. Tournier

Boundary Coupling Method for Non-Conforming Meshes in a Severe Accident Thermohydraulic Code

***C. Pierre**, P. Gubernatis, M. Medale

Quasi-Trefftz Spaces for Time-Harmonic Electromagnetism

***I. Fontana**, L. Imbert-Gérard

A Diffusion-coupled Frontal Cellular Automaton for Phase Transitions in Steels with Grid Independence and Adaptive Mesh Coarsening

***A. Golesch**, P. Raninger, T. Antretter

Wed, 22/07/2026 11:30 - 13:00

H4 - 8 (Eventcenter)

MS239A - Advances in Shape Optimization and Form-Finding for Engineering Design I

Main Organizer: Prof. Kai-Uwe Bletzinger (Technical University of Munich, Germany)

Chaired by: Prof. Kai-Uwe Bletzinger (Technical University of Munich, Germany), Dr. Majid Hojjat (BMW Group)

Towards a Fully Automated Design Workflow for Thin Walled Structures in Automotive Design Keynote

***B. Devresse**, A. Geiser, D. Schmölz, K. Bletzinger

Unified Isogeometric Configuration Design Sensitivity Analysis of Curved Structures Using Design Gradient Approach

***K. Ko**, S. Kang, H. Kim, S. Cho

Shape Optimization of Mechanical Logic Gates

***K. Swartz**, M. Tupek, B. MacNider, D. Tortorelli, B. Talamini

Numerical Optimization of Nozzle Shapes for Fused Deposition Modeling

***S. Tillmann**, F. González, S. Elgeti

Shape and Size Optimization of Stiffeners in the Context of Hybrid Manufacturing

***D. Valoroso Madeira**, A. Geiser, M. Hojjat, B. Kriegesmann

Wed, 22/07/2026 11:30 - 13:00

BrainLab - Training

MS266B - Recent Advances in Computational Fracture Mechanics and Failure Analysis II

Main Organizer: Prof. Yoshitaka Wada (Kindai University)

Chaired by: Prof. Yoshitaka Wada (Kindai University)

Finite Strain Elastoplastic Crack Propagation Analysis Considering Arbitrary Shaped Crack based on the Redefined J-Integral Range ?J

*K. Arai, H. Okada

Three-Dimensional Crack Propagation Prediction Using Transfer Learning with Discovered PDE

*Y. Wada, R. Akimoto

3D Linear Elastic Fracture Analysis using the Fragile Points Method (FPM)

K. Murakoshi, *H. Okada

Dynamic crack propagation analysis based on a hybrid s-version of the Isogeometric analysis

*T. He, K. Kurosaki, N. Mitsume, K. Shibamura

Mixed-Mode Fracture Analysis of Standing Brazilian Disk Rotating about Diameter

*S. Singh, K. Surendra

A Substructuring Homogenization Model for Efficient Fracture Analysis in Perforated Plates

*G. Krishnan M U, N. Muthu, K. Surendra

Wed, 22/07/2026 11:30 - 13:00

NM - 6 (Munich)

MS377B - Analytical Models for Nonlinear Analysis in Engineering Sciences II

Main Organizer: Dr. Ricardo Tomás Ferreyra (Universidad Nacional de Córdoba)

Chaired by: Dr. Alexander Prokopenya (Warsaw University of Life Sciences), Prof. Yeunwoo Cho (Korea Advanced Institute of Science and Technology)

Nonlinearity and Periodic Motion of a Swinging Atwood's Machine

*A. Prokopenya

Bifractional reaction diffusion dynamics with generalized ?-Hilfer memory and Riesz–Feller nonlocal diffusion

*A. GOMEZ, J. DA COSTA SOUSA, F. SORA

A Pre-solved Inverse Laplace Transform Approach for Noised Sampling Data

*R. Ferreyra

Emergent Thermodynamic Behavior in Large-Scale Coupled Building Systems

*A. Seo, H. Goh

Wed, 22/07/2026 11:30 - 13:00

NM - 7 (Venice)

MS361A - Efficient Simulators as Predictive Digital-Twin Enablers I

Main Organizer: Dr. Vasileios Tsiolakis (SINTEF Digital)

Chaired by: Dr. Vasileios Tsiolakis (SINTEF Digital), Prof. Trond Kvamsdal (Norwegian University of Science and Technology (NTNU))

Reduced Order Modelling (ROM) and Hybrid Analysis and Modelling (HAM) as Enabling Technologies for Predictive Digital Twins

*T. Kvamsdal, E. Fonn, K. Johannessen, A. Rasheed

Numerical Simulations for Optimal Sensor Placement on Structures

*K. Okstad, A. Rasheed, T. Kvamsdal

Real-time Wear Prediction in Inaccessible Machinery via a Multiphysics Digital Twin: An Ice Cream Freezer Case Study

*S. Froehle, L. Nagel

Joint State and Parameter Estimation in a Structural Digital Twin Using Online POD and Bayesian Filtering

*S. Hoda, B. Bhattacharyya

Development of a Physics-Based Dynamic SAG Mill Simulator Using Synthetic Particle Size Distributions

*M. Dridi, M. Mannoubi, H. Mrad, C. Ahabchane, S. koubaa

Chain-ROM: Efficient Simulator for Coupled Turbulent Flow

*V. Tsiolakis, T. Kvamsdal, A. Rasheed, E. Fonn, H. van Brummelen

Wed, 22/07/2026 13:00 - 14:00

Lunch Break

Wed, 22/07/2026 13:00 - 14:30

ICM - 50 (Seeblick)

Career Forum Lunch

Previous reservation is required

Wed, 22/07/2026 14:00 - 14:45

ICM - 1 Auditorium

PL04A - Plenary Lecture - Charles Taylor

Chaired by: Prof. Irene Vignon-Clementel (INRIA)

Biomedical Digital Twins for Heart Disease: From Bench to Business to Bedside

*C. Taylor

Wed, 22/07/2026 14:00 - 14:45

ICM - 14b

PL04B - Plenary Lecture - Makoto Tsubokura

Chaired by: Prof. Kenjiro Terada (Tohoku University)

Integrating HPC-CFD and Data Science for Smart Industrial Design: From Fugaku toward FugakuNEXT

***M. Tsubokura**

Wed, 22/07/2026 14:00 - 14:45

ICM - 14a

PL04C - Plenary Lecture - Axel Klawonn

Chaired by: Prof. Peter Wriggers (Leibniz University of Hannover)

Domain Decomposition and Machine Learning - Opportunities and Challenges

***A. Klawonn**

Wed, 22/07/2026 14:00 - 14:45

ICM - 14c

PL04D - Plenary Lecture - Marcela Cruchaga

Chaired by: Prof. Sara Zahedi (KTH Royal Institute of Technology)

Numerical & Experimental Modelling for Free-Surfaces and FSI Problems

***M. Cruchaga**

Wed, 22/07/2026 14:45 - 15:00

Short Break

Wed, 22/07/2026 15:00 - 16:30

ICM - 1 Auditorium

MS283C - Recent Progress in Topology Optimization and Its Applications III

Main Organizer: Prof. Junji Kato (Nagoya University)

Chaired by: Prof. Junji Kato (Nagoya University), Prof. Weisheng Zhang (Dalian University of Technology)

An AI Co-Pilot for 2D Human-in-the-Loop Topology Optimization **Keynote**

D. Ha, ***J. Carstensen**

Neural-field-based topology and toolpath co-design for continuous fiber-reinforced composite structures

***Y. Chen**, Z. Chen, Y. Xiong

Topology optimization of airborne acoustic metasurface for reflective sound field manipulation

***M. HE**, W. LUO, L. XIA

Topology-Parameter Concurrent Optimization Method for Impact Resistance of Lattice-Filled Structures Based on Equivalent Analysis

***J. Yan**, C. Zhang

Wed, 22/07/2026 15:00 - 16:30

ICM – 2

MS020A - Large Deformation Beams and Shells: Formulation Advances and Innovative Applications I

Main Organizer: Prof. Enzo Marino (University of Florence)

Chaired by: Prof. Enzo Marino (University of Florence), Prof. Giovanni Garcea (University of Calabria)

Control of (highly) flexible Reissner beam by energy shaping of distributed port-Hamiltonian system **Keynote**

***A. Ibrahimbegovic**, S. Ljukovac, R. Mejia-Nava

Structure-preserving simulation of Cosserat rod dynamics in a mixed, port-Hamiltonian framework

P. Kinon, S. Eugster, ***P. Betsch**

Locking-free Formulations of Beams, Plates and Shells Through Stabilization

***A. Aguirre**, J. Baiges, R. Codina

Dimensional Reduction of Geometrically Nonlinear Beams: A Center Manifold Approach

***S. Han**

Advancements in Modeling of Short-Ranged Potential-Based Interactions between Geometrically Exact Finite Beam Elements

***D. Rudlstorfer**, M. Grill, I. Steinbrecher, C. Meier, W. Wall

MS097A - Machine Learning Methods for Aerospace Applications I**Main Organizer:** Dr. Alexander Ruettggers (German Aerospace Center (DLR))**Chaired by:** Dr. Alexander Ruettggers (German Aerospace Center (DLR)), Dr. Philipp Knechtges (German Aerospace Center)

ESSPINNs: Entropy-Stable Finite-Volume Solvers Embedded in Physics-Informed Neural Networks

***A. Madrane**, A. Soulaïmani

Wall-Based Three-Dimensional Turbulent Flow Reconstruction Using a Physics-Guided ControlNet–Animatediff Model

P. Portero**, L. Jofre, J. CalafellKinetic-energy- η -constrained model using an artificial neural network for large-eddy simulation of compressible wall-bounded turbulenceC. Yu**

Preconditioned FEM-informed Neural Networks for Simulation and Optimization of PDEs in Aerospace Applications

***H. Fabian**, F. von der Lehr, P. Knechtges

Neural Predictive Control for Efficient On-Device Control in Hardware-Constrained Aerospace Applications

F. von der Lehr**, F. Hoppe, P. Knechtges**MS317A - Recent Advances in Mesh-free and Particle Methods I*Main Organizer:** Prof. Mitsuteru Asai (Kyushu university)**Chaired by:** Prof. Mitsuteru Asai (Kyushu university), Dr. Hiroyuki Omura (National Research Institute for Earth Science and Disaster Resilience)Present Status and Future Perspectives of the Particle Methods for Fluid Dynamics **Keynote*****S. Koshizuka**

Simulating thermal convection with meshless methods: Lagrangian vs Eulerian models

***H. Lyu**, N. Bartwal, P. Suchde, A. Colagrossi, P. Sun

An Efficient High-Order Time-Integration Framework for Incompressible SPH

***Y. Inoue**, K. Tsuji, M. Asai

A projection-based least-squares meshfree method with a staggered-variable arrangement for incompressible Navier–Stokes equations

T. Matsuda**, S. Ii**MS184A - Theory-guided Design of Deep Learning-based Surrogates I*Main Organizer:** Dr. Nicola Rares Franco (MOX, Politecnico di Milano)**Chaired by:** Dr. Nicola Rares Franco (MOX, Politecnico di Milano), Dr. Nikolaj Mücke (TU Delft)Theory-to-Practice Gap in Operator Learning **Keynote*****M. Trautner**

Combining DL-ROMs and Operator Learning: Towards Efficient And Mesh-Agnostic Surrogates

***S. Brivio**, G. Kissas, A. Manzoni, S. Mishra

Approaching the Optimal Closure: Equivariance, Inductive Bias, and Reynolds-Number Generalization in Data-Driven LES

***S. Agdestein**, B. Sanderse

Universal Optimal Learning of High-Dimensional Anisotropic Sobolev Functions from Point Samples

B. Adcock, ***A. Gupta**

Holomorphic neural networks for linear elasticity and Laplace problems in 2D and 3D

E. Ballini**, M. Calafà, E. Hovad, A. Engsig-Karup, T. Andriollo**MS018E - Immersed Boundary Variational Methods: Theory, Data Structures, and Applications V*Main Organizer:** Prof. Alexander Düster (Hamburg University of Technology)**Chaired by:** Prof. John Evans (University of Colorado)

A data-driven approach for discontinuous integration

***M. Saberi**, M. Tashfin, A. Vogel

Analysis and quadrature error estimates of an Augmented Fictitious Domain method on unfitted meshes

***G. Casella**, F. Regazzoni

Error Analysis for a Bubble-Enriched Fictitious Domain Method for Dirichlet Problems

S. Berrone, ***L. Neva**, S. Scialò, F. Vicini

Flux Recovery and A Posteriori Error Analysis for an Elliptic Interface Problem Approximated by CutFEM

***A. Gouasmi**, D. Capatina, C. He

Equivalent Polynomial Implementation of CutFEM and Immersed Interface Finite Element Methods for Multiphase Flows

***C. Kees**, D. Nathawani

MS300B - Bayesian Analysis and Model Calibration II**Main Organizer:** Dr. Lea Friedli (Technical University of Munich)**Chaired by:** Dr. Lea Friedli (Technical University of Munich), Prof. Daniel Straub (Technische Universität München)

Introducing Stochastic Emulators for Hierarchical Bayesian Inference of Population Parameters

***A. Herr**, S. Marelli, B. Sudret

Robust Bayesian Analysis with Information Geometry and Riemannian Optimization - Application to Nonlinear Dynamics

***D. Rossat**

Hierarchical Bayesian Learning of Degradation Models for Remaining Useful Life Prediction

***X. Jia**, I. Papaioannou, D. Straub

Leveraging Historical Effects for a Precise Inversion of Time-varying Systems

M. Yachouti**, G. Perrin, J. GarnierProbabilistic Assessment of CO₂ Injectivity Loss Using Bayesian Updating and FEMD. Peixoto**, T. Santos, G. Siqueira**MS337D - Modelling and Simulations of Structural Responses Under Extreme Conditions IV****Main Organizer:** Prof. Dongdong Wang (Xiamen University)**Chaired by:** Prof. Yonggang Zheng (Dalian University of Technology)Dynamic Responses Assessment of Steel Building Structures Considering Non-linearity of Exposed Column Bases Keynote***J. Fujiwara**, T. Miyamura, M. Ohsaki

Computational Decoupling of Universal Mount Systems for Autonomous Counter-UAV Heavy Machine Guns

***M. Nguyen**, C. Nguyen, D. Le, Q. Tran

Modeling Complex Boundaries Using Polygonal and Polyhedral Grid Cells in the Material Point Method

***H. Ma**, X. Zhang

Several Self-Starting Symplectic-Conserving Explicit Time Integration Schemes in Dynamical Systems

***Y. WANG**, P. CHEN

Structural Optimization Method of Smart Hydrogel Actuators and Functional Metamaterials

Y. Qiu**, Y. Zheng**MS324B - Engineering and Mathematics for Environmental Care and Sustainability II*Main Organizer:** Prof. Simona Perotto (Politecnico di Milano)**Chaired by:** Dr. Marianna Cerasuolo (University of Sussex), Prof. Patrizia Bagnerini (University of Genoa)

From PDE-Constrained Design to 3D-Printed Porous Scaffolds for Soilless Agriculture

G. Speroni, N. Mondini, N. Ferro, ***S. Perotto**

Growth-Stage-Dependent Optimization of Indoor Farming Systems via CFD and Crop Growth Modeling

***S. Mirabella**, P. Bagnerini, N. Ferro, S. Perotto

Adaptive Vertical Farm Scheduling with a Digital Twin and Multi Shift Feasibility Repair

P. Bagnerini, M. Gaggero, ***S. Hosseini**

Dynamic and Learning-Based Crop Growth Prediction for Adaptive Vertical Farming

E. Chnib, M. Gaggero, ***P. Bagnerini**

Cooperative and Optimization-based Framework for Aerial Manipulation

***M. Focchi**, M. Sanguineti

Wed, 22/07/2026 15:00 - 16:30

ICM - 12b

MS224B - Machine Learning Frontiers in Multiscale and Materials Modeling II

Main Organizer: Prof. Chuin-Shan (David) CHEN (National Taiwan University)

Chaired by: Dr. Remi Dingreville (Sandia National Laboratories), Dr. T.-H. (Michael) Su (Computational and Multi-scale Mechanics Group, Synopsys)

A Unified Homogenization Framework for Heterogeneous Materials Based on Deep Material Networks

*C. CHEN, T. Wei

Deep Material Networks for Homogenization of Heterogeneous Piezoelectric Materials

*T. Wei, C. Chen

Virtual material characterization of fiber reinforced composites under high cycle fatigue using Deep Material Networks

*P. Bhat Keelanje Srinivas, M. Kabel, M. Schneider

AI-Empowered Multiscale CAE with Deep Material Networks for Composite Material Modelling

*H. Wei, A. Erhart, F. Pavia, W. Hu, C. Wu

Beyond Pure-Data-Driven: Knowledge-Guided AI for Structural Optimization and Manufacturing: Physics-Informed Machine Learning and Multi-Agent LLM

*S. Ryu

Integrating Large Language Models with Surrogate-Assisted Optimization for Woven Composites Design

M. Hsu, *C. Yu

Wed, 22/07/2026 15:00 - 16:30

ICM - 13a

MS090D - Machine Learning For Computational Mechanics Across Scales IV

Main Organizer: Prof. Fadi Aldakheel (Leibniz Universität Hannover)

Chaired by: Prof. Fadi Aldakheel (Leibniz Universität Hannover), Prof. Elias Cueto (Universidad de Zaragoza)

Reasoning Agentic AIs for enhancing robustness of path-dependent material laws Keynote

*W. Sun

Transferable Latent-Temporal Learning for Path-Dependent Nonlinear Mechanical Responses Across Heterogeneous Microstructures

*Y. Yang, L. Guo, X. Ren

Resolution-Independent Surrogate Modeling for Crystal Plasticity Finite Element Analysis via the Fourier Neural Operator

*H. Ishihara, Y. Yamazaki, R. Najian, S. Rezaei, M. Muramatsu

From Vibrations to Computation: Physical Reservoir Computing with a Nonlinear Mechanical Oscillator

*G. Mondello Malvestiti, A. Galli, I. Messina, M. Torzoni, A. Corigliano

Wed, 22/07/2026 15:00 - 16:30

ICM - 13b

MS426E - Data-driven Approaches in Mechanics V

Main Organizer: Prof. Kostas Karapiperis (EPFL)

Chaired by: Prof. Burigede Liu (University of Cambridge), Prof. Miguel Bessa (Brown University)

Attention-based Point Cloud Networks for 3D Solid Mechanics Simulation

*R. Narkhede, M. Makki, S. Chandran, M. Raissi, B. Mohebbi

Learning Transient Rheology in Segregating Granular Flows

*H. Menon, G. Anantha Padmanabha, K. Karapiperis

Data-Driven Forecasting of Geophysical Mass Movements

*G. Anantha Padmanabha, L. Blatny, J. Gaume, K. Karapiperis

Patch-Based Modelling of Turbulent Flows using Graph Neural Networks

*V. Ravishankar, C. Gscheidle, J. Garcke

A Data-Driven Approach for Incompressible Flow in Hydraulic Networks

*P. Balbão Bazon, R. Ausas, C. Gebhardt

Machine Learning for Predicting Hydrogen-Assisted Fatigue Crack Growth in Pipeline Steels

*P. Aduwenye, F. Šebek, H. Yeddu

Wed, 22/07/2026 15:00 - 16:30

ICM - 14a

MS031A - Open-Source Software in Mechanics I

Main Organizer: Dr. Vladislav Yastrebov (MINES Paris, PSL University, CNRS)

Chaired by: Dr. Vladislav Yastrebov (MINES Paris, PSL University, CNRS)

Developments of the FEniCSx libraries for GPU-accelerated computations **Keynote**

J. Dean, C. Richardson, ***G. Wells**

More than 25 Years of CalculiX: Sustaining an Industrial Open-Source FEM Code

***L. Bruder**, C. Wöfle, G. Dhondt

ddfencs: a (Model-Free) Data-Driven Computational Mechanics implementation in FEniCSx (and Beyond)

***F. Rocha**

Towards Flexible Constitutive Modelling in FEniCSx with External Operators and Automatic Differentiation

***A. Latyshev**, J. Dokken, J. Bleyer, C. Maurini, J. Hale

BeamMe: A general purpose 3D beam finite element input generator

***I. Steinbrecher**, D. Rudlstorfer, A. Popp

Wed, 22/07/2026 15:00 - 16:30

ICM - 14b

MS026F - Contact and Interface Mechanics: Modeling and Computation VI

Main Organizer: Prof. Michel Raous (Laboratoire de Mécanique et d'Acoustique - CNRS - France)

Chaired by: Prof. Rolf Krause (KAUST)

Hydrodynamic Modelling and Contact Considerations to Estimate Friction Coefficients in Wet Grinding Processes

***P. Thunich**, M. Müller

Interface Element for an Efficient Simulation of Fiber-reinforced Concrete

***P. Poriete**, V. Curotu, S. Löhnert

A Discrete Path-Dependent Wear Model within a Cohesive Zone Framework for Steel–Concrete Interfaces

***Z. Xu**, X. Gao

Green's Function Lattice Dynamics: a semi-analytical boundary element method for architected materials

***J. Van Dokkum**, D. Büeler, A. Sanner, D. Kammer

Impact of Uncertainty on Debonding Failure of Orthodontic Brackets

***B. Azarov**, O. Rabinovitch

Investigation on Supporting Property of Angular Contact Ball Bearing Using the Proposed Virtual Contact Method

***X. Zhang**, X. Chen, S. Zhang, W. Hu, J. Wu, W. Li, J. Zhang

Wed, 22/07/2026 15:00 - 16:30

ICM - 14c

MS083B - Multiscale Computational Homogenization for bridging scales in the mechanics and physics of complex materials II

Main Organizer: Prof. Julien Yvonnet (Universite Gustave Eiffel)

Chaired by: Dr. Georgios Drosopoulos (International Hellenic University)

Automated Discovery of Effective Material Models for Nonhomogeneous Hyperelastic Materials

***M. Shojaee**, O. Weeger

A Model Order Reduced Finite Element Approach for the Multiscale Simulation of Ferroelectric Structures

***R. Wakili**, S. Lange, A. Ricoeur

A Stochastic Multiscale Method to Consider Uncertainties of Microstructure in Heterogeneous Materials

***T. Hori**, Y. Shintaku, K. Terada

A FFT-based variational procedure for homogenization of maxwellian viscoelastic composites

***A. Martin**

FE-FFT multiscale model of damage in hydroelectric dams under alkali-silica reaction

***L. Fourel**, J. Molinari

Numerical Homogenization for Nonlinear Darcy Flow

***J. Gasick**, X. Qian

Wed, 22/07/2026 15:00 - 16:30

ICM - B11

MS132E - Machine Learning and AI in Constitutive Modeling of Complex Materials V

Main Organizer: Dr. Francisco Sahli Costabal (Pontificia Universidad Católica de Chile)

Chaired by: Prof. Jan Fuhr (The University of Texas at Austin), Ms. Ellen Kuhl (Stanford University)

Automated Model Discovery for Elastomeric Foams in High Performance Running Shoes

***J. McCulloch**, E. Kuhl

Data-Driven Multi-Material Finite Viscoelasticity via Neural ODE Evolution Laws with Application to 3D-Printed Materials

***J. García-Ávila**, M. Boyce, A. Buganza-Tepole, B. Shen, M. Rausch

Microstructure-Driven Constitutive Model Discovery Using Microfocus Computed Tomography-Based Arterial Representative Volume Elements

***H. Wolfs**, M. Pétré, T. Vervenne, I. Gennart, G. Kerckhofs, N. Famaey

Design, mechanical characterization, and probabilistic model discovery of hydrogel-scaffold composites

***M. Rolf**, M. Kainz, K. Linka, G. Holzapfel, E. Kuhl

Data-Driven Discovery of Fiber Dispersion in Myocardial Tissue

***D. Martonová**, P. Ingalkar, E. Kuhl

AI Human Bone Material Model for Stochastic Explicit FEM Simulations

***C. Saenz-Betancourt**, D. Draper, P. Wernicke, S. Peldschus, F. Duddeck

Wed, 22/07/2026 15:00 - 16:30

ICM - B12

MS302A - Computational Mechanics With Free and Moving Boundaries: Methods and Applications I

Main Organizer: Dr. Rekha Rao (Sandia National Laboratories)

Chaired by: Dr. David Noble (Sandia National Laboratories), Dr. Marcela Cruchaga (Universidad de Santiago de Chile)

Treating drag forces explicitly in time-stepping methods for dispersed multiphase flows

***D. Pacheco**

Numerical approaches and validation of interface-conforming high-fidelity multiphase modeling for advanced manufacturing applications

***S. Lin**, B. Hejnal, D. Moser

Adaptive Mesh Refinement with Space-Time Meshes for Polymer Injection Molding Simulations

***B. Ferrer Fabón**, M. Behr

Implicit–Explicit Methods for Two-Phase Viscoplastic Flow Simulation

***V. Improta Moreira**, D. Ramalho Queiroz Pacheco

Modeling Direct Ink Write of Sinusoidal Patterns Using the Conformal Decomposition Finite Element Method

***R. Rao**, A. Kucala, M. Golobic, T. Weisgraber

Wed, 22/07/2026 15:00 - 16:30

ICM - B13

MS419A - Computational Models for the Nucleation and Propagation of Fracture in Solids Under Quasi-Static and Dynamic Loading Conditions I

Main Organizer: Prof. John Dolbow (Duke University)

Chaired by: Prof. John Dolbow (Duke University)

Beam Breaker

***O. Lopez-Pamies**

Modeling three-dimensional Thermomechanical Fracturing in Orthotropic Composites Using a parallel-adaptive Phase-Field framework

***W. Munshi**

Stress-Intensity-Factor-Driven Phase Modeling of Fracture

***S. Li**

Modeling rate-dependent deformation, damage and fracture of soft polymers

***V. Srivastava**, A. Konale

Controlling meso-scale dynamics in testing and simulating brittle failure

***G. Nguyen**, N. Nguyen, M. Karakus, H. Bui

A Physics- and Chemistry-Informed Phase-Field Constitutive Framework for Thermo-Oxidative Aging of Semi-Crystalline Polyimides

***M. Shakiba**, M. Yacouti

MS262A - Advances of Quantum and Quantum-Inspired Algorithms for Solving Flow Simulation Problems I**Main Organizer:** Prof. Thomas Rung (Hamburg Univ. of Technology)**Chaired by:** Prof. Thomas Rung (Hamburg Univ. of Technology), Dr. Mujeeb Malik (NASA Langley Research Center)

Data-Driven Quantum Koopman Method for Simulating Nonlinear Dynamics

Keynote

*B. Zhang, Z. Lu, Y. Yang

Quantum Algorithms for Assimilative Intelligence

*X. Gao

A Quantum-Classical Surrogate Model for the Collision Operator of the Lattice Boltzmann Method

*L. Birk, D. Wawrzyniak, J. Winter, C. Janßen, N. Adams

Surrogate Quantum Circuit for Nonlinear Dynamics in Quantum Lattice Boltzmann Methods

*M. L?c?tu?, M. Möller

Quantum algorithms for Lagrangian fluid turbulence

F. Schindler, J. Ingelmann, T. Gubaev, *J. Schumacher

MS274A - Computational plasticity: theoretical development and its applications I**Main Organizer:** Prof. Li-Wei Liu (National Taiwan University)**Chaired by:** Prof. Li-Wei Liu (National Taiwan University), Dr. Slavomir Parma (Institute of Thermomechanics of the Czech Academy of Sciences)

Finite Element Implementation of a Plasticity Model with Orthotropic Yield Function and Advanced Hardening Rules to Simulate 3D-Printed Metals

*S. Parma, T. Vankova, R. Marek, H. Feigenbaum, D. Gabriel

Experimental and numerical analysis of tension in notched specimens made of aluminum alloy AW5083

*M. Mucha, S. Tokiewicz, S. Brabender, L. Rose, B. Wcis?o, A. Menzel, J. Pamin

Calibration of a Plasticity Model under Biaxial Loading Utilizing a Measured Field of Equivalent Plastic Strain and an Existing Closed-Form Solution

*R. Marek, T. Va?ková, S. Parma

Asymptotic State Analysis of Thermomechanically Cycled Structures with Temperature-Dependent Elastic Coefficients Using a Direct Numerical Method

V. Tsotoulidi, *K. Spiliopoulos

Implementation of a Plasticity Model with Orthotropic Yield Function and Damage in Finite Element Code

*T. Va?ková, S. Parma, R. Marek, L. Liu, D. Gabriel

Reducing Computational Cost in Primal-Dual Interior Point Methods for Single-Crystal Plasticity at Finite Strains

*F. Steinmetz, L. Scheunemann

MS130B - Advances in discretization techniques, element technology, mesh adaptivity, and solution strategies for inelasticity, contact, localization, and failure II**Main Organizer:** Dr. James Foulk III (Sandia National Laboratories)**Chaired by:** Dr. James Foulk III (Sandia National Laboratories), Dr. Alejandro Mota (Sandia National Laboratories)

Stabilised ALE Transport of Scalar Internal Variables in Rolling Problems

*R. Hosseinezhad, U. Nackenhorst

In-Core Remeshing and its Applications in Sierra Solid Mechanics

*M. Merewether, M. Veilleux, J. Foulk, A. Stershic, G. de Frias

Energetic mesh improvement: a mixed continuous-discrete optimization approach

K. Garanger, A. Mota, J. Foulk III, *J. Rimoli

The Schwarz Alternating Method for Concurrent Multiscale Coupling in Solid Mechanics: Theory, Implementation, and Application to Complex Structures

*A. Mota, I. Tezaur, M. Merewether, B. Phung, M. Diab

Wed, 22/07/2026 15:00 - 16:30

ICM - 21b

MS196B - Deployable, Adaptive and Intelligent Structures in Engineering and Soft Robotics II

Main Organizer: Dr. Malte von Scheven (University of Stuttgart)

Chaired by: Prof. Edoardo Milana (University of Freiburg), Prof. Aniket Pal (University of Stuttgart)

System Identification and Active Vibration Control of an Elastic Kinetic Structure

***R. Jirasek**, T. Schauer, A. Bleicher

Nonlinear dynamics of a tensegrity modular structure

***M. Santana**, P. Gonçalves

Damage Detection and Sensor Optimization for Stability Characterization of a Meter-Scale Origami Pill-Bug Structure

***A. Sychterz**

Prototype Scale Validation of Soft Pneumatic and Cable Driven Actuation for a Bending Kinetic Shading Façade

***J. Liu**, T. Wortmann, M. Matheou

Automated Design of Tubular Origami with High-Degree Vertices

***M. Zhang**, D. Farhadi

Wed, 22/07/2026 15:00 - 16:30

ICM - 22a

MS332B - thrombus mechanics II

Main Organizer: Prof. Frank Gijsen (TU Delft)

Coarse-Grained Simulations of von Willebrand Factor Self-Association: Effects of Flow and Geometry

***N. Roebersen**, G. Závodszy

Flow-induced thrombosis in tubing connectors for medical devices: An haemodynamic study

***V. Lupi**, R. Verzicco, F. Viola

A Thrombus Digital Twin to Link Microstructure, Mechanics, and Imaging Features

***B. Fereidoonhezahad**

Local Sensitivity Analysis of a Thrombosis Model: Towards the Design of an Experiment

D. Thissen, F. van de Vosse, ***W. Huberts**

Thrombus Mechanics: from Reproducibility Assessment to Clinical Recommendations for Endovascular Thrombectomy in Stroke

L. Bontempi, B. Fereidoonhezahad, ***F. Gijsen**

Wed, 22/07/2026 15:00 - 16:30

ICM - 22b

MS038A - Simulation and Modeling Approaches in 3D Concrete Printing I

Main Organizer: Dr. Robens-Radermacher Annika (Bundesanstalt für Materialforschung und -prüfung)

Chaired by: Dr. Robens-Radermacher Annika (Bundesanstalt für Materialforschung und -prüfung), Dr. Giacomo Rizzieri (Politecnico di Milano)

FEM Modelling of 3D Concrete Printing across Process Scales Using a Unified Fluid-Solid Elasto-Viscoplastic Formulation

***G. Rizzieri**, D. Bos, R. Wolfs, L. Ferrara, M. Cremonesi

Simulation of a Novel Vibration-Based Extrusion Process for Concrete 3D Printing Using the Discrete Element Method with Thixotropy

***K. Krenzer**, J. Lipowsky, R. Fetter

Discrete Element Modeling of Screw Extrusion and Time-Dependent Hardening in 3D Concrete Printing

***P. Zhi**, W. Zhou, Y. Wu

Modeling of Morphological Changes in 3D Concrete Printing Interlayers with Embedded Reinforcement

***H. Jung**, J. Lee, M. Lee, H. Naing

Wed, 22/07/2026 15:00 - 16:30

ICM - 41 (Ostersee A)

MS044B - Advances on Structure-Preserving Numerical Methods for Nonlinear PDEs II

Main Organizer: Prof. Marvin Fritz (University of Vienna)

Chaired by: Prof. Marvin Fritz (University of Vienna)

Relaxation-based methods for coupled hyperbolic problems

***N. Kolbe**, M. Herty, S. Müller

Structure-preserving Mixed Finite Element Method for the Incompressible Hall--magnetohydrodynamic Equations

***A. Soenjaya**, B. Goldys, T. Tran

GPU Accelerated Hybridized Discontinuous Galerkin Framework

***C. Gürkan**, J. Urrutia Madrid, D. Martinez Perez

Proximal Galerkin Schemes for Enforcing Pointwise Inequality Constraints in de Rham Complex Finite Element Discretizations

***A. Izmailov**, P. Potu, B. Keith

Parameter-limit preserving low-regularity method in fluid models: analytic and numerical results

***X. Cheng**, Z. Luo, S. Wang

Wed, 22/07/2026 15:00 - 16:30

ICM - 42 (Ostersee B+C)

MS074C - Modelling of the Degradation of Fuel Cell and Electrolyzer Materials III

Main Organizer: Prof. Thomas Lauer (Vienna University of Technology)

Chaired by: Prof. Alessandro d'Adamo (Università degli Studi di Modena e Reggio Emilia), Prof. Thomas Lauer (Vienna University of Technology)

MEASURED Project: Multi-Physics Modelling of HT-PEM Fuel Cell Systems for Heavy-Duty Mobility

***I. Prah**

Comparison Between Simulation of PEMFC Degradation Models and Experimental TEM Results

***D. Wuketich**, S. Schwarz, A. Schweitzer

Clustering-based Local Model Network Design for Efficient Simulation of PEM Fuel Cell Aging Stressors

***B. Fuchs**, M. Kozek, I. Skrijanc, S. Jakubek, C. Hametner

Impact of Cosmic Radiation on PEM Fuel Cells in Aviation

***L. Kösters**, M. Heere

Sensitivity Analysis of Ageing Effects in LT-PEM Fuel Cells Under VECTO Cycles

A. Ferri-Sirvent, M. Lopez-Juarez, ***R. Novella**, J. Gomez-Soriano

Wed, 22/07/2026 15:00 - 16:30

ICM - 43 (Eibsee)

MS273B - Modern Approaches to Enabling Mutual Enrichment of Computational and Experimental Methods II

Main Organizer: Dr. Steffen Gerke (Universität der Bundeswehr München)

Chaired by: Dr. Steffen Gerke (Universität der Bundeswehr München)

Full-Field Inverse Identification of Sheet Metal Anisotropy from a Single Biaxial Test

***B. Starman**, A. Mašek, M. Halilović, S. Coppieters

Full-Field Inverse Identification of Sheet Metal Anisotropy from a Single Biaxial Test - Part 2

***B. Starman**

Integrating Microstructural Damage Characterization with Elasto-Plastic FE Modeling to Assess Damage-Induced Property Changes in DP800

***J. Gerlach**, W. Muhammad, A. P. Brahme, M. Hahn, K. Inal, Y. P. Korkolis

Experiments and Numerical Simulations of Ductile Damage and Fracture Behavior in Anisotropic Aluminum Sheets

***S. Koirala**, S. Gerke, M. Brünig

A Closed-Loop Framework for Experimental-Computational Multiscale Modeling of Auxetic Sheet Metals

***A. Gordanshekan**, S. Diebels

Wed, 22/07/2026 15:00 - 16:30

ICM - 44 (Schliersee)

MS178A - Process Simulation for Composite Manufacturing I

Main Organizer: Prof. Roland Hinterhölzl (FH OÖ Campus Wels)

Chaired by: Prof. Roland Hinterhölzl (FH OÖ Campus Wels), Ms. Sophia Keller (University of Applied Sciences Upper Austria)

Tailored Fiber Placement: Process-Dependent Mesostructures for Resin Transfer Molding Applications

***L. Bittrich**, C. Welker, D. Weitze, S. Schlegel, L. Kärger, A. Spickenheuer

Process-Induced Deformation of Composite Materials: Mechanisms, Modeling, and Validation

J. Lee, ***H. Lim**, S. Ji, H. Ju

Creep and stress relaxation in binder stabilised composite preform

***D. Adhikari**, J. Lisegaard, J. Hattel, S. Mohanty

Approximating FE Draping Simulations using AI-based Surrogate Models

***S. Keller**, P. Blies, R. Hinterhoelzl

Numerical Modelling of Induction Welding for Thick Thermoplastic Components in Aerospace Applications

***N. van Hoorn**, T. Koenis, B. de Wit, S. Sterk, O. Erartsin

Wed, 22/07/2026 15:00 - 16:30

ICM - 31 (Zugspitze)

MS383A - Machine Learning-Enhanced Solvers for Partial Differential Equations in Computational Science I

Main Organizer: Prof. Ioannis Kalogeris (National Technical University Of Athens)

Chaired by: Prof. VISSARION PAPADOPOULOS (National Technical University of Athens), Dr. Gerasimos Sotiropoulos (N.T.U.A.)

Two-level preconditioning with Neural Green's Operators

***H. Melchers**, J. Prins, M. Abdelmalik

Sparse domain decomposition method for large neural networks

***B. Rosic**, T. Godde

Modelling stochastic, anisotropic material tensors by spatially-decomposed neural networks

***T. Gödde**, B. Rosi?

Demonstration of a Modular Library of Learned Operators for the Composition of Partial Differential Equation Solutions

***E. Kostas**, A. Lachanas, T. Gortsas, P. Papadopoulos

A Hybrid Framework for Coupled Multi-Domain Structural Analysis with Neural Operators

***C. Lyoo**, M. Yu, G. Noh

Operator Learning for Long-Time Prediction of Nonlinear Partial Differential Equations

***F. Tokmukhamedova**, J. Lux, C. Allery

Wed, 22/07/2026 15:00 - 16:30

ICM - 32 (Watzmann)

MS237A - Recent Advances in Scientific Machine Learning for Differential Equations and Control Problems I

Main Organizer: Dr. Hendrik Kleikamp (University of Graz)

Chaired by: Dr. Hendrik Kleikamp (University of Graz)

Decaying Sensitivity Enables High-Dimensional Optimal Feedback Control with Deep Neural Networks

M. Sperl, L. Saluzzi, D. Kalise, ***L. Grüne**

Linear quadratic control of nonlinear systems with Koopman operator learning and the Nyström method

***E. Caldarelli**, A. Chatalic, A. Colomé, C. Molinari, C. Ocampo-Martinez, C. Torras, L. Rosasco

Learning Controlled Stochastic Differential Equations

***L. Brogat-Motte**, R. Bonalli, A. Rudi

Risk-Averse Approach to Control-Affine Systems of ODEs

***A. Scagliotti**, T. Surowiec

Function Approximations for Parametric Optimization Problems and Its Use Cases in Optimal Control

***S. Gottschalk**

Wed, 22/07/2026 15:00 - 16:30

BrainLab - Auditorium

MS181A - Computational Brain Multiphysics I

Main Organizer: Dr. Ivan Fumagalli (Politecnico di Milano)

Chaired by: Dr. Ivan Fumagalli (Politecnico di Milano), Prof. Stefano Pagani (Politecnico di Milano)

Inferring Human Intracranial CSF Absorption Sites via Inverse Modelling of Protein Transport

***M. Causemann**, K. Mardal

A Quantitative Understanding of Glymphatic Transport and Amyloid Deposition Using Image-Based Subject-Specific Modelling

A. Bakiler, M. Johnson, M. Abdelmalik, F. Baidoo, A. Badachhape, T. Hughes, ***S. Hossain**

Multiphysics Framework for Cerebrospinal Fluid and Glymphatic Transport in the Brain--Spinal Cord System

***V. Vandana**

Geometry-Driven Prediction of Brain Solute Transport: A Registration-Based Modeling Approach

***A. Solheim**, K. Mardal, G. Ringstad, P. Eide, K. Nordengen

A cut finite element method for the Biot system of poroelasticity

N. Berre, ***A. Massing**, K. Mardal, I. Yotov

System-Level Modeling of Skull-Borne Vibration: Quantifying Intracranial CSF Responses and Energy Pathways under tVAS

***T. Kim**, S. Lee, N. Kim

Wed, 22/07/2026 15:00 - 16:30

NM - 1 (Multimedia Saal)

MS244E - Advanced Numerical Methods for Scale-Resolving Simulations V

Main Organizer: Prof. F.Xavier Trias (Technical University of Catalonia)

Chaired by: Prof. Francesco Capuano (Universitat Politècnica de Catalunya), Prof. F.Xavier Trias (Technical University of Catalonia)

A Novel Hybrid RANS/LES Method by Residual Stress Offset for Wall-Bounded Turbulent Flow Simulation

***Q. Li**, G. Wang

Gray Area Mitigation through Volume Forcing for Hybrid RANS/LES Simulation of Complex Flows

A. Monot, C. Friess, E. Guilmineau, M. Visonneau, ***J. Wackers**

Wall-Model implementation for efficient Implicit LES in a Discontinuous Galerkin framework

F. Mangini, D. Regener Roig, F. Massa, A. Crivellini, ***A. Colombo**

Numerical Simulation of an Active Turbulence Grid for Replacement of Suction Side Heat Exchanger

***A. Akardere**, F. Czweilong, S. Becker

Wed, 22/07/2026 15:00 - 16:30

NM - 2 (Salzburg)

STS422C - Advanced Numerical Methods for Simulation, Optimisation and Validation for Applications in Aeronautics and Industry III - Advanced Numerical Methods

Main Organizer: Dr. Dietrich Knoerzer (Aeronautics Consultant)

Chaired by: Dr. Dietrich Knoerzer (Aeronautics Consultant), Prof. Jacques Periaux (cimne)

Green Aircraft Morphing Elevator Aero Optimization through Evolutionary Algorithm and Radial Basis Functions

D. Romano, ***D. Quagliarella**, M. Minervino, N. Montella

Non-Linear Corrector and Norm-oriented mesh adaptation for Reynolds-averaged Navier-Stokes equations

***T. Gauchery**, F. Alauzet

Numerical simulation of realistic aeronautical configurations using a coupled lattice-Boltzmann - Immersed Boundary solver

***R. JAEGER**, I. CHEYLAN, J. JACOB, J. FAVIER

Improving optimal focusing in computational simulation of cochlear implants with evolutionary algorithms

***D. Greiner**, M. Hernández-Gil, Á. Ramos-de-Miguel, G. Montero, J. Escobar

Flux Limiters for Mixed Element Volume Scheme

***A. Gobbi**, F. Alauzet, J. Vanharen

Wed, 22/07/2026 15:00 - 16:30

NM - 4 (Hamburg)

STS424B - Integrating AI and Fluid Dynamics II

Main Organizer: Prof. Yao Zheng (Zhejiang University)

Chaired by: Prof. Yao Zheng (Zhejiang University)

Enhancing Predictions of Unsteady Separated Flows via Super-Resolution and Reduced-Order Modeling

***Y. Huang**, F. Xie, T. Ji

A GPU-Accelerated AI-based Tools Framework for CFD-Based Ship Hull Design

***E. Costa**, B. Di Paolo, A. Krassas, P. Geremia, J. Linford, N. Ashton, I. Pegler, R. Ranade, A. Ghasemi, M. Machowski, M. Biancolini

Physics-Informed Neural Networks for the Design of ORC Supersonic Axial Turbine Stator Blades

***Ž. Tukovi?**, A. Horvat, I. Batisti?, L. Frani?in, S. Majer

Wed, 22/07/2026 15:00 - 16:30

NM - 5 (KK)

MS214C - Recent Trends in Scientific Computing for Computational Fluid Dynamics and Solid Mechanics in the Exascale Range III

Main Organizer: Prof. Stefan Turek (TU Dortmund University)

Chaired by: Prof. Stefan Turek (TU Dortmund University), Prof. Axel Klawonn (Universität zu Köln)

Coupling Rotating and Translating Meshes -- Performance Improvements for the Zonal Interfaces of the Flow Solver TRACE

***M. Clemens**, F. Schwarzenthal, G. Geiser

Improved Arithmetic Intensity in Preconditioned Krylov Subspace Method by Multiple Search Vectors

***A. Suzuki**

A Scalable Multigrid Solver with Reduced Synchronization and Enhanced Parallelism

T. Toprak, ***P. Hollmann**

Roofline-Driven Optimization of Fully Non-Uniform Octree and AMR on GPU

***J. Latt**, C. Coreixas

Hybrid Domain Decomposition for PDEs Using Neural Network Subdomain Surrogates

***V. Puklath**, D. Ghosh

Wed, 22/07/2026 15:00 - 16:30

NM - 3 (BB)

MS021A - Enabling Technologies for Digital Twins: Model Reduction And Scientific Machine Learning I

Main Organizer: Prof. Alvaro Coutinho (COPPE/Federal University of Rio de Janeiro)

Chaired by: Prof. Alvaro Coutinho (COPPE/Federal University of Rio de Janeiro), Prof. Gianluigi Rozza (SISSA)

Mixed-initiative engineering design: towards a more-than-human design process Keynote

***S. Elgeti**

When AI Meets Partition of Unity Finite Element Method – A Promising Paradigm for AI-Enhanced Computational Solid Mechanics

***Y. Guo**, X. Guo

DeepONet-FNO Surrogates for Multiphase Flow in Porous Media

E. Santos, ***G. Barros**, A. Oliveira, R. Silva, R. Freitas, D. Valiveti, X. Wu, F. Rochinha, A. Coutinho

Adaptive ?-Variational Autoencoders ROMs for Coupled Fluid Flow and Transport

G. Barros, R. Silva, ***A. Coutinho**

Digital twins for age-related chronic disease: applications in HIV, Alzheimer's and beyond

***A. Viguerie**, E. Iacomini, G. Bertaglia

Wed, 22/07/2026 15:00 - 16:30

H4 - 1 (Ludwig)

MS041D - Advances and Applications in Meshfree, Particle, and Peridynamic Methods IV

Main Organizer: Prof. Jiun-Shyan Chen (University of California, San Diego)

Chaired by: Dr. Mike Hillman (Karagozian and Case Inc.), Prof. Sheng-Wei Chi (University of Illinois Chicago)

A Computational Shell SPH–MCK Damage Framework for Failure Prediction in Sheet Metal Forming

H. Huang, Y. Jia, ***H. Naceur**

SoliDualSPHysics: An Open-Source GPU-Accelerated SPH Framework for Solid Mechanics and Fracture

***G. Moutsanidis**, M. Rahimi

Reaction volumes, Reaction Kinetics and Transport Discretisations.

***M. Kirkilionis**

3D-CFD Simulation of Water Spillage on a Center Console

***E. Rugerri**, D. Baeder, T. Indinger

Modelling and Predicting Snow Behaviour for Vehicle Applications

***E. Schlesinger**

Wed, 22/07/2026 15:00 - 16:30

H4 - 2 (Leopold)

MS004E - Data-Driven innovations and machine learning In aerodynamic analysis, optimization and uncertainty quantification V

Main Organizer: Dr. Esther Andrés Pérez (INTA)

Chaired by: Phd. Rodrigo Castellanos (Universidad Carlos III de Madrid), Dr. Domenico Quagliarella (CIRA)

Multi-Fidelity Modeling for Uncertainty Quantification of a Supersonic Aircraft Design

***E. Batur**, D. K?lç, M. Nikbay

Online learning of turbulence closure models via ensemble Kalman inversion and reinforcement learning

Y. Guan, ***K. Kostova**, P. Hassanzadeh

Multi-Fidelity Bayesian Optimization for Aerodynamic Design via Linear Gaussian Integration of Discrete Data and Physical Laws in Functional Form

***D. Maruyama**

Spatial Shock-Gated Mixture of Experts for Transonic Surface-Load Prediction

***M. Arnabat-Martin**, A. Mateo-Gabín, S. Lanzan-Ferran, G. Rubio, E. Valero

Wed, 22/07/2026 15:00 - 16:30

H4 - 3 (Franz)

MS227D - Modeling and Simulation of Additive Manufacturing: Part-Scale Approaches IV

Main Organizer: Prof. Christoph Meier (Technical University of Munich)

Chaired by: Dr. Magdalena Schreter-Fleischhacker (Technical University of Munich), Dr. Michael Stender (Sandia National Laboratories)

Optimizing Direct Energy Deposition Process Parameters for Enhanced Print Reliability and Quality

***A. Wiegink**, T. Koenis, J. Vroon

Scalable Multiscale Thermal Simulation of DED Additive Manufacturing using an Arlequin Approach

P. Barral, ***M. Picos**, P. Quintela, J. Rodríguez

Geometry-Dependent Heat Flow Mechanisms in Directed Energy Deposition Repair

***S. Yang**, X. Jin, L. Chechik

A PFEM based framework for numerical simulation of additive manufacturing processes

***P. Kadam**, K. de Payrebrune, L. Scheunemann

Part-Scale Layer Morphology and Residual Stress Simulation for Wire-Arc Additive Manufacturing

***M. Das**, C. Ayas, J. Wu

Simulation of Displacements and Residual Stresses During the Fabrication of Large, Additively Manufactured, Polymer Parts Using an Efficient Beam Based Approach

***I. Hepler**, W. Davids

Wed, 22/07/2026 15:00 - 16:30

H4 - 4 (Alois)

MS017B - Topology Optimization for Multidisciplinary Design II

Main Organizer: Dr. Shun Ogawa (The university of Tokyo)

Chaired by: Dr. Jan Oellerich (The University of Tokyo), Dr. Shun Ogawa (The university of Tokyo)

LLM-in-the-Loop Topology Optimization for Autonomous Microstructural Material Design

***S. Ogawa**, K. Suzuki

A Topology Optimisation Framework Incorporating Fracture and Contact

***M. Ciceri**, R. Hewson, M. Santer

PILLTOP: Multi-Material Topology Optimization of Polypills for Target Drug-Release Kinetics

R. Padhy, A. Chandrasekhar, ***A. Mirzendehtdel**

A Stress-Constrained Topology Optimisation Framework for Concurrent Material Distribution and Fibre Orientation in Composite Structures

***Z. Ullah**, B. Swarbrick, G. Gao, G. STEFANO

A Parallel-Driven Hybrid Reduced-Order Framework for Transient Heat Transfer Topology Optimization

***K. Yan**, Y. Yang, J. Yan

Structural topology optimization with contact via particle-added element connectivity approach

***Y. Choi**, G. Yoon

Wed, 22/07/2026 15:00 - 16:30

H4 - 5 (Xaver)

MS159A - Asymptotic-Preserving Schemes and Multiscale Approaches in Biology and and Fluid Dynamics I

Main Organizer: Dr. Clarissa Astuto (Universita' Degli Studi di Catania)

Chaired by: Dr. Clarissa Astuto (Universita' Degli Studi di Catania), Dr. Hridya Dilip (Ruhr-Universitat Bochum)

Higher-Order Ghost Finite Element Methods for the Navier-Stokes Equations on Moving Domains

***H. Dilip**, C. Astuto, A. Coco, G. Russo

A Multiscale Approach for vegetation patterning

G. Consolo, C. Currò, ***G. Grifò**, A. Iorio, G. Valenti, F. Veerman

An Adaptive Two-stage Algorithm for Error-Bounded Compression of Data Arising from Multiscale Physics

***R. Nuca**, M. Parsani

Fluid-Poromechanics Interaction in Human Brain Waste Clearance

***I. Fumagalli**, M. Corti, N. Parolini, R. Petrucci, P. Antonietti

Wed, 22/07/2026 15:00 - 16:30

H4 - 6 (Sissi)

MS254A - Structure Preserving Particle in Cell Methods I

Main Organizer: Prof. Eric Sonnendrücker (Max Planck Institute for Plasma Physics)

Chaired by: Prof. Eric Sonnendrücker (Max Planck Institute for Plasma Physics), Prof. Katharina Kormann (Ruhr University Bochum)

An explicit energy-conserving particle method for the Vlasov-Fokker-Planck equation

L. Ricketson, J. Yoo, ***J. Hu**

Mesh Refinement in Geometric Particle-In-Cell Methods

***J. Thiel**, E. Sonnendrücker

Geometric Numerical Discretization of Fully Kinetic and Hybrid Drift-Kinetic Electromagnetic Quasineutral Models

***N. Narechania**, G. Meng, E. Poulsen, E. Sonnendrücker

An implicit, conservative, asymptotic-preserving electrostatic particle-in-cell algorithm for arbitrarily magnetized plasmas

***G. Chen**, L. Ricketson, L. Chacon

Structure-preserving relativistic electromagnetic particle-in-cell simulations

***K. Kormann**, E. Hirvijoki, M. Prugger, E. Sonnendrücker

Wed, 22/07/2026 15:00 - 16:30

H4 - 7 (Maximilian)

MS371A - Dynamic fracture of materials and structures I

Main Organizer: Prof. Mahmood Jabareen (Technion - Israel of Technology)

Chaired by: Prof. Mahmood Jabareen (Technion - Israel of Technology), Prof. Pedro Areias (Instituto Superior Técnico)

Peridynamic Investigation of Cascading Crack Branching in Dynamic Brittle Fracture

***F. Bobaru**, D. Salzar, G. Stan

Experimental testing and numerical simulation of dynamic crack propagation in polyoxymethylene plates

***M. Kroon**

Experimental Characterization and Numerical Modelling of Two-Stage Fracture in Foam-Skin Bilaminates Under High Strain Rate Loading

***J. Mogk**, G. Baumann, G. Gstrein, S. Weber, C. Klug

Dynamic crack propagation in thin incompressible membranes at finite deformations

***M. Jabareen**

Wed, 22/07/2026 15:00 - 16:30

H4 - 8 (Eventcenter)

MS239B - Advances in Shape Optimization and Form-Finding for Engineering Design II

Main Organizer: Prof. Kai-Uwe Bletzinger (Technical University of Munich, Germany)

Chaired by: Prof. Thomas Rung (Hamburg Univ. of Technology), Prof. Daniel Tortorelli (Lawrence Livermore National Laboratory)

Adjoint-Based Aerodynamic Shape Optimization with a Manifold Constraint Learned by Diffusion Models

Keynote

***L. Chen**, E. Özkaya, J. Rottmayer, N. Gauger, Z. Shen, Y. Ye

Adjoint-based shape optimization of free-floating ships using ML-based propulsion surrogate models

***G. Bletsos**, M. Arian Maram, A. Hassan, T. Nguyen, T. Rung

An Unsteady Continuous-Adjoint Riemann SPH Shape-Optimization Approach

***E. Di Costanzo**, J. Marongiu, T. Rung

Identification of Ship Hull Roughness Parameters Using an Adjoint Optimization Method

***S. Alam**, T. Rung, G. Bletsos

SPGD: Steepest Perturbed Gradient Descent Optimization

A. Vahedi, ***H. Ilies**

Wed, 22/07/2026 15:00 - 16:30

BrainLab - Training

MS002A - Advanced Materials: Computational Analysis of Properties and Performance I

Main Organizer: Prof. Vadim Silberschmidt (Loughborough University)

Chaired by: Prof. Vadim Silberschmidt (Loughborough University)

Towards the Fatigue Behavior Assessment of Ni-Ti Biomedical Devices through the Integration of Different Predictive Approaches

Keynote

A. Brambilla, F. Berti, L. Patriarca, L. De Lorenzis, ***L. Petrini**

Crystal Plasticity Simulations and Machine Learning-Enhanced Modelling of Sub-Grain Structure in Ni-Based Superalloys

***P. Antonioni**, M. Ekh, K. Meyer

Data Driven Prediction of Fatigue Life in Welded Joints via Automated FE Simulations and Machine Learning Based Geometry Generation

***M. Harder**, F. Renken, M. Braun

Predicting mechanical properties of cast aluminium microstructures with phase-field damage and defect modelling

***R. Larsson**, M. Ekh

Full-field melt-pool characterisation in laser powder bed fusion using high-fidelity thermo-fluid simulations

***S. RODRIGUEZ**, P. Cardiff, P. Cosic, A. Ivankovic

Wed, 22/07/2026 15:00 - 16:30

NM - 6 (Munich)

MS105A - Kernel and Machine Learning-based Solutions of PDEs I

Main Organizer: Prof. ZHUOJIA FU (Hohai University)

Chaired by: Prof. ZHUOJIA FU (Hohai University), Dr. Zhiyuan Ma (Hohai University)

Physics-Informed Deep Energy Approach with Phase-Field Modeling for Coupled Thermo-Mechanical and Hydro-Mechanical Fracture

***H. Zhang**, M. Alamdari, B. Shahbodagh, M. Vahab, E. Atroshchenko

Several PDE solvers based on improved Physics-informed neural networks

***Z. Fu**

Machine Learning-based DPIM for the stochastic acoustic-vibration response analysis of underwater structure

***H. Chen**, G. Chen, D. Yang, Z. Fu

LMM-DPIM-based neural network model for the efficient stochastic shakedown and reliability analyses of printed circuit heat exchangers

H. Chen, ***Z. Ma**, Z. Fu, H. Chen

Numerical study of underwater acoustic radiation and propagation induced by structural vibration in ocean environments

***Q. Xi**, Z. Fu

Stochastic response analyses of various plate structures based on the hybrid GFDM-DPIM solver

***L. Li**, Y. Cao, H. Chen, Z. Fu

Wed, 22/07/2026 15:00 - 16:30

NM - 7 (Venice)

MS344A - Agentic AI and Physics-Informed Machine Learning for Next-Generation Design and Manufacturing I

Main Organizer: Prof. Seunghwa Ryu (KAIST)

Chaired by: Prof. Seunghwa Ryu (KAIST), Prof. YuanTong Gu (Queensland University of Technology)

A Variational-informed Neural Operator for Topology Optimisation Keynote

S. Xiao, J. Bai, H. Jeong, L. Gainey, Y. Xi, ***Y. Gu**

A Physics-Informed Machine Learning for Topological Optimisation of Patient-Specific Medical Plates

***B. Clark**, C. Brown, Y. Gu

Physically Consistent Inverse Design of Nonlinear Microstructures via Physics-Informed Diffusion Model

***J. Yu**, J. Byun, S. Ryu

Text-Guided Multiscale Topology Optimization for Mechanical Anisotropy Design with TPMS

***S. Kim**, H. Kim, N. Kang

LLM-Driven Multi-Agent Framework for Autonomous Topology Optimization

***H. Park**, H. Chung

Wed, 22/07/2026 16:30 - 17:00

Coffee Break

Wed, 22/07/2026 17:00 - 18:30

ICM - 1 Auditorium

MS283D - Recent Progress in Topology Optimization and Its Applications IV

Main Organizer: Prof. Junji Kato (Nagoya University)

Chaired by: Prof. Bin Niu (Dalian University of Technology), Prof. Josephine Carstensen (MIT)

An Integrated Computational Framework for Design Optimization and 3D Printing of Prestressed Concrete Structures

***E. Shakur**, O. Amir

Topology Optimization of Ductile and Quasi-Brittle Multi-Material Structures Based on Subloading Surface Model

***S. Nara**, K. Nishiguchi, J. Kato

Topology Optimization of Phase Change Material-embedded Vibroacoustic Structures for Thermally Switchable Transmission

***H. Jeong**, J. Hyun

Density-Based Topology Optimization for Turbulent Flows with Wall Functions: A Penalty Method for Enforcing Multiple Boundary Conditions

***A. Bayat**, H. Li, J. Alexandersen

An Interface-Enriched Topology Optimization for Mitigating the Effect of Surface Flaws in 3-D Brittle Solids

***M. Kosta**, S. Liu, A. Aragón

Wed, 22/07/2026 17:00 - 18:30

ICM – 2

MS020B - Large Deformation Beams and Shells: Formulation Advances and Innovative Applications II

Main Organizer: Prof. Enzo Marino (University of Florence)

Chaired by: Dr. Rainer Groh (University of Bristol), Prof. Enzo Marino (University of Florence)

A Thermo-viscoelastic Isogeometric Formulation for Programmable Geometrically Exact Beam Systems Keynote

F. Rahmani, G. Ferri, ***E. Marino**

A Virtual Element Formulation for 2-D Geometrically Exact Initially Curved Beams under Large Displacements and Rotations

***F. Chirianni**, P. Gaziano, G. Vairo, M. Marino, P. Wriggers

Viscoelastic Constitutive Modelling for Cable Simulation: A Computational & Experimental Assessment

***A. Shirke**, F. Schneider-Jung, J. Linn, O. Weeger

Chemoelastic Constitutive Modeling for Cosserat Beams

***J. Alzate**, B. Xu, O. Weeger

Finite element model for buckling analysis of angle-ply laminated beam type structures

***D. Bani?**, G. Turkalj, G. Štimac Ron?evi?, D. Lanc

MS097B - Machine Learning Methods for Aerospace Applications II**Main Organizer:** Dr. Alexander Ruetters (German Aerospace Center (DLR))**Chaired by:** Dr. Philipp Knechtges (German Aerospace Center), Prof. Günther Waxenegger-Wilfing (German Aerospace Center (DLR))

Symbolic Regression Aerodynamic Modeling for High-Speed Projectiles at High Angle of Attack Considering Physical Constraints

***T. Lin**, Y. Diao, G. Wang

Learning-Based Control of a Nonlinear and Constrained Liquid Rocket Engine

***J. Dauer**, V. Bareiß, E. Kurudzija, K. Dresia, J. Deeken, G. Waxenegger-Wilfing

Machine-learning surrogates for exploring progressive failure in composite impact

***I. Batista Paes de Oliveira**, F. Luiz de Silva Bussamra, F. Olmi

Multi-Fidelity Physics Informed Neural Networks for Nonlinear Pseudoshock Modeling in Scramjet Inlets

***D. Thiemann**, A. Peyvan, V. Narayanaswamy, L. Bravo Robles, G. Karniadakis

Finite-Element Method Based Neural Networks for Mechanical Building Blocks of Built Infrastructure: Beams, Frames and Plates

***P. Franz**, M. von Danwitz, A. Popp

Fast Infrared Signature Prediction with LBL accuracy from CFD using Machine Learning

M. Massa**, P. Borrelli, T. Astarita, R. Tognaccini**MS317B - Recent Advances in Mesh-free and Particle Methods II*Main Organizer:** Prof. Mitsuteru Asai (Kyushu university)**Chaired by:** Prof. Ahmad Shakibaeinia (Polytechnique Montreal), Dr. Abbas Khayyer (Kyoto University)

On the persistent zero-order consistency issue and background pressure for the conservative SPH fluid dynamics

***F. Wang**, X. Hu

Free-Surface Treatment with Surface Tension in the Least-Squares SPH Method

***K. Matsunaga**, S. Fujioka, K. Shobuzako, M. Asai

Generalized Multidirectional Coordinate Transformations for Spatially Varying Resolution in Eulerian SPH

***S. Fujioka**, K. Tsuji, N. Mitsume, M. Asai

Heat Conduction Analysis Using a Nonlocal Gradient Operator

***S. Kim**, S. Jin, J. Hong

A Multi-Resolution Meshfree Method for Mass Transfer with Cell-Membrane Permeation in the Brain Parenchyma

***T. Tsuzuki**, T. Matsuda, H. Wakimura, S. Ii

Particle Size Conversion for Mold Filling Analysis of Casting Processes using Particle-based SPH method

Y. Matsushima**, K. Miwa, Y. Maeda**MS184B - Theory-guided Design of Deep Learning-based Surrogates II*Main Organizer:** Dr. Nicola Rares Franco (MOX, Politecnico di Milano)**Chaired by:** Prof. Andrea Manzoni (Politecnico di Milano), Mr. Simone Brivio (Politecnico di Milano)

PIKS: Universal Physics Informed Kernel Methods

J. Bona-Pellissier, G. Meanti, M. Santacesaria, ***L. Rosasco**

Optimal sampling and natural gradient for fast online learning in non-linear reduced order models

A. Nouy, J. Soffo, ***A. Somacal**

Probabilistic neural operators for functional uncertainty quantification

***C. Bülte**, P. Scholl, G. Kutyniok

Enhanced surrogate modelling via Autodecoders and Neural ODEs

F. Regazzoni, ***G. Ziarelli**

Symmetric Convolutional AutoEncoders for Model Order Reduction

***G. Li Causi**, N. Tonicello, L. Magri, G. Rozza

Bridging Low- and High-Fidelity Simulations of Parametrized Time-Dependent PDEs with Multi-Fidelity Neural Operators

***M. Migliavacca**, A. Manzoni, A. Frangi

MS018F - Immersed Boundary Variational Methods: Theory, Data Structures, and Applications VI**Main Organizer:** Prof. Alexander Düster (Hamburg University of Technology)**Chaired by:** Mr. Jinhui Yan (University of Illinois Urbana Champaign)

NURBSLab: a flexible NURBS manipulation toolbox for Immersed Boundary Methods

H. Navarro-García, E. Nadal, R. Sevilla, J. Ródenas, ***J. Navarro-Jiménez**

Immersed isogeometric analysis with boundary conformal method for magnetostatics: challenges and remedies

***Y. Elbadry**, G. Guarino, P. Antolín, O. Weeger

A Posteriori Error Estimation for Interface Simplifications in Elliptic Problems

***P. Weder**, D. Grappein, A. Buffa

New Trends on the ROD method

***S. Clain**, D. Lopes, G. Machado, T. Malheiro, P. Pereira, R. Pereira, R. Costa

Unfitted Superposition Refinement for Moving Interfaces

J. Schmäke**, M. Ruess**MS300C - Bayesian Analysis and Model Calibration III*Main Organizer:** Dr. Lea Friedli (Technical University of Munich)**Chaired by:** Dr. Xinyu Jia (Technical University of Munich), Dr. Lea Friedli (Technical University of Munich)

Interpretability and identifiability limits in sequential parameter estimation for structural digital twins

***S. Ahamed**, S. Ali, A. Arockiarajan

Surrogate-enhanced Marginal Likelihood Estimation for Robust and Scalable Bayesian Model Selection in Physics-based Models

***V. Kumar**, A. Yildiz, D. Bhattacharya, N. Dirkes, S. Hegde, J. Kowalski

The Effect of Discretization Choice on the Uncertainty in the Reconstruction for X-Ray Reflectometry

***N. Lokhorst**, M. Schlottbom, R. van de Kruijs, M. Ackermann

Identification of Johnson-Cook, Thermal and Damage-related Material Parameters of S355MC Steel through Bayesian Inverse Analysis

***R. Jousen**, K. Prüfer, D. Ana, C. Hartmann, W. Volk, W. Wall, C. Meier

Adaptive Bayesian Experiment Selection for Expensive Computational Models

M. Dinkel**, D. Ana, B. Goderbauer, W. Wall**MS281A - Numerical Strategies for the Multi-Scale Modelling and Design of Advanced Materials with Complex Mechanical Response I*Main Organizer:** Dr. Igor A. Rodrigues Lopes (INEGI - Institute of Science and Innovation in Mechanical and Industrial Engineering)**Chaired by:** Dr. Igor A. Rodrigues Lopes (INEGI - Institute of Science and Innovation in Mechanical and Industrial Engineering), Mr. José Vila-Chã (Department of Mechanical Engineering, Faculty of Engineering, University of Porto)

Micromechanical Analyses of Strain Gradient Plasticity in Fibre-Reinforced Polymers

***A. Carvalho Alves**, I. Rodrigues Lopes, N. Klavzer, T. Pardo, P. Camanho

A Displacement-Based Solid Element for the Second-Order Computational Homogenisation of 3D Woven Composites

***A. Kumar**, A. K.W. Hii, S. R. Hallett, B. El Said

A Second-Order FE2 Approach to Hydraulic Fracturing in Porous Media

***E. Polukhov**, V. Marulkar, M. Keip

A Multiscale Approach for Multilayered Shell Structures Using a Refined Zigzag Theory

***M. Sorrenti**, F. Turon, F. Otero, A. Ferrer, X. Martinez

The 2D+ Multiscale Approach for Nonlinear Analysis of Multilayered Bending Flat Shells

J. Triclot, ***O. Lloberas-Valls**

4D printing: Programming Shape Morphing of Drying Foods via Symmetry Breaking Patterns

***R. van der Sman**, M. curatolo, L. Teresi

Wed, 22/07/2026 17:00 - 18:30

ICM - 12a

MS324C - Engineering and Mathematics for Environmental Care and Sustainability III

Main Organizer: Prof. Simona Perotto (Politecnico di Milano)

Chaired by: Prof. Patrizia Bagnerini (University of Genoa), Prof. Simona Perotto (Politecnico di Milano)

High-Throughput Characterization of Multi-Component Phase Separating Systems

***B. Frank**, B. Marelli

Piecewise DMD for Reconstructing and Forecasting Chemotaxis-Driven Soil Carbon Spot Patterns

***A. Monti**

A Digital Twin Framework For Sustainable Forest Management

***R. Fornaro**, F. Giannino, F. Carteni, D. Heathfield, V. Minopoli, L. Saulino

A Gradient-Flow Approach for Combined Layout-Control Design of Wave Energy Parks

***G. Ciaramella**, M. Gambarini, E. Miglio

Homogenization-Based Approach to Modeling Plant Tissue Dynamics

F. Magni, ***N. Mondini**, V. Pederzoli, N. Ferro, D. Avitabile, S. Perotto

Wed, 22/07/2026 17:00 - 18:30

ICM - 12b

MS224C - Machine Learning Frontiers in Multiscale and Materials Modeling III

Main Organizer: Prof. Chuin-Shan (David) CHEN (National Taiwan University)

Chaired by: Dr. Chun-Wei Pao (Academia Sinica), Prof. Shigenobu Ogata (The University of Osaka)

Machine?Learning Interatomic Potentials Unveil the Fundamental Mechanisms of Hydrogen Embrittlement

***S. Ogata**

Predicting Morphology and Hydrogen Coverage of Ru Nanoparticle via Multiscale Modelling

W. Xuan, Y. Liu, ***H. Chen**

KAN-EAM and KAN-SNAP Potentials for Five-Element High-Entropy Alloys Trained from VASP Trajectories

***H. Huang**, C. Pao

A Resource-Efficient Hybrid Quantum–Classical Force Fields for Large-Scale Molecular Dynamics

***H. Cheng**, C. Pao

Modeling Grain Evolution by Mechanics-based Graph Neural Cellular Automata

***W. Lee**, Y. Chou, Y. Guo, C. Lee, C. Pao, T. Huang

Reverse Design of Bio-inspired Layered Structures Combining Deep Learning and Reinforcement Learning

***H. Mao**, C. Yu

Wed, 22/07/2026 17:00 - 18:30

ICM - 13a

MS090E - Machine Learning For Computational Mechanics Across Scales V

Main Organizer: Prof. Fadi Aldakheel (Leibniz Universität Hannover)

Chaired by: Prof. WaiChing Sun (Columbia University), Prof. Yousef Heider (Universität Kassel)

Recent Advances in Graph-based Neural PDE Solvers

L. Tesan, M. Iparraguirre, P. Martins, I. Alfaro, D. Gonzalez, ***E. Cueto**

Graph-Based Physics-Informed Neural Networks for PDE Solving

***P. Urdeitx**, F. Chinesta, E. Cueto

Thermodynamics-Informed Graph Neural Networks for Efficient Generalizable Welding Simulation via the GENERIC Formalism

***B. Ronquillo**, D. Canales, A. Durán-Rosal, D. González, E. Cueto

Development of a Defect Estimation Method for CFRP Interstage Structures with Holes Using Finite Element Analysis and Graph Neural Networks

***K. Nishioka**, Y. Kojima, T. Saito, M. Washiya, K. Kawakami, M. Muramatsu

A Physics-Informed Graph Neural Network Conserving Linear and Angular Momentum for Dynamical Systems

***V. Sharma**, O. Fink

Fourier-Embedded PINNs Integrated with Sparse DIC Data for Mechanical Modeling and Uncertainty Quantification of Metamaterials

***J. Liu**, B. Yi

Wed, 22/07/2026 17:00 - 18:30

ICM - 13b

MS426F - Data-driven Approaches in Mechanics VI

Main Organizer: Prof. Kostas Karapiperis (EPFL)

Chaired by: Prof. Kostas Karapiperis (EPFL), Prof. Yue Yu (Lehigh University)

FEM-Bench: A Structured Scientific Reasoning Benchmark for Evaluating Code-Generating LLMs

S. Mohammadzadeh, E. Hamdi, J. Shor, ***E. Lejeune**

Predicting Effective Coefficients of Perforated Conductive Media: A Hybrid Asymptotic Homogenization and Machine Learning Approach

***H. Bojorquez-Marrufo**, J. Bravo-Castillero, J. Perez-Gonzalez, R. Guinovart-Díaz

Data-Gap Resistant Learning of Partially Known Dynamics Using Physics-Informed Neural Networks

***H. Zeipel**, V. Schnückerl, J. Schütte, W. Sextro

A Comparative Study of Hybrid Modeling Approaches for Nonlinear Dynamic Systems Using Additive Discrepancy Compensation

***M. Wohleben**, J. Schütte, W. Sextro

A Data-Driven Framework for Linear Solver Selection in Computational Mechanics

***H. Liu Weng**, H. Bungartz, F. Dietrich

Wed, 22/07/2026 17:00 - 18:30

ICM - 14a

MS031B - Open-Source Software in Mechanics II

Main Organizer: Dr. Vladislav Yastrebov (MINES Paris, PSL University, CNRS)

Chaired by: Prof. Lukasz Kaczmarczyk (University of Glasgow)

The 4C Multiphysics Framework

L. Engelhardt, A. Gebauer, G. Hammerl, ***M. Mayr**, C. Meier, A. Popp, P. Praegla, C. Schmidt, I. Steinbrecher, W. Wall

Cast3M, an Open Source Numerical Simulation Code for Structural and Fluid Analysis

***F. Di Paola**, M. Breuzé, O. Fandeur, S. Gounand, S. Pascal, P. Verpeaux, C. Berthier

Akantu: a finite-element code for fracture and contact mechanics

***G. Anciaux**, N. Richart, J. Molinari

tatva: A Monolithic Differentiable Framework for Scalable, Energy-Centric Mechanics

***M. Pundir**, F. Lorez, D. Kammer

GalerkinToolkit.jl: Towards a Multi-Purpose and Multi-Platform Finite Element Toolbox in Julia

***F. Verdugo**, X. Ouyang

The FLATiron Toolkit: A Versatile Open-source Modeling Framework for Flow and Transport Phenomena

N. Rovito, J. Holmes, ***D. Mukherjee**

Wed, 22/07/2026 17:00 - 18:30

ICM - 14b

MS026G - Contact and Interface Mechanics: Modeling and Computation VII

Main Organizer: Prof. Michel Raous (Laboratoire de Mécanique et d'Acoustique - CNRS - France)

Chaired by: Prof. Michel Raous (Laboratoire de Mécanique et d'Acoustique - CNRS - France)

Solving contact problems using Fiber Monte Carlo

X. Wang, W. Xu, ***T. Xue**

Assessment of Interfacial Bonding Effects on the Structural Response of HBU SNF Rods under Quasi-Static and Dynamic Loading

***G. Jeong**, S. Lee

Predictive Wear Assessment of Plain Bearings in Variable Stator Vanes: Accounting for Geometric Tolerances in Early-Stage Design

***V. Fouquet**, P. Guidault, F. Louf, P. Boucard, J. Lexilus, N. Serres, A. Ahye

A computational analysis of interface conditions during hot compression bonding of Al-6061 specimens

***M. Hazan**, E. Priel

Wed, 22/07/2026 17:00 - 18:30

ICM - 14c

MS083C - Multiscale Computational Homogenization for bridging scales in the mechanics and physics of complex materials III

Main Organizer: Prof. Julien Yvonnet (Universite Gustave Eiffel)

Chaired by: Mr. Antoine Martin (CEA Cadarache)

Homogenization of continuously embedded sub-structures in hyperelasticity

***T. Fries**, J. Neumeyer, M. Sojer, M. Kaiser

X-FFT: Uniting X-FEM Accuracy with FFT Efficiency for Mechanical Homogenization in 3D

***F. Gehrig**, M. Schneider

A Fully Coupled Monolithic Finite Element Framework for Pore-Scale Hydromechanical Processes in Porous Media

***L. Zhang**, N. Collins-Craft, P. Braun

Multiscale modelling of particles transport in deforming porous media based on homogenization

***E. Rohan**, V. Lukeš, J. Heczko

NanoMic: A Two Scale Homogenization Coupling using Molecular Statics and the Finite Element Method

***A. Neelakandan**, K. Albe, B. Eidel

Multiscale Modelling of Shell Structures with Lattice-Like Microstructures

***J. Ochs**, J. Wackerfuß

Wed, 22/07/2026 17:00 - 18:30

ICM - B11

MS132F - Machine Learning and AI in Constitutive Modeling of Complex Materials VI

Main Organizer: Dr. Francisco Sahli Costabal (Pontificia Universidad Católica de Chile)

Chaired by: Prof. Nikolaos Bouklas (Cornell University & Pasteur Labs), Dr. Nikolaos Napoleon Vlassis (Rutgers University)

Towards Physics-Informed Artificial General Intelligence for Food

B. Boes, L. Boyle, R. Dunne, H. Holthusen, A. Koosis, S. St. Pierre, V. Tac, T. Vervenne, ***E. Kuhl**

Constitutive learning of feature-dependent texture in hydrated materials

***B. Boes**, J. Simon, H. Holthusen, E. Kuhl

A comparative organoleptic analysis of shrimp texture

***A. Koosis**, E. Kuhl, V. Tac

A Comprehensive Mechanical and Sensory Comparison of Mycelium, Fruiting Body, and Blended Protein Fungi-Based Steaks

***S. St. Pierre**, T. Vervenne, E. Darwin, E. Kuhl

Automated Model Discovery and Mechanical Analysis of Fungi-Based Meats

***L. Boyle**, M. Goodson, M. Palomares, N. Zhang, S. St. Pierre, E. Kuhl

Generative AI for Food Discovery - Assessing the Taste and Texture of AI-made Burgers

***V. Tac**, C. Gardner, E. Kuhl

Wed, 22/07/2026 17:00 - 18:30

ICM - B12

MS302B - Computational Mechanics With Free and Moving Boundaries: Methods and Applications II

Main Organizer: Dr. Rekha Rao (Sandia National Laboratories)

Chaired by: Dr. Rekha Rao (Sandia National Laboratories), Dr. David Noble (Sandia National Laboratories)

Quasi-Steady-State Formulation of the Dissolution Boundary in HPHT Diamond Single Crystal Growth

***J. Derby**, E. Enos, M. Hainke, M. Lang, M. Durmus, J. Friedrich, I. Ponomarev

Generalization of an arbitrary-Lagrangian Eulerian Method to 3D Free-Surface Flows

***T. Benkley**, S. Deparis, P. Ricci, A. Mortensen

Simulation and Optimization of Horizontal Ribbon Growth

M. Farah, ***B. Helenbrook**

Adaptive Interface-Conforming Discretization Methods for Simulating the Performance of Implicit Neural Designs

***D. Noble**, J. Tencer, J. Needels

Modelling submerged rigid bodies: numerical and experimental assessments

***E. Zamora**, M. Cruchaga, L. Battaglia, M. Storti

Wed, 22/07/2026 17:00 - 18:30

ICM - B13

MS419B - Computational Models for the Nucleation and Propagation of Fracture in Solids Under Quasi-Static and Dynamic Loading Conditions II

Main Organizer: Prof. John Dolbow (Duke University)

Chaired by: Prof. Oscar Lopez-Pamies (University of Illinois at Urbana-Champaign)

Stochastic Modeling of Anisotropic Strength Surfaces from Atomistic Simulations

***A. Bonacci**, J. Dolbow, J. Guilleminot

Robust Crack Propagation With X-FEM: A Study of the Impact of the Level Set Error on the Results

***N. Poyet**, P. Duranton, O. Ancelet, E. Feulvarch

Crack nucleation from Foreign object damages in metals

B. Lange, J. Albiez, W. Nöhring, F. Rienäcker, ***J. von Lautz**

Micromorphic Variational Cohesive Gradient Damage Models to Describe Brittle Fracture Discretized by the Hybrid High Order Method

***P. Nava Soto**, T. Helfer, J. Scherer, O. Fandeur, A. Jaccon, J. Besson

The Nine Circles Of Elastic Brittle Fracture

F. Kamarei, B. Zeng, ***J. Dolbow**, O. Lopez-Pamies

Wed, 22/07/2026 17:00 - 18:30

ICM - B21

MS262B - Advances of Quantum and Quantum-Inspired Algorithms for Solving Flow Simulation Problems II

Main Organizer: Prof. Thomas Rung (Hamburg Univ. of Technology)

Chaired by: Mr. Paul Over (Hamburg Univ. of Technology)

Parameter-Efficient Hybrid Quantum PINNs for Resolving Shocks in two-phase Buckley–Leverett Flow

***N. Azatbekuly**, B. Daribayev, A. Mukhanbet, T. Imankulov

Operator Learning for efficient Quantum Computation

***P. Over**, S. Bengoechea, L. Borello Busilacchi, M. Kiffner, T. Rung, A. Michailidis

Tensor-Programmable Variational Quantum Algorithms for Flow Simulations

***P. Siegl**, N. van Hülst, G. Reese, T. Hashizume, D. Jaksch

Quantum Dynamics Simulation of the Advection-Diffusion Equation

H. Alipanah, D. Madrid, F. Zhang, Y. Yao, R. Thompson, N. Nguyen, J. Liu, ***P. Givi**, B. McDermott, J. Mendoza-Arenas

Solving the Burgers Equation on Superconducting Quantum Processors

***J. Jesus**, A. Setty, F. Cárdenas-López, F. Motzoi

Wed, 22/07/2026 17:00 - 18:30

ICM - B22

MS274B - Computational plasticity: theoretical development and its applications II

Main Organizer: Prof. Li-Wei Liu (National Taiwan University)

Chaired by: Dr. Slavomir Parma (Institute of Thermomechanics of the Czech Academy of Sciences), Prof. Li-Wei Liu (National Taiwan University)

Computational investigation on plastic flows of cellular composites Keynote

C. Chuang, G. Yu, ***L. Liu**, C. Huang, S. Chang

Non-linear Calibration Procedures for Advanced Complex Multiaxial Creep Model

***D. Gabriel**, J. Masák, J. Kopařka, S. Parma

Modeling of the Elasto-Plastic Material Behavior of Basal Textured Magnesium Alloys

***K. Mokroß**, A. Nischler, O. Huber

Dislocation and twin mediated high strain rate deformation of single crystal beta-HMX

***V. Agrawal**, K. Larkin

Life Prediction of Nickel-Based Superalloy Turbine Blades Using Crystal Plasticity Finite Element Method

***S. Shaw**, R. Periwal, S. Chatterjee, A. Alankar

MS130C - Advances in discretization techniques, element technology, mesh adaptivity, and solution strategies for inelasticity, contact, localization, and failure III**Main Organizer:** Dr. James Foulk III (Sandia National Laboratories)**Chaired by:** Prof. Julian Rimoli (University of California, Irvine), Dr. Michael Buche (Sandia National Laboratories)Arbitrary-Order Contact Formulation Using Tensorial Lagrange Multipliers in $H(\text{div})$ Space Tailored for an Exact Schur Complement Preconditioner***A. Shvarts**, I. Athanasiadis, K. Lewandowski, C. Runcie, A. Bijaya, R. Williams, A. McBride, P. Steinmann, C. Pearce, L. Kaczmarczyk

On The Differentiability of the Gap Function

***E. Chin**, M. Tupek, R. Lutz, K. Swartz, J. Wang, R. Rieben

Hybrid Fe–Al Methodology For Predicting Wheel–Rail Contact Behavior

***M. Moreira Lopes**, V. Lima, R. Souza, F. Profito, I. Machado, L. Driemeier

Novel Two-step Method to Compute Stresses in Rigid Bodies and Rigid Inclusions

***J. Boungard**, J. Wackerfuß

Arbitrary-order virtual element methods for high-order phase-field modeling of dynamic fracture

***Y. Leng**, H. Mourad

Application of the 10-node composite tetrahedral framework to impact and fracture via mesh adaptivity

J. Foulk**, A. Stershic, D. Noble, M. Veilleux, M. Merewether, M. Staten, R. Wilson, D. Torres, J. Dolbow**MS134A - Multiphysics-Driven Fracture & Damage Simulation: Bridging Scales and Fields I*Main Organizer:** Dr. Leong Hien Poh (National University of Singapore)**Chaired by:** Dr. Leong Hien Poh (National University of Singapore)A rigorously convergent and irreversible gradient damage model Keynote***H. Yu**, H. Huang

Mesoscopic Modeling of Corium-Concrete Interaction during Severe Nuclear Accidents

***M. Laaziri**, S. Semenov, M. Antoni, R. Chauvin

A Thermomechanically Coupled Visco-Elasto-Plastic Model with Nonlocal Damage for Semi-Crystalline Thermoplastics

***T. Liu**, X. Li, M. Tabib, M. Giresberg, J. Cui, J. Neumann, H. Celik, M. Valsecchi, C. Hopmann, S. Kumar, J. Fish, J. Simon

Optimal Continuous-Domain Sensor Placement for Vibration-Based Parameter Identification

***O. Saleem**, T. Suchan, V. Schulz, K. Welker

Fracture and Delamination Prediction in Solid Oxide Electrolysis Cells via Multiphysics Finite Element Simulation in ANSYS

L. Meng**, M. Muramatsu**MS038B - Simulation and Modeling Approaches in 3D Concrete Printing II*Main Organizer:** Dr. Robens-Radermacher Annika (Bundesanstalt für Materialforschung und -prüfung)**Chaired by:** Dr. Giacomo Rizzieri (Politecnico di Milano), Dr. Robens-Radermacher Annika (Bundesanstalt für Materialforschung und -prüfung)

Viscoplastic Modeling of Shotcrete 3D Printing Material

***Q. La**, K. Meyer, S. Kollmannsberger, R. Jänicke

Assessing structural failure in extrusion-based 3D concrete printing using a smoothed Mohr-Coulomb model with non-linear hardening

***-. Saif-Ur-Rehman**, A. Robens-Radermacher, R. Wolfs, J. Unger

Coupled Chemo-Thermo-Poromechanical Models to Simulate Printing and Ageing of 3D Concrete

***M. Pierre**, S. Ghabezloo, P. Dangla, R. Mesnil, M. Vandamme, J. Caron

Numerical Modeling of Buildability in Extrusion-Based 3D Concrete Printing Considering Ambient Temperature and Realistic Layer Geometry

***A. Robens-Radermacher**, S. Ur-Rehman, G. Rizzieri, J. Unger

Wed, 22/07/2026 17:00 - 18:30

ICM - 41 (Ostersee A)

MS293A - Multilevel, Multiscale, and Hierarchical Machine Learning Methods for Scientific Machine Learning I

Main Organizer: Dr. Graham Harper (Sandia National Laboratories)

Chaired by: Dr. Graham Harper (Sandia National Laboratories), Dr. Jonas Actor (Sandia National Laboratories)

Multilevel Training and Preconditioning for Kolmogorov-Arnold Networks

***G. Harper**, J. Actor, E. Cyr, B. Southworth

Multi-Level Patch Diffusion Models

***S. Jiang**, E. Cyr, G. Zhang, Z. Zhang, A. Heinlein

A multilevel proximal trust-region method for nonsmooth optimization with applications

R. Baraldi, M. Hintermüller, ***Q. Wang**

Multilevel Training of Convolutional Kolmogorov-Arnold Networks via Nested Spline Refinement

***D. McBride**

Multi-fidelity graph-based neural networks architectures to learn Navier-Stokes solutions on non-parametrized 2D domains

***F. Songia**, R. Salle de Chou, H. Talbot, I. Vignon-Clementel

Majorization Minimization for Neural Network Training

R. Baraldi, ***A. Javeed**, D. Kouri

Wed, 22/07/2026 17:00 - 18:30

ICM - 43 (Eibsee)

MS291A - Reasoning Active Flow Control I

Main Organizer: Dr. Markus Rütten (German Aerospace Center - DLR)

Chaired by: Dr. Markus Rütten (German Aerospace Center - DLR)

Vorticity and Energy Dynamics for Flow Control

***M. Rütten**

Bayesian Optimization of Synthetic Jet Actuator Parameters Using a Gaussian-Process Surrogate

***J. Ventura Siches**, A. Nabhani, J. Bergadà, J. Pons-Prats, G. Bugeđa

Numerical Investigation of Transonic Leading Edge Vortex Control by Steady Blowing

***M. Werner**

Feedback Control of Dynamic Stall Using Plasma Actuators Based on Laminar-Separation-Bubble Characteristics in Pitching Airfoil Flow

***R. Ozono**

Viscoelastic Turbulent Channel Drag Reduction via Opposition Control Using Multi-Agent Reinforcement Learning

***U. Sharma**, M. Beneitez, L. Prah, S. Mirjalili, R. Vinuesa, O. Tammisola

Wed, 22/07/2026 17:00 - 18:30

ICM - 44 (Schliersee)

MS072A - Advances in Multiscale Modeling and AI for Materials Design I

Main Organizer: Prof. Shu-Wei Chang (National Taiwan University)

Chaired by: Prof. Chia-Ching Chou (National Taiwan University), Prof. Shu-Wei Chang (National Taiwan University)

A Deep Learning–Driven Approach for Optimizing 1D Phononic Crystals

***I. Chang**, S. Liao

FEA-Assisted Cutting Force Prediction for Precision Machining Considering Steel Constitutive Properties

***P. Hung**, P. Chen, S. Lin, C. Chou, P. Chang, W. Li

Machine Learning-Enabled Multiscale Modeling of Phase Stability in 2D Perovskites

S. Najman, P. Yang, D. Moradas, ***C. Pao**

Wed, 22/07/2026 17:00 - 18:30

ICM - 31 (Zugspitze)

MS383B - Machine Learning-Enhanced Solvers for Partial Differential Equations in Computational Science II

Main Organizer: Prof. Ioannis Kalogeris (National Technical University Of Athens)

Chaired by: Prof. VISSARION PAPADOPOULOS (National Technical University of Athens), Dr. Gerasimos Sotiropoulos (N.T.U.A.)

Uncertainty-Aware Operator Learning for Parametric PDEs Using Gaussian Processes

***S. Kumar**, R. Nayek, S. Chakraborty

Structure-preserving deep operator networks to the Boltzmann equation

L. Chaichenets, M. Frank, S. Krumscheid, ***Y. Tang**

Physics-Informed Neural Networks for Bending Analysis of Bi-Directionally Functionally Graded Microbeams

***M. Akp?nar**, B. Delikta?, A. Tariq, B. Uzun, M. Yayl?

Differentiable-Chemistry PINNs for the Transient Flamelet Equation: Memory-Light Surrogates for Stiff Non-Premixed Combustion

***S. Posch**, M. Babic, F. Rohrhofer, J. Garcia-Oliver, R. Novella

Data–Free Surrogate for Polymer Thermo–Oxidation by Boundary–Parametrized Multi–PINNs

***A. Assi**, E. Goncalves da Silva, A. Ammar, M. Beringhier

Stochastic Manifold-Aware Neural Preconditioning for Parametric Elliptic PDES

A. Konstantinos, S. Gerasimos, S. George, ***V. Papadopoulos**

Wed, 22/07/2026 17:00 - 18:30

ICM - 32 (Watzmann)

MS237B - Recent Advances in Scientific Machine Learning for Differential Equations and Control Problems II

Main Organizer: Dr. Hendrik Kleikamp (University of Graz)

Chaired by: Dr. Hendrik Kleikamp (University of Graz)

Global Convergence of Adjoint-Optimized Neural PDEs

***K. Riedl**, J. Sirignano, K. Spiliopoulos

Learning Structured and Physically Consistent Models from Data

***E. Morina**, M. Holler

Learning When and How to Filter: Reinforcement Learning for Convection-Dominated Flows

***A. Ivagnes**, M. Strazzullo, G. Rozza

An Efficient Neural Network Framework Based on Jacobi Wavelets for Solving Nonlinear Ordinary Differential Equations

***S. Dey**, S. Dubey

Evolving Clusters: A Dynamical Perspective on Time-Dependent Mixture Models

A. Basti, F. Camilli, ***A. Festa**

Wed, 22/07/2026 17:00 - 18:30

BrainLab - Auditorium

MS181B - Computational Brain Multiphysics II

Main Organizer: Dr. Ivan Fumagalli (Politecnico di Milano)

Chaired by: Mr. Marius Causemann (Simula Research Laboratory), Prof. Kent-Andre Mardal (Simula Research Laboratory / University of Oslo)

Bridging Systemic and Intracranial Circulations using a 1D-0D Arterio-Venous Model Keynote

***L. Müller**, L. Mansilla Alvarez, C. Dalmaso, E. Toro, R. Albuquerque Pacheco Andrade, P. Blanco

The relation of microvascular pulsatility and mechanical properties

***H. Rundfeldt**, M. Báez-Yáñez, C. Lee, J. Zwanenburg, H. Kim, N. Petridou

An adaptive high-order polytopal method for modeling neuronal electrophysiology

***C. Leimer Saglio**, S. Pagani, P. Antonietti

Hybridized Discontinuous Galerkin Discretization for a Mathematical Model of Multiple Sclerosis

S. Bertoluzza, C. Prud'homme, G. Bretti, ***M. Pennacchio**

Detecting Seizures through Bifurcation in Neuron Dynamics

***N. Kumar**, S. Pagani, P. Antonietti

Wed, 22/07/2026 17:00 - 18:30

NM - 1 (Multimedia Saal)

MS360A - Recent Progress on Interface Problems: Multiscale Modeling, Numerics and Analysis I

Main Organizer: Dr. Chaozhen Wei (University of Electronic Science and Technology of China)

Chaired by: Dr. Chaozhen Wei (University of Electronic Science and Technology of China), Dr. Shuyang Dai (Wuhan University)

A unified variational model for grain boundary dynamics incorporating microscopic structure

***Y. Xiang**, L. Zhang, X. Qin

Data-Driven Dimension Reduction Analysis of the Minimum Energy Path in Solid-State Phase Transition

***H. Wang**

Bound-perserving Numerical Scheme of Bulk-Membrane Coupled Models

***X. Zhao**, X. Chen, J. Shen

Interfacial Self-Assembly of Carbon Nanotubes at Immiscible Liquid Interfaces: A Computational Study

***S. Eom**, Y. Shin, J. Kwon, B. Kim

Molecular Aggregation and Phase Separation Behavior in Aqueous Binary mixtures

R. Singh, J. Ryu, ***J. Choi**

Wed, 22/07/2026 17:00 - 18:30

NM - 2 (Salzburg)

STS412A - MBSE Technologies In Civil Air Transportation I

Main Organizer: Dr. Wen BAI (Chinese Aeronautical Establishment (CAE))

Chaired by: Dr. Lefeng LYU (Chinese Aeronautical Establishment), Ms. Yifan Zhang (Tsinghua University)

Research on Digital Requirements Modeling for Quad-tiltrotor High-Speed Civil Rotorcraft

*Y. Li, L. Lv, X. Wu

Design Technology of Low-Altitude Spectrum Monitoring System Based on MBSE

*F. He, H. Bai, X. Wang, D. Yang

A Minimal Operational Unit–Based Decoupled Optimization Framework for Aerial Emergency-Response System-of-Systems Layout

*G. Wang, W. Cheng, H. Feng, Y. Wu

Low-altitude Air Transportation System Architecture Development based on UAF

Q. Wang, *W. Li, S. Liu, J. Yuan

Research on System Architecture Modelling Method for Civil Rotorcraft Using SysML V2

*X. HE, F. TAO, F. XIE, W. BAI

Safety Assessment Methods of Multi-modal Complex Avionics Systems based on MBSA

*C. ZHAO, Z. Jin

A Compartment-perspective Methodology for Modeling and Analyzing Complex Aircraft Integration Assembly Processes: An Extended Application of the RFLP Framework

*Y. Zhang, L. Li

Wed, 22/07/2026 17:00 - 18:30

NM - 4 (Hamburg)

STS424C - Integrating AI and Fluid Dynamics III

Main Organizer: Prof. Yao Zheng (Zhejiang University)

Chaired by: Prof. Yao Zheng (Zhejiang University)

A Hybrid CNN-based Fourier Neural Operator for Airfoil Flow Field Prediction

X. Wang, *S. Chen, D. Li, X. Lu, M. Jia, J. Yu

Wed, 22/07/2026 17:00 - 18:30

NM - 5 (KK)

MS115A - Computational Fluid Dynamics for Safety, Security and Defense I

Main Organizer: Prof. Markus Klein (Institute of Applied Mathematics and Scientific Computing, University of the Bundeswehr München)

Chaired by: Prof. Markus Klein (Institute of Applied Mathematics and Scientific Computing, University of the Bundeswehr München), Dr. Tony Di Fabbio (Politecnico di Torino)

Towards Simulation-Based Certification: Recent Flight Physics Activities at DLR Keynote

*P. Bekemeyer, S. Geisbauer

Model Uncertainty Quantification Using Adjustable Turbulence Resolution

*R. Mörsch, E. Tangermann, M. Klein

Robust High-Fidelity Dataset-Based Shape and Structure Optimization for Aircraft Design

*M. Maier, K. Sørensen-Libik, Ö. Petersson, C. Breitsamter

Multifidelity Aerodynamic Modelling through Uncertainty-Aware Bayesian Neural Network Fusion

*F. Dunkes, C. Breitsamter

Wed, 22/07/2026 17:00 - 18:30

NM - 3 (BB)

MS021B - Enabling Technologies for Digital Twins: Model Reduction And Scientific Machine Learning II

Main Organizer: Prof. Alvaro Coutinho (COPPE/Federal University of Rio de Janeiro)

Chaired by: Prof. Gianluigi Rozza (SISSA), Prof. Alvaro Coutinho (COPPE/Federal University of Rio de Janeiro)

Hybrid Physics-AI Digital Twins of the Earth's Climate Keynote

*G. Mengaldo

Construction, Verification, and Validation of a Machine Learning Surrogate Model to Predict Flow in Occluded Coronary Arteries

*D. Parsons, A. Fisher

POD Based Reduced Order Modeling for Underground Mine Ventilation Systems

*S. Ben Youssef, M. Ben Hassen, H. Mrad, H. Marouani

Data-Driven Prediction of Motor Winding Temperature with Lightweight Neural Network Models for Embedded Applications

*H. Jeong, Y. Hwang, G. Noh

Digital Twins for sloshing fluids: Coupling Computer Vision with Thermodynamics-informed Deep Learning

*A. Tierz, I. Alfaro, D. González, E. Cueto

Wed, 22/07/2026 17:00 - 18:30

H4 - 1 (Ludwig)

MS253A - Computational Geomechanics I

Main Organizer: Prof. Jinhyun Choo (Seoul National University)

Chaired by: Prof. Jinhyun Choo (Seoul National University), Prof. Jidong Zhao (Hong Kong University of Science and Technology, Hong Kong)

Knowledge-Driven Neural Networks for Constitutive Relations Discovery and Stress Integration in Geomechanics Keynote

***P. ZHANG**

A Dynamic Stabilization Scheme for Salt Cavern Simulations

***H. Tasinafo Honório**, A. Franceschini, M. Ferronato, H. Hajibeygi

Inertial Effects in Fluid-Driven Rupture Under Ultimately Stable Conditions

***R. Ferry**, M. Antunes, X. Yang, B. Lecampion, J. Molinari

Oedometer DEM Simulations of Glass Ballotini Using Rough Contact Model Considering Plastic Unloading

***X. Zhang**

Horizontal Load Tests and Physics-Informed Learning for Soil–Pile Interaction in Solar Tracker Systems

***A. de Assis**, L. Zampieri, M. Garcia

Wed, 22/07/2026 17:00 - 18:30

H4 - 2 (Leopold)

MS016A - Scientific Machine Learning for Nonlinear Model Reduction I

Main Organizer: Prof. Boris Kramer (University of California San Diego)

Chaired by: Prof. Boris Kramer (University of California San Diego), Prof. Benjamin Peherstorfer (Courant Institute of Mathematical Sciences, New York University)

Model order reduction through projection onto random features Keynote

***F. Dietrich**

Hyper Reduction on Retraining of Data-Augmented Predictive Deep Neural Network

***S. Sun**, L. Feng, P. Benner

Nonlinear Model Reduction: Combining the Descriptive Power of ODEs with Neural Networks in a Universal Differential Equation

***G. Doehner**, E. Liebke, C. F. Silva

Reduced modeling of chaotic, turbulent, and stochastic systems via population dynamics

***B. Peherstorfer**

Evidence-Based Prediction of Thermoacoustic Limit Cycles with Bayesian Neural Networks

***A. Zimmermann**, M. Désor, W. Polifke

Wed, 22/07/2026 17:00 - 18:30

H4 - 3 (Franz)

MS087A - Data-Driven Computational Mechanics and AI for Advanced Materials and Multiphysics Systems I

Main Organizer: Dr. Lijun Liu (The University of Osaka)

Chaired by: Dr. Lijun Liu (The University of Osaka)

In-situ X-ray computed tomography based convolutional networks for polymeric foam material modelling

***R. Auenhammer**, F. Wöhr, W. Wei, B. Camprubi

Inverse model for predict turbidity current characteristics based on graph neural networks

***V. Dorneles Jr**, K. Ruschel, L. Kupssinskü, B. Scapin

Multilayer Stacking Method for Measuring In-Plane Thermal Conductivity of Nanoscale Thin Films by Frequency-Domain Thermoreflectance

***Y. Akura**, Y. Ikeda, L. Liu, J. Hirotani

Wed, 22/07/2026 17:00 - 18:30

H4 - 4 (Alois)

MS017C - Topology Optimization for Multidisciplinary Design III

Main Organizer: Dr. Shun Ogawa (The university of Tokyo)

Chaired by: Dr. Shun Ogawa (The university of Tokyo), Dr. Jan Oellerich (The University of Tokyo)

Topology Optimization of Continuous Fiber Composites for 3D Printing using NURBS and Geometry Projection

***J. Castro**, E. Fernandez, J. Rothkegel, P. Duysinx

Topology Optimization of Thin-walled Three-dimensional Structures by Decomposition into Two-dimensional Subproblems

***K. Büscher**, J. Oellerich

Topology optimization of dual phase change materials (dual-PCM) heatsinks for minimizing temperature oscillations

***S. Pan**, S. Nishiwaki, K. Izui

Conditional Flow Matching for Topology Optimization with Deterministic Manufacturing Constraint Projection

***T. Sugai**, T. Yamada

Multi-Fidelity Simulation-Based Shape Optimization of Hydrogen Burners

***R. Strickling**, F. Vance, A. Scholtissek

Simulation-Driven Design Optimization Framework for Orthodontic Aligner Structures

***D. Patel**

Wed, 22/07/2026 17:00 - 18:30

H4 - 5 (Xaver)

MS190A - Advances in Soft Robotics Computational Modeling I

Main Organizer: Dr. Gianmarco Mengaldo (National University of Singapore)

Chaired by: Dr. Yuchen Sun (National University of Singapore), Mr. Leonardo Pesce (National University of Singapore)

Modeling Fabric-Based Soft Robotic Artificial Hearts

***M. Lauber**, M. Arfaee, M. Peirlinck

Control Method for Large Deformation of Soft Robots via Topology Optimization

***A. Li**, W. Zhang

Octopus arm movements unveiled: a computational modeling approach to muscle activation patterns

***Y. Sun**, A. Dhaker, M. Bucelli, F. Regazzoni, L. Dede', L. Zullo, C. Laschi, G. Mengaldo

Stereotypical force patterns of the elephant trunk in planar reaching movements

***C. Agabiti**, E. Donato, E. Setti, P. Dagenais, M. Milinkovitch, C. laschi, B. mazzolai, E. Falotico

Wed, 22/07/2026 17:00 - 18:30

H4 - 6 (Sissi)

MS013A - Physics-Based Data-Driven Modeling and Uncertainty Quantification in Computational Materials Science and Engineering I

Main Organizer: Prof. Johann Guilleminot (Duke University)

Chaired by: Prof. Johann Guilleminot (Duke University)

Physics-Constrained Data-Driven Constitutive Modeling for Microstructure-Informed Anisotropic Progressive Damage Analysis

***L. Mackin**, H. Kim

Generative Physics-Aware Neural Implicit Solvers Inverse Problems in Heterogeneous Media.

***M. Chatzopoulos**, P. Koutsourelakis

Data-driven Approaches for Tracking Error in Adaptive Training of Non Intrusive Reduced Order Models

***T. Chakravorty**, D. Ghosh

Continuous-Scale Bridge Processes for Multiscale Generation

J. Yong, ***J. Guilleminot**

Reliability-Aware Physically-Guided Neural Networks for uncertainty assimilation, error propagation and statistically-informed decision making

***J. Ayensa-Jiménez**, R. Muñoz-Sierra, M. Doblare

Wed, 22/07/2026 17:00 - 18:30

H4 - 7 (Maximilian)

MS375A - Advances in AI, Machine Learning and Data Science for Multi-Physics Modelling: Algorithms, Applications and Future Directions I

Main Organizer: Dr. Jefferson Gomes (University of Aberdeen)

Chaired by: Phd. Francisco Bruno Souza Oliveira (Universidade Estadual de Santa Cruz - UESC), Dr. Jefferson Gomes (University of Aberdeen)

Scalable Scientific Machine Learning Approach for Heat Transport in Groundwater

***J. Pelzer**, A. Totounferoush, M. Schulte

A Study of Neutron Transport Solutions Using a Hybrid Nodal and Data-Assisted Approach

***F. Souza Oliveira**, H. Alves Filho, D. Sanchez, P. Ambrósio, M. Souza, L. Goulart

Deep Learning-Based Micro-PIV Image Reconstruction in Optically Turbulent Supercritical Flows

***N. Krauss**, J. Calafell, L. Jofre

Physics-Informed Modeling of Flow Instabilities During CO2 Migration in Saline Aquifers

***H. Zhai**, Z. Lin, F. Oliveira, J. Gomes

Inertial friction welding modelling using AI algorithm

***M. TOUBOUL**, J. PANCRAE, C. FRIEBEL, A. DE GROOTE

Wed, 22/07/2026 17:00 - 18:30

H4 - 8 (Eventcenter)

MS239C - Advances in Shape Optimization and Form-Finding for Engineering Design III

Main Organizer: Prof. Kai-Uwe Bletzinger (Technical University of Munich, Germany)

Chaired by: Prof. Daniel Tortorelli (Lawrence Livermore National Laboratory), Prof. Thomas Rung (Hamburg Univ. of Technology)

On the Generalization in Topology Optimization via Sensitivity-Conditioned Bernoulli Flow Matching

***M. Rashed**, D. Valoroso, B. Gholami, C. Gurbuz, Y. yang, N. Thuerey

Adjoint-Based Shape Optimization of Marine Energy Saving Devices Using Partially Moving Reference Frame Propeller Resolution Method

***D. Andreev**, A. Kritikos, G. Bletsos, D. Hafermann, N. Kühl, T. Rung

Parametric geometry modeling for robust and efficient aerodynamic shape optimization

***T. Wunderlich**

A Computational Framework for Predicting Foreign Object Damage in Aero-Engines

***J. Albiez**, J. Hörmann, P. Leopold, J. Keller, J. von Lautz

Multi-Point Aerodynamic Shape Optimization of Angular Airfoils for Micro-Scale Mars Airplane

***Y. Iida**, A. Oyama, M. Sato

Wed, 22/07/2026 17:00 - 18:30

BrainLab - Training

MS002B - Advanced Materials: Computational Analysis of Properties and Performance II

Main Organizer: Prof. Vadim Silberschmidt (Loughborough University)

Chaired by: Prof. Vadim Silberschmidt (Loughborough University)

Trabecular-bone Adaptation: Numerical Simulations with Separated Mechanical Stimuli Keynote

*Z. LIU, S. Li, V. Silberschmidt

Inverse Design of Nacre-Inspired Composites with Multi-Physics Constraints via Diffusion Model

*J. Byun, D. Park, K. Park, S. Ryu

Computational Insights into the Morphing Skin of Porcupinefish

*B. Taherkhani, C. Micheletti, S. Amini, A. Camp, A. Rafsanjani

Dynamic Modeling and Analysis of Hard-Magnetic Soft Robots with Variable Residual Magnetization

A. Moezi, *R. Sedaghati, S. Rakheja

A Computational Modeling Framework for Predicting Progressive Fatigue in Polymer Composites

*P. Hofman, F. van der Meer, L. Sluys

Wed, 22/07/2026 17:00 - 18:30

NM - 6 (Munich)

MS213A - Mathematics of thin material structures I

Main Organizer: Prof. Axel Voigt (TU Dresden)

Chaired by: Mr. Matteo Teodori (Sapienza University of Rome), Mr. Joseph Duque Lopez (University of Warwick)

A Computational Surface ALE Formulation for Self-Evolving Navier-Stokes Manifolds

*R. Sauer

Self-Avoiding Fluid Deformable Surfaces

*M. Porrmann, S. Bartels, A. Voigt

Hydrodynamic Liquid Crystal Models for Lipid Bilayers

I. Nitschke, *J. Sischka, A. Voigt

Phase Field Crystal Model of Out-of-Plane Deformations in Thin Crystalline Sheets Induced by Thermal Expansion

*E. Radice, M. Salvalaglio, A. Voigt

Wed, 22/07/2026 17:00 - 18:30

NM - 7 (Venice)

MS344B - Agentic AI and Physics-Informed Machine Learning for Next-Generation Design and Manufacturing II

Main Organizer: Prof. Seunghwa Ryu (KAIST)

Chaired by: Prof. JAEHO JUNG (chungbuk national university), Dr. Thomas Hugle (TNG Technology Consulting GmbH)

Robust State-Based Multi-Agent-Systems for Complex Engineering Workflows

*M. Vogt, T. Hugle

A Multi Agentic LLM-Based Expert System for Injection Molding Process

*J. Lee, J. Kim, H. Kim, I. Lee, S. Ryu

Accelerating Automotive Reliability Engineering using an Agent-based AI System

*A. Kaiser, B. Maier, B. Uekermann

An End-to-End LLM-Agent Framework for Automated CAD–FEA–Optimization Workflows

*H. Lee, J. Jung

AI-Assisted Generation and Validation of FEM Geometry and Mesh for Multibody Systems

*T. Möltner, S. Weyrer, M. Pieber, P. Manzl, J. Gerstmayr

A Framework for Sketch-Based Generation and Validation of Multibody Models Using LLMs

*M. Pieber, P. Manzl, T. Möltner, S. Weyrer, A. Humer, J. Gerstmayr

Wed, 22/07/2026 18:45 - 20:45

ICM - 14c

FRC - Female Researchers Chapter Event

Celebrating 10 years of technical contribution, community engagement, and support for women in computational mechanics.

Thursday, 23/07/2026

Thu, 23/07/2026 08:00 - 18:00

ICM - FOYER Ground floor

Registration

Congress Registration - ICM FOYER Ground floor

Thu, 23/07/2026 08:30 - 09:15

ICM - 1 Auditorium

PL05A - Plenary Lecture - Manu Kapur

Chaired by: Prof. Simone Deparis (MATH - EPFL)

Productive Failure for Learning & Growth

*M. Kapur

Thu, 23/07/2026 08:30 - 09:15

ICM - 14b

PL05B - Plenary Lecture - Irene Vignon-Clementel

Chaired by: Prof. Charles Taylor (University of Texas at Austin)

Digital Twins for Clinical Applications: Complementarity of Mechanistic and Deep-Learning Modelling

*I. Vignon-Clementel

Thu, 23/07/2026 08:30 - 09:15

ICM - 14a

PL05C - Plenary Lecture - Jung-Wuk Hong

Chaired by: Prof. Jiun-Shyan Chen (University of California, San Diego)

A Journey through Meshless Methods for Solids and Fluids

*J. Hong

Thu, 23/07/2026 08:30 - 09:15

ICM - 14c

PL05D - Plenary Lecture - Zhuo Zhuang

Chaired by: Prof. Leszek Demkowicz (The University of Texas at Austin)

Artificial intelligence empowers the surrogate models for composite structure design and defect bone reconstruction

*Z. Zhuang

Thu, 23/07/2026 09:00 - 18:00

ICM - FOYER Ground floor

CFCE - Career Fair in Computational Engineering (CFCE)

Where Talent Meets Innovation

Thu, 23/07/2026 09:15 - 09:45

Coffee Break

Thu, 23/07/2026 09:45 - 11:15

ICM - 1 Auditorium

MS283E - Recent Progress in Topology Optimization and Its Applications V

Main Organizer: Prof. Junji Kato (Nagoya University)

Chaired by: Prof. Liang Xia (Huazhong University of Science and Technology), Dr. Boyan Lazarov (Lawrence Livermore National Laboratory)

Topology Optimization with Local Perimeter Constraints and Non-Linear Filtering for Minimum Length and Overhang Control

*J. Torres, F. Otero, A. Ferrer

Topology optimization with approximated constraints on multi-interface stiffness matrices

T. Wanninger, *M. Zimmermann

Automatic CAD-Reconstruction of Rib Design from Topology Optimization

*P. Clausen, G. Randon, P. Hebrard

Dynamic topology optimization of multi-material viscoelastic structures: from impact mitigation to thermo-mechanical coupled design

G. Liu, K. Nishiguchi, *J. Kato

Thu, 23/07/2026 09:45 - 11:15

ICM – 2

MS020C - Large Deformation Beams and Shells: Formulation Advances and Innovative Applications III

Main Organizer: Prof. Enzo Marino (University of Florence)

Chaired by: Prof. Peter Betsch (Karlsruhe Institute of Technology (KIT)), Prof. Manfred Bischoff (University of Stuttgart)

Convergence Behaviour of Geometrically Nonlinear Beam Formulations Keynote

N. Heuer, ***A. Niemi**

A geometrically exact beam finite element with local interpolation of rotations

R. Gonçalves, M. Ritto-Corrêa, ***G. Garcea**

Space-time finite element path-following of periodic solutions in high-dimensional nonlinear dynamics

***D. Magisano**, A. Leonetti, G. Garcea

A space-time finite element approach for nonlinear dynamics of geometrically exact beams

***I. Steinbrecher**, A. Humer

Thu, 23/07/2026 09:45 - 11:15

ICM – 3

MS097C - Machine Learning Methods for Aerospace Applications III

Main Organizer: Dr. Alexander Ruetters (German Aerospace Center (DLR))

Chaired by: Prof. Günther Waxenegger-Wilfing (German Aerospace Center (DLR)), Dr. Alexander Ruetters (German Aerospace Center (DLR))

Smooth 3D Reconstruction of Rocket Fin Edges Using Geometric Deep Learning

***L. Gerhard**, O. Aßenmacher, A. Rüttgers, J. Kleinert, G. Gassner

Multi-fidelity Strategies to Support Pintle Injector Design

***A. Ferrero**, L. Stumpo, F. Masseni, E. Martelli, L. Casalino, P. Ciottoli, L. Lucchese, R. Malpica Galassi, D. Cavallieri, E. Laurora, G. De Stefano

Multi-step Shape Optimization of Airfoil based on Reinforcement Learning

***Y. Feng**, S. Schmidt, N. Adams

Physics-Informed Neural Network for the Design of Shape-Adaptive Airfoils

***J. Yi**, C. Bisagni

FusLaB: A Novel AI-based Model for Fusing CFD and Experimental Aerodynamic Data

***F. Tost**, G. Catalani, X. Bertrand

Sparse Design Field Construction using PINNs

***M. ?engüler**, M. Nikbay

Thu, 23/07/2026 09:45 - 11:15

ICM – 4a

MS317C - Recent Advances in Mesh-free and Particle Methods III

Main Organizer: Prof. Mitsuteru Asai (Kyushu university)

Chaired by: Prof. Takuya Matsunaga (The University of Tokyo), Prof. Andrea Colagrossi (CNR-INM)

Mesh-free particle continuum and discrete approaches for ice–water dynamics

***A. Shakibaeinia**, F. Jelevehgar, C. Huang, M. Jandaghian

A Robust FD–SPH Framework for Fluid–Rigid Body Interaction of Complex-Shaped Objects

***C. Galvin**, K. Tsuji, H. Omura, R. Nomura, M. Asai

Progress in Resolved and Unresolved SPH–DEM Coupling for Solid–Fluid Interaction Problems

***K. Tsuji**, M. Asai

Strongly coupled fictitious domain-SPH and FEM for fluid-structure interactions

***H. Omura**, T. Yamashita, K. Tsuji, N. Mitsume, M. Asai, D. Isobe

Enhanced wave-structure interaction simulations using DualSPHysics+

***M. Luo**, Y. Zhan, G. Cai, A. Khayyer

GPU-Accelerated SPH Framework for Multi-objective Thermoelastic Topology Optimization

***J. Lee**, E. Kim

Thu, 23/07/2026 09:45 - 11:15

ICM – 4b

MS184C - Theory-guided Design of Deep Learning-based Surrogates III

Main Organizer: Dr. Nicola Rares Franco (MOX, Politecnico di Milano)

Chaired by: Dr. Nikolaj Mücke (TU Delft), Mr. Simone Brivio (Politecnico di Milano)

A Physics-Informed Convolutional Neural Network with Variational Regularization for Diffusion in Heterogeneous Media

***Z. Han**, M. Mirkhalaf

Data-Calibrated Simulations of Photoresist Photoreactions via Physics-Informed Neural Operators

Y. Singh, ***C. Straub**, T. Santos, A. Erdmann, A. Rosskopf

Dimensionally Reduced Depth-Encoded Surrogate Modelling for Fully Stressed Cantilever Beam Profile design

***C. D R**, N. Muthu

Reliable Forecasting via Physics-Guided Stochastic Augmentation

***X. Wu**, K. Wu

Data-Driven Optimization of Granular Dispersion Dynamics Using Particle Swarm optimization

***A. Jleli**, J. Mastouri, H. Mrad, M. Abbas

Thu, 23/07/2026 09:45 - 11:15

ICM - 5

MS018G - Immersed Boundary Variational Methods: Theory, Data Structures, and Applications VII

Main Organizer: Prof. Alexander Düster (Hamburg University of Technology)

Chaired by: Prof. Alexander Düster (Hamburg University of Technology)

Time-Adaptive Fully Coupled Parallel Simulation of Sand Dune Morphodynamics

***D. Gonzalez Esparza**, D. Logashenko, A. Nägel, G. Wittum, R. Krause

finite difference immersed boundary method for an inverse problem in medical imaging: electrical impedance tomography.

J. Dardé, ***N. Nasr**, L. Weynans

Enhanced Digital Volume Correlation in Heterogeneous Materials Based on Mechanical Regularization Using Equilibrium Gap Method and Finite Cells

***M. Schmidt**, N. Miska, D. Balzani

Simulation of Neuronal Growth using the Level-Set Method

***N. Flores-Pretell**, D. Gonzalez-Esparza, D. Logashenko, G. Wittum, R. Krause

Thu, 23/07/2026 09:45 - 11:15

ICM - 11a

MS059A - Bridging scientific machine learning and scientific discovery: Novel developments I

Main Organizer: Dr. Romit Maulik (Purdue University)

Chaired by: Dr. Romit Maulik (Purdue University), Prof. Ricardo Vinuesa (University of Michigan)

Information-theoretic machine learning for time-varying modal analysis of separated flows

Keynote

***K. Fukami**, R. Koshikawa, R. Araki, Q. Liu

Learning Coarse-Grained Dynamics with Causal and Conservative Spatiotemporal Neural Operators

***J. CHEN**

Manifold Dimension Identification for the Kuramoto-Sivashinsky Equation Using a Spectral Autoencoder

***Z. Meng**, Y. Wang, B. Khoo

Toward Spectrally Consistent γ -VAE Reduced-Order Models of Automotive Aeroacoustics

***C. Pimenta**, T. Virdung, A. Sjögren, M. Mihaescu, R. Vinuesa, S. Mirjalili

Thu, 23/07/2026 09:45 - 11:15

ICM - 11b

MS281B - Numerical Strategies for the Multi-Scale Modelling and Design of Advanced Materials with Complex Mechanical Response II

Main Organizer: Dr. Igor A. Rodrigues Lopes (INEGI - Institute of Science and Innovation in Mechanical and Industrial Engineering)

Chaired by: Dr. Oriol Lloberas-Valls (International Centre for Numerical Methods in Engineering), Dr. Francisca Alves (INEGI)

Hybrid Physically Recurrent Neural Network Surrogate for Multiscale Analysis of Metal Matrix Composites

***V. Pereira Barros**, E. Parente Junior, L. Antônio Taumaturgo Mororó, M. Silva Medeiros Júnior, I. Barcelos Carneiro Montenegro da Rocha, M. Alves Maia

Experimental and Numerical Investigation of the Non-linear Mechanical Behavior of Particulate Composites: A Physically Recurrent Neural Network Approach

B. Silva, ***L. Mororó**, E. Parente Junior, M. Medeiros Junior, M. Maia, I. Rocha

Physics- and Geometry-Informed Fluid Dynamics Neural Operator for Lattice Structures

***X. Li**, Y. Zhao

Mean Field Homogenization Based on the Principle of Multi-Scale Virtual Power and Its Dual: Application to Semi-Crystalline Polymers

***J. Vila-Chã**, A. Carneiro, B. Ferreira, F. Pires

Multi-Scale Surrogate Modelling for the Prediction of Fibre-Reinforced Composite Properties

***I. Rodrigues Lopes**, C. Furtado, J. Ferreira, G. Guillaumet, J. Esteves, L. Rodrigues, P. Camanho

Thu, 23/07/2026 09:45 - 11:15

ICM - 12a

MS047A - Advances in Model Calibration Techniques in Computational Mechanics I

Main Organizer: Dr. Andrew Stershic (Sandia National Laboratories)

Chaired by: Dr. Coleman Alleman (Sandia National Laboratories), Dr. Daniel Seidl (Sandia National Laboratories)

Calibration of Anisotropic Elastic-plastic Constitutive Models from Full-field Data

Keynote

***D. Seidl**, B. Granzow, R. Jones, R. Patel, A. Jadoon, J. Fuhs

A Regularized Constitutive Parameters Identification Scheme Using Full-Field Displacements

***A. Jafari**, E. Chatzi, J. Unger

Material Model Parameter Estimation Using Bayesian Data Assimilation: Effects of Specimen Geometry and Strain Measurement Region

***M. Isegawa**, S. Nakajima, S. Takashina, A. Yamanaka

Inverse Parameter Identification for the Digital Inspection of Existing Reinforced Concrete Bridges

***M. Haseeb Ulla**, N. Gerzen

Multi-Response Fracture Parameter Estimation for Crack Simulation Model of Spent Nuclear Fuel Cladding with Hydrides under Pinch Load

***G. Jeong**, S. Kim, S. Lee

Thu, 23/07/2026 09:45 - 11:15

ICM - 12b

MS309A - Data-Driven Design and Optimization of Architected and Adaptive Materials Across Scales I

Main Organizer: Dr. Pinar Acar (Virginia Tech)

Chaired by: Dr. Pinar Acar (Virginia Tech), Prof. Avinkrishnan Ambika Vijayachandran (University of Washington)

Phase Field Simulation of Brittle Fracture in Topology Optimized Multi-Phase Structures with Prescribed Mass and Structural Envelope Volume

***J. Pravda**, D. Jantos, A. Schlüter, R. Müller, P. Junker

Deep-Learning-Assisted Optimization of Composite Spinodoids for Enhanced Elastic and Thermal Behavior

S. Yildiz, Z. Eger, ***P. Acar**

Data-Driven Design of Isotropic and High-Stiffness TPMS-based Aperiodicity-Induced Architected Materials

***M. Park**, J. Jo, S. Ryu

On the Feasibility of Physics-Informed and Data-Driven Surrogates for Non-Equilibrium Thermal Responses in Binary Gas Mixtures

***D. Madjarevi?**

Numerical Implementation of a Discrete-Based Model for Bi-Modulus (Meta)Materials

***A. Morozov**, V. Balabanov, G. Lavrenteva, S. Khakalo

Field-Driven AI Inverse Design of Multifunctional Shell-Based Metamaterials

***P. Secchi**, D. Balint, M. Maurizi

Thu, 23/07/2026 09:45 - 11:15

ICM - 13a

MS090F - Machine Learning For Computational Mechanics Across Scales VI

Main Organizer: Prof. Fadi Aldakheel (Leibniz Universität Hannover)

Chaired by: Prof. Yousef Heider (Universität Kassel), Prof. Fadi Aldakheel (Leibniz Universität Hannover)

Accelerated Multiphysics Simulation of Injection Molding using Universal Physics Transformers [Keynote](#)

***Q. Hernandez**, S. Kaltenbach, J. Brandstetter

Inverse Design of Architected Metamaterials for Targeted Responses under Different Strain Rates

***T. Gärtner**, H. Wang, F. Aldakheel

Evaluating Large Language Models as Optimizers for Engineering Design and Control

***A. Starostina**, K. Bali, A. Hermann, A. Shojaei, R. Nair, C. Cyron, K. Linka, R. Aydin

Two-Branch Problem-Independent Machine Learning (TB-PIML)-Based Large-Scale Load-Dependent Topology Optimization

***X. Luan**, Y. Liang, X. Guo

Equivariant Machine Learning for Modelling and Design of Mechanical Metamaterials with Instabilities

F. Hendriks, M. Doskar, V. Menkovski, M. G.D. Geers, M. Etman, ***O. Rokos**

Thu, 23/07/2026 09:45 - 11:15

ICM - 13b

MS295A - Continuum Biomechanics of Living Active Systems – Computational Modeling & Experimental Validation I

Main Organizer: Prof. Tim Ricken (University of Stuttgart)

Chaired by: Prof. Tim Ricken (University of Stuttgart)

Electromechanical Computational Model of the Human Stomach

***C. Cyron**, M. Henke, S. Brandstaeter, A. Gizzi, R. Aydin

Computational modeling and parameter identification of multi-species biofilms

***H. Geisler**, P. Junker

Comparison of Finite Element Approximations for Electro-Mechanical Models of the Human Heart

***L. Stengel**, J. Krauß, A. Loewe, C. Wieners

Computational Modeling of Stent Failure during Crimping and Deployment in Coronary Arteries

***A. Tragoudas**, G. Holzapfel, F. Aldakheel

A morphoelastic phase field model predicts buckling instability in tumor growth

***L. Zieger**, M. Wu, C. Wei, J. Lowengrub, S. Aland

MS031C - Open-Source Software in Mechanics III**Main Organizer:** Dr. Vladislav Yastrebov (MINES Paris, PSL University, CNRS)**Chaired by:** Dr. Matthias Mayr (Universität der Bundeswehr München)

An efficient implementation of ANM with FEM for solving nonlinear solid thermo-elastic problems in the FreeFEM++ language.

***P. VENTURA**, F. HECHT, M. POTIER-FERRY, H. ZAHROUNI, F. XU, M. BRUN, A. CHAU, P. Jolivet

An Advanced Mechanical Nonlinear-Dynamic Solver to Democratize Simulation and Boost Innovation in Applied Sciences and Engineering – OpenRadioss

***M. Bulla**, E. Lequinou

MANTA: An industrial strength open source high performance explicit and implicit multi-physics solver

O. Jamond, N. Lelong, T. Helfer, B. Prabel, ***A. Jaccon**, A. Motte, C. Nahed, C. Calonnec, P. Bouda, L. Schuler, M. Ellouze, T. Douillet-Grellier

YADE as an Interactive Open-Source Software for Simulating the Coupled Mechanics of Particulate Systems

***J. Duriez**, V. Angelidakis, K. Boschi, K. Brzezinski, R. Caulk, B. Chareyre, C. del Valle, A. Gladky, D. van der Haven, J. Kozicki, L. Scholtès, K. Thoeni

An Efficient Finite-Element Framework for Large-Scale Phase-Field Simulations of Many-Particle Solid-State Sintering

***V. Ivannikov**, M. Kronbichler, P. Munch, C. Cyron

MeltPoolDG: A High-Performance Framework for Mesoscale Powder–Liquid–Gas Modeling in Metal Additive Manufacturing

***M. Schreter-Fleischhacker**, N. Much, J. Brotz, A. Koch, P. Munch, M. Kronbichler, C. Meier

MS153A - Data-driven dynamical systems: learning, simulation, and control I**Main Organizer:** Prof. Andrea Manzoni (Politecnico di Milano)**Chaired by:** Dr. Matteo Tomasetto (Politecnico di Milano)

Discovery and sensing in data-driven dynamical systems: recent strategies and open challenges Keynote

***A. Manzoni**, M. Tomasetto, N. Kutz

Data assimilation and discrepancy modeling with shallow recurrent decoders

***Y. Bao**, N. Kutz

Uncertainty Quantification in Sequence Models via Bayesian Inference

***D. Coscia**, N. Demo, M. Welling, G. Rozza

Continuous-time Latent Dynamics: from Trajectories to Velocities

***N. Farenga**, A. Manzoni

Neuro-Symbolic AI for Analytical Solutions of Differential Equations

O. Oikonomou, L. Lingsch, D. Grund, S. Mishra, ***G. Kissas**

MS083D - Multiscale Computational Homogenization for bridging scales in the mechanics and physics of complex materials IV**Main Organizer:** Prof. Julien Yvonnet (Universite Gustave Eiffel)**Chaired by:** Prof. Stephan Wulfinghoff (Kiel University)

Local Homogenization Based Heterogeneous Multiscale Method for Efficiently Predicting Mechanical Responses of Conformal Lattice Structures

***B. Ye**, S. Duan, H. Lei

Data-Driven Constitutive Modeling of Graded Metamaterial with Microstructural Contact

***M. Frey**, S. Brandstaeter, A. Popp

A Mixed Formulation for Homogenization of Incompressible Hyperelastic Magneto-Mechanical Materials

***L. Spencer**, J. Fuhrig

Multiscale Chemo-mechanical Modeling of Li-ion Batteries

***Y. Zhao**

Surrogate Computational Homogenization for Three-Dimensional Two-Scale Problems Based on RBF Interpolation With Decision Tree

***Y. Yamanaka**, N. Hirayama, K. Terada

Thu, 23/07/2026 09:45 - 11:15

ICM - B11

MS173A - Mechanobiology of Cells, Vesicles and Biomembranes I

Main Organizer: Prof. Roger Sauer (Ruhr University Bochum)

Chaired by: Prof. Roger Sauer (Ruhr University Bochum), Dr. SHAOFAN LI (University of California-Berkeley)

Fluid Deformable Surfaces: Modeling, Numerics and Applications **Keynote**

I. Nitschke, M. Porrmann, J. Sischke, ***A. Voigt**

Continuous Description of 3D Cell Tilt and Skewing in Epithelial Monolayers

***Q. Vagne**, G. Pernollet, A. Roux, G. Salbreux

An Extended Boundary Integral Method for Viscoelastic Cells

***T. Mayr**, S. Gekle

Computational Analysis of Membrane Stalk Formation in Complex Lipid Environments

***S. Seo**

Microscale flow dynamics of blood cells in health and disease

***X. Li**

Thu, 23/07/2026 09:45 - 11:15

ICM - B12

MS118A - Scalable Iterative Solvers: Recent Advances in Domain Decomposition and Multigrid Methods I

Main Organizer: Dr. Ivan Prusak (Ruhr-Universität Bochum)

Chaired by: Prof. Martin Kronbichler (Ruhr University Bochum), Dr. Richard Schussnig (Ruhr University Bochum)

R3MG: Automated Grid Agglomeration for Discontinuous Galerkin Multilevel Solvers **Keynote**

***M. Feder**, P. Africa, L. Heltai, A. Cangiani

Recent advances in multipreconditioned domain decomposition methods

***C. Bovet**

Performance Improvement of Flow Computation on Overset Grids Method with Multigrid Method and Domain Decomposition Hybrid Parallelization

***K. OHASHI**

Speeding up an unsteady flow simulation by adaptive BDDC and Krylov subspace recycling

M. Hanek, J. Papež, ***J. Šístek**

Iterative Solvers in the Exascale Era: Revisiting Domain Decomposition and Multigrid

***I. Prusak**, M. Kronbichler, I. Pribec, E. Soydan

Thu, 23/07/2026 09:45 - 11:15

ICM - B13

MS310A - Computational Modeling of Cancer Therapy: from Physics to Clinical Decision Support I

Main Organizer: Dr. Silvia Hervas-Raluy (Technical University of Munich)

Chaired by: Dr. Silvia Hervas-Raluy (Technical University of Munich), Ms. Barbara Wirthl (Technical University of Munich)

A Multiphase Porous-Media Model for Intratumoral Immunotherapy Delivery and Tumour Response

***S. Hervas-Raluy**, W. Wall

A Data-Informed Framework for Immunotherapy Optimization Using Mechanistic Modeling and Deep Operator Networks

***G. Sotiropoulos**, K. Atzarakis, V. Papadopoulos

On the coupling between tumor-induced deformation and mass-transport within the brain

***C. Cornillon**, G. Sciumé, P. Rohan, M. Azaiez

An MRI-informed poromechanical model for organ-scale prediction of glioma growth

***M. Abbad Andaloussi**, S. Urcun, D. Hormuth II, G. Lorenzo, G. Sciumé, C. Wu, T. Yankeelov, S. Bordas

Hybrid Learning–Numerical Modeling of Electric Fields in Irreversible Electroporation

***C. Poignard**, B. Denis de Senneville, O. Séror, O. Sutter

Towards a Digital Twin of Magnetic Nanoparticle-Mediated Cancer Therapy

***B. Wirthl**, C. Janko, B. Schrefler, C. Alexiou, W. Wall

Thu, 23/07/2026 09:45 - 11:15

ICM - B21

MS262C - Advances of Quantum and Quantum-Inspired Algorithms for Solving Flow Simulation Problems III

Main Organizer: Prof. Thomas Rung (Hamburg Univ. of Technology)

Chaired by: Dr. Felix Tennie (City-St. George's, University of London)

Adaptive Interpolation for Solving Nonlinear PDEs with Tensor Networks **Keynote**

B. Ghahremani, ***H. Babaei**

Compressible Flows for the Euler and Navier–Stokes Equations with Quantum-Inspired Methods

***M. Menon**, P. Thoma, A. Michailidis, D. Jaschke, M. Kiffner

Matrix Product States Simulations of Rayleigh–Bénard Convection

***N. van Hülst**, M. Cecile, H. Van, T. Hashizume, D. Jaksch

Matrix Product State for Computational Turbulent Scalar Mixing and Reaction

R. Pinkston, M. Esmaeili, H. Alipanah, N. Gourianov, D. Jaksch, D. Livescu, A. Daley, P. Givi, ***J. Arenas**

Thu, 23/07/2026 09:45 - 11:15

ICM - B22

MS150A - Efficient Numerical Methods for Large-Scale Non-Linear Problems I

Main Organizer: Prof. Marco Donatelli (University of Insubria)

Chaired by: Prof. Rolf Krause (KAUST), Prof. Marco Donatelli (University of Insubria)

Operator-learning enhanced iterative methods

***A. Kopanicakova**

Efficient Solvers for Cardiac Electrophysiology

***J. Schramm**

Further improvements of the ENATE scheme

***A. Pascau, V. Lorente**

Thu, 23/07/2026 09:45 - 11:15

ICM - 21a

MS064A - Computational Modelling of Bone Growth and Adaptation across Scales I

Main Organizer: Prof. Areti Papastavrou (Technische Hochschule Nürnberg Georg Simon Ohm)

Chaired by: Prof. Peter Pivonka (Queensland University of Technology), Prof. Areti Papastavrou (Technische Hochschule Nürnberg Georg Simon Ohm)

Multi-Scale Mechanobiological Simulations for Predicting and Modifying Femoral Growth in Children [Keynote](#)

***H. Kainz, C. Egner, K. Kitir, L. Rathmair, G. Mindler, A. Kranzl, W. Koller**

Finite-element-based algorithm of organ growth with application to bone modelling

***J. Martínez Reina, P. Manchado-Morales, P. Pivonka, J. Calvo Gallego**

Multi-scale Simulation of Bone Remodelling and Mineralization: Capturing Bone Disorders in Chronic Kidney Disease

***Y. Kim, T. Tanijiri, T. Adachi**

Numerical Issues in Bone Cell Population Models

***A. Karweger, A. Papastavrou, P. Pivonka, P. Steinmann**

Using Bed Rest Study Data to Support Load Estimation on the Distal Human Tibia for Simulating Bone Loss During Mechanical Disuse

***T. Tran, A. Müller, M. Lepieur, N. Castoldi, L. Vico, A. Niehoff, P. Pivonka, S. Leyendecker, A. Liphardt**

Thu, 23/07/2026 09:45 - 11:15

ICM - 21b

MS109A - Multiscale Modeling Approaches for the Design and Optimization of Complex and Engineered Materials I

Main Organizer: Prof. Andrea Chiozzi (University of Ferrara)

Chaired by: Prof. Vincenzo Mallardo (University of Ferrara)

A NURBS-based approach for non-smooth contact dynamics of curved rigid blocks structures [Keynote](#)

***N. Grillanda, V. Mallardo**

Rational Design of an Auxetic Architected Material Using a RBMS-based Approach

***L. Martins da Silva, S. Casolo**

Topology-Driven Multi-Physics Field Manipulation in Porous Architectures

***C. Lou, H. Yuan, Y. Liu, Z. Wu, Z. Li**

Numerical modeling of active mass dampers applied to masonry structures

***R. Giacometti, N. Grillanda, L. Pelà, V. Mallardo**

Multi-scale damage evolution analysis of C/C–SiC composites: implications for non-linear mechanical response

***R. Padan, R. Haj-Ali**

Thu, 23/07/2026 09:45 - 11:15

ICM - 22a

MS134B - Multiphysics-Driven Fracture & Damage Simulation: Bridging Scales and Fields II

Main Organizer: Dr. Leong Hien Poh (National University of Singapore)

Chaired by: Dr. Hao Yu (University of Science and Technology of China)

FRACSIM: AI--FEM Fracture Simulation Platform

***J. Amani**

A Coupled Damage-Plasticity Constitutive Framework for Modelling Deformation of Quasi-Brittle Materials Using Bond-Based Peridynamics

***M. Akram, G. Nguyen, A. Sheikh, M. Karakus, H. Bui**

Macroscopic Equivalence, Microscopic Variability: The Influence of Initial Dislocation Density Assumptions on Deformation Localization

***K. Sedighiani, R. Peerlings**

Multiscale Fatigue Assessment of Polycrystalline Metals: From Shakedown-Based Limit Prediction to MTS-DCA Accelerated Damage Evolution

***X. Wu, G. Chen, L. Zhang**

Fracture Prediction Using a Two Length Scale Non-Local GTN Model in Low-Alloy Steel

***S. Rajeev, J. Faleskog**

Multiscale Simulation of Thermo-Mechanical Fatigue in Semiconductor Metallisation under High Heating Rates

***A. Huber, M. Petersmann, T. Antretter**

Thu, 23/07/2026 09:45 - 11:15

ICM - 22b

MS038C - Simulation and Modeling Approaches in 3D Concrete Printing III

Main Organizer: Dr. Robens-Radermacher Annika (Bundesanstalt für Materialforschung und -prüfung)

Chaired by: Dr. Giacomo Rizzieri (Politecnico di Milano), Dr. Robens-Radermacher Annika (Bundesanstalt für Materialforschung und -prüfung)

A Reduced Basis Framework for Real-Time Simulation of 3D Concrete Printing with Nonlinear Material Behaviour

***I. Akica**, A. Hürkamp

Multiscale Analysis of Anisotropy and Scale Effects in 3D Printed Concrete Using Periodic Homogenization and Weibull Law

***A. Gribonval**, N. Ducoulombier, K. Sab, R. Mesnil, J. Bleyer

Anisotropic Fracture in 3D-Printed Concrete: A Phase-Field Cohesive Zone Method

***Y. Yi**, M. Gopakumar, A. Baktheer, A. Antonini, G. Xotta, F. Aldakheel

Investigation of Bonding Behaviour for 3D Concrete Printing as Permanent Formwork based on Microstructural Characteristics

***J. Kim**, C. Yoo, H. Jeong

3D particle shape generation for Hybrid particulate process modeling: GANs and Diffusion Transformers

***K. Giannis**, J. Guo, S. Hashemi, C. Thon, C. Schilde

Thu, 23/07/2026 09:45 - 11:15

ICM - 41 (Ostersee A)

MS335A - Multi-scale and Multi-physics Modeling of Interfaces I

Main Organizer: Prof. Ralf Jänicke (TU Braunschweig)

Chaired by: Prof. Ralf Jänicke (TU Braunschweig), Prof. Fredrik Larsson (Chalmers University of Technology)

Chemo-Thermo-Mechanical Model for Imperfect Interfaces **Keynote**

***D. Grazioli**, C. Larsson, F. Larsson, K. Runesson, A. Simone, L. Asp

Multiscale and Multiphysics Modeling of Hygrothermal Aging and Interface Debonding in Sensor-Integrated PA6/GF30 Composites

A. Hamza, ***A. Ammar**, D. Vasiukov, T. Kanit

A multiscale model of friction considering the influence of third-body wear particles

P. Alavi, J. Molinari, ***G. Anciaux**

Electronic-Structure-Based DFT Analysis of Catechol Adsorption and Electric-Field-Induced Desorption on Graphene-Based Surfaces

***S. Jung**, T. Yoon

Interphase formation, load bearing, and failure of epoxy-based adhesive joints examined with reactive coarse-grained molecular dynamics

***M. Ries**

Thu, 23/07/2026 09:45 - 11:15

ICM - 42 (Ostersee B+C)

MS365B - Computational Modeling of Solids and Structures Under Severe Loading II

Main Organizer: Dr. Stephen Beissel (Southwest Research Institute)

Chaired by: Dr. Stephen Beissel (Southwest Research Institute), Dr. Kent Danielson (US Army Engineer Research and Development Center)

Blast-Resistant Glazing Design: Comparative Evaluation of SDOF P-I Approaches, FEM, and Isogeometric Analysis

***M. Andrae**, J. Kiendl, N. Gebbeken

Numerical Modeling of Blast Loaded Concrete Buildings Using Massively-Parallel Coupled CFD-CSD Techniques

***O. Soto**, J. Baum, M. Giltrud, R. Lohner

Continued Coupling of Isogeometric Analysis with the Elastic-Plastic Impact Code (EPIC)

***C. Gerlach**

Recent Advances in Modelling Structural Responses to Extreme Loadings with the Material Point Method

***Z. Chen**

Mesh free Hamiltonian method for material failure dynamics simulation

***J. Zhang**, E. Fahrenthold

Thu, 23/07/2026 09:45 - 11:15

ICM - 43 (Eibsee)

MS287A - Causal and Graphical Models for Scientific Applications I

Main Organizer: Dr. Elise Walker (Sandia National Laboratories)

Chaired by: Dr. Elise Walker (Sandia National Laboratories), Dr. Jonas Actor (Sandia National Laboratories)

Learning acyclicity and reproducibility on directed graphs for scientific applications

A. Voronin, ***E. Walker**, T. Bourdais, H. Owhadi, N. Trask

Greedy equivalence search for nonparametric graphical models

***B. Aragam**

Causal modeling of atomistic mechanisms in functional materials

***A. Ghosh**

Producing Weather Counterfactuals by Bogusing a Weather Foundation Model for Tropical Cyclone Prediction

***J. Nichol**, E. Walker, P. Bosler, E. Cyr

Thu, 23/07/2026 09:45 - 11:15

ICM - 44 (Schliersee)

MS072B - Advances in Multiscale Modeling and AI for Materials Design II

Main Organizer: Prof. Shu-Wei Chang (National Taiwan University)

Chaired by: Prof. Chia-Ching Chou (National Taiwan University), Prof. Shu-Wei Chang (National Taiwan University)

A Multiscale Investigation of Pediatric and Neonatal Acute Respiratory Distress Syndrome: From Bedside Data to Pulmonary Surfactant

***S. Lin**, J. Wu, E. Wu, C. Chou

Local molecular determinants of cysteine-associated osteogenesis imperfecta severity in human type I collagen

***P. Li**, Y. Kao, S. Chang

Molecular Dynamics Study of Block Copolymer Thin Film Orientation

***S. Bae**

Discrete-Based Model for Bi-Modulus (Meta)Materials

***S. Khakalo**, A. Morozov

Thu, 23/07/2026 09:45 - 11:15

ICM - 31 (Zugspitze)

MS278A - Design and Topology Optimization for Multi-Component Systems I

Main Organizer: Prof. IL YONG KIM (Queen's University)

Chaired by: Prof. Markus Zimmermann (Technical University of Munich), Prof. IL YONG KIM (Queen's University)

Simultaneous topology, fiber angle and fastener layout optimization of the assembly of a composite shells and a metal bracket

Keynote

***B. Kriegesmann**, K. Schneider

Multi-material Topology Optimization for Minimizing Material Switching in Additive Manufacturing

***S. Shin**, H. Chung

Multi-Material and Multi-Joint Topology Optimization: A Key Milestone in the Development of Topology Optimization

***I. Kim**, Y. Shi, Y. Huang

DistributedDesignOptimizer: A Modular Python Framework for Setup, Execution and Processing Distributed Design Optimization

***S. Ellmaier**, A. de Wit, A. Raveendran, M. Vogt, T. Bäck, A. Kononova

Multiscale concurrent topology optimization for large-scale assembled structures

R. Zheng, ***B. Yi**, G. Yoon, W. Liu, L. Liu, X. Peng

Thu, 23/07/2026 09:45 - 11:15

ICM - 32 (Watzmann)

MS370A - Advances in Model Reduction and Scientific Machine Learning for Large-Scale Dynamical Systems I

Main Organizer: Dr. Parisa Khodabakhshi (Lehigh University)

Chaired by: Dr. Parisa Khodabakhshi (Lehigh University), Prof. Elnaz Seylabi (University of Nevada Reno)

Neural Field based Surrogate Model for Ditching Load Prediction

***H. Schwarz**, P. Lin, J. Zemke, T. Rung

Neural Differential Equations for Efficient Substructured Aircraft Crash Simulations

***H. Dahmen**, M. Haupt, S. Heimbs

A graph autoencoder architecture for projection-based model-order reduction

***P. Khodabakhshi**, L. Magargal, S. Rodriguez, J. Jaworski, J. Michopoulos

A Multiscale Machine-Learning Framework for Surrogate Modeling of the Dynamic Response of Nonlinear Geo-Structural Systems

***A. Yaseen**, E. Seylabi

Hyper-reduction-free Newton solvers for projection-based model-order reduction of nonlinear dynamical systems

***L. Magargal**, P. Khodabakhshi, S. Rodriguez

Thu, 23/07/2026 09:45 - 11:15

BrainLab - Auditorium

MS311A - Experimental and Numerical Approaches to Understanding the Vascularized Brain I

Main Organizer: Ms. Nina Reiter (Friedrich-Alexander-Universität Erlangen-Nürnberg)

Chaired by: Ms. Nina Reiter (Friedrich-Alexander-Universität Erlangen-Nürnberg), Ms. Yashasvi Verma (Institute of Applied Mechanics , FAU Erlangen)

Ex-Vivo Biomechanical Characterization of Cerebral Vasculature

***L. Kennedy**, S. Thorpe, D. MacManus

Insights Into the Myogenic Mechanisms of Cerebral Autoregulation From Multiscale Modeling

***N. Demeersseman**, L. Maes, B. Depreitere, N. Famaey

Investigating the Impact of Vascular Structure and Occlusion Fraction on Blood Flow to Basilar Perforators

***J. McCullough**, A. Narata, I. Zacharoudiou, B. Joo, P. Coveney

Predicting Impact-related Injury of the Neurovascular Unit Associated with Chronic Traumatic Encephalopathy

***Y. Xiao**, J. Weickenmeier, L. Cunniff

How brain pulsations drive clearance: a coupled poroelastic framework

***A. Nuti**, A. Neff, M. Dvoriashyna, A. Vallet

In-Vivo Effects of Vascular Pressure on Brain Tissue Mechanics

***Y. Verma**, L. Heltai, P. Steinmann

Thu, 23/07/2026 09:45 - 11:15

NM - 1 (Multimedia Saal)

MS362A - Scientific Machine Learning to Enable Real-time Inference for Digital Twins I

Main Organizer: Dr. Tim Wildey (Sandia National Labs)

Chaired by: Prof. Tan Bui-Thanh (The University of Texas)

A Neural Network-Based Surrogate Model for Intelligent Prediction and Control of Caisson Sinking Attitude

***Z. Chen**, H. Zhu, Y. Rui

Enhancing Accuracy and Interpretability in Electrophysiological Surrogates via CNN-DeepONets

E. Sainz, L. Tesán, ***P. Martins**

Gradient-Informed Neural Networks for Data-Efficient Surrogate Modeling Using Prior Beliefs: Application to Diesel Engine Emissions Estimation

***F. Aglietti**, F. Della Santa, A. Piano

A Comparative Study of Physics-Informed and Finite Element-Informed Neural Networks for Non-Uniform Material Property Identification in Beams with Limited Measurements

***I. Thawon**, P. Suttakul, N. Siroros, D. Vo

A Real-time Digital Twin Analysis Method for Shield Tunneling Based on Physical-data Dual-driven Approach and Its Application

***Y. Gou**

Deep Reinforcement Learning for Energy-Efficient Control in Smart Buildings

***A. Sapargali**, S. Aibagarov, A. Mukhanbet

Thu, 23/07/2026 09:45 - 11:15

NM - 2 (Salzburg)

STS405A - Advances in Simulation Technologies Towards Next-Generation Aircraft Design I

Main Organizer: Dr. Yoshiaki Abe (Tohoku University)

Chaired by: Dr. Yoshiaki Abe (Tohoku University)

Reduced-Order Simo--Reissner/Semi-Monocoque Coupling for Structural Sizing of a Truss-Braced Wing

***A. Di Natale**, P. Höfer

Analysis and Wind Tunnel Experiment for High Aspect Ratio Wing Dynamics under Fuselage Vibration

***K. Shimura**, Y. Abe, K. Otsuka

Multibody Dynamics of Tethered Aerial Vehicle Using Arbitrary Lagrangian--Eulerian Absolute Nodal Coordinate Formulation with Rigid-Flexible Coupling

***R. Kuzuno**, K. Otsuka

Simulating Unsteady Base Flow Around an Axisymmetric Bluff Body with Strut Interference Using High-Order ILES

***D. Kim**, J. Park

Multidisciplinary Conceptual Design and Analysis of Ammonia-Fueled Composite Aircraft

***Y. Liu**, Y. Abe, S. Obayashi

On the Implementation and Analysis of a Domain-Coupling Algorithm in CODA

***G. Ashcroft**, H. Birliker, R. Blazquez-Navarro, T. Node-Langlois

Thu, 23/07/2026 09:45 - 11:15

NM - 4 (Hamburg)

STS417A - AI-Machine learning methodologies to accelerate CFD-Based design and optimisation I

Main Organizer: Prof. shahrokh Shahpar (Rolls-Royce plc)

Chaired by: Prof. shahrokh Shahpar (Rolls-Royce plc)

Development and Application of AI-Machine Learning Methodologies to Accelerate Turbomachinery Flow Analysis

H. Bartlett, ***S. shahpar**, J. Ramsay

Data-driven fine-grained prediction of laminar-turbulent transition in zero-pressure-gradient flat-plate boundary layers

W. Chang, H. Hu, Y. Xi, M. Kloker, H. Teng, ***J. Ren**

Learning nonlinear dynamics of turbulent flows for noise generation

D. Zhou, ***Z. Wang**

Inverse Design Using Surrogate-Assisted Score-Based Diffusion Models

***M. Leborgne**, J. Dominique, H. Perez, T. Benamara, L. Baert, F. Gea Aguilera

Thu, 23/07/2026 09:45 - 11:15

NM - 5 (KK)

MS115B - Computational Fluid Dynamics for Safety, Security and Defense II

Main Organizer: Prof. Markus Klein (Institute of Applied Mathematics and Scientific Computing, University of the Bundeswehr München)

Chaired by: Prof. Markus Klein (Institute of Applied Mathematics and Scientific Computing, University of the Bundeswehr München), Dr. Eike Tangermann (Bundeswehr University Munich)

Transient FSI thermal simulation of heating of solid fuel rocket nozzle structures

***D. Stadler**

Aerodynamic Study of a Venting Device for Air Intake of a Ramjet Engine

***L. Noll**, C. Bauer

Next-Generation CFD Models for the Design of Multistage Compressors Using the Harmonic Balance Method to overcome Steady RANS Limitations: Potentials and Challenges

***M. Zuccaro**, G. Brignole, J. Heners, S. Ioannidou, N. Wolfrum

Numerical Investigation of Turbulent Effects in Delta Wing Leading Edge Vortices

***E. Tangermann**, M. Klein

CFD for the Design and Performance Assessment of Modern Fighter Type Aircraft Configurations

A. Schütte, ***M. Werner**, M. Ghoreyshi

GPU-accelerated Scale-Resolving Simulation of Vortex–Shock Phenomena on Multi-Sweep Delta Wings

***T. Di Fabbio**, L. Vasquez Giuliano, J. Guerrero Rivas, R. Hottot, G. Brès, C. Ivey, L. Heidt, K. Wang, S. Bose

Thu, 23/07/2026 09:45 - 11:15

NM - 3 (BB)

MS021C - Enabling Technologies for Digital Twins: Model Reduction And Scientific Machine Learning III

Main Organizer: Prof. Alvaro Coutinho (COPPE/Federal University of Rio de Janeiro)

Chaired by: Prof. Alvaro Coutinho (COPPE/Federal University of Rio de Janeiro), Prof. Gianluigi Rozza (SISSA)

Evolution of the Digital Twin towards Certification: Integrating Physically Interpretable ML Pipelines into the FDE Ecosystem for Service Life Extension Programs

F. Sanchez Moreno, ***J. Rozalen Perez**, J. Gomez-Escalonilla Martin

A Physics-Informed Neural Network Framework for Multiphase Flows with Interface-Capturing Schemes

***R. Halder**, N. Tonicello, D. Coscia, G. Rozza

A Finite Element-Inspired Mesh-Adaptive Hypergraph Neural Network Framework for Oscillating and Rotating Domains

R. Gao, Z. Cheng, ***R. Jaiman**

Autoencoder-Based Multi-Fidelity Modelling for EMC filter design

***S. sallinger**, B. Nayak, J. Hansen

An Advanced Graph Neural Pipeline for CO2 Plume Migration in Complex Geological Formations

R. Luna, T. Coelho, R. Velho, ***A. Cortes**, R. Elias, A. Evsukoff, F. Rochinha, H. Gross, M. Araya-Polo, A. Coutinho

A parametric reduced-order modeling of wake interactions in multi-turbine configurations

***A. Regmi**, S. Dave, G. Stabile, G. Rozza, A. Korobenko

Thu, 23/07/2026 09:45 - 11:15

H4 - 1 (Ludwig)

MS253B - Computational Geomechanics II

Main Organizer: Prof. Jinhyun Choo (Seoul National University)

Chaired by: Prof. Jidong Zhao (Hong Kong University of Science and Technology, Hong Kong), Prof. Jinhyun Choo (Seoul National University)

Overcoming Time Discontinuity in Finite-Discrete Element Method using a Node Binding Scheme

***Z. Shuai**, K. Gao, W. Cai

Pullout of a Plate Intruder from a Granular Medium beyond the Point of Failure

***D. Krenzel**, J. Chen, S. Nomura, S. Ota, H. Takahashi

A unified multi-phase, multi-physics, and multi-resolution SPH framework for modelling soil-water-rock-structure interactions

***S. Zhang**, J. Zhao

Accelerating stochastic simulation of post-failure landslide runout using a random graph neural network-based simulator

***Y. Choi**, S. Lee, S. Ryu

Topology Optimization of Foundation Structures Considering Uncertainty in the Stratigraphy

***L. Irshaid**, B. Kriegesmann

Sequential coupling strategy for thermohydromechanical simulation of geological fault reactivation during cold CO2 injection

***C. Mejia**, J. Rueda, D. Roehl

Thu, 23/07/2026 09:45 - 11:15

H4 - 2 (Leopold)

MS016B - Scientific Machine Learning for Nonlinear Model Reduction II

Main Organizer: Prof. Boris Kramer (University of California San Diego)

Chaired by: Prof. Benjamin Peherstorfer (Courant Institute of Mathematical Sciences, New York University), Prof. Boris Kramer (University of California San Diego)

A Shifted POD Framework for Optimal Control of Dynamical Systems

***T. Breiten**, S. Burela, P. Schulze

Physically consistent predictive reduced-order modeling by enhancing Operator Inference with state constraints

***H. Kim**, B. Kramer

Nonlinear Model Reduction of Parametrized Transport-Dominated Problems via Composite Sparsity

***Q. Dai**, M. Yano

Robust and Reliable Nonlinear Model Order Reduction for Shocked Flows

***A. Razavi**, M. Yano

Manifold-Adaptive Empirical Cubature for Hyper-Reduction in Nonlinear Computational Homogenization

***J. Hernández**, S. Ares de Parga, R. Rossi

Nonlinear Manifold-based pROM for Gas-Bearing Rotordynamics

***G. Mossinelli**, F. Nobile, S. Riffaud

Thu, 23/07/2026 09:45 - 11:15

H4 - 3 (Franz)

MS087B - Data-Driven Computational Mechanics and AI for Advanced Materials and Multiphysics Systems II

Main Organizer: Dr. Lijun Liu (The University of Osaka)

Chaired by: Dr. Lijun Liu (The University of Osaka)

Machine learning–assisted three omega method for predicting multiple thermophysical properties with low variation

***Y. Ikeda**, R. Yamasaki, Y. Matsunaga, Y. Akura, L. Liu, J. Hirotani

Entropy-Guided Ensemble Active Learning for Efficient Structural Selection in Machine-Learning Interatomic Potentials

***H. Nonaka**, L. Liu, W. Jia, J. Hirotani

Graph Neural Network–Based Multiscale Modeling of Lithium-Ion Batteries Incorporating Polycrystalline Microstructure

***Z. Wang**, W. Chen, Y. Zhao, B. Xu

Learning to Swarm: Mechanics-Informed AI for Nature-Inspired Collective Robotics

M. Bekkuliyeve, ***C. Peco**

A data-driven inelastic constitutive framework for polymeric materials

***H. Dal**, A. Açan, R. Durna

Thu, 23/07/2026 09:45 - 11:15

H4 - 4 (Alois)

MS017D - Topology Optimization for Multidisciplinary Design IV

Main Organizer: Dr. Shun Ogawa (The university of Tokyo)

Chaired by: Dr. Jan Oellerich (The University of Tokyo), Dr. Shun Ogawa (The university of Tokyo)

Topology Optimization of Flexible Modular Metamaterials for Lightweight and Adaptive Prosthetic Feet

Keynote

***H. MAO**, R. Wang

Explicit Topology Optimization of Three-dimensional Bi-modulus Hyperelastic Structures under Finite Deformation

***L. Xiao**, Z. Du, X. Guo

Multi-Material Density-Based Thermo-Mechanical Topology Optimization via Coupled Adjoint Sensitivity Analysis

***S. Jalayer**, I. Kim

Variable Cross-Section Optimization of Stiffeners in Thin-Walled Structures via Feature-Driven Optimization (FDO)

***H. Zhang**, S. Cai, W. Zhang

Topology optimization of structural materials for broadband electromagnetic wave absorption and load-bearing

***T. Xu**, K. Qiu, Y. Luo

Thu, 23/07/2026 09:45 - 11:15

H4 - 5 (Xaver)

MS212A - Numerical Modelling of Viscoelastic Flow Problems: Advanced Numerical Techniques, High Performance Computing, and Challenges I

Main Organizer: Prof. Stefan Turek (TU Dortmund University)

Chaired by: Prof. Stefan Turek (TU Dortmund University), Prof. MEHMET SAHIN (ISTANBUL TECHNICAL UNIVERSITY)

A Side/Face-Centered ALE Framework With Exact Mass Conservation for Viscoelastic Multiphase Fluid Flows

C. Guventurk, ***M. Sahin**

From Polymer Coils to Continuum Flow: A Fully Lagrangian Heterogeneous Multiscale Framework for Viscoelastic Rheology

***N. Moreno**, E. Patino-Narino, E. Zohravi, S. Hamzehlou, M. Raj, M. Fernandez, N. Ballard, J. Asua, M. Ellero

Modeling of Photopolymerizable Droplets for Voxel-Based 3D Printing

***S. Rouf**

Designing non-Gaussian operations for continuous-variable quantum computing platforms

X. Gao, ***S. Abel**, O. Pfister

Thu, 23/07/2026 09:45 - 11:15

H4 - 6 (Sissi)

MS328A - Advances in PDE-constrained Optimization I

Main Organizer: Dr. Johannes Haubner (University of Graz)

Chaired by: Prof. Michael Ulbrich (Technical University of Munich), Dr. Johannes Haubner (University of Graz)

Stochastic approximation for state-constrained optimal control problems under uncertainty

***C. Geiersbach**

Optical flow based optimal control for image registration

***J. Haubner**

Linear convergence of a one-cut conditional gradient method for total variation regularization

G. Cristinelli, J. Iglesias, ***D. Walter**

Multi-Material Topology Optimization with General Convex Polytopal Constraints

***D. Kim**, B. Lazarov, T. Surowiec, P. Gangl, B. Keith

Optimization of Borehole Heat Exchangers fields via Accelerated Analytical Models

***O. Heinzel**, M. Ulbrich, S. Halilovic

Sparse Regularization Techniques for Efficient Inverse Problem Solving with Application in Contaminant Dispersion

***M. Mattuschka**, M. von Danwitz, A. Popp

Thu, 23/07/2026 09:45 - 11:15

H4 - 7 (Maximilian)

MS367A - Data-Driven Approaches for Accelerating Model-Based Analysis of Physical Systems I

Main Organizer: Dr. Zachary Morrow (Sandia National Laboratories)

Chaired by: Dr. Zachary Morrow (Sandia National Laboratories)

Discovering Physical Structure with Shallow Universal Polynomial Networks

***Z. Morrow**, M. Penwarden, T. Yen

VPBoost: Accelerating Gradient Boosting with Variable Projection for Separable Neural Networks

***A. Chowdhary**, E. Newman, D. Verma

An Optimal Weighted Least-Squares Method for Operator Learning

***J. Turnage**, M. Lowery, J. Jakeman, Z. Morrow, A. Narayan, V. Shankar

Predicting the Screening Effect of an Inclined Wave Barrier due to a Seismic Event with a Wave Based Approach

***M. Lainer**, G. Müller

Surrogate Modeling for MHD Flows in Liquid Metal Fusion Blankets

***M. Stoyanov**, H. Tran, C. Hauck, S. Smolentsev

Thu, 23/07/2026 09:45 - 11:15

H4 - 8 (Eventcenter)

MS239D - Advances in Shape Optimization and Form-Finding for Engineering Design IV

Main Organizer: Prof. Kai-Uwe Bletzinger (Technical University of Munich, Germany)

Chaired by: Prof. Kai-Uwe Bletzinger (Technical University of Munich, Germany), Prof. Pierluigi D'Acunto (Technical University of Munich (TUM))

Multiscale Shape Optimization method for Vibration Design of Laminated Porous Shell Structure

***M. Shimoda**, G. Kuwayama, A. Kamiya, M. Naguib

Auto-Differentiable Locally-Conservative Transport Solver for Designing Tritium Breeders

***H. Li**, S. Arevalo Carcamo, J. Barrera, T. Roy, B. Talamini, M. Tupek, A. Yang, B. El Dasher

Shape Optimization Using a Neural Implicit Geometry Representation Framework

***L. Freinberger**, M. Kofler, S. Elgeti

Shape Gradients in Metamaterial Unit Cells: A Comparison of FEA and IGA

***L. Mazza**, J. Liedmann

Parameterized shape optimization of programmable liquid crystal elastomer structures

***B. MacNider**, K. Riley, M. Abdelrahman, D. Tortorelli, C. Krikorian, E. Lee, J. Barrera Cruz

Thu, 23/07/2026 09:45 - 11:15

BrainLab - Training

MS002C - Advanced Materials: Computational Analysis of Properties and Performance III

Main Organizer: Prof. Vadim Silberschmidt (Loughborough University)

Chaired by: Prof. Vadim Silberschmidt (Loughborough University)

Microscopic Mechanics of Fracture in Glassy Polymers Revealed by Particle-Continuum Coupling Simulations

***W. Zhao**

Longitudinal compressive failure analysis of UD composites with 3D fibre waviness considering fibre induced residual stresses

***L. Wan**

Quantification of Damage in Energetic Granular Material

***C. Robin**, S. Belon, P. Dokladal, E. Fousson, V. Goetz, E. Kaeshammer, F. Willot

Effective Mechanical Properties of Multi-Layer Lattice Structures: Analytical and Computational Methods

***P. Suttakul**, I. Thawon, T. Fongsamootr, N. Siroros, D. Vo

Geometric Characterisation of Fibrous Porous Networks Based on Microstructural Analysis

***Y. Kayali**, E. Smotrova-Kayali, A. Gleadall, V. Silberschmidt

Computational Anharmonic Thermoelectric Transport in Barium Chalcogenide Perovskites

***A. Shafique**, S. F. Elatresh

Thu, 23/07/2026 09:45 - 11:15

NM - 6 (Munich)

MS129A - The Role of Nonlocality in Fracture Mechanics I

Main Organizer: Dr. Francesco Scabbia (Università degli studi di Padova)

Chaired by: Dr. Francesco Scabbia (Università degli studi di Padova), Dr. Francisco Vieira (IDMEC, Instituto de Engenharia Mecânica)

An Overview of Nonlocal Vector and Variational Calculus based on Nonlocal Gradients

***J. Cueto**

Nonlocality and its Influence on the Fracture of Architected Solids

***R. Sinha**, S. Sarkar

Peridynamic Modeling of Fatigue Damage in Inconel 718 with Surface and Internal Defects

***M. Nasrollahnejad**, F. Scabbia, M. Zaccariotto, U. Galvanetto

Scale Effects in Elastic Solids via Cosserat-Enhanced Peridynamics

***P. Nosal**, F. Scabbia, D. Morin

Peridynamic Simulation of Mining-Induced Dynamic Evolution of the Overburden Three-Zone Structure during Coal Seam Extraction

***T. Ni**, J. Shao

A Nonlocal Peridynamic Approach to Modelling Anisotropic Heat Transfer and Phase-Change Evolution in SLM

***Q. Liu**, F. Scabbia, U. Galvanetto, M. Zaccariotto

Thu, 23/07/2026 09:45 - 11:15

NM - 7 (Venice)

MS344C - Agentic AI and Physics-Informed Machine Learning for Next-Generation Design and Manufacturing III

Main Organizer: Prof. Seunghwa Ryu (KAIST)

Chaired by: Prof. Seunghwa Ryu (KAIST), Dr. Ci He (Yangzhou University)

Physics-informed generative framework incorporating data importance for performance enhancement under data scarcity

***G. Lee**, M. Lee, I. Lee

A physics-informed multi-fidelity optimization framework for constrained aerodynamic optimization of high-speed elevator

***C. He**, J. Sun, K. Izui, Z. Wang, L. Qiu, S. Zhang

A Physics-Informed Machine Learning Framework for Aerodynamic Performance-Driven Shape Optimization

***H. Noh**, J. Park, M. Park, S. Lee

Physics-Informed Inverse Design of Multistable Origami with Programmable Energy Barriers

***S. Kang**, Y. Kim, J. Yang, S. Ryu

Rapid Inverse Design of Wire Braided Architectures Using Physics-Informed Neural Operator

***S. Lee**, S. Kang, S. Ryu

Thu, 23/07/2026 09:45 - 11:15

ICM - 50 (Seeblick)

MS304A - Teaching Computational Science and Engineering across the Spectrum: from First-Year Transitions to Graduate Education I

Main Organizer: Prof. Simone Deparis (MATH - EPFL)

Chaired by: Prof. Simone Deparis (MATH - EPFL), Mr. Steve Bennoun (UCLA)

How to visualize computational mechanics: Animating finite elements, continuum mechanics, and tensor calculus

***M. Flaschel**

Do Generative AI Demonstrations in an Engineering Mechanics Course Enhance Learning?

***E. Lejeune**

Exploring the Impact of Computer-Aided Assessment on Classroom Interactions in Preparatory Mathematics Tutorials

***T. Treskatis**

Bridging the Gap Between The Math Taught in First-Year Courses and The Math Used in Research: Example in the Life Sciences

***S. Bennoun**

Students Perspective about Active Learning Strategies to Teach Numerical Methods

S. Teixeira, ***M. Ribeiro**, N. Rodrigues, V. Carvalho

Thu, 23/07/2026 11:15 - 11:30

Short Break

Thu, 23/07/2026 11:30 - 13:00

ICM - 1 Auditorium

MS283F - Recent Progress in Topology Optimization and Its Applications VI

Main Organizer: Prof. Junji Kato (Nagoya University)

Chaired by: Prof. Bin Niu (Dalian University of Technology), Dr. Ryohei Katsumata (Nagoya University)

PDE-constrained High-order R-refinement For GPU-accelerated Density Topology Optimization

***B. Lazarov**, M. Schmidt

Hierarchical stiffened thin-walled structures using topology optimization methods

***C. Wang**, L. Xia

Large-Scale Simultaneous Potential and Topology Optimization of Electroactive Polymers

***D. Hård**, M. Wallin, M. Ristinmaa

A Fully Eulerian Framework for Topology Optimization of Unsteady Fluid–Structure Interactions

***R. Katsumata**, K. Nishiguchi, J. Kato

Thu, 23/07/2026 11:30 - 13:00

ICM – 2

MS020D - Large Deformation Beams and Shells: Formulation Advances and Innovative Applications IV

Main Organizer: Prof. Enzo Marino (University of Florence)

Chaired by: Prof. Manfred Bischoff (University of Stuttgart), Prof. Josef Kiendl (University of the Bundeswehr Munich)

A Fully Nonlinear Triangular Shell Element Based on an Incremental Rodrigues Update Formalism

Keynote

***C. Sousa**, M. Vorwerk, P. Pimenta, J. Schröder

A new quadrilateral shell element based on Cartan's moving frames: static and dynamic analysis

***R. Yi**, J. Chen, Q. Tian

Nonlinear Shell Finite Elements with Arbitrary Displacement Fields along the Thickness

E. Carrera, ***D. Scano**

A spectral Reissner--Mindlin shell element with enhanced efficiency

***N. Azizi**, W. Dornisch

Thu, 23/07/2026 11:30 - 13:00

ICM – 3

MS258A - Scientifically Sound Generative Design for Engineering Applications I

Main Organizer: Prof. Chady Ghnatios (University of North Florida)

Chaired by: Prof. Elías Cueto (Universidad de Zaragoza), Dr. sebastian rodriguez (ENSAM)

Rigid polyurethane generation and functional properties predictions using Rank-reduction autoencoders

***C. Ghnatios**, I. Hage, E. Feghaly

Reduced-Rank Autoencoders for Structured Latent Manifolds in Constrained Engineering Design

***W. Liu**, C. Mailhé, F. Chinesta

Physics-informed generative adversarial design of funicular shells

***R. Lourenço**, I. Alfaro, B. Moya, E. Cueto

Probabilistic recovery of unobserved exogenous variables in expert-defined causal DAGs

***B. Boussaid**, C. Ghnatios, M. Jebahi, R. Bonidal, F. Chinesta

Thu, 23/07/2026 11:30 - 13:00

ICM – 4a

MS317D - Recent Advances in Mesh-free and Particle Methods IV

Main Organizer: Prof. Mitsuteru Asai (Kyushu university)

Chaired by: Prof. Min Luo (Zhejiang University), Dr. Abbas Khayyer (Kyoto University)

Numerical Simulation of Droplet Runback on a Solid Wall by Coupling Moving Particle Simulation and Finite Volume Method

***H. Tsujimura**, K. Kubota

Simulation of Mixing Processes Using Particle Methods with Surrogate-Based Flow Prediction

***E. Ishii**, T. Hosaka, K. Mitsufuji, S. Koshizuka, T. Matsunaga, M. Ikeno, H. Wang

An Accurate Thermodynamic SPH Model for Multiphase Flows

X. Fang, ***P. Wang**, S. Wang

An Improved Multiphase Riemann SPH Method for Strongly Compressible Flows

X. Fang, ***S. Wang**, A. Zhang, P. Wang

Numerical Simulation of Liquid-liquid Droplet Breakup in Axisymmetric Extensional Flow

***M. Bito**, T. Matsunaga, S. Koshizuka, A. Maki, A. Ohara, Y. Kaneko, S. Kuwagaki, K. Sugiyama, K. Yamauchi, A. Horiguchi, E. Miyasaka

SPH Formulation for Fresh Concrete under Vibration Using a Modified Non-Newtonian Fluid Model

***T. Segawa**, Y. Yuki, S. Kano, M. Asai

Thu, 23/07/2026 11:30 - 13:00

ICM – 4b

MS198A - Multiphysics and Data-driven Modeling for Cardiovascular Biomedicine I

Main Organizer: Prof. Debanjan Mukherjee (University of Colorado Boulder)

Chaired by: Prof. Debanjan Mukherjee (University of Colorado Boulder), Prof. Adarsh Krishnamurthy (Iowa State University)

CardioPINNs: An Inverse Physics-Informed Neural Network Platform for Cardiovascular Blood Flow Simulations

***O. Khan**

Modeling Lower-Limb Venous Hemodynamics: A 1D Computational Framework for Investigating Valves and External Compression

***S. Ferlito**, M. Reda, A. Sen, J. Alastruey, S. Avril

Learning Spatio-Temporal Dynamics with Latent Dynamics Networks for Constructing Cardiac Digital Twins

***L. Dede'**

A Julia framework for modelling endovascular device interaction

***M. Aguirre**, B. Bisighini, A. ARgilaga, M. Shankar Yadav, N. Nama, S. Avril

Combining Fluid-Structure Interaction and Systems Biology to Predict Aortic Valve Calcification

M. Quan, L. Harris, ***H. Luo**

Thu, 23/07/2026 11:30 - 13:00

ICM - 5

MS100A - New Trends in Topology Optimization I

Main Organizer: Prof. Emilio Silva (University of Sao Paulo)

Chaired by: Prof. Emilio Silva (University of Sao Paulo), Dr. Renato Picelli Sanches (University of São Paulo)

Design of a Specimen to Train Path-Dependent Deep Learning Material Models from a Single Uniaxial Test: Eliciting Strain Diversity via Automatically Differentiable Elastoplastic Topology Optimization

Keynote

***S. Yin**, B. Ferreira, G. Ku?, M. Bessa

Structural damage identification based on Fourier neural operators

***K. Li**, J. Na, M. Shin, G. Yoon

Trajectory-Based Learning of Evolution Dynamics for Efficient Multi-Objective Topology Optimization in Fluid Flow and Heat Transfer

***H. Tang**, J. Zhu, Z. Tao, L. Qiu

Problem Independent Machine Learning-Based Fast and High Accuracy Topology Optimization for Large Scale Heat Conduction Structures

***Z. Wei**, C. liu, X. Guo

Gradient Based Start Design Generation for Feature Mapping

***F. Wein**, P. Jung, M. Stingl

Thu, 23/07/2026 11:30 - 13:00

ICM - 11a

MS059B - Bridging scientific machine learning and scientific discovery: Novel developments II

Main Organizer: Dr. Romit Maulik (Purdue University)

Chaired by: Prof. Ricardo Vinuesa (University of Michigan), Dr. Gianmarco Mengaldo (National University of Singapore)

MOJITO: Multi-Output Joint Information-Theoretic Optimization for Scientific Discovery

***M. Cabral**, B. Font, G. Weymouth

Differentiable Dynamic Mode Decomposition

***S. Pan**

Inverse flowfield reconstruction from streaklines

***A. Linot**, I. Scherl

Knowledge-informed machine learning for shaping model behaviour

***Z. Fang**, G. Mengaldo

Discovering Predictability Limits and Structural Origins of Extremes in Turbulent Flows via Diffusion-Based Modeling

***Y. Yang**, C. Dong, G. Mengaldo

Classically studied coherent structures only paint a partial picture of wall-bounded turbulence

***S. Hoyas**, A. Cremades, R. Vinuesa

Thu, 23/07/2026 11:30 - 13:00

ICM - 11b

MS028A - Bridging Disciplines and Scales for Sustainable Cement and Concrete I

Main Organizer: Prof. Bernhard Pichler (TU Wien)

Chaired by: Prof. Luise Göbel (Bauhaus-Universität Weimar), Dr. Jithender Timothy (Technical University of Munich)

Nonlinear Creep in Concrete: Stress-Induced Stick-Slip Transition of Viscous Interfaces and Damage from Microcracking

R. Díaz Flores, C. Hellmich, ***B. Pichler**

Multiscale modeling of slag-based CEM II concrete: Identification of the basic creep behavior of hydrates

***M. Sorgner**, R. Díaz Flores, B. Pichler, T. Pilgerstorfer, B. Moritz, C. Hellmich

Effects of Boundary Configuration and Spatial Data Representation on the Performance of Dynamic Mode Decomposition in Predicting Chloride Ingress

***Y. Li**, M. Vořechovský

Potential-based modeling of concrete fatigue: discrete and continuum formulations validated on prestressed beams

***S. Esfandiari**, N. Alkasasbeh, M. Aguilar, M. Vořechovský, R. Chudoba

Structure-Preserving Machine Learning for Viscoelastic Constitutive Modeling of Cementitious Materials

***A. Delpasand**, M. Vořechovský, R. Chudoba

Thu, 23/07/2026 11:30 - 13:00

ICM - 12a

MS047B - Advances in Model Calibration Techniques in Computational Mechanics II

Main Organizer: Dr. Andrew Stershic (Sandia National Laboratories)

Chaired by: Dr. Coleman Alleman (Sandia National Laboratories), Dr. Daniel Seidl (Sandia National Laboratories)

Capturing High-Frequency Features in Full-Field Shock Dynamics Simulations using Machine Learning

***A. Lenau**, A. Robertson, J. Stewart, R. Dingreville, D. Damm

A Decoupled Micromorphic–Second Gradient Computational Framework for the Homogenization of Hyperelastic Fiber-Reinforced Media

***A. Gamra**, K. Mansouri, Y. Renard, M. Arfaoui, T. Homolle

A Parametric Study of Crystal Plasticity-Based Multi-Scale Models for the Calibration of Component Scale Anisotropic Plasticity

***C. Fietek**, H. Lim, J. Seidt, Y. Korkolis

Sparse Grid Surrogates to Replace Physics Simulations for Material Model Calibration

***K. Karlson**, D. Seidl

Graph networks for non-linear materials and mesh super resolution

***R. Buarque de Macedo**, C. Hamel

Thu, 23/07/2026 11:30 - 13:00

ICM - 12b

MS203A - Sensitivity Analysis in Science and Engineering: Methods, Applications, and Emerging Directions I

Main Organizer: Dr. Sebastian Brandstaeter (University of the Bundeswehr Munich)

Chaired by: Dr. Sebastian Brandstaeter (University of the Bundeswehr Munich), Dr. Gian Marco Melito (TU Graz)

Sensitivity Indices Based on Finite Differences

R. Yue, ***G. Ökten**

Sensitivity Analysis in Structural Health Assessment Using Generalized Polynomial Chaos Expansion: a Full-scale Bridge Test Case

***J. Bonari**, F. Marsili, M. von Danwitz, A. Popp

The Last Expectation: Importance Sampling for Measurement Outcomes in Value of Information Analysis

***L. Friedli**, I. Papaioannou, D. Straub

Identifying Performance-Critical Parameters in Preconditioned Iterative Solvers Using Surrogate-Assisted Global Sensitivity Analysis

***R. Bühler**, M. Mayr, A. Popp, S. Brandstaeter

MS318A - Quantum Computing in Engineering Mechanics: Opportunities and Challenges I**Main Organizer:** Dr. Pania Newell (The University of Utah)**Chaired by:** Dr. Pania Newell (The University of Utah), Prof. Lucy Zhang (Rensselaer Polytechnic Institute)

Quantum Algorithms in Computational Mechanics

M. Deiml, ***D. Peterseim**

A Quantum Spectral Method for Non-Periodic Boundary Value Problems

***E. Febrianto**, Y. Wang, B. Liu, M. Ortiz, F. Cirak

Quantum-Classical Adaptive-Stabilized Finite Element Method for Advection-Diffusion-Reaction Model

***R. Drebotiy**

Towards Measurement-Efficient Quantum Lattice Boltzmann Methods for Advection–Diffusion on NISQ Hardware

***M. Quartey**, L. Zhang

Quantum algorithm for the lattice Boltzmann method with applications on real quantum devices

A. Bastida-Zamora, ***L. Budinski**, O. Kerppo, V. Lahtinen, O. Niemimäki, P. Sagaut, W. Steadman, R. Zamora-Zamora, V. Bohun, M. Koch-Janusz, M. Maksymenko**MS295B - Continuum Biomechanics of Living Active Systems – Computational Modeling & Experimental Validation II****Main Organizer:** Prof. Tim Ricken (University of Stuttgart)**Chaired by:** Prof. Silvia Budday (Friedrich-Alexander-Universität Erlangen-Nürnberg)

The Role of Aponeurosis Thickness in Three-Dimensional Muscle Mechanics: A Finite-Element Study

***R. Ring**, M. Böl, T. Siebert

Biomechanical Analysis of Procedural and Biological Factors in Intra- Arterial Thrombolysis for Medium Vessel Occlusions

***A. Lucchetti**, L. Juhl, C. Weyland, O. Nikoubashman, I. Mager, J. Clauser, M. Neidlin

Experimental determination of active and passive mechanical properties in uniaxial and biaxial tensile testing to develop a continuum mechanical model of urinary smooth muscle tissue

***J. Geldner**, S. Papenkort, S. Kiem, M. Böl, T. Siebert

A Unified Framework for Validating Computational Models of Human Brain Development

***M. ZARZOR**, Q. Ma, B. Kainz, S. Budday

In-vivo Estimation of Corneal Hyperelastic Material Properties from Clinical Tomography Data

***R. Grytz**, H. Shirazi, K. Hsu, W. Dupps

Analyzing and Simulating the Force Development of Active Muscle Fibers During Lengthening

M. Millard**, A. Tomalka, T. Siebert, C. Rode**MS031D - Open-Source Software in Mechanics IV*Main Organizer:** Dr. Vladislav Yastrebov (MINES Paris, PSL University, CNRS)**Chaired by:** Dr. Tzanio Kolev (Lawrence Livermore National Laboratory (LLNL))

Salome_meca: A Mechanical Simulation Platform Tailored for Studies and Research

M. Abbas, ***E. Agouzal**, J. Cornejo Fuentes, V. Le Corvec, N. Tardieu

Implementation of fracture in Mixed Finite Element

***L. Kaczmarczyk**, A. Bijaya, A. Shvarts, C. Pearce, C. Runcie

PeriFast: an open source peridynamic code for dynamic fracture and corrosion damage

***F. Bobaru**, D. Salzar

HPC Performance and Parallel Scalability of OFFBEAT for Large Scale Fuel Performance Simulations

***M. Barbieri**, A. Scolaro, S. Gianfelici

An Object-Oriented Framework for Finite element and Isogeometric Analysis of Composite Structures

E. Barroso, ***E. Parente Jr.**, L. Mororó, J. Sousa Jr., A. Melo

Mantis.jl: a structure-preserving FECC library

D. Costa Cabanas, J. Dekker, ***A. Palha**, D. Toshniwal

Thu, 23/07/2026 11:30 - 13:00

ICM - 14b

MS153B - Data-driven dynamical systems: learning, simulation, and control II

Main Organizer: Prof. Andrea Manzoni (Politecnico di Milano)

Chaired by: Prof. Andrea Manzoni (Politecnico di Milano)

Data-Driven Control of Efficient Periodic Motions

O. Brook, ***U. Fasel**

Plug-and-Play Benchmarking of Reinforcement Learning Algorithms for Large-Scale Flow Control

***J. Becktepe**, A. Franz, N. Thuerey, S. Peitz

Control of Parametric Distributed Systems with Hypernetwork-based Reinforcement Learning

***N. Botteghi**, M. Tomasetto, U. Fasel, F. Braghin, A. Manzoni

Hypernetwork-Based Adaptive Response Prediction for Structural Dynamics

***D. Weiss**, P. Vlachas, K. Vlachas, E. Chatzi

VENI, VINDy, VICI: a generative reduced-order modeling framework with uncertainty quantification

***P. Conti**, J. Kneiff, A. Manzoni, A. Frangi, J. Fehr, S. Brunton, N. Kutz

Tensor-Train-Based Methods for High-Dimensional Optimal Control Problems

S. Dolgov, D. Kalise, ***L. Saluzzi**

Thu, 23/07/2026 11:30 - 13:00

ICM - 14c

MS305A - The Fast and The Curious: Exploring data-efficient sampling in science and engineering I

Main Organizer: Dr. Ana Larrañaga (University of Washington)

Chaired by: Mr. Filippo Zacchei (Politecnico di Milano), Dr. Ana Larrañaga (University of Washington)

Data-Efficient Nonlinear and Parametric Aeroelastic Modeling via Physics-Informed Sparse Identification

***M. Sinani**, U. Fasel, R. Palacios, A. Wynn

Model order reduction and adaptive sampling for data-efficient parameter inference in granular flows

***H. Cheng**, M. Guo

Active sampling for sparse dictionary learning of nonlinear dynamical systems under data constraints

***A. Larrañaga**, U. Fasel, S. Brunton

Risk-Optimal Multifidelity Linear Regression for Surrogate Modeling from Scarce Data

***A. Rex**, E. Qian

Multi-Fidelity SINDy: Sparse Discovery of Nonlinear Dynamical Systems with Fidelity-Weighted Measurements

***F. ZACCHEI**, A. Larranaga, A. Manzoni, S. Brunton

Thu, 23/07/2026 11:30 - 13:00

ICM - B11

MS173B - Mechanobiology of Cells, Vesicles and Biomembranes II

Main Organizer: Prof. Roger Sauer (Ruhr University Bochum)

Chaired by: Dr. SHAOFAN LI (University of California-Berkeley), Prof. Roger Sauer (Ruhr University Bochum)

Computational Mechanics of Lipid Membranes with Embedded Semiflexible Filaments.

***S. Dharmavaram**

Wrinkling-banding transition in lipid monolayers through Structured Deformations

A. Carotenuto, A. Gaffney, A. Mirandola, N. Nguyen, K. Lee, D. Owen, S. Palumbo, L. Pocivavsek, M. Fraldi, ***L. Deseri**

Electric-Field-Induced Destabilization of Amyloid- β Fibrils with Lys16 Mutations

***S. Lim**, J. Yeom, H. Shin, T. Yoon

Inverse Finite-Element Model Determination of Human iPSC-Derived Endothelial Progenitor Stress-Fiber Changes During Vasculogenesis

***G. Peery**, T. West, M. Sacks

The mechanical response of the human Zona Pellucida

***Y. Yosef**, T. Priel, I. Har-vardi, E. Priel

Thu, 23/07/2026 11:30 - 13:00

ICM - B12

MS118B - Scalable Iterative Solvers: Recent Advances in Domain Decomposition and Multigrid Methods II

Main Organizer: Dr. Ivan Prusak (Ruhr-Universität Bochum)

Chaired by: Dr. Richard Schussnig (Ruhr University Bochum), Dr. Ivan Prusak (Ruhr-Universität Bochum)

Nonlinear two-level Schwarz methods avoiding global sparse matrix computations

A. Klawonn, ***M. Lanser**, J. Weber-Hamacher

A GPU-Oriented Bootstrap Multigrid Framework in BootCMatchGX for Extreme-Scale Problems

M. Bernaschi, M. Carrozzo, A. Celestini, G. Piperno, ***P. D'Ambra**

RB-GEVP: Reduced-basis acceleration of adaptive coarse-space construction in FETI-DP for high-contrast problems

T. Medvedev, A. Heinlein, ***M. Doškál**

Improving Aggregation in Algebraic Multigrid Methods for Problems with Heterogeneous and Anisotropic Materials

M. Firmbach, M. Phillips, C. Glusa, A. Popp, C. Siefert, ***M. Mayr**

Two-level Overlapping Schwarz Preconditioners with Algebraic Multiscale Coarse Spaces for Large-scale Heterogeneous Problems

***F. Cumarú**, A. Heinlein, H. Hajibeygi

Matrix-Free Patch Smoothers: Efficient Local Solvers for High-Order Finite Elements

***M. Wichrowski**

Thu, 23/07/2026 11:30 - 13:00

ICM - B13

MS359A - Robust Design and Tolerance Optimization I

Main Organizer: Prof. Benedikt Kriegesmann (Hamburg University of Technology)

Chaired by: Prof. Benedikt Kriegesmann (Hamburg University of Technology), Prof. Markus Zimmermann (Technical University of Munich)

Stochastic Gradient Recycling for Efficient Topology Optimization Under Uncertainty

L. Pflug, M. Stingl, ***A. Uihlein**

Topology Optimization with Connectivity Constraint of Extruded Rib Structures for Robust Lost-Foam Casted Forming Tools

***T. Franke**, R. Bartz, L. Bösser, M. Mackiewicz

Efficient Reliability-Based Topology Optimization via an Analytical Approach for Modeling Probabilistic Defects in Additive Manufacturing

***Y. Park**, O. Nejadseyfi, M. Langelaar

Novel Robust Optimization method for Partial Squealer Tip design of Gas turbine Blade with Wind Tunnel Experiment Validation

M. Huang, ***K. Zhang**, B. Bai, W. Shao, Z. Li, J. Li

Uncertainty Quantification to Support Hybrid Electric Engine Robust Design

***L. Stumpo**, S. Zanotti, M. Antonazzo, F. Babbini, M. Russo, A. Ferrero, F. Masseni, D. Pastrone, F. Amato, J. Lopez Ruiz

Thu, 23/07/2026 11:30 - 13:00

ICM - B21

MS262D - Advances of Quantum and Quantum-Inspired Algorithms for Solving Flow Simulation Problems IV

Main Organizer: Prof. Thomas Rung (Hamburg Univ. of Technology)

Chaired by: Prof. Peyman Givi (University of Pittsburgh)

Quantum-Inspired Fractional Step Method For Incompressible Flow Simulations In Curvilinear Coordinates

***N. van Hülst**, M. Cecile

Quantum-Inspired Tensor-Network Simulation Environment for Internal Flows

N. van Hülst, P. Over, S. Bengoechea, M. Cecile, ***L. Scandurra**, E. de Villiers, T. Rung, D. Jaksch

Prospects for the application of mean-field nonlinear quantum solvers to computational fluid dynamics problems

***F. Tennie**

Efficient quantum state tomography with Chebyshev polynomials

***H. Su**, S. Xiong, Y. Yang

Resource-Efficient Hadamard Test Tailored Variational Framework for Nonlinear Dynamics on Quantum Computers

***E. Mastorakis**, M. Umer, M. Guevara-Bertsch, J. Ulmanis, F. Rohde, D. Angelakis

Thu, 23/07/2026 11:30 - 13:00

ICM - B22

MS150B - Efficient Numerical Methods for Large-Scale Non-Linear Problems II

Main Organizer: Prof. Marco Donatelli (University of Insubria)

Chaired by: Prof. Marco Donatelli (University of Insubria), Prof. Rolf Krause (KAUST)

Analysis of multigrid methods for multilevel block Toeplitz matrices

***M. Bolten**, M. Donatelli, P. Ferrari, I. Furci

Multilevel Preconditioning Strategies for Convex Optimisation Methods in Image Deblurring

S. Aleotti, ***C. Binda**, M. Donatelli, R. Krause

Additive Nonlinear Preconditioning for Trust Region Optimization of Physics Informed Neural Networks

***S. Likaj**, B. Capriqi, K. Trotti, R. Krause, A. Angino

Steady Flow of Natural Gas in Pipeline Networks via Solution of a Nonlinear Differential-Algebraic System of Equations

***S. Srinivasan**, K. Sundar

Thu, 23/07/2026 11:30 - 13:00

ICM - 21a

MS064B - Computational Modelling of Bone Growth and Adaptation across Scales II

Main Organizer: Prof. Areti Papastavrou (Technische Hochschule Nürnberg Georg Simon Ohm)

Chaired by: Dr. Stefan Scheiner (TU Wien), Prof. Paul Steinmann (Friedrich-Alexander-Universität Erlangen-Nürnberg)

Longitudinal Analysis of Hip Joint Contact Pressure in Growing Children using Subject-Specific Multi-Scale In-Silico Simulations

***K. Kitir**, A. Synek, W. Koller, D. Pahr, H. Kainz

Quantifying Regional Mineral Variations in Femoral Midshaft Sections Using Large-Scale XCT

***C. Modiz**, N. M. Castoldi, C. Yang, A. Lagzouli, V. Sansalone, A. Kingston, P. Pivonka

Integrating experimental and numerical analyses in a framework to model vertebral growth

***N. Castoldi**, P. Pivonka, V. Sansalone

The Impact of Initial Fixation Stiffness and Biodegradation of Mg-alloy Fixation Plates on Fracture Healing

***P. Ansoms**, L. Geris, J. Vander Sloten

Influence of boundary conditions on modelling of trabecular bone adaptation to mechanical loading

***E. Smotrova-Kayali**, S. Li, V. Silberschmidt

Thu, 23/07/2026 11:30 - 13:00

ICM - 21b

MS109B - Multiscale Modeling Approaches for the Design and Optimization of Complex and Engineered Materials II

Main Organizer: Prof. Andrea Chiozzi (University of Ferrara)

Chaired by: Prof. Andrea Chiozzi (University of Ferrara)

A three-dimensional approach for soil structure interaction in masonry structures based on rigid blocks and boundary elements

***V. Mallardo**, N. Grillanda

The effective damping behavior of particle filled hollow sphere structures

***L. Jabs**, M. Schneider

A Perlin-Noise-Based Method for Multiscale Bio-Inspired Porous Materials

H. Yuan, Z. Li, C. Lou, ***Z. Wu**

Concurrent Multiscale Topology Optimization with TPMS Architectures

***A. Chiozzi**, A. Nale

Dislocation dynamics analysis to elucidate the mechanism of stacking fault strengthening in Nickel-based superalloy

***A. Hirano**, K. Nonoyama, A. Takahashi

Dislocation Dynamics Modeling of Stacking Fault Growth in 4H-SiC during Bipolar degradation

***M. Sugano**, A. Hirano, A. Takahashi

Thu, 23/07/2026 11:30 - 13:00

ICM - 22a

MS256A - Multiscale and Multiphysics Modelling of Heterogeneous Materials with Random and Periodic Microstructures I

Main Organizer: Dr. Greta Ongaro (Sapienza University of Rome)

Chaired by: Prof. George Stefanou (Aristotle University of Thessaloniki), Dr. Marco Pingaro (Sapienza University of Rome)

Numerical Identification of Elastic Parameters for Heterogeneous and Periodic Structures Composed of Orthotropic Materials

P. Barral, L. Pérez-Pérez, ***P. Quintela**

Micromechanical Modeling of Interface-Driven Nonlinear Behavior in Particle-Reinforced Polymers

***J. Ganslmaier**, P. Höfer

Macrohomogeneity condition in micropolar continua for heterogeneous materials with microstructure

P. Trovalusci, M. De Bellis, ***G. Ongaro**

Calibration of yield criterion parameters for composite materials within a micropolar continuum framework

***M. Colatosti**, P. Trovalusci, B. Carboni

Generating Concrete Mesostructures With High Aggregate Volume Fractions

***M. Krause**, L. Jabs, M. Schneider

Thu, 23/07/2026 11:30 - 13:00

ICM - 22b

MS161A - Cutting-Edge Mathematical Models: Dynamics, Vibrations, Control, and Fractional Calculus Applications I

Main Organizer: Dr. Frederico Silva (Federal University of Goiás)

Chaired by: Dr. Frederico Silva (Federal University of Goiás)

Nonlinear Dynamics and Instability of a Stayed Mast with Unilateral Constraints

***F. Silva**, F. Silva, D. Orlando

Dynamics Model for Orbit Propagation with Sloshing Perturbing Force

***K. Cichorek**, E. Jarz?bowska

Fractal geometry supporting 2D silica networks: sample generation and its mechanical properties

***L. Ochoa Ontiveros**, F. Bamer

Semi-Analytical Spectral Framework for Free–Free Timoshenko Beams on Elastic Foundation under Transverse Ground Vibration

***G. Banushi**

Energy-Integrated Task Planning for Space-Like Rover Operations

***V. Zvonarova**, E. Jarz?bowska

Thu, 23/07/2026 11:30 - 13:00

ICM - 41 (Ostersee A)

MS335B - Multi-scale and Multi-physics Modeling of Interfaces II

Main Organizer: Prof. Ralf Jänicke (TU Braunschweig)

Chaired by: Dr. Varvara Kouznetsova (Eindhoven University of Technology), Prof. Fredrik Larsson (Chalmers University of Technology)

Modeling and Computational Homogenization of Electro-Chemo-Mechanical Interactions in Multiphase Battery Electrode Materials

D. Rollin, F. Larsson, K. Runesson, ***R. Jänicke**

The Effects of Morphology Formation on the Performance of Organic Photovoltaics

***C. Tretmans**, P. Çilo?lu, R. Herzog, J. Pietschmann, M. Stoll

A Physics-Based Crystal Plasticity Model of Dislocation-Grain Boundary Interaction in Bicrystals

***A. Khan**, P. Chakraborty

Vibroacoustic analysis of periodic metamaterials with elastic frame porous components

***F. Weber**, G. Müller

Enhanced Convergence and Spectral Properties in Implicit Solutions of Gradient Flow Equations: A Lippmann--Schwinger-inspired Approach

***B. Yaraguntappa**, A. Krischok, M. Keip

An Effective Model for Flows over Flexible Hairy Surfaces

F. Colaco, ***S. Yogaraj**

Thu, 23/07/2026 11:30 - 13:00

ICM - 42 (Ostersee B+C)

MS365C - Computational Modeling of Solids and Structures Under Severe Loading III

Main Organizer: Dr. Stephen Beissel (Southwest Research Institute)

Chaired by: Dr. Michael Puso (Lawrence Livermore Nat'l Lab), Dr. Stephen Beissel (Southwest Research Institute)

Material Modelling for Blade Containment Simulations in Aircraft Engines

***M. Nahrman**, M. Wimmer, R. Böhm

Impact?Driven Wear Prediction of SAG Mill Lifters

***E. Kharrat**, J. Mastouri, M. Mannoubi, H. Mrad, A. Frikha

Modeling the Influence of Aggregate Shape on Concrete's Ballistic Resistance

***A. Bowman**, W. Lawrimore, S. Giesler, J. Santiago Padilla

The Large-Deformation Performance of Lagrangian Higher-Order Elements for Explicit Dynamics

***S. Beissel**

Thu, 23/07/2026 11:30 - 13:00

ICM - 43 (Eibsee)

MS023A - Nonlinear Analysis of Slender Structures: Numerical Methods and Discretisation Techniques I

Main Organizer: Prof. Antonio Madeo (University of Calabria)

Chaired by: Prof. Antonio Madeo (University of Calabria), Dr. Giovanni Zucco (University of Limerick)

Directed Deflation for Finding Unstable Saddle Points around Stable Equilibria Keynote

***R. Groh**

Dirichlet-Embedded Geometric Parameterization for Reduced-Order Modeling of Geometrically Nonlinear Slender Structures

***S. Yu**, Y. Tang

Reinforcement Learning for the Control of Simulations of Geometrically Non Linear Structures

***E. Marquis**, E. Baranger, P. Guidault, E. Agouzal, M. Courtois, T. Douillet-Grellier

Seismic Vulnerability Assessment of Masonry Minarets: Integrating the Minaret3D Parametric Framework with Limit Analysis

***S. AVCI**, M. Pourfouladi, G. Milani

Post-buckling Optimization of Slender Composite Structures using a Gradient-Based Approach and Implicitly Differentiated Koiter Method

F. Liguori, F. Morrone, G. Garcea, ***A. Madeo**

Thu, 23/07/2026 11:30 - 13:00

ICM - 44 (Schliersee)

MS169A - Industrial Applications of Isogeometric Analysis I

Main Organizer: Dr. George Moutsanidis (Rutgers University)

Chaired by: Dr. George Moutsanidis (Rutgers University)

Accelerating Structural Analysis: Pre-Processing Shell and Solid IGA Models with ANSA

***I. Chalkidis**, L. Rorris, T. Giannopoulos, C. Fountoukidou, S. Papaefstathiou

Iga in LS-Dyna: an Overview

***S. Hartmann**, L. Leidinger, D. Benson, L. Li, A. Nagy, L. Nguyen, M. Pigazzini

Thu, 23/07/2026 11:30 - 13:00

ICM - 31 (Zugspitze)

MS278B - Design and Topology Optimization for Multi-Component Systems II

Main Organizer: Prof. IL YONG KIM (Queen's University)

Chaired by: Prof. IL YONG KIM (Queen's University), Prof. Markus Zimmermann (Technical University of Munich)

Topology Optimization of Bolted Components Considering Assembly Constraints and Tool Accessibility

***S. Pagès**, M. Zimmermann

A Comparative Study of Topology Optimization Approaches for Bolted Joints

***J. Soika**, M. Zimmermann

GPU-accelerated Topology Optimization of Large-scale 3D Structures for Stress Minimization

X. Cheng, Y. Xiong, J. Ding, ***X. Huang**

Multi-component topology optimization of structures under design-dependent pressure loads

***O. Ibhadode**, N. Orakwe

A Convex Hull-Based 3D VSVT Framework for Anisotropic Multiscale Lattice Design

Y. Liu, ***Z. Wu**, Z. Li

Thu, 23/07/2026 11:30 - 13:00

ICM - 32 (Watzmann)

MS358A - Physics-Informed Machine Learning (PIML) for Interface Problems in Mechanics I

Main Organizer: Dr. Pratanu Roy (Lawrence Livermore National Laboratory)

Chaired by: Dr. Chandrasekhar Annavarapu (Indian Institute of Technology Madras), Dr. Pratanu Roy (Lawrence Livermore National Laboratory)

DD-FEM: Progress Toward Foundation Models via Data-Driven Reduced Order Modeling

Keynote

***Y. Choi**

Interface PINNs (I-PINNs): A physics-informed neural networks framework for interface problems

A. Sarma, S. Roy, ***C. Annavarapu**, P. Roy

Beyond Soft Penalties: Hard-Constrained Neural Methods for Accurate Solution of Elliptic Interface

***S. Chung**, P. Roy, S. Castonguay, Y. Fu, M. Penwarden

J-PINN: A Domain-Decomposed Physics-Informed Neural Network Framework for Kinematic Field Reconstruction in Fracture Mechanics

***G. Stamatelatos**, G. Kotsinis, L. Binsfeld, T. Loutas

??DeepONet: A Discontinuity Capturing Neural Operator

S. Roy, ***P. Roy**, M. Shields

ML-Enabled Optimisation Framework for High-Performance Tissue Scaffold Design

C. Wu, B. Wan, Y. Xu, W. Lewin, J. Fang, J. Crook, J. Clark, ***Q. Li**

Thu, 23/07/2026 11:30 - 13:00

BrainLab - Auditorium

MS288A - Machine Learning in Computational Mechanics and Earthquake Engineering I

Main Organizer: Dr. Wei-Tze Chang (National Center for Research on Earthquake Engineering)

Chaired by: Dr. Wei-Tze Chang (National Center for Research on Earthquake Engineering)

Risk Assessment for Concrete Buildings under Geothermal Induced Seismicity Using Gaussian Process Regression

Keynote

***S. Cebulj**, F. Taddei, G. Müller

Towards Practical Nonlinear Response-History Analysis: A Machine Learning-Based Framework for Structural Analysis and Design

***W. Chang**, K. Li, I. Chang, Y. Huang, C. Chen

A PINN Assisted Framework for Prediction of Hysteresis in Prefabricated Partition Walls in Shield Tunnels

***Z. Tang**, X. Liu, B. Cao, Z. Liu

Applicability of Dynamic Mode Decomposition with Control to Vertical Array Ground Motion Records for Assessing Site Effects

***Y. Fukunaga**

Thu, 23/07/2026 11:30 - 13:00

NM - 1 (Multimedia Saal)

MS275A - Advanced Numerical and Data-Driven Methods in Geotechnical Engineering I

Main Organizer: Prof. Jelena Ninic (Durham University)

Chaired by: Prof. Guenther Meschke (Ruhr University Bochum), Prof. Jelena Ninic (Durham University)

Uncertainty-aware surrogate modelling for structure-soil-structure interaction problems in elastodynamics

***H. Liravi**, S. Wang, H. Lyu, J. Ninic

Machine Learning-Based Tip Damage Detection and Shape Reconstruction in Offshore Monopiles Using Pile Driving Data

***G. Piunno**, J. Hayes Vigerust

Computational Model for Metal Hydride with Application for Sustainable Hydrogen Storage

***H. Bui**, T. Le, J. Ninic

Data – driven prediction of dynamic properties of fine-grained offshore marine sediments

***M. Ferentinou**, D. Samadian, G. Nikitas, M. Gkantou

Deep Learning Surrogate for Ground Penetrating Radar Simulation in Underground Structure Digital Twins

***H. Zhu**, J. Ninic

Thu, 23/07/2026 11:30 - 13:00

NM - 2 (Salzburg)

STS405B - Advances in Simulation Technologies Towards Next-Generation Aircraft Design II

Main Organizer: Dr. Yoshiaki Abe (Tohoku University)

Chaired by: Prof. Jin Seok Park (Inha University)

Multidisciplinary analysis and optimization of a regional aircraft with higher fidelity models

***L. Zanardi**

Conservation in Load and Displacement Transfer Methods for Fluid–Structure Interaction

***K. Kamakura**, Y. Abe

Aerothermal Investigation of Throat Leakage Cooling in a Faceted Supersonic Variable Nozzle

***S. Chang**, E. Kim, K. Yune, J. Kim, C. Kim

Aeroelastic Design of High-Aspect-Ratio Wings for High Altitude Platform Station

***Y. Yatsu**, K. Morimoto, Y. Abe

Robust Trajectory Optimization for a Mars Airplane with a Deployable Membrane Wing

Keynote

S. Kudo, ***M. Kanazaki**

On the Multiphysics Modelling and Simulation of Morphing Air-Launched and Air-Retrieved UAVs

***S. van Elsloo**, R. De Breuker, M. Voskuil

Thu, 23/07/2026 11:30 - 13:00

NM - 4 (Hamburg)

STS418A - Noise impact and control of eVTOL I

Main Organizer: Mr. Bao Chen (AVIC ARI)

Chaired by: Mr. Bao Chen (AVIC ARI)

Numerical Investigation on Aerodynamics and Aeroacoustics of Looped Propeller with Gurney Flap

***T. Matsumoto**

Scalable Gaussian Beam Tracing with Dynamic Parallelism for City-Scale Urban Aerial Noise Prediction

***H. Jiang**

Research on Wind Tunnel Test Validation of Computational Aeroacoustics for Rotor

***P. WANG**

Dual-Biomimetic Conceptual Design of a Blended Wing Body Unmanned Aerial Vehicle Inspired by Eagle and Manta Ray

***Y. Liu**, X. Yang

A Robust Numerical Method for Rotor-Based Simulations on Unstructured Overset Grids

***S. Cui**, X. Yang

Multidisciplinary, Multi-Point optimization of aircraft propellers, including Aero-Acoustic and Structural Constraints

***S. Marques**, J. Doherty, Z. McKee, P. Wong, M. Doherty, K. Hackett, D. Philpott

Thu, 23/07/2026 11:30 - 13:00

NM - 5 (KK)

MS115C - Computational Fluid Dynamics for Safety, Security and Defense III

Main Organizer: Prof. Markus Klein (Institute of Applied Mathematics and Scientific Computing, University of the Bundeswehr München)

Chaired by: Dr. Kolja Elssel (Airbus Defence and Space GmbH), Dr. Eike Tangermann (Bundeswehr University Munich)

Extreme-Scale LES of Reactive Flows for Safety and Defense Applications

***S. Navarro-Martinez**, T. Un, J. Qiao, L. Cifuentes, A. Lintermann

A Three-Dimensional Unsteady Shock-Fitting Finite-Difference Solver for Stability/Transition Analysis

***Z. Zhu**, Y. Xi, S. Fu

Design and Optimization of an Actively Cooled Deformable Mirror for High-Energy Laser Systems

***P. Kang**, J. Lee, H. Rhee

Numerical Study of Atomic Mushroom Cloud Formation with Phase Change and Latent Heat Effects

***K. Nakajima**, A. Matsuo

Numerical Simulations of Emergency Helium Release into the FCC Accelerator Tunnel

***J. Hopman**, Z. Malecha, A. Henriques

Euler-Euler Simulation of Aerosol Scrubbing in a Rectangular Bubble Column

***Y. Liao**, S. Li

Thu, 23/07/2026 11:30 - 13:00

NM - 3 (BB)

MS021D - Enabling Technologies for Digital Twins: Model Reduction And Scientific Machine Learning IV

Main Organizer: Prof. Alvaro Coutinho (COPPE/Federal University of Rio de Janeiro)

Chaired by: Prof. Gianluigi Rozza (SISSA), Prof. Alvaro Coutinho (COPPE/Federal University of Rio de Janeiro)

Real-time solution of forward and inverse PDE problems via a model-constrained autoencoder

***T. Bui-Thanh**

PINNs and ROMs as Enabling Technologies for Digital Twins in Cultural Heritage

F. Colace, D. Conte, F. Pichi, G. Rozza, ***C. Valentino**

Computational Framework for Resource Optimization in Smart Buildings Using Multi-Objective Reinforcement Learning and Digital Twins

T. Imankulov, E. Nurakhov, B. Daribayev, ***S. Shinassyllov**

Autonomous Prognostic Health Monitoring for a Combustion System via Digital Twins

***D. Lee**

Minimally Intrusive Data-Driven Approximation of Coupling Operators for Heterogeneous Numerical Methods

A. de Castro, ***P. Kuberry**

Thu, 23/07/2026 11:30 - 13:00

H4 - 1 (Ludwig)

MS253C - Computational Geomechanics III

Main Organizer: Prof. Jinhyun Choo (Seoul National University)

Chaired by: Prof. Keita Yoshioka (Montanuniversität Leoben), Dr. Pin Zhang (National University of Singapore)

Liquefaction Analysis of Gravelly Soils Using DEM and Network Theory

***T. Konishi**, J. Kurima

Deep Learning-based Calibration of DEM Models for Granite and Chalk

***M. Kholodniak**, A. Panchenko, I. Berinskii

Spiral Shear Fracture Networks in Borehole Contraction

***Y. Gao**, E. Detournay

Elastoplastic Response of Surrounding Rock and the Intermediate Principal Stress Effect based on the 3D GZZ Criterion

***C. Su**, H. Zhu, W. Cai

Thu, 23/07/2026 11:30 - 13:00

H4 - 2 (Leopold)

MS016C - Scientific Machine Learning for Nonlinear Model Reduction III

Main Organizer: Prof. Boris Kramer (University of California San Diego)

Chaired by: Prof. Boris Kramer (University of California San Diego), Prof. Benjamin Peherstorfer (Courant Institute of Mathematical Sciences, New York University)

Fast, Data-Assisted Simulations of Recurrent Flows using a Deviation-Propagation Approach

***T. Lichtenegger**

Efficient subspace-distance-enhanced nonlinear model order reduction for parametric CFD

***F. Betti**, R. Zhang, A. Sacconi, P. Tiso, E. Chatzi

Deep Convolutional–Transformer Models for Stable Autoregressive Evolution of Parametric Partial Differential Equations

***I. Mikuš**, B. Muha, D. Vlah

Nonlinear Model Order Reduction of Multiscale Problems using Graph-Based Manifold Learning Methods and Hyperreduction Techniques

***E. Faust**, L. Scheunemann

RRAE-Based Nonlinear Compressed Sensing for Field Reconstruction and PDE Hyper-Reduced Resolution

***S. Rodriguez**, J. Mounayer, F. Chinesta

Effective Drone Formation Operations Dedicated to Safe Ground Vehicle Motions in the Presence of Obstacles

A. Chełchowski, ***J. Mikołajczyk**, E. Jarzabowska

Thu, 23/07/2026 11:30 - 13:00

H4 - 3 (Franz)

MS247A - Computational Design of Lightweight Fiber-reinforced Composite Structures I

Main Organizer: Prof. Gokhan Serhat (KU Leuven)

Chaired by: Prof. Gokhan Serhat (KU Leuven), Dr. Jun Wu (Delft University of Technology)

A multidisciplinary optimisation framework for fibre-reinforced composite materials

***F. Cepero**, S. Abubakar, C. Bastien, J. Christensen

Neural Co-Optimization for Fiber-Reinforced Composites by 3d Printing

***T. Liu**, Y. Chen, N. Dutta, C. Wang

Efficient Multi-Objective Optimization of Composite Topology and Fiber Orientations for Enhanced Static and Dynamic Performance

***S. Nozawa**, G. Serhat

Design and Optimization of a Sports Automotive Rear Crash Box Based on Natural Fiber-Reinforced Composites

***M. Capretti**, D. Dall'ì, P. Nuno Fernandes, A. Arteiro, S. Boria, V. Castorani

Filament-Level Finite Element Modelling of High-Velocity Impact of FDM Kevlar Continuous Fiber Composites

H. Kim, E. Lee, ***Y. Kim**

Finite Element Modelling of Skis with a Recycled Fiber Composite Layer Compared to Virgin Material

***C. Neeser**, M. Jedla, A. Bernasconi, H. Lammer, L. Martulli

Thu, 23/07/2026 11:30 - 13:00

H4 - 4 (Alois)

MS017E - Topology Optimization for Multidisciplinary Design V

Main Organizer: Dr. Shun Ogawa (The university of Tokyo)

Chaired by: Dr. Shun Ogawa (The university of Tokyo), Dr. Jan Oellerich (The University of Tokyo)

A Hybrid Crashworthiness Topology Optimization Method for Thin-Walled Tubes Based on Segmented Force Boundary and Progressive Deformation

***Y. Guo**, L. Zhang, W. Dou, K. Schröder

Thermo-Mechanical Topology Optimization with CutFEM and Moving Morphable Components Methods

***T. Peng**

Multiscale stress-constrained topology optimization using level set functions and trimmed meshes

J. Kim, ***H. Kim**

Numerical Verification of Viscoelastic Modulus Bounds Based on Complex-Valued Homogenization Method

***H. Deguchi**, K. Matsushima, T. Yamada

Stress Constrained Topology Optimization of Flywheel Energy Storage Systems

***V. Kale**

Graph-Assisted Design (GAD): A Multi-Objective GNN–Evolutionary Framework for Automated Structural Optimization

***G. Laurente**, S. Huaman

Thu, 23/07/2026 11:30 - 13:00

H4 - 5 (Xaver)

MS212B - Numerical Modelling of Viscoelastic Flow Problems: Advanced Numerical Techniques, High Performance Computing, and Challenges II

Main Organizer: Prof. Stefan Turek (TU Dortmund University)

Chaired by: Prof. MEHMET SAHIN (ISTANBUL TECHNICAL UNIVERSITY), Prof. Stefan Turek (TU Dortmund University)

An alternative description of the visko-elastic flow behavior of highly elastic polymer melts

***J. Kroll**

Numerical Techniques for Microscopic Viscoelastic Flow Modelling Based on Mode-Coupling Theory

***T. Treskatis**, S. Turek, T. Voigtmann

Effects of Viscoelastic Polymer Melts on Natural Convection Instabilities in a 2D Stretched Cavity

***H. Damanik**, S. Turek

Thu, 23/07/2026 11:30 - 13:00

H4 - 6 (Sissi)

MS180A - Digital Twins for Oceanic and Atmospheric Systems I

Main Organizer: Dr. Jeffrey Harris (École nationale des ponts et chaussées)

Chaired by: Dr. Jeffrey Harris (École nationale des ponts et chaussées), Dr. Konstantin Kuznetsov (GRASP Earth)

High-Fidelity Phase-Resolved Simulation and POD Characterization of Coastal Rogue Waves during Typhoon Mangkhut

***C. gao**, J. wang

Oceanographic Data Services as a Foundation for Machine-Learning Applications and Digital Twins

***W. Düsterhöft-Wriggers**, L. Spruch, V. Maurer, J. Meyer, B. Ehlers, H. Morisson, I. Lorkowski, J. Brauch

Parametric Reduced-Order Modeling of Urban Boundary-Layer Dynamics via Streaming DMD and Manifold Interpolation

***K. Kuznetsov**, O. Dubovik, P. Litvinov, E. Alekseenko

Reconstructing Coastal Ocean Fields from Time-Series Observations Using Shallow Decoders

***J. Harris**

Thu, 23/07/2026 11:30 - 13:00

H4 - 7 (Maximilian)

MS367B - Data-Driven Approaches for Accelerating Model-Based Analysis of Physical Systems II

Main Organizer: Dr. Zachary Morrow (Sandia National Laboratories)

Chaired by: Dr. Zachary Morrow (Sandia National Laboratories)

Bayesian Inference Via Interacting Particles With Preconditioned Dynamics

***D. Sharp**, A. Belhadji, Y. Marzouk

Integration of Dynamic Mode Decomposition with Manifold Interpolation for Data-Driven Reduced-Order model

***T. Chiu**

Acceleration of Head Impact Mechanics Using Neural Network-Based Surrogates for Rapid Brain Injury Estimation

***J. Sun**, J. Zhang, Z. Liu

A Study of Neural Network-Based Tube Model Predictive Control with Mathematical Guarantees

***S. S M**, L. Chamoin

Thu, 23/07/2026 11:30 - 13:00

H4 - 8 (Eventcenter)

MS239E - Advances in Shape Optimization and Form-Finding for Engineering Design V

Main Organizer: Prof. Kai-Uwe Bletzinger (Technical University of Munich, Germany)

Chaired by: Prof. Pierluigi D'Acunto (Technical University of Munich (TUM)), Prof. Kai-Uwe Bletzinger (Technical University of Munich, Germany)

3DNFDM - A Force Density Method for 3D problems **Keynote**

***R. Pauletti**

Message Passing Combinatorial Equilibrium Modeling

***L. Bleker**, K. Tam, P. D'Acunto

Consistent formulation of the revised force density method for form finding and shape identification of cable-lattice-structures

***A. Goldbach**, K. Bletzinger

A Numerical Framework for Form-Finding of Gridshells Accounting for Material Uncertainties

***B. Tóth**, M. Bruggi, J. Lógó

Graphic Statics-Based Form-Finding of Layer-Wise Self-Supporting Vaulted Structures Fabricated using Robotic Extrusion 3D Printing

***F. Chovghi**, P. D'Acunto

Thu, 23/07/2026 11:30 - 13:00

BrainLab - Training

MS002D - Advanced Materials: Computational Analysis of Properties and Performance IV

Main Organizer: Prof. Vadim Silberschmidt (Loughborough University)

Chaired by: Prof. Vadim Silberschmidt (Loughborough University)

Well-defined local damage models with softening

C. Lauff, ***M. Schneider**, A. Schlichting, T. Böhlke

Determining Brittle Fracture Paths with Strain Splitting Using Shape Optimization Algorithms

***T. Suchan**, W. Wollner, K. Welker

3D Atomic Density Tomography for Shear Transformation Zone Analysis and Plasticity Optimization in Metallic Glasses

***P. Huang**, Y. Xue, F. Wang

Helium Bubble-Mediated Modulation of Plastic Deformation and Fracture in Crystal/Amorphous Nanocomposites

***F. Wang**, S. Zhang, P. Huang

Coupled Thermo-Mechanical Modeling of First- and Second-Order Phase Transformation Kinetics Based on the Hamilton Principle

***T. Rudolf**, M. Soleimani, P. Junker

Thu, 23/07/2026 11:30 - 13:00

NM - 6 (Munich)

MS129B - The Role of Nonlocality in Fracture Mechanics II

Main Organizer: Dr. Francesco Scabbia (Università degli studi di Padova)

Chaired by: Dr. Francesco Scabbia (Università degli studi di Padova), Dr. Francisco Vieira (IDMEC, Instituto de Engenharia Mecânica)

Phase-Field Inspired Fracture with Bond-Associated Peridynamics

***K. Partmann**, C. Wieners, K. Weinberg

Nonlocal Modeling of Anisotropy in Ordinary State-Based Peridynamics

***F. Scabbia**, F. Vieira, M. Zaccariotto, U. Galvanetto

Application of Peridynamics to J-Integral Prediction in Ti-10V-2Fe-3Al Titanium Alloy

P. Nosal, R. Bogucki, ***M. Warzecha**

The Role of the Flow Rule in Mesh-Convergence of Gradient ?Enhanced Plasticity Models for Explicit Dynamics

***S. Rosenbusch**, D. Balzani, J. Unger

On the Role of Nonlocality in Holed Peridynamic Plates

***S. Damian**, R. Cavuoto, N. Pugno, M. Fraldi, L. Deseri

Thu, 23/07/2026 11:30 - 13:00

NM - 7 (Venice)

MS344D - Agentic AI and Physics-Informed Machine Learning for Next-Generation Design and Manufacturing IX

Main Organizer: Prof. Seunghwa Ryu (KAIST)

Chaired by: Prof. Hyunseok Oh (GIST)

Accelerating Ultrasonic Wavefield Simulations Using Physics-informed Neural Networks

N. Munir, ***H. Oh**

Physics-Informed Deep Operator Network for Predicting Temperature Field of a Lithium-Ion Battery Under Variable Operating Conditions

***Y. Oh**, J. Kim, B. Park, J. Park, B. Lee, S. Lee

Physics-Informed Machine Learning for Predicting Microstructure Evolution Including Grain Growth and Spinodal Decomposition

***J. Park**, H. Park, H. Noh, K. Kim, S. Lee

Machine Learning-based Domain Decomposition Approach via the Predefined Lagrange Multipliers

***Y. Park**, S. Lee, S. Lee, S. Kang, H. Cho, S. Shin

Physics-Informed Neural Network-Based Discovery of Hyperelastic Constitutive Models from Extremely Scarce Data

***H. Moon**

Nonparametric Identification of Multimaterial Structure via Physics-Informed Neural Networks

***S. Lee**, H. Chung

Thu, 23/07/2026 11:30 - 13:00

ICM - 50 (Seeblick)

MS304B - Teaching Computational Science and Engineering across the Spectrum: from First-Year Transitions to Graduate Education II

Main Organizer: Prof. Simone Deparis (MATH - EPFL)

Chaired by: Mr. Steve Bennoun (UCLA), Prof. Simone Deparis (MATH - EPFL)

Shape-to-Music as a Multimodal Tool for Teaching Topology in Solid Mechanics

S. Cassara, B. Sansa, ***P. Acar**

Intuition or Proof First? Mathematical Conviction at the Transition to University

***M. Piñeros Rodríguez**, S. Deparis

Exploring Mathematical Self-Efficacy in a Flipped Classroom: A Qualitative Study of Student Experiences

***K. Veerayah**, V. Krivoshchekov, R. Tormey

Active Learning in First-Year Mathematics: Ten Years of Teaching Flipped Classes

***S. Deparis**

Thu, 23/07/2026 13:00 - 14:00

Lunch Break

Thu, 23/07/2026 14:00 - 14:45

ICM - 1 Auditorium

MS283G - Recent Progress in Topology Optimization and Its Applications VII

Main Organizer: Prof. Junji Kato (Nagoya University)

Chaired by: Prof. Junji Kato (Nagoya University), Dr. Oded Amir (Technion - Israel Institute of Technology)

Optimization based Remap for Multi-Material Finite Element ALE Hydrodynamics

***M. Schmidt**, B. Keith, D. Kim, B. Lazarov, V. Tomov, C. Petra

Nested Topology Optimization Framework for Collaborative Morphing, Load-Bearing, and Actuation Design of Morphing Wings

***Y. Tang**, L. Xia

Why Checkerboarding Localizes in Shear Regions under SIMP

***I. Paunel**, J. Stollberg, D. Schillinger

Thu, 23/07/2026 14:00 - 14:45

ICM – 2

MS020E - Large Deformation Beams and Shells: Formulation Advances and Innovative Applications V

Main Organizer: Prof. Enzo Marino (University of Florence)

Chaired by: Prof. Josef Kiendl (University of the Bundeswehr Munich), Dr. Domenico Magisano (Università della Calabria)

A Geometrically Exact SE(3) Beam–Shell Formulation for Lattice Boom Structures

L. Gao, ***J. Xiao**, Y. Zhou, M. Kleeberger, J. Fottner

A 6-parameter Nonlinear Shell Formulation without Rotational Parametrization by a Hierarchical Quadrature Element Method

***C. Peng**, B. Liu, Y. Lan

A simple fully nonlinear cubic triangular element for multilayer Kirchhoff-Love shells - nonlinear dynamics

G. Gomes, ***P. Pimenta**, A. Ibrahimbegovic

Thu, 23/07/2026 14:00 - 14:45

ICM – 3

MS258B - Scientifically Sound Generative Design for Engineering Applications II

Main Organizer: Prof. Chady Ghnatios (University of North Florida)

Chaired by: Prof. Chady Ghnatios (University of North Florida), Mr. Mohammed EL FALLAKI IDRISI (ENSAM - PIMM - CNRS)

Towards Parametric Surrogates for Data-Scarce Industrial Design via Sensitivity-Enriched Learning

***H. Navarro García**, D. Muñoz, S. Torregrosa, C. Farhat, F. Chinesta

Design Exploration of Vehicle Geometries using Physically Structured SDF Latent Spaces

***K. Shintani**, C. Yuan, F. Permenter

From Discrete Fields to Semantic Descriptions: Generative Inverse Structure Design under Multi-Objective Constraints

***Z. Yang**, Y. Wang, S. Tang

Thu, 23/07/2026 14:00 - 14:45

ICM – 4a

MS317E - Recent Advances in Mesh-free and Particle Methods V

Main Organizer: Prof. Mitsuteru Asai (Kyushu university)

Chaired by: Prof. Seiichi Koshizuka (The University of Tokyo), Dr. Kumpei Tsuji (Tohoku University)

Simulation and Analysis of Fully Turbulent Sloshing Dynamics with the delta-LES-SPH Model Keynote

***A. Colagrossi**, C. Pilloton, H. Lyu, P. Sun

Implicit ISPH Method for Unified Free-Surface and Non-Darcy Flow Simulation

***K. Takahashi**, K. Tsuji, M. Asai

Thu, 23/07/2026 14:00 - 14:45

ICM – 4b

MS198B - Multiphysics and Data-driven Modeling for Cardiovascular Biomedicine II

Main Organizer: Prof. Debanjan Mukherjee (University of Colorado Boulder)

Chaired by: Prof. Adarsh Krishnamurthy (Iowa State University), Prof. Debanjan Mukherjee (University of Colorado Boulder)

Highly Parallel FE Simulation for Navier-Stokes and Darcy Equations with Applications to Human Liver

***Z. Lin**

Computational Models Show Afterload Dominates Cardiac Function, and Functional Remodeling Increases Anatomical Dependency

***C. Rodero**, L. Curran, C. Lanyon, P. Inglese, A. Qayyum, R. Barrows, J. Solis-Lemus, S. Rahmani, M. Strocchi, A. Lee, T. Baptiste, L. Cicci, E. Burford, E. Karabelas, C. Augustin, G. Plank, R. Wilkinson, A. de Marvao, J. Ware, D. O'Regan, S. Prasad, S. Niederer

Uncertainty-Aware Calibration of Windkessel Outflow Parameters in Cardiovascular Flow Simulations

***S. Rathore**, M. Battistoni, J. Zembi

Thu, 23/07/2026 14:00 - 14:45

ICM - 5

MS100B - New Trends in Topology Optimization II

Main Organizer: Prof. Emilio Silva (University of Sao Paulo)

Chaired by: Dr. Renato Picelli Sanches (University of São Paulo), Prof. Shinji Nishiwaki (Kyoto University)

Unsteady topology optimisation for compressible-flow control and suppression of the von Kármán vortex street

***I. Carvalho**, D. Alonso, L. Garcia Rodriguez, E. Silva

Topology optimisation for enhancing external compressible flows of viscous fluids

I. Amorim Carvalho, D. Hayashi Alonso, L. Garcia-Rodriguez, F. Silva Maffei, ***E. Nelli Silva**

A 3D Multi-Objective and Multiscale FSI Topology Optimization for Industrial Applications

***G. Melo Gomes Pereira**, N. Blal, A. Gravouil, J. Minne, J. Desseignes, F. Louis, D. Bardel

Thu, 23/07/2026 14:00 - 14:45

ICM - 11a

MS059C - Bridging scientific machine learning and scientific discovery: Novel developments III

Main Organizer: Dr. Romit Maulik (Purdue University)

Chaired by: Dr. Gianmarco Mengaldo (National University of Singapore), Dr. Romit Maulik (Purdue University)

An improved Random Fourier Method with physics informed learning for turbulence generation

***P. Rival**, S. Braik, A. Brunel, J. Viquerat, A. Larcher, F. Duval

Virtual Pressure Sensing in Hydraulic Circuits using Equation Discovery and Physics Informing

***H. Sauerland**

DASSH — Diffusion-Accelerated Smoothing Using Score-Based Heuristics

***M. Andreou**, N. Chen, D. Venturi

Thu, 23/07/2026 14:00 - 14:45

ICM - 11b

MS028B - Bridging Disciplines and Scales for Sustainable Cement and Concrete II

Main Organizer: Prof. Bernhard Pichler (TU Wien)

Chaired by: Prof. Bernhard Pichler (TU Wien), Prof. Luise Göbel (Bauhaus-Universität Weimar)

Transient Elastic Properties of Cementitious Materials: Kinetics, Thermodynamics and Multi-Scale Homogenization

***E. Jägle**, J. Timothy, D. Jansen, A. Machner

Mesoscale Modelling and Experimental Validation of Lightweight Aggregate Concrete with Partial Cement Replacement Using a By-product from Dunite Mining

***M. Brana-Linares**, L. Silva-Klein, A. Lezcano-Betegon, M. Alonso-Martinez

Computational Characterization of Salt Frost Surface Scaling and Mesostructural Wall Effects in Concrete

***A. Haynack**, T. Kränkel, C. Gehlen, J. Timothy

Thu, 23/07/2026 14:00 - 14:45

ICM - 12a

MS047C - Advances in Model Calibration Techniques in Computational Mechanics III

Main Organizer: Dr. Andrew Stershic (Sandia National Laboratories)

Chaired by: Dr. Daniel Seidl (Sandia National Laboratories), Dr. Coleman Alleman (Sandia National Laboratories)

Minimizing the Effects of Model Form Error with Context-Specific Calibration

***C. Alleman**, J. Pechac

Calibration of Implicit Yield Surface Model Parameters with Multiple Sources of Uncertainty Using Scientific Machine Learning and a Hierarchical Bayesian Approach

***D. Birky**, A. Su, M. Buche, C. Hamel, J. Emery, J. Hochhalter

Material model discovery with FEMU

***S. Ghouli**, A. Benady, M. Flaschel, L. De Lorenzis

Thu, 23/07/2026 14:00 - 14:45

ICM - 12b

MS203B - Sensitivity Analysis in Science and Engineering: Methods, Applications, and Emerging Directions II

Main Organizer: Dr. Sebastian Brandstaeter (University of the Bundeswehr Munich)

Chaired by: Dr. Gian Marco Melito (TU Graz), Ms. Friederike Schäfer (INRIA Saclay)

On Parametric Sensitivity and Identifiability in Electrochemical Battery Models for Numerical Impedance Simulation

***E. Zonta**, G. Rei, I. Jovanovic Buha, H. Bungartz, W. Wall, A. Jossen

Global Sensitivity Analysis in Maximum Projection Based Bayesian Optimization of Radial Turbine Designs

***E. Diehl**, A. Tosun, D. Loukrezis

Adjoint-based Sensitivity Analysis of Chaotic Flows using Stabilized March with Entropy-Stable Schemes

***P. Thakur**, S. Nadarajah

Thu, 23/07/2026 14:00 - 14:45

ICM - 13a

MS088A - Advanced Multi-physics CFD Simulations in Science and Engineering I

Main Organizer: Prof. Takahiro Tsukahara (Tokyo University of Science)

Chaired by: Prof. Takahiro Tsukahara (Tokyo University of Science), Prof. Hiroya Mamori (The University of Electro-Communications)

Direct Numerical Simulations of Subsonic, Transonic and Supersonic Flows past a Circular Cylinder

***X. Wu**

Drag Crisis in Fractal Trees Predicted by Analytical Modeling

***T. Tokiwa**, Y. Yin, R. Onishi

Vortex Suppression for Flow past a Circular Cylinder with Blowing and Suction

***C. Chuang**, J. Chen

Thu, 23/07/2026 14:00 - 14:45

ICM - 13b

MS295C - Continuum Biomechanics of Living Active Systems – Computational Modeling & Experimental Validation III

Main Organizer: Prof. Tim Ricken (University of Stuttgart)

Chaired by: Dr. Seyedmorteza Seyedpour (University of Stuttgart/ Institute of Structural Mechanics and Dynamics in Aerospace Engineering)

Modeling Flow and Transport in Liver Lobules in the Context of Multilevel Digital Twins

***P. Kottman**, E. Rohan, D. Drasdo, I. Vignon-Clementel

Numerical Aspects of a Computational Model for Meniscus Tissue Regeneration

***B. Simeon**

Coupled Geometric-Constitutive Constraints in Numerical Modeling of Lumbar Intervertebral Disc Degeneration

***K. Nispel**, T. Lerchl, C. Liebsch, H. Wilke, J. Kirschke

Thu, 23/07/2026 14:00 - 14:45

ICM - 14a

MS031E - Open-Source Software in Mechanics V

Main Organizer: Dr. Vladislav Yastrebov (MINES Paris, PSL University, CNRS)

Chaired by: Dr. Francesc Verdugo (Vrije Universiteit Amsterdam)

DAMASK – The Düsseldorf Advanced Material Simulation Kit

***M. Diehl**, P. Eisenlohr, S. Roongta, D. Otto de Mentock, Y. Hu, N. Prabhu, A. Aadithyan, J. Velo, P. Shanthraj, F. Roters

Ambit - An Open-Source Multi-Physics Solver

***M. Hirschvogel**, D. Nordsletten, E. Esche

TorchFSM: A Differentiable Fourier Spectral Solver for Machine Learning–Enabled PDE Simulation

***Q. Liu**, F. Koehler, N. Thuerey

Thu, 23/07/2026 14:00 - 14:45

ICM - 14b

MS153C - Data-driven dynamical systems: learning, simulation, and control III

Main Organizer: Prof. Andrea Manzoni (Politecnico di Milano)

Chaired by: Dr. Matteo Tomasetto (Politecnico di Milano)

Learning Linear Representations of Classical Bifurcations

***T. Breunung**

Learning and predicting complex fluid flows

***C. Oishi**, F. Amaral, D. de Aguiar

Constraint-Preserving Learning of Multibody Dynamics

***D. Meroni**, P. Forster, N. van de Wouw, I. Cortes Garcia

Thu, 23/07/2026 14:00 - 14:45

ICM - 14c

MS305B - The Fast and The Curious: Exploring data-efficient sampling in science and engineering II

Main Organizer: Dr. Ana Larrañaga (University of Washington)

Chaired by: Dr. Ana Larrañaga (University of Washington), Mr. Filippo Zacchei (Politecnico di Milano)

Controlling Soft Robots via Adiabatic Spectral Submanifolds

***R. Shankar Kaundinya**, M. Ethan Leone, R. Sabella, J. Irvin Alora, J. G. Matt, L. A. Pabon, M. Pavone, G. Haller

Towards Estimating Heat Release Rates in Turbulent Flames using Diffusion Models

***L. Marshall Jr.**, D. Rossinelli, G. Iaccarino

Noise-Robust Multi-Fidelity Surrogate Modelling for Parametric Partial Differential Equations

***B. Kent**, L. Tamellini, M. Giacomini, A. Huerta

Thu, 23/07/2026 14:00 - 14:45

ICM - B11

MS173C - Mechanobiology of Cells, Vesicles and Biomembranes III

Main Organizer: Prof. Roger Sauer (Ruhr University Bochum)

Chaired by: Prof. Roger Sauer (Ruhr University Bochum), Dr. SHAOFAN LI (University of California-Berkeley)

Computational modeling of curvature effects on transport in neuronal membranes

***S. Rudraraju**

Monte Carlo simulations of osmotically stressed vesicles: The role of membrane-embedded curvature proteins in shaping morphology

***L. Li, J. Wang**

A Modified Helfrich Model for Large Deformations of Lipid Bilayers: Formulation and Comparative Analysis

***E. Jagadeesh Savitha, R. Sauer**

Thu, 23/07/2026 14:00 - 14:45

ICM - B12

MS298A - Applied Sciences on Metamaterials – Modelling, Simulation and Fabrication I

Main Organizer: Prof. Denis Anders (TH Köln – University of Applied Sciences)

Chaired by: Prof. Denis Anders (TH Köln – University of Applied Sciences), Prof. Marcel Walkowiak (TH Köln)

Metamaterials as Functional Material Architectures: Numerical Investigation of Auxetic Structures and TPMS for Mechanical and Thermophysical Applications

***D. Anders, M. Walkowiak**

Flow topology, helicity and operator-learning surrogate modelling for cross-flow TPMS Inconel heat exchangers

***J. Reuter, R. Schwarze, U. Mahn**

Strain-Energy-Based Analytical Modelling of a Novel Fully Auxetic Three-Dimensional Lattice Structure

***M. Asgari, S. Imani, C. Mittelstedt**

Thu, 23/07/2026 14:00 - 14:45

ICM - B13

MS359B - Robust Design and Tolerance Optimization II

Main Organizer: Prof. Benedikt Kriegesmann (Hamburg University of Technology)

Chaired by: Prof. Markus Zimmermann (Technical University of Munich), Prof. Benedikt Kriegesmann (Hamburg University of Technology)

Multi-disciplinary design of a vibratory rammer with surrogate models and solution spaces

***A. Babaja, T. Wanninger, F. Nießl, B. Venkatesh, D. Zierer, M. Käser, E. Kramp, R. Berger, S. Chrisopoulos, R. Cudmani, M. Zimmermann**

Computing solution spaces for underbody protection of electric vehicles

***F. Wöhr, R. Auenhammer**

Computing Multimodal Solution Spaces for Disjoint Feasible Regions

***K. Demir, D. Gerhard**

Thu, 23/07/2026 14:00 - 14:45

ICM - B21

MS262E - Advances of Quantum and Quantum-Inspired Algorithms for Solving Flow Simulation Problems V

Main Organizer: Prof. Thomas Rung (Hamburg Univ. of Technology)

Chaired by: Prof. Juan Jose Mendoza Arenas (University of Pittsburgh)

High-Order Operator Splitting for Non-Unitary Quantum Computation: Application to Shear Flow

***P. Brearley, P. Pfeiffer**

Schrödingerization-based quantum simulation of some nonlinear scalar partial differential equations

É. Cancès, D. Huerga, ***H. Pinsolle**, F. Renac

Quantum time-marching algorithm for solving the bounded Diffusion equation

***S. Bengoechea, P. Over, T. Rung**

Thu, 23/07/2026 14:00 - 14:45

ICM - B22

MS080A - Geosciences at the Extreme Scale: Advances in Computational Science and Engineering I

Main Organizer: Dr. Marcus Mohr (Ludwig-Maximilians-Universität München)

Chaired by: Dr. Marcus Mohr (Ludwig-Maximilians-Universität München), Mr. Ponsuganth Ilangoan (LMU Munich)

Parallel-in-time integration for geophysical fluid dynamics

T. Saupe, T. Lunet, P. Freese, M. Schreiber, S. Götschel, R. Speck, ***D. Ruprecht**

An Advanced Dynamical Core based on Adaptive Mesh Refinement and Discontinuous Galerkin Methods

***B. Geihe, K. Hartung**

Mixed Finite Difference Operators for Reduced Dispersion of Elastic Waves

***R. Dymér, M. Almquist**

Thu, 23/07/2026 14:00 - 14:45

ICM - 21a

MS236A - Peridynamic Theory and Nonlocal Continuum Models: Methods and Applications I

Main Organizer: Prof. Erkan Oterkus (University of Strathclyde)

Chaired by: Prof. Erdogan Madenci (University of Arizona), Prof. Erkan Oterkus (University of Strathclyde)

Finite Deformation Peridynamics Model of Warping in Shells and Metasurfaces

***N. Choudhary**, P. Roy

A Bond-Associated Peridynamic Correspondence Framework Using Non-Spherical Influence Functions

***H. Chen**, X. Hu, D. Liu

Peridynamics Modeling of Shell Piezoelectricity: Application to Metasurfaces

***A. Mondal**, N. Choudhary, P. Roy

Thu, 23/07/2026 14:00 - 14:45

ICM - 21b

MS042A - Numerical Analysis on Polytope Meshes: Geometry Processing, SBFEM, VEM and beyond I

Main Organizer: Prof. Carolin Birk (Universität Duisburg-Essen)

Chaired by: Dr. Hauke Gravenkamp (Otto von Guericke University Magdeburg)

A High-Order Stabilization-Free Virtual Element Method for 3D Linear Elasticity

***T. Bouchez**, A. Gravouil, N. Blal, A. Giacomini, E. Delor, J. Beley

An Energy-Based Virtual Element Method Framework for Polycrystalline Plasticity

***C. Liu**

Thu, 23/07/2026 14:00 - 14:45

ICM - 22a

MS256B - Multiscale and Multiphysics Modelling of Heterogeneous Materials with Random and Periodic Microstructures II

Main Organizer: Dr. Greta Ongaro (Sapienza University of Rome)

Chaired by: Dr. Marco Pingaro (Sapienza University of Rome), Prof. George Stefanou (Aristotle University of Thessaloniki)

Resonant metasurfaces for the mitigation of elastic wave propagation

***P. Li**, A. Pau, M. Lepidi

Biomechanics of collective cell invasion

***L. Bonilla**, M. Carretero, R. González-Albaladejo

Numerical Simulation of Transdermal Insulin Delivery Using a Coated Microneedle in a 2D Skin Model

***M. Tesfamariam**, M. Heisig, G. Wittum, R. Krause

Thu, 23/07/2026 14:00 - 14:45

ICM - 22b

MS161B - Cutting-Edge Mathematical Models: Dynamics, Vibrations, Control, and Fractional Calculus Applications II

Main Organizer: Dr. Frederico Silva (Federal University of Goiás)

Chaired by: Prof. Clivaldo Oliveira (UFGD), Prof. Jose Manoel Balthazar (UNESP)

Machine Learning Support of Improving Performance and Load Safety of Car-Like Robots Suspension Systems

Y. Söylegüzel, ***E. Jarz?bowska**

Modal Analysis of CNC Machine's Structures for Controller Design and Monitoring Applications

***M. mehrabi**

Thu, 23/07/2026 14:00 - 14:45

ICM - 41 (Ostersee A)

MS257A - Multiscale & Multiphysics Approaches in Soft Tissues I

Main Organizer: Dr. Tian Yuan (Imperial College London)

Chaired by: Dr. Tian Yuan (Imperial College London), Dr. Suhaib Ardah (Imperial College London)

Predictive Modelling of Soft Tissue Biomechanics

S. Wanniarachchi, A. Aamir, ***O. BARRERA**

An Integrated Analytical and Numerical Study of the Mechanism of Thrombolysis Across Multiple Scales

***H. Xiao**, X. xu

Multiscale modelling of cerebral fluid

***J. Kang**, S. Shi, Y. Wang, M. Wawng

Thu, 23/07/2026 14:00 - 14:45

ICM - 42 (Ostersee B+C)

MS373A - Innovative Materials and Smart Structures: Analysis, Computation, and Experiment I

Main Organizer: Prof. Mieczyslaw Kuczma (Poznan University of Technology)

Chaired by: Prof. Ekkehard Ramm (University of Stuttgart), Dr. Magdalena ąasecka-Plura (Poznan University of Technology)

Intelligent structures: How to handle them using the variational-asymptotic method

***K. Le**

Gradient Flow and Topological Derivatives in the Optimal Design of Elastic Structures

***J. Sokolowski**, Y. Tan

Parametric Numerical Investigation of Switching Shunts Techniques for Vibration Reduction

M. Daraki, G. Foutsitzi, J. Deü, ***G. Stavroulakis**

Thu, 23/07/2026 14:00 - 14:45

ICM - 43 (Eibsee)

MS023B - Nonlinear Analysis of Slender Structures: Numerical Methods and Discretisation Techniques II

Main Organizer: Prof. Antonio Madeo (University of Calabria)

Chaired by: Prof. Antonio Madeo (University of Calabria), Dr. Francesco Salvatore Liguori (University of Calabria)

Bending Direction Reversal in Pressurized Slender Hyperelastic Eccentric Tube: A Regime Map of the Mooney–Rivlin Parameter Space

S. Pani, ***S. Raut**

Modelling interacting diffusiophoretic filaments in viscous fluids

U. Makanga, T. Montenegro-Johnson, C. Marangos, ***P. Katsamba**

Euler wavelets scheme for Neutral Fractional Delay Differential Equation

M. Sharma, ***B. Prusty**

Thu, 23/07/2026 14:00 - 14:45

ICM - 44 (Schliersee)

MS272A - Modeling Mechanical Behavior of Nano- and Micro Scale Materials I

Main Organizer: Prof. Aylin Ahadi (Mechanical Engineering Sciences, Division of Mechanics)

Chaired by: Prof. Bilen Emek Abali (Uppsala University), Mr. Amirhossein Abi (Sabanci University)

Mg-Zn-Al Brazing Filler Alloy Design and Its Reinforcement Effect on Interlaminar Mechanical Properties of Mg-based FMLs via Ultrasonic-assisted Brazing

***X. Zhou**, G. Qu

Predicting Material Properties in Tribological Contacts Based on Continuum Dislocation Dynamics

***C. Kübler-Tesch**, K. Schulz

Dislocation Plasticity of TiC-Reinforced Nickel Alloy Under Thermomechanical Conditions: Insights From Discrete Dislocation Dynamics

***Z. Wang**, J. Schleifenbaum, M. Sudmanns

Thu, 23/07/2026 14:00 - 14:45

ICM - 31 (Zugspitze)

MS278C - Design and Topology Optimization for Multi-Component Systems III

Main Organizer: Prof. IL YONG KIM (Queen's University)

Chaired by: Prof. IL YONG KIM (Queen's University), Prof. Markus Zimmermann (Technical University of Munich)

Multi-material Decomposition Optimization for Topology-optimized Structures under Additive Manufacturing Constraints

***H. Kim**, I. Kim

Electric Bus Chassis Design Optimisation with Integrated Battery: A Rapid Hierarchical Design Workflow

***P. Tan**, A. Murphy, K. Hogarty, M. Barr, N. Graham, A. Harris

Preliminary design of compressors for high-temperature heat pumps using coupled aerodynamic-rotordynamic optimization

***S. Dubey**, J. Jomson, M. Kriese, M. Lockan

Thu, 23/07/2026 14:00 - 14:45

ICM - 32 (Watzmann)

MS045A - Energy-Aware High-Performance Computing I

Main Organizer: Dr. Alexander Heinlein (TU Delft)

Chaired by: Dr. Alexander Heinlein (TU Delft), Dr. Carola KRUSE (Cerfacs)

Understanding performance and energy efficiency trade-offs under power capping and frequency scaling scenarios

Keynote

G. Hager, M. Mayr, A. Ujeniya, ***G. Wellein**

Automatic Job-specific Energy Optimization within the ClusterCockpit Monitoring Framework

***J. Eitzinger**, M. Panzlaff, C. Kluge, A. Ujeniya, T. Gruber, G. Wellein

Thu, 23/07/2026 14:00 - 14:45

BrainLab - Auditorium

MS032A - Exploring Brain Mechanics I

Main Organizer: Prof. Silvia Budday (Friedrich-Alexander-Universität Erlangen-Nürnberg)

Chaired by: Prof. Silvia Budday (Friedrich-Alexander-Universität Erlangen-Nürnberg)

A unified computational model of cortical folding for the cerebrum and the cerebellum

***K. Martinez-Anhom**, N. Aflak, C. Caporal, A. Legouhy, N. Traut, K. Heuer, R. Toro

Stress Driven Axon Organization in the Folding Brain

***M. Razavi**

Modeling brain malformations: from ferrets to FCD II epilepsies

***J. Hinrichsen**, N. Reiter, M. Zarzor, L. Hoffmann, I. Blümcke, F. Paulsen, D. Delev, S. Budday

Thu, 23/07/2026 14:00 - 14:45

NM - 1 (Multimedia Saal)

MS275B - Advanced Numerical and Data-Driven Methods in Geotechnical Engineering II

Main Organizer: Prof. Jelena Ninic (Durham University)

Chaired by: Dr. Maria Ferentinou (Liverpool John Moores University), Dr. Hassan Liravi (University of Durham)

A Generative Adversarial Neural Network for Modelling State-dependent Sand Behaviour

***Q. Chen**, Z. Gao, E. Febrianto

A Computational Framework for Maintenance-Oriented Tunnel Digital Twins

***J. Ninic**, Z. Ye, H. Bui, V. Vila

Numerical and Experimental Modelling of Crest Surcharge Effects on Pile-reinforced Sand Slopes

B. Pearce, ***A. Ahangar Asr**

Thu, 23/07/2026 14:00 - 14:45

NM - 5 (KK)

MS195A - Computational Methods in Environmental Fluid Mechanics I

Main Organizer: Prof. Eirik Valseth (Norwegian University of Life Sciences)

Chaired by: Prof. Eirik Valseth (Norwegian University of Life Sciences), Prof. Kazuo Kashiya (Chuo University)

A Data-Consistent Approach to 4D-Var

R. Spence, ***T. Butler**, C. Dawson

Utilizing NASA's Cyclone Global Navigation Satellite System (CYGNSS) wind data within a discontinuous Galerkin storm surge model

***E. Kubatko**, A. Sines, M. Al-Khaldi

Development of Hydraulic Roughness Coefficients Estimation from Point Cloud and Its Application to Flood Inundation Simulation

***Y. Odate**, M. Hitokoto, K. Kashiya

Zoomy: Simulation Software for Hierarchical Free-Surface Flow Models

I. Steldermann, ***J. Kowalski**

Thu, 23/07/2026 14:00 - 14:45

NM - 3 (BB)

MS179A - Advanced Space-Time Methods I

Main Organizer: Prof. Thomas Elguedj (INSA-Lyon / Lamcos)

Chaired by: Prof. Thomas Elguedj (INSA-Lyon / Lamcos), Phd. Stéphane Lejeunes (LMA, CNRS)

Adaptive Simplex Meshes for Time-Continuous Space-Time Finite Elements

***O. Wege**, N. Hosters, M. Behr

Iterative Space-Time Finite Element Method for Problem-Dependent Domains

***J. Kravchenko**, N. Hosters, M. Behr

Dispersion Analysis and Guidelines for Velocity-Based Space-Time FEM in Wave Propagation Problems

***S. Shimizu**, V. Sharma, K. Fujisawa

Thu, 23/07/2026 14:00 - 14:45

H4 - 1 (Ludwig)

MS253D - Computational Geomechanics IV

Main Organizer: Prof. Jinhyun Choo (Seoul National University)

Chaired by: Dr. Pin Zhang (National University of Singapore), Prof. Keita Yoshioka (Montanuniversität Leoben)

An Automatically Differentiable, GPU-Accelerated Implicit MPM Framework for Geomechanics

***J. Choo**, Y. Zhao, C. Jiang

Simple Sparse Grid for Efficient Simulation of Large-scale Mass Flows Using the Material Point Method

***Y. Zhao**, L. Blatny, M. Juel, C. Jiang, J. Gaume

Calcite Damage in MICP-Treated Soils with Non-Spherical Particles via MP-LSDEM Coupling

***T. Saha**, Y. Jiang

Thu, 23/07/2026 14:00 - 14:45

H4 - 2 (Leopold)

MS089A - Advanced Computational Modelling of Wood, Wood-Based Products, Biocomposites, and Timber Structures I

Main Organizer: Dr. Markus Lukacevic (TU Wien/CD-Labor Lukacevic)

Chaired by: Dr. Markus Lukacevic (TU Wien/CD-Labor Lukacevic), Prof. Thomas K. Bader (Linnaeus University)

A nonlinear constitutive model for wood in compression longitudinal to the grain under constant climate conditions

***C. Yang**, A. Khaloian-Sarnaghi, J. van de Kuilen

Unravelling Microstructural Stiffness Relationship in Softwood via AI-Assisted Hybrid Analytical-Numerical Multiscale Homogenization

***A. Thirion**, M. Königsberger, S. Pech, J. Füssl

A computational framework for spruce failure: anisotropic plasticity with discrete cracking

***D. Rahmi**, R. Fleischhauer, M. Kaliske

Thu, 23/07/2026 14:00 - 14:45

H4 - 3 (Franz)

MS247B - Computational Design of Lightweight Fiber-reinforced Composite Structures II

Main Organizer: Prof. Gokhan Serhat (KU Leuven)

Chaired by: Dr. Jun Wu (Delft University of Technology), Prof. Gokhan Serhat (KU Leuven)

Concurrent Optimization of Layups and Stiffeners for Stiffened Laminated Composite Structures Considering Manufacturing Constraints

***S. Li**

Implicit Neural Field-Based Process Planning for Direct Control in Multi-Axis Composite 3D Printing

***N. Dutta**, T. Zhang, T. Liu, Y. Chen, C. Wang

A Survey of Select Force Inversion Methods for Structural Dynamics

***J. Pechac**, M. Chen

Thu, 23/07/2026 14:00 - 14:45

H4 - 4 (Alois)

MS106A - Advances in Model Order Reduction: Bridging Physics and Machine Learning I

Main Organizer: Dr. Youngsoo Choi (Lawrence Livermore National Laboratory)

Chaired by: Dr. Youngsoo Choi (Lawrence Livermore National Laboratory), Prof. Masayuki Yano (University of Toronto)

Accelerating Numerical Simulations in CFD by Model Reduction and Scientific Machine Learning

***G. Rozza**

On-the-Fly Learning of Reduced Order Models for Efficient PDE-Constrained Optimization Problems

B. Klein, ***M. Ohlberger**

Weak formulation-based GENERIC formalism neural networks for learning dynamical systems from noisy measurements

J. Park, A. Hashim, S. Cheung, Y. Choi, ***Y. Shin**

Thu, 23/07/2026 14:00 - 14:45

H4 - 5 (Xaver)

MS143A - Hybrid Methods for Computational Solid Mechanics and Multi-Physics Problems I

Main Organizer: Mr. Panos Pantidis (New York University Abu Dhabi)

Chaired by: Mr. Panos Pantidis (New York University Abu Dhabi), Dr. Mostafa Mobasher (New York University Abu Dhabi)

Extending Classical Solvers with Neural Operators for Efficient Nonlinear PDE Solutions

***S. Rezaei**, R. Najian Asl, K. Taghikhani, Y. Yamazaki, J. Paul Varghese, M. Muramatsu, M. Apel

Integrated Finite Element Neural Networks (I-FENN) for accelerating the solution of coupled problems

***M. Mobasher**, P. Pantidis, D. Abueidda, H. Eldababy, F. Amin

The Integrated Finite Element Neural Network (IFENN) approach to phase-field fracture initiation and propagation

***P. Pantidis**, F. Amin, D. Abueidda, M. Mobasher

Thu, 23/07/2026 14:00 - 14:45

H4 - 6 (Sissi)

MS058A - Structure-Preserving Discretization Techniques for Coupled Problems I

Main Organizer: Prof. Peter Betsch (Karlsruhe Institute of Technology (KIT))

Chaired by: Prof. Peter Betsch (Karlsruhe Institute of Technology (KIT)), Prof. Sigrid Leyendecker (Friedrich-Alexander-Universität Erlangen-Nürnberg)

A Geometric Integrator Based on the Double Bracket Structure for Coupled Thermo-Elastodynamics

***B. Georgette**, D. Dureisseix, A. Gravouil

Constitutive model discovery for dielectric elastomer actuator structures

G. Amer, D. Martonova, ***S. Leyendecker**

Structure Preserving Discretization of Polyconvexity-Inspired, Mixed Nonlinear Thermoelasticity Using Port-Hamiltonian and GENERIC Frameworks

M. Hille, P. Betsch, ***M. Franke**

Thu, 23/07/2026 14:00 - 14:45

H4 - 7 (Maximilian)

MS368A - Cardiovascular Disease-Computational Mechanics and AI I

Main Organizer: Prof. Nenad Filipovic (BIOIRC doo Kragujevac)

Chaired by: Prof. Nenad Filipovic (BIOIRC doo Kragujevac)

Predictive Modeling of False Lumen Volume in Type A Aortic Dissection Using Machine Learning Algorithms

I. Saveljic, T. Djukic, S. Tomasevic, ***N. Filipovic**

Hemodynamic Characterisation of Type B Aortic Dissection: A Patient Specific CFD Model Validated in Vitro via PIV

***M. Correnti**, M. Roy, S. Di Leonardo, A. Monteleone, R. Lim, A. Ooi, G. Micale, S. Chakraborty, G. Burriesci

Overview of Muscle Surrogate Models for Cardiac Cycle Simulations

***B. Milicevic**, M. Ivanovic, B. Stojanovic, M. Milosevic, M. Kojic, N. Filipovic

Thu, 23/07/2026 14:00 - 14:45

H4 - 8 (Eventcenter)

MS239F - Advances in Shape Optimization and Form-Finding for Engineering Design VI

Main Organizer: Prof. Kai-Uwe Bletzinger (Technical University of Munich, Germany)

Chaired by: Dr. Majid Hojjat (BMW Group), Prof. Pierluigi D'Acunto (Technical University of Munich (TUM))

Form-Finding of Vaulted Masonry Structures Driven by Intermediate Equilibrium States

***J. Meza Zeron**, P. D'Acunto

Gradient-Based Form Finding for Thin-Walled Engineering Structures

***F. Jungreitmayer**

Linking Discrete Equilibrium-Based Form Finding and Continuum FEM Analysis for Early-Stage Structural Design

***C. Richter**, P. Jakobs, R. Wüchner, P. D'Acunto

Thu, 23/07/2026 14:00 - 14:45

BrainLab - Training

MS249A - Uncertainty Quantification in Structural Mechanics I

Main Organizer: Dr. Marc Fina (Karlsruhe Institute of Technology)

Chaired by: Dr. Marc Fina (Karlsruhe Institute of Technology), Prof. Steffen Freitag (Karlsruhe Institute of Technology (KIT))

A Computationally Efficient Algorithm For Structural Uncertainty Quantification Under Stochastic Loading

***S. Shabir**, S. Sarkar

Robust Design Optimization Considering the Correlation of Multiple Load Cases

***N. Reuter**, B. Kriegesmann

Real-Time Structural Health Monitoring with Bayesian Neural Networks: Distinguishing Aleatoric and Epistemic Uncertainty

***H. Cho**, J. Yu, H. Moon, J. Lee, S. Ryu

Thu, 23/07/2026 14:00 - 14:45

NM - 6 (Munich)

MS070A - Multi-Physics and Multi-Scale Simulations With The Coupling Library preCICE I

Main Organizer: Mr. Gerasimos Chourdakis (University of Stuttgart)

Chaired by: Mr. Gerasimos Chourdakis (University of Stuttgart), Dr. Benjamin Uekermann (University of Stuttgart)

A quick introduction to the coupling library preCICE

***G. Chourdakis**, B. Uekermann

Beyond Static Meshes in preCICE

***F. Simonis**, D. Schneider, B. Uekermann

Turek-Hron FSI Benchmark simulations with TRACE and CalculiX

***M. Freimuth**, E. Peter, M. von Langsdorff, S. Behre

Thu, 23/07/2026 14:00 - 14:45

NM - 7 (Venice)

MS344E - Agentic AI and Physics-Informed Machine Learning for Next-Generation Design and Manufacturing V

Main Organizer: Prof. Seunghwa Ryu (KAIST)

Chaired by: Prof. Seunghwa Ryu (KAIST)

Physics-Guided Machine Learning for Solving Transient Nonlinear Partial Differential Equations with Sparse Measurements and Optimal Sensor Placement

Keynote

***J. Lim**, J. Park, H. Noh

Predicting Discontinuous and Long-Tailed Physical Fields via Tail-Aware Mixture of Experts

***S. Hong**, N. Kang, Y. Kwon, D. Jeong, J. Ha, S. Lee, J. KIM

Thu, 23/07/2026 14:45 - 15:00

Short Break

MS283H - Recent Progress in Topology Optimization and Its Applications VIII**Main Organizer:** Prof. Junji Kato (Nagoya University)**Chaired by:** Dr. Oded Amir (Technion - Israel Institute of Technology), Prof. Bin Niu (Dalian University of Technology)

3D Truss-Continuum Topology Optimization with Demolding Constraint of Prestressed Concrete Floors

***P. Wongsittikan**, J. Jewett, J. Carstensen

Extended discrete material optimization: multi-material topology optimization for nonlinear materials

***J. Han**, K. Izui, S. Nishiwaki

Matlab Code for 2D and 3D MMC-based Natural Frequency Topology Optimization

***J. Huang**, Y. Zhang, Z. Du, X. Guo

Topology Optimization of 3D Finite Deformation Mortar Frictional Contact Problems Using Adjoint Sensitivities

L. Rinderer, ***M. Gee**, A. Popp, K. Maute

Adjoint based Topology Optimization for multiphase flows with phase change due to boiling

V. Garg*MS020F - Large Deformation Beams and Shells: Formulation Advances and Innovative Applications VI****Main Organizer:** Prof. Enzo Marino (University of Florence)**Chaired by:** Prof. Bastian Oesterle (Hamburg University of Technology), Dr. Rainer Groh (University of Bristol)

A Winkler-Foundation Beam Model for Accurate Dynamic Prediction of Long Overhang Boring Bars

***W. ALVES DA SILVA**, M. Vinicius Begossi, F. Kuranaka, J. Peterka

A 1D Kinematically Enriched Ribbon Model for Simulation of Winding of Superconducting Tapes

***M. Saadat**, A. Torre, D. Durville

Modeling and Simulation of the Winding Process for Electric Motor Rotors

***G. Crippa**, D. Durville, S. Lemesle, J. Lavault

Numerical analysis of curved honeycomb and metastructure panels

***R. Augello**, E. Carrera

An Objective FE-Formulation for Cosserat Shells Based on Spherical Bézier Interpolation

K. KOUMAKO**, L. Greco, M. Cuomo, N. Challamel, L. Placidi, V. Picandet**MS008A - Computational Damage and Fracture Mechanics I*Main Organizer:** Prof. Michael Brüning (University of the Bundeswehr Munich)**Chaired by:** Prof. Michael Brüning (University of the Bundeswehr Munich)

An Enhanced Rousselier Model to Predict Ductile Fracture under a Wide Range of Loading Conditions

***S. Matsui**, Y. Shintaku, K. Terada

An Enhanced Strategy for Ductile Fracture Simulation under Large Deformation Incorporating Effective Element Size

***W. Zhang**, Y. Kim, K. Shibamura

Dynamic ductile fracture modelling using a 3D XFEM based methodology

***L. Scheidt**, J. Crété, P. Longère

Reconstructing the full stress-strain curves from sub-size tensile specimens using finite element analysis incorporating a ductile damage model

***B. Mittelman**, G. Guttman, M. Ajami, S. Samuha, E. Priel

Characterization of the anisotropic damage evolution within Double-network hydrogels

***C. Wang**, Z. Liu

Neural Network-Based Constitutive Modelling Coupled with Phase-Field Damage

A. Šegon, ***T. Lesi?ar**

Thu, 23/07/2026 15:00 - 16:30

ICM – 4a

MS157A - Computational Fluid Dynamics (CFD) and Fluid-Structure Interaction (CFSI): Methods Development and Applications I

Main Organizer: Dr. George Moutsanidis (Rutgers University)

Chaired by: Dr. George Moutsanidis (Rutgers University)

Numerical Analysis of Sinusoidal Energy Deposition for Aerodynamic Performance Enhancement on a Dynamically Heaving-Pitching Wing

D. Dolla, ***C. Wang**

Effect of spatial and dynamically varying stiffness on a flexible self-propelled swimmer

M. Xu, ***B. Yin**

Flight stability of cones and wedges

***P. Sanaei**

Adaptive Selection of Frequencies for Cost-Efficient Harmonic Balance Simulations

***H. Kersken**, G. Geiser, C. Frey, G. Ashcroft

Integrated CFD-FSI Framework for Harmonic Response and Fatigue Assessment of Francis Hydraulic Turbine

***I. Sohn**, T. Kim, S. Lee

A Containerised Fluid–Structure Interaction Framework for Bristled Insect Wings at Low Reynolds Number

***J. Li**, H. Li, M. Nabawy, L. Margetts

Thu, 23/07/2026 15:00 - 16:30

ICM – 4b

MS198C - Multiphysics and Data-driven Modeling for Cardiovascular Biomedicine III

Main Organizer: Prof. Debanjan Mukherjee (University of Colorado Boulder)

Chaired by: Prof. Debanjan Mukherjee (University of Colorado Boulder), Prof. Adarsh Krishnamurthy (Iowa State University)

Multi-modal Data Integration with In Silico Models for Digital Twin Frameworks with Applications in Stroke.

R. Roopnarinesingh, ***D. Mukherjee**

Towards a clinical thrombosis model: platelet adhesion, activation, and aggregation in arteries

***A. Garcha**, N. Grande Gutierrez

In Vivo Deformation of the Human Single Ventricle

B. Thomas, R. Chabiniok, ***U. Akyuz**, M. Sacks

An Agentic-AI Pipeline for Procedural Generation of Cardiovascular Geometry

M. Saraeian, S. McDaniel-Rold, ***A. Krishnamurthy**

Thu, 23/07/2026 15:00 - 16:30

ICM - 5

MS100C - New Trends in Topology Optimization III

Main Organizer: Prof. Emilio Silva (University of Sao Paulo)

Chaired by: Dr. Renato Picelli Sanches (University of São Paulo), Prof. Shinji Nishiwaki (Kyoto University)

Topology Optimization for Coupled Reaction-Diffusion and Finite Elasticity Problems [Keynote](#)

***N. Ishida**, S. Nishiwaki, J. Han, S. Kobayashi, K. Izui

Structure Optimization of Elastoplastic Multiphase Hierarchical Systems

***A. Modak**, R. Chowdhury, T. Gangwar

Topology Optimization for Large Deformation: A Robust Framework for Ogden Hyperelastic Materials

***T. Shimada**, Y. Okuda, K. Nishiguchi, J. Kato

Large-Deformation Topology Optimization Using a Micropolar-Based Third Medium and Arc-Length Method

***M. Tanaka**, A. Kawamoto, T. Nomura

Simultaneous Optimization of Soft Body Shape, Skeletal Structures, and Actuation for Locomotion

***H. Kobayashi**, Y. Takaha, C. Yuhn, Y. Sato, A. Kawamoto, T. Nomura

Thu, 23/07/2026 15:00 - 16:30

ICM - 11a

MS166A - Uncertainty-aware Machine Learning Surrogates for Scientific Applications I

Main Organizer: Dr. Cosmin Safta (Sandia National Laboratories)

Chaired by: Dr. Cosmin Safta (Sandia National Laboratories), Dr. Pieterjan Robbe (Sandia National Laboratories)

Evaluating the Robustness of Generative Models in Emulating Non-stationary Dynamical Systems

***T. Maier**, K. Debeire, N. Thuerey, V. Eyring

Few?Shot Gaussian Mixture Models for Uncertainty-Aware Process Window Identification in Laser ?Based Additive Manufacturing

S. Basterrech, ***S. Mohanty**

Mixture-of-experts Surrogate Constitutive Models for Viscoplastic Creep Simulation of HT-9 Steel

***P. Robbe**, A. Ruybalid, H. Najm, L. Capolungo, C. Safta

Uncertainty Propagation in Spring-Mass-Damper Systems with Data-Driven Nonlinear Force Correction

***K. Mariantes**

Physics-Constrained Bayesian Inference of Density Functionals in Machine-Learning-Augmented Classical Density Functional Theory

***E. Monti**, P. Yatsyshin, K. Gkagkas, A. Duncan

Thu, 23/07/2026 15:00 - 16:30

ICM - 11b

MS028C - Bridging Disciplines and Scales for Sustainable Cement and Concrete III

Main Organizer: Prof. Bernhard Pichler (TU Wien)

Chaired by: Prof. Miroslav Vožechovský (Brno University of Technology), Dr. Jithender Timothy (Technical University of Munich)

Role of Water Balance from Perspective of Hydration and its Impact on Shrinkage

***J. Hübner**, L. Dudi, T. Matschei

Linking Thermodynamic Model to Microstructural Evolutions and Beyond!

***L. Dudi**, T. Matschei

Spatially Heterogeneous ITZ Modeling in Recycled Aggregate Concrete: Multiscale Upscaling with Uncertainty Propagation

***A. Shittu**, L. Göbel

Micromechanical experimental and analytical investigation of the spatially varying interfacial transition zone in concrete with different recycled aggregate types

A. Shittu, F. Li, E. Linß, C. Rößler, ***L. Göbel**

Thu, 23/07/2026 15:00 - 16:30

ICM - 12a

MS296A - Auxetic from Lattices to Limits: Design, Simulation, and Realization of Architected Metamaterials I

Main Organizer: Prof. Tim Ricken (University of Stuttgart)

Chaired by: Prof. Tim Ricken (University of Stuttgart), Dr. Seyedmorteza Seyedpour (University of Stuttgart/ Institute of Structural Mechanics and Dynamics in Aerospace Engineering)

Computational Engineering of discrete metamaterials

***N. Nagengast**, O. Weeger

Puzzle-like Modular Auxetic Lattice Structures: Construction Method, Experimental and Numerical Dynamic Investigation

***N. Grünfelder**, M. Brodbeck, N. Waschinsky, S. Morteza Seyedpour, T. Ricken

Asymptotic Rigidity and Homogenization of Auxetic Metamaterials with Checkerboard Structure

***W. Düll**, D. Engl, C. Kreisbeck

Exploring the Potential of Thermomechanically Activated Auxetic Architectures for Dental Implant Drills

***B. Dieckgraeff**, N. Grünfelder, S. Seyedpour, T. Ricken

Investigation and Optimization of Inverse Honeycombs Manufactured out of Plastics Using 3D-Printing

***J. Hufert**, C. Bonten

On the Design and Characterization of an Auxetic Wearable Pad

S. Cantella, D. Di Brizzi, E. Jonathan, C. Bollati, L. Micoli, R. Viganò, C. Lammi, L. D'Andrea, P. Vena, R. Pugliese, ***S. Graziosi**

Thu, 23/07/2026 15:00 - 16:30

ICM - 12b

MS119A - Computational Mechanics-Inspired Machine Learning for Forward and Inverse Problems I

Main Organizer: Dr. Sourav Saha (Virginia Tech)

Chaired by: Dr. ZHENGTAO GAN (Arizona State University), Prof. Tianju Xue (The Hong Kong University of Science and Technology)

Advanced Computational Techniques and Deep Learning Algorithms for Automated Modeling of Materials

***S. Soghrati**, S. Shuvo, M. Shirazi, K. Kashyap

Built for AI, used for Solid Mechanics: Automatic Differentiation, Multi-GPU and Mixed Precision for Inverse Problems

***L. Rehm**, M. Afrasiabi, M. Bambach

Reducing the Cost of Differentiable Physics Solvers During Training

***K. Bhatia**, F. Koehler, N. Thuerey

Hybrid Method for Statistical Mean Estimation in Bayesian Inversion and Filtering Problems with Deep Learning Surrogate

***J. Yang**

Holomorphic-PINNs: A Novel Framework for Kirchhoff Plate Bending

***A. Forooghi**, E. Ruocco, T. Andriollo

Thu, 23/07/2026 15:00 - 16:30

ICM - 13a

MS088B - Advanced Multi-physics CFD Simulations in Science and Engineering II

Main Organizer: Prof. Takahiro Tsukahara (Tokyo University of Science)

Chaired by: Prof. Ryo ONISHI (Institute of Science Tokyo), Prof. Takahiro Tsukahara (Tokyo University of Science)

Heat transfer enhancement in a swirling pipe flow at low Reynolds number

***A. Wakiyasu**, H. Mamori, M. Wang, T. Miyazaki, H. Nakamura, T. Tsukahara, K. Fukudome

A New Compressibility Correction for the SST Turbulence Model in Hypersonic Boundary Layer Flows

***S. Liu**, H. Zhang, Z. Xiao

Turbulent Channel Flow Controlled by Buoyancy Force Using Traveling Wave Wall Temperature

***S. Aoyama**, H. Mamori, M. Wang, T. Miyazaki

A Flux-Control Strategy for Wall-Modeled Large Eddy Simulation Using the Compressible Law of the Wall

***Y. Xu**, S. Schmidt, N. Adams

Opposition Control Based on Nonlinear Forecasting for Turbulent Taylor-Couette Flow

***T. Noguchi**, H. Mamori, T. Miyazaki, M. Wang

Direct Numerical Simulation of Premixed Turbulent Ammonia Flames

***P. Handle-Kesselring**, C. Gößnitzer, S. Posch, H. Steiner

Thu, 23/07/2026 15:00 - 16:30

ICM - 13b

MS095A - Advances and Challenges in Phase-Field Modeling and Computations I

Main Organizer: Prof. Fadi Aldakheel (Leibniz Universität Hannover)

Chaired by: Prof. Fadi Aldakheel (Leibniz Universität Hannover), Prof. Jörg Schröder (University Duisburg-Essen)

Multiple Time-Scale Homogenization of Coupled Corrosion-Fatigue in Structural Concrete

Keynote

***A. Baktheer**, M. Gopakumar, G. Kenjo, F. Aldakheel

Towards a Monolithic Phase-Field Formulation for Chemo-Mechanical Fracture with Dissolution Effects

***M. Alaleeli**, M. Mobasher

Phase-Field Modelling of Hydrogen-Assisted Fracture in Biodegradable Magnesium Implants

***B. Mudigere Narasimhashetty**, R. Singh, A. Alankar

A general phase-field model for electrical degradation and breakdown under electro-thermo-mechanical loading

***F. Fuentes**, J. Mardonez, J. Basulto

Scalable simulation of chemo-mechanical degradation for oxidation at extreme environments

***S. Motghare**, S. Pal

Thu, 23/07/2026 15:00 - 16:30

ICM - 14a

MS031F - Open-Source Software in Mechanics VI

Main Organizer: Dr. Vladislav Yastrebov (MINES Paris, PSL University, CNRS)

Chaired by: Prof. Garth Wells (University of Cambridge)

High-Performance Finite Elements with MFEM

***T. Kolev**

QUEENS: A Python Framework for Solver-Independent Multi-Query Analyses of Large-Scale Computational Models

J. Biehler, ***S. Brandstaeter**, R. Bühler, M. Dinkel, L. Haeusel, S. Hervás-Raluy, R. Joussen, B. Maradni, J. Nitzler, A. Popp, G. Robalo Rei, W. Wall, D. Wolff

UQLab - An Open-Source Tool for Uncertainty Quantification with Dynamical Systems

***S. Marelli**, S. Schär, B. Sudret

Uranie: An Open-Source Black-Box Platform for Uncertainty Quantification Analyses in Computational Mechanics

***J. Nespoulous**

Open Source Software and Open Data in the Development of Simulation Methods for Digital Twins

***J. Bonari**, S. Trentin, M. Mattuschka, L. Kühn, P. Franz, M. von Danwitz, A. Popp

Streamlining Your Data-driven Process with f3dasm

***M. van der Schelling**, B. Ferreira, M. Bessa

Thu, 23/07/2026 15:00 - 16:30

ICM - 14b

MS153D - Data-driven dynamical systems: learning, simulation, and control IV

Main Organizer: Prof. Andrea Manzoni (Politecnico di Milano)

Chaired by: Prof. Andrea Manzoni (Politecnico di Milano)

Learning Latent Degradation Dynamics from Sparse Data and Population Statistics for Sequential Maintenance Decisions

***T. Heinzele**, D. Straub

Component-Level Machine Learning for Mechanical System Dynamics

***B. Todorov**, T. Slimak, A. Zwölfer

Thu, 23/07/2026 15:00 - 16:30

ICM - 14c

MS133A - Data-Driven Design of Materials – from Performance to Sustainability I

Main Organizer: Prof. Markus Kästner (TU Dresden)

Chaired by: Prof. Daniel Balzani (Ruhr University Bochum)

Variance estimation Bayesian Neural Networks (VeBNNs): Cooperative training for uncertainty disentanglement and robust materials design

Keynote

***M. Bessa, J. Yi**

Data-Driven Inverse Design of Structured Materials in the Small-Data Regime

***A. Raßloff, M. Kästner**

Design-GenNO: A physics-informed generative model with neural operators for inverse microstructure design

***Y. Zang, P. Koutsourelakis**

Inferring the underlying kinetics of phase-separating systems from microstructure observations

***I. Jain, T. Kong, Y. Guo, C. Dransfeld, S. Kumar**

Multi-Objective Quantum Optimization for Data-Driven and Sustainable Materials Design

***T. Plehn, D. Barragan-Yani, E. Breitbarth, G. Requena, D. Melching**

Thu, 23/07/2026 15:00 - 16:30

ICM - B11

MS094A - Integrating Experimental Data and Computational Models in Biomechanics I

Main Organizer: Dr. Silvia Hervas-Raluy (Technical University of Munich)

Chaired by: Dr. Silvia Hervas-Raluy (Technical University of Munich), Dr. Sebastian Brandstaeter (University of the Bundeswehr Munich)

Differentiable Surrogates for Cell Migration Models: Learning Conditional Movement Laws from Trajectory Data **Keynote**

***F. Spill, B. Cardoen**

Metabolic-Mechanic Integration in In-Silico Tumor Growth: Simulating the Behaviors of Mesenchymal and Epithelial Cells

***P. Garcia-Gomez, P. Guerrero-Lopez, S. Hervas-Raluy, J. Garcia-Aznar**

A Particle-Based Viscoelastic Model to Characterize Cell Mechanics During Confined Migration: Experimental Validation and Bayesian Optimization

***D. Garcia-Navarro, J. Zhang-Zhou, D. Camacho-Gomez, J. Garcia-Aznar**

An Experimental-Computational Framework to Characterize PBMCS Migration in the Glioblastoma Microenvironment

***R. Arroyo-Vazquez, G. Mora-Ruiz, M. Pérez-Aliacar, T. Randelovic, I. Ochoa, M. Doblaré, J. Sanz-Herrera, J. Ayensa-Jiménez**

Probabilistic Continuum-Mechanical Modeling of the Human Shoulder: Bayesian Calibration and Uncertainty Quantification of an Active Skeletal Muscle Model

***L. Engelhardt, M. Dinkel, S. Hervas-Raluy, G. Robalo Rei, B. Wirthl, W. Wall**

Thu, 23/07/2026 15:00 - 16:30

ICM - B12

MS298B - Applied Sciences on Metamaterials – Modelling, Simulation and Fabrication II

Main Organizer: Prof. Denis Anders (TH Köln – University of Applied Sciences)

Chaired by: Prof. Marcel Walkowiak (TH Köln), Prof. Denis Anders (TH Köln – University of Applied Sciences)

Homogenized Yield Surface of an Anisotropic Plate Lattice Metamaterial

***M. Maier, F. Hartl, O. Huber, H. Saage**

Closed-Form Buckling Analysis of Lattice-Core Sandwich Plates with Composite Facesheets

***S. Osmanoglu, C. Mittelstedt**

Investigation of additive-manufactured TPMS structures in static creep and/or relaxation tests using DMA equipment

***K. Harrass, D. Anders, M. Walkowiak**

Recovering Asymmetric Material Placement in TPMS Shell Lattices via Sequential Size–Shape Optimization

***N. Milenkovski, C. Mittelstedt**

Comparative Analysis of Analytical and Numerical Modeling Approaches for Psychoacoustic Performance Assessment of Vibro-Acoustic Metamaterials

***J. ZHANG, L. Van Belle, L. De Ryck, J. Cuenca, E. Deckers**

Evaluation of Shear Deformation Theories for Additively Manufactured Lattice-Core Sandwich Beams under Distributed Loading

***E. Dereli, C. Mittelstedt**

Thu, 23/07/2026 15:00 - 16:30

ICM - B13

MS231A - Applications of Advanced Numerical Analyses in Oil and Gas Industry I

Main Organizer: Dr. Allan Zhong (Halliburton Company)

Chaired by: Ms. Amandine Battentier (SLB), Dr. Allan Zhong (Halliburton Company)

Analytics for Small Sample Size Engineering Problems – A Case Study in Flapper Valve Closure Keynote

***A. Zhong**, H. Arabnejad, D. Dockweiler

Numerical Investigation of Turbulence-Induced Loading on Control Lines in Intelligent Well Completions

T. Eduardo, A. Braga, ***A. Nieckele**

Predicting the Helical Path in Coiled Tubing Drilling with Continuous Bottom Hole Assembly Rotation

***T. Su**, A. Nigretto, M. Abuhaikal

Modeling Mud Invasion with Miscible Flow in a Deviated Well

***Y. Chang**

An Iterative Algorithm to Simulate the Mechanical and Thermal Behavior of Stator Elastomers in Positive Displacement Motors

***A. Schöne**, R. Landgraf, J. Ihlemann, S. Zeller, T. Regener, C. Hohl

Thu, 23/07/2026 15:00 - 16:30

ICM - B21

MS262F - Advances of Quantum and Quantum-Inspired Algorithms for Solving Flow Simulation Problems VI

Main Organizer: Prof. Thomas Rung (Hamburg Univ. of Technology)

Chaired by: Mr. Sergio Bengoechea (TUHH)

A Quantum Algorithm for Solving the Inhomogeneous Poisson Equation for Free Field Conditions via the Hockney Method

***H. Kösel**, R. Ewert, J. Delfs

continuous variable quantum simulation of nonlinear partial differential equations

Y. Gan, H. Alipanah, J. Cheng, Z. Wu, G. Li, J. Mendoza-Arenas, P. Givi, M. R. Malik, B. J. McDermott, ***J. Liu**

A Comparative Study of Quantum Algorithms for Linear Stochastic Differential Equations in Oil Spill Transport

***A. Kudaikulov**

Thu, 23/07/2026 15:00 - 16:30

ICM - B22

MS080B - Geosciences at the Extreme Scale: Advances in Computational Science and Engineering II

Main Organizer: Dr. Marcus Mohr (Ludwig-Maximilians-Universität München)

Chaired by: Prof. Michael Bader (Technical University of Munich), Dr. Marcus Mohr (Ludwig-Maximilians-Universität München)

Numerical and Scalability Studies with TerraNeo: Matrix-Free Mantle Convection Framework

***P. Ilangoan**, G. Robl, F. Rezaei, B. Vilacis, A. Burkhart, F. Böhm, N. Kohl, M. Mohr

Terraneo: Large-Scale Mantle Convection Simulation on GPUs

***F. Boehm**

Performance Portability for the Shallow Water Equations on Multi-Accelerator Systems with SYCL

***M. Büttner**, C. Alt, T. Kenter, V. Aizinger

Exascale electromagnetic modeling

***O. Castillo-Reyes**

Goal-Oriented OED for Large Scale Bayesian Inverse Problems Governed by Autonomous Dynamical Systems

S. Henneking, S. Venkat, F. Kutschera, J. Wong, A. Gabriel, ***O. Ghattas**

Thu, 23/07/2026 15:00 - 16:30

ICM - 21a

MS236B - Peridynamic Theory and Nonlocal Continuum Models: Methods and Applications II

Main Organizer: Prof. Erkan Oterkus (University of Strathclyde)

Chaired by: Prof. Erdogan Madenci (University of Arizona), Prof. Erkan Oterkus (University of Strathclyde)

An Adaptive Hybrid Peridynamic Framework Combining Mesh-Free Formulation and the Fast Convolution-Based Method

***M. Zaccariotto**, S. Galeazzo, F. Scabbia, U. Galvanetto

Mathematical Results on the Convergence of the Mesh-Free Discretization of Peridynamics.

***M. Zetzmann**, M. Stingl, L. Pflug

A variational mechanics perspective on dual-horizon bond-based peridynamics

***P. Prateek**, G. Capobianco, K. Weinberg, M. Ortiz, S. Leyendecker

Chemo-mechanical Coupled Peridynamic Model for Hydrogen Embrittlement Fracture Analysis

***X. Gu**, C. Wang, Y. Wang, Q. Zhang

Coupled THM Peridynamics for Thermal Fluid-Solid Interactions with Fracturing

***C. Yang**, J. Zhao

Thu, 23/07/2026 15:00 - 16:30

ICM - 21b

MS042B - Numerical Analysis on Polytope Meshes: Geometry Processing, SBFEM, VEM and beyond II

Main Organizer: Prof. Carolin Birk (Universität Duisburg-Essen)

Chaired by: Prof. Sven Klinkel (Sven Klinkel, Professor, RWTH Aachen University), Prof. Carolin Birk (Universität Duisburg-Essen)

A stabilization method based on a Taylor series expansion for the virtual element method with application to inelasticities

***N. Pacolli**, J. Kehls, S. Reese, H. Holthusen

Creating Weakly Star-Shaped Spline Elements for IGA-Enhanced SBFEM

B. Juettler, ***Y. Delpak**

Polygonal Scaled Boundary Elements For Reissner–Mindlin Plates with Improved Locking Behavior

***A. Hellers**, M. Reichle, S. Klinkel

Fracture modelling in brittle polycrystalline material using polygon elements based on the scaled boundary finite element method

***A. Pasupuleti**, C. Birk, H. Hirshikesh, S. Natarajan

An Analysis-Suitable Reissner-Mindlin Shell Formulation for Polygonal Scaled Boundary Isogeometric Analysis

***M. Reichle**, J. Arf, M. Choi, B. Simeon, S. Klinkel

Enhancing Scaled Boundary Isogeometric Analysis with Machine Learning-Driven Quadrature

***D. Teran**, M. Chasapi

Thu, 23/07/2026 15:00 - 16:30

ICM - 22a

MS256C - Multiscale and Multiphysics Modelling of Heterogeneous Materials with Random and Periodic Microstructures III

Main Organizer: Dr. Greta Ongaro (Sapienza University of Rome)

Chaired by: Dr. Greta Ongaro (Sapienza University of Rome), Dr. Marco Colatosti (Sapienza Università di Roma)

Relative entropy in homogenization method of composites with truncated uncertainties

***M. Kamiński**

Computation of the Apparent Elastic Properties of 3D Printed Materials with Random Microstructural Defects

D. Savvas, ***G. Stefanou**

Modelling of random tensor-valued symmetric positive definite material parameter fields in thermoplastic composites

***W. Schuttert**, M. Abdul Rasheed, B. Rosic

Advanced optimization scheme for heterogeneous beam-lattice systems

F. De Canio, ***M. Pingaro**, P. Venini, P. Trovalusci

Thu, 23/07/2026 15:00 - 16:30

ICM - 22b

MS078A - Modeling and Simulations of Additively Manufactured Metamaterials I

Main Organizer: Dr. Massimo Carraturo (University of Pavia)

Chaired by: Prof. Simone Morganti (University of Pavia), Prof. Ferdinando Auricchio (Università di Pavia)

Modeling Residual-Stress Relaxation in Cryogenically Cycled PBF-LB/M 316L

***P. Maasch**, D. Schob, A. Kromm

Direct numerical simulations of TPMS using the Finite Cell Method

***G. Mangiameli**, P. Kopp, S. Kollmannsberger, F. Auricchio, M. Carraturo

Modeling and validation of an immersed boundary framework for PBF-LB/M process simulations of TPMS structures

***M. Carraturo**, P. Kopp

Designing elastic anisotropy of atom-mimetic metamaterials based on finite element method and density functional theory analyses

***Y. Teramoto**, M. Okugawa, Y. Koizumi, S. Ogata

From Experiments to Simulations: Fatigue Performance of Strut-Based Lattice Structures

M. Greiner, ***A. Kappel**, C. Mittelstedt

Virtual-to-physical design of functionally graded mechanical metamaterials for buckling-critical performance

***K. Azher**, A. Nazir

Thu, 23/07/2026 15:00 - 16:30

ICM - 41 (Ostersee A)

MS257B - Multiscale & Multiphysics Approaches in Soft Tissues II

Main Organizer: Dr. Tian Yuan (Imperial College London)

Chaired by: Dr. Suhaib Ardah (Imperial College London), Dr. Tian Yuan (Imperial College London)

Multiscale and Multiphysics Modelling of Fluid Transport in the Brain

***T. Yuan**, Y. Yang, W. Zhan, D. Dini

Linking Collagen Geometry, Waviness and Rupture Stress in Arterial Tissue: a FE2 Multiscale Approach

***A. Utrera**, C. García, D. Celentano, E. Fancello

Multiscale and Multiphysics Modeling of Thrombus–Hemodynamics Interaction in Aortic Dissection

***X. Li**, Y. Xue, S. Zhang, C. Xie, Y. Ventikos, D. Chen

Airway Wall Deformability Influences Liquid Plug Dynamics during Airway Reopening

A. Badrou, B. Rallabandi, ***M. Eskandari**

Towards multiscale modelling of placental oxygen transport using capillary micro-cells

***D. Cruz De Oliveira**, M. Berg, Z. Yang, P. Slator, D. Alexander, R. Shipley

Thu, 23/07/2026 15:00 - 16:30

ICM - 42 (Ostersee B+C)

MS373B - Innovative Materials and Smart Structures: Analysis, Computation, and Experiment II

Main Organizer: Prof. Mieczysław Kuczma (Poznan University of Technology)

Chaired by: Prof. Peter Wriggers (Leibniz University of Hannover), Prof. Jörg Schröder (University Duisburg-Essen)

Fast Evaluation of a Micromechanical Energy Model for Polycrystalline Shape Memory Alloys

[Keynote](#)

***M. Peigney**

Engineered Cementitious Composites with Embedded Shape Memory Alloy Nets

***M. Kuczma**

Real-Time Hybrid Simulation of Shape Memory Alloy Dampers using Nonlinear Model Order Reduction

***F. Kolisch**, S. Klinkel

New 2D Innovative Materials Generated by Intelligent Computing

A. Mrozek, M. Ma?dziarz, ***T. Burczyk?ski**, W. Ku?

Modelling of Spinodoid Metamaterials Manufactured from Aluminium Alloys

***J. Platen**, F. Harazin, M. Kaliske

Thu, 23/07/2026 15:00 - 16:30

ICM - 43 (Eibsee)

MS147A - Impact of Materials Microstructure on Damage and Damage Mechanisms Under Multi-Physics Environments I

Main Organizer: Prof. Stefan Reh (German Aerospace Center)

Chaired by: Prof. Stefan Reh (German Aerospace Center), Prof. Fadi Aldakheel (Leibniz Universität Hannover)

Progressive Collapse Simulations of Pallet Rack Systems Subjected to Impact Loads

***D. Isobe**, B. Xie, K. Nakai, U. Narayanan, N. Veeraraghavan

A Phase-Field Framework for the Interaction Between Microstructural Evolution and Fracture

***D. VALECHA**, J. Reiner, B. Rolfe, A. Rajagopal

A machine learning model for the lifetime prediction of engine components based on microstructural damage

***M. Labusch**, D. Ivanov

Beyond Diffusion-Limited Oxidation: A Physics-Based Volatile Trapping Model for the Photo-Oxidative Degradation of Nanometric LDPE Films

***G. Caramanno**, M. Shakiba

Minimizing Damage Initiation in Dual Phase Steel using Multi-Fidelity Bayesian Optimization

***I. Biermann**, N. Fehleemann, S. Münstermann

Thu, 23/07/2026 15:00 - 16:30

ICM - 44 (Schliersee)

MS272B - Modeling Mechanical Behavior of Nano- and Micro Scale Materials II

Main Organizer: Prof. Aylin Ahadi (Mechanical Engineering Sciences, Division of Mechanics)

Chaired by: Phd. Tito Andriollo (Aarhus University), Mr. Constantin Kübler-Tesch (Karlsruher Institut of Technology / University of Applied Sciences Karlsruhe)

High strain-rate microstructural spall failure modes in refractory alloys

O. Eldaly, M. Chen, ***M. Zikry**

Strengthening by Orowan Loop Accumulation around Theta' Precipitates in Al-Cu Alloys: A Dislocation Dynamics Study

***K. Kinoshita**, A. Hirano, A. Takahashi

Simulation of Morphological Change of Polyhedral Nanoparticles Using Phase Field Model

***T. Uehara**, T. Sango

Thu, 23/07/2026 15:00 - 16:30

ICM - 31 (Zugspitze)

MS292A - Large-Scale Applications in Scientific Machine Learning I

Main Organizer: Dr. Fanny Lehmann (ETH Zurich)

Chaired by: Dr. Fanny Lehmann (ETH Zurich), Prof. Stefania Fresca (University of Washington)

Metamodeling of large parametric model using A-HDMR Kriging

***C. Freyssinet**, T. Moro

Flow-based Bayesian filtering for high-dimensional nonlinear stochastic dynamical systems

***X. Wang**, X. Guan, L. Guo, H. Wu

Learning Coarse Solvers with DeepONet for Hybrid Preconditioning of PDE Systems

***C. Millevoi**, C. Janna, M. Ferronato

Preconditioning for Neural Networks and Vice Versa

***A. Heinlein**

Neural scaling laws for learning port Hamiltonian systems

M. Roschkowski, ***K. Cherifi**, H. Gernandt

Learning Guarantees and Scalable Algorithms for Sparse Sensing and Nonlinear System Identification

***K. Manohar**

Thu, 23/07/2026 15:00 - 16:30

ICM - 32 (Watzmann)

MS045B - Energy-Aware High-Performance Computing II

Main Organizer: Dr. Alexander Heinlein (TU Delft)

Chaired by: Dr. Carola KRUSE (Cerfacs), Dr. Alexander Heinlein (TU Delft)

Application Case Study of Gyselalib++ for Energy Optimisation

E. Bourne, ***N. Richart**, E. Malaboeuf, E. Orilac, T. Padioleau, J. Paolini, M. Peybernes

Alya on GPU: Breakthroughs in Time-to-Solution and Energy-to-Solution

***Y. Ould Rouis**, G. Houzeaux, F. Spiga, H. Owen

Energy Usage of Matrix-Free Finite Element Methods on Modern GPU Architectures

***I. Pribec**, E. Soydan, M. Allalen, G. Mathias, I. Prusak, M. Kronbichler

Energy-Efficient Simulation of Non-Homogeneous Turbulent Flows on Neuromorphic Platforms with Custom Neuron Dynamics

***B. Taylor**, J. Smith, H. Kolla, M. Schmidt

Virtual Gain via Complex Frequency Excitation: Transcending Passivity Constraints in Wave-Based Analog Computing

***M. Shin**, H. Goh

Thu, 23/07/2026 15:00 - 16:30

BrainLab - Auditorium

MS032B - Exploring Brain Mechanics II

Main Organizer: Prof. Silvia Budday (Friedrich-Alexander-Universität Erlangen-Nürnberg)

Chaired by: Prof. Paul Steinmann (Friedrich-Alexander-Universität Erlangen-Nürnberg)

Taking the Sample Geometry into Consideration: The Effect of Geometric Deviations on Material Parameter Identification of Ultra-soft Tissues

***P. Scherm**, J. Hinrichsen, S. Budday

Modified two-term Ogden model for multimodal characterization of spinal cord tissue

***R. Gopalan Ramachandran**, O. Neumann, H. Surana, S. Budday, P. Steinmann

Towards Reliable Poro-viscoelastic Parameter Identification of Human Brain Tissue

***A. Greiner**, P. Scherm, J. Hinrichsen, E. Comellas, P. Steinmann, S. Budday

Estimation of Fluid Exchange in Brain using Poroelasticity: a Hamilton's Principle Approach

***F. Costanzo**, P. Drew, M. Jannesari, B. Ghitti

Modelling Compressive Loading Induced Damage of Brain Tissue

***J. Goedhals**, S. Budday

Thu, 23/07/2026 15:00 - 16:30

NM - 1 (Multimedia Saal)

MS063A - Neural Network Solvers for PDEs: Bridging Theory and Practice in Scientific Computing I

Main Organizer: Dr. Jooyoung Hahn (Czech Technical University in Prague / Faculty of Nuclear Sciences and Physical Engineering)

Chaired by: Dr. Alexander Heinlein (TU Delft), Dr. Jooyoung Hahn (Czech Technical University in Prague / Faculty of Nuclear Sciences and Physical Engineering)

Efficient training of physics-informed neural operators **Keynote**

***A. Howard**, A. Heinlein, P. Stinis

Multi-Level Monte Carlo Training in Operator Learning

***S. Fresca**, J. Rowbottom, P. Liò, C. Schönlieb, N. Boullé

Hybrid Least Squares/Gradient Descent Methods for DeepONets

J. Choi, ***C. Lee**, M. Moon

Physics-Informed Laplace Neural Operator for Learning Differential Equations

***M. Choi**

Learning to Initialize: Neural Operator–Based Preconditioning for Lattice Boltzmann Blood Flow Simulations

A. Junk, ***F. Holzberger**, S. Lunowa, J. Winter, B. Wohlmuth

Thu, 23/07/2026 15:00 - 16:30

NM - 2 (Salzburg)

STS425A - Disruptive Aircraft's Wing design through innovative Electroactive Morphing towards sustainable aviation I

Main Organizer: Ms. Marianna Braza (INPT)

Chaired by: Mr. Yannick Hoarau (University of Strasbourg), Ms. Marianna Braza (INPT)

Aerodynamic performance increase of an A320 morphing wing in subsonic regime at Reynolds number of 1 M **Keynote**

J. Abou Khalil, I. Asproulis, N. Maynard, X. Delon, R. El Akoury, G. Haran, J. Rouchon, ***M. Braza**

Experimental and numerical analyses of the travelling waves electroactive morphing implemented on the high lift A320 wing flap system in the subsonic regime.

***X. DELON**

Comparative Analysis of Radial Basis Function and Polynomial Parametrisation for Camber-Morphing Aerofoil

***M. Abbadi**, Y. Yao, S. Lo, J. Wang

Thu, 23/07/2026 15:00 - 16:30

NM - 4 (Hamburg)

STS399A - Advances in scale-resolving simulation for turbomachinery I

Main Organizer: Dr. Oriol Lehmkuhl (Barcelona Supercomputing Center (BSC))

Chaired by: Dr. Oriol Lehmkuhl (Barcelona Supercomputing Center (BSC))

GLASS: a GPU-accelerated Linear Algebra framework for exascale problems in physics and engineering

***L. Gasparino Ferreira da Silva**, A. Quintanas, C. McDonnell, F. Spiga, O. Lehmkuhl

Wall-Modeled Large Eddy Simulation of Transonic Buffet over the OAT15A Airfoil: Spanwise Extent Effects on Flow Dynamics

***S. Limonchi**, T. Arslan, I. Rodríguez, O. Lehmkuhl

Towards a spectral element framework for tetrahedral meshes using entropy stable two-point flux formulations

***O. Lehmkuhl**, J. Muela

Filling the Gaps: Video Inpainting for Fluid Flow Reconstruction

***M. Sánchez-Domínguez**, I. Padilla-Montero, J. de Vicente, D. Rodríguez, E. Valero

Experimental and Numerical Design of a High-Pressure Reciprocating Compressor

***A. Simsek**, B. Erdogan, N. Uner

Elasticity Based R-Adaptation for High Order Spectral Element Methods

***J. Cela Paris**, A. Gargallo-Peiro, O. Lehmkuhl

Thu, 23/07/2026 15:00 - 16:30

NM - 5 (KK)

MS195B - Computational Methods in Environmental Fluid Mechanics II

Main Organizer: Prof. Eirik Valseth (Norwegian University of Life Sciences)

Chaired by: Prof. Ethan Kubatko (The Ohio State University), Prof. Eirik Valseth (Norwegian University of Life Sciences)

Assessment of flood inundation prediction using dimensionality reduction and deep learning

***K. Yamaguchi**, R. Nakayama, M. Hitokoto, K. Kashiwama

Thin Layers, Limiting, and Multiple Time Scales for DG Layered Ocean Modeling

***R. Higdon**

Parametric and Non-Parametric Ocean Swell Dynamics Modeling in Particle-In-Cell

***T. Protin**, V. Resseguier, M. Hell, B. Chapron, R. Fablet

Low-Mach and Well-Balanced Numerical Methods for Atmospheric Flow Simulation

***S. Panday**, S. Gaudreault, P. Birken, C. Pereira

Enhancing Urban Flood Resilience: Integrating Nature-Based Solutions and Rapid Stormwater Modelling with SWIM

***O. Andersen**, E. Abdalla

Thu, 23/07/2026 15:00 - 16:30

NM - 3 (BB)

MS179B - Advanced Space-Time Methods II

Main Organizer: Prof. Thomas Elguedj (INSA-Lyon / Lamcos)

Chaired by: Phd. Stéphane Lejeunes (LMA, CNRS), Prof. Thomas Elguedj (INSA-Lyon / Lamcos)

Sparse-grid solvers for a space-time discretization of the wave equation

***M. Ferrari**, A. Moiola, C. Perinati, I. Perugia

Asymptotic Optimization of Transmission Conditions for Schwarz Waveform Relaxation applied to the Damped Wave Equation

***G. Cicalese**, G. Ciaramella, I. Mazzieri, M. Gander

Parallel-In-Time Spacetime Discontinuous Galerkin Method for Elastodynamics Via Hamilton's Principle

P. Ravi, C. Howard, ***R. Haber**, R. Abedi, J. Erickson

Space-time formulation of geometrically exact beams

***E. Sahin**, C. Hesch

On space-time isogeometric analysis for the dynamics of beam structures

***S. Lejeunes**, D. Eyheramendy

Fast Space-time IsoGeometric solvers for nonlinear transient heat transfer problems

***T. Elguedj**, J. Cornejo-Fuentes, G. Sangalli, M. Tani, A. Duval, D. Dureisseix

Thu, 23/07/2026 15:00 - 16:30

H4 - 1 (Ludwig)

MS253E - Computational Geomechanics V

Main Organizer: Prof. Jinhyun Choo (Seoul National University)

Chaired by: Prof. Jidong Zhao (Hong Kong University of Science and Technology, Hong Kong), Prof. Jinhyun Choo (Seoul National University)

Modeling Cohesive Viscoplastic Geophysical Flows with the Material Point Method

***L. Blatny**

A Model Informed Transfer Learning Framework for Predicting Mechanical Behaviour of Sands

***T. Sungurtekin**, Z. Gao, E. Febrianto

A Stabilized Fractional Step Material Point Method for Robust and Efficient Hydromechanical Modeling

***M. Juel**, H. Vicari, Y. Zhao, L. Blatny, C. Jiang, J. Gaume

Three-dimensional coupled thermo-hydro-mechanical modelling of processes in Opalinus Clay for geological disposal facilities

***M. Taghvaei**, A. Paluszny, R. Zimmerman

Extension of DG-based SEAS Model in tandem for Viscoelastic Relaxation using Standard Linear Solid Rheology

***P. Karki**, Y. Magen, D. May, A. Gabriel

A numerical methodology for the geometric and geomechanical characterization of fault damage zones

***R. Quevedo**, F. Dias, A. Scherer, D. Roehl, B. Carvalho

Thu, 23/07/2026 15:00 - 16:30

H4 - 2 (Leopold)

MS089B - Advanced Computational Modelling of Wood, Wood-Based Products, Biocomposites, and Timber Structures II

Main Organizer: Dr. Markus Lukacevic (TU Wien/CD-Labor Lukacevic)

Chaired by: Dr. Stefan Scheiner (TU Wien), Dr. Markus Lukacevic (TU Wien/CD-Labor Lukacevic)

Linking Microstructures of Wooden Cell Walls to Stiffness and Microstresses of Softwood and Hardwood

J. Hofegger, ***M. Königsberger**, S. Pech, J. Füssl

Simulating a Wood Cell-Wall Nanoindentation Test using a Finite-Strain Rheological Model

M. Gresve, R. Lazo-Molina, ***C. Guzmán**

Theory and numerical implementation for modelling viscoelastic properties of wood including effects of temperature, moisture content, and mechanosorption

J. Nairn, ***L. Muszynski**

Influence of Sorption Hysteresis and Multi-Phase Moisture Transport on Creep Behaviour of Timber Beams

***R. Dsouza**, S. Hu?, T. Hozjan, T. Avikainen, S. Fortino

A Hybrid Mixed-Interpolation Model for Thermo-Hygro-Mechanical Behaviour of Timber Structures

***S. Suljevic**, E. Karavelic, E. Mesic, S. Dolarevic, A. Ibrahimbegovic

Simulation-Based Prediction of Timber Beam Deformation Factors under Variable Climate

L. Jegli?, ***T. Hozjan**, S. Hu?

Thu, 23/07/2026 15:00 - 16:30

H4 - 3 (Franz)

MS251A - Optimal Control and Sensitivity Analysis I

Main Organizer: Dr. Jose Munoz (Universitat Politècnica de Catalunya)

Chaired by: Dr. Jose Munoz (Universitat Politècnica de Catalunya)

Adjoint-based optimal control of magnetically actuated slender structures **Keynote**

S. Bashir, V. Nirav Kamleshbhai, ***A. Bijalwan**

Computational Aspects for Gradient-Based Optimization Methods for Sensitivity Analysis or Optimal Control Problems

P. Zallinger, M. Pikulinski, P. Malczyk, W. Steiner, ***K. Nachbagauer**

Optimal Control of Non-Smooth Musculoskeletal Multibody Systems

***V. Sonnevile**

Designing Symplectic Algorithms for Optimal Control Problems

N. Rabiei, J. J. Muñoz, ***E. Arapcic-Uevak**

Thu, 23/07/2026 15:00 - 16:30

H4 - 4 (Alois)

MS106B - Advances in Model Order Reduction: Bridging Physics and Machine Learning II

Main Organizer: Dr. Youngsoo Choi (Lawrence Livermore National Laboratory)

Chaired by: Dr. Siu Wun Cheung (Lawrence Livermore National Laboratory), Dr. Youngsoo Choi (Lawrence Livermore National Laboratory)

Optimal learning in Shallow AutoEncoders

***R. Bousquet**, C. Nore, D. Lucor

A Multi-layer POD-FFT Bridging Framework for Stable Neural Compression of Mesh-based Finite Element Data with Complex Geometry Boundaries

P. Yu, ***C. Wang**, Z. You, L. Feng

Sparse POD Mode Selection and Manifold Dimensionality Reduction with Neural Networks

***T. Koike**, P. Mohan, M. Henry de Frahan, E. Qian, J. Bessac

Local Nonlinear Reduced-Order Models with Regression-Based Latent-Space Closure

***S. Ares de Parga Regalado**, R. Rossi, J. Hernandez Ortega, A. Cornejo Velazquez, R. Tezaur, C. Farhat

Interpretable Latent Dynamics via Graph Convolutional Networks

***F. Pichi**, L. Tomada, G. Rozza

Nonlinear Performance Bounds for Reduced Order Models

W. Cho, K. Lee, N. Park, D. Rim, ***G. Welper**

Thu, 23/07/2026 15:00 - 16:30

H4 - 5 (Xaver)

MS143B - Hybrid Methods for Computational Solid Mechanics and Multi-Physics Problems II

Main Organizer: Mr. Panos Pantidis (New York University Abu Dhabi)

Chaired by: Mr. Panos Pantidis (New York University Abu Dhabi), Dr. Mostafa Mobasher (New York University Abu Dhabi)

NOWS: Neural Operator Warm Starts for Accelerating Iterative Solvers

***M. Eshaghi Khanghah**, C. Anitescu, N. Valizadeh

On the Potential of Neural Operators for Spatiotemporal Fracture Prediction in Heterogeneous Solids

***R. Najafi Koopas**, S. Rezaei, N. Rauter

Integrated Finite Element Neural Network Framework for Phase-Field Fracture Simulations in Multiphase Materials with Inclusions

***P. Dulal**, P. Pantidis, M. Mobasher, L. Svolos

Higher-Order Finite Volume Solid Mechanics with Newton–Krylov Solution Strategies

***P. Cardiff**, A. Mullen-Hales, P. Castrillo, D. Armfield, Ž. Tukovic, I. Batistic

Thu, 23/07/2026 15:00 - 16:30

H4 - 6 (Sissi)

MS058B - Structure-Preserving Discretization Techniques for Coupled Problems II

Main Organizer: Prof. Peter Betsch (Karlsruhe Institute of Technology (KIT))

Chaired by: Prof. Peter Betsch (Karlsruhe Institute of Technology (KIT)), Mr. Moritz Hille (Karlsruhe Institute of Technology (KIT))

Noether identities in space-time: Geometrically exact beams.

***C. Hesch**, E. Sahin

Modeling and computation of inelastic materials: Continuum basis and structure-preserving algorithms

***J. Liu**

Structure-Preserving Particle Methods for Collision Operators in Plasma Physics

***S. Jeyakumar**, M. Kraus

Thu, 23/07/2026 15:00 - 16:30

H4 - 7 (Maximilian)

MS368B - Cardiovascular Disease-Computational Mechanics and AI II

Main Organizer: Prof. Nenad Filipovic (BIOIRC doo Kragujevac)

Chaired by: Prof. Nenad Filipovic (BIOIRC doo Kragujevac)

Artificial intelligence-based decision support system for risk stratification and early detection of heart failure

***N. Filipovic**, D. Jakovljevic, Z. Bosnic, D. Boucharas, P. Malitas, M. Ascanio, M. Gacic

Detecting Heart Failure through Voice Analysis and Multi-branch Neural Network

***L. Daši?**, T. Geroski, O. Pavi?, A. Blagojevi?, N. Filipovi?

A computational heart model for predicting heart failure progression

***M. Milosevic**, B. Milicevic, V. Simic, N. Filipovic, M. Kojic

Our Heart-Lung Finite Element Multiscale Computational Model

***M. Kojic**, M. Milosevic, V. Simic, B. Milicevic, N. Filipovic

Thu, 23/07/2026 15:00 - 16:30

H4 - 8 (Eventcenter)

MS239G - Advances in Shape Optimization and Form-Finding for Engineering Design VII

Main Organizer: Prof. Kai-Uwe Bletzinger (Technical University of Munich, Germany)

A Graph-Based Deep Q-Learning Agent for Grammar-Guided Structural Form-Finding

***B. Kumaravel**, L. Bleker, K. Tam, P. D'Acunto

Designing Lightweight Giants: Buckling-Constrained Optimization of Transmission Line Towers

***S. Peters**

Sizing and Shape Optimization of Truss Structures Using the Improved Best-Mean-Worst-Random Algorithm

***S. Degertekin**

Adjoint-Based Optimization of Vegetation Distribution for Reducing Heat Stress in Urban Areas

***L. Coste de Champeron**, T. Rung

Shape and Topology Optimization with Variable Design Domain for Coated Porous Structure

***M. Naguib**, M. Shimoda

Thu, 23/07/2026 15:00 - 16:30

BrainLab - Training

MS249B - Uncertainty Quantification in Structural Mechanics II

Main Organizer: Dr. Marc Fina (Karlsruhe Institute of Technology)

Chaired by: Prof. Steffen Freitag (Karlsruhe Institute of Technology (KIT)), Dr. Marc Fina (Karlsruhe Institute of Technology)

Modelling Crack Initiation under Uncertainty Using Finite Fracture Mechanics

***M. Hach**, J. Hopfe, P. Weißgraeber

Stochastic Shakedown Analysis of Trusses with a Truncated Gaussian Distribution of Strength

N. Tran, T. Ho Thi, ***M. Staat**

Efficient Uncertainty Quantification using Automatic Differentiation and Taylor Series Expansion

***H. Millwater**, A. Rios, D. Posso, S. Roberts, D. Restrepo, A. Montoya

Multi-Objective Buckling Design Optimization of Next-Generation Composite Structures under Polymorphic Uncertainties

***M. Fina**, S. Freitag, C. Bisagni

Thu, 23/07/2026 15:00 - 16:30

NM - 6 (Munich)

MS070B - Multi-Physics and Multi-Scale Simulations With The Coupling Library preCICE II

Main Organizer: Mr. Gerasimos Chourdakis (University of Stuttgart)

Chaired by: Mr. Gerasimos Chourdakis (University of Stuttgart), Dr. Benjamin Uekermann (University of Stuttgart)

Simulation of Moving Electromagnetic Parts with Finite- and Boundary Elements

***J. Zechner**, T. Rüberg, L. Kielhorn

Partitioned Physics Coupling for Thermal Transport Problems in the Subsurface using preCICE

***O. Cecil**, C. Shelton, M. Farthing, A. Trautz

Numerical Integration of OpenFOAM with BioDynaMo Using preCICE for Multiscale and Multiphysics Problems in (Bio)Physics

***A. Iosif**, V. Vavourakis

Thermo-Mechanically Coupled FE–FFT Homogenization of Porous Materials

***J. Dahler**, L. Scheunemann, S. Staub

Thu, 23/07/2026 15:00 - 16:30

NM - 7 (Venice)

MS344F - Agentic AI and Physics-Informed Machine Learning for Next-Generation Design and Manufacturing VI

Main Organizer: Prof. Seunghwa Ryu (KAIST)

Chaired by: Prof. Jae Hyuk Lim (Kyung Hee University), Mr. João Alves Ribeiro (MIT, FEUP & Inductiva)

Evaluation of NeuroSim-FLOAT: A Multi-Agent AI Framework for Fatigue-Aware Design Optimization of Floating Offshore Wind Turbine Towers

Keynote

***J. Alves Ribeiro**, B. Alves Ribeiro, F. Pimenta, S. M. O. Tavares, F. Ahmed

Multi-agent framework for micromechanical modeling, simulation, and applicability analysis

***H. Lee**, S. Ryu

Automating Coarse-Grained Molecular Dynamics via Multi-Agent Large Language Models

***J. Choi**, J. Lee, S. Ryu

An Autonomous Multiscale Simulation Framework for Ion Transport in High-Aspect-Ratio Plasma Etching

***Y. Sunwoo**, B. Kim

An AI Research Agent for Hybrid Physics-Inspired Modeling in Powder and Particle Processes

***S. Hosseinhahsemi**, C. Thon, C. Schilde

Thu, 23/07/2026 16:30 - 17:00

Coffee Break

Thu, 23/07/2026 17:00 - 18:30

ICM - 1 Auditorium

MS348A - Biomedical Digital Twins - Science and Clinical Application I

Main Organizer: Prof. Charles Taylor (University of Texas at Austin)

Chaired by: Prof. Charles Taylor (University of Texas at Austin), Prof. Irene Vignon-Clementel (INRIA)

Patient-Specific Virtual TAVI Assessment for the Quantification of Paravalvular Leakage

B. Grossi, L. Perri, V. Raona, O. Cozzi, G. Condorelli, G. Stefanini, F. Migliavacca, ***G. Luraghi**

Scientific Machine Learning and Digital Twins for Computational Oncology

F. Arceci, P. Botta, N. Dimola, C. Macaluso, P. Vitullo, ***P. Zunino**

A Computational Modelling Strategy for the Assessment of Potential In-stent Restenosis Predictors

***M. Alonso Chornet**, D. Perrin, J. Albertini, Y. Goueffic, A. Hauguel, S. Avril

Automated Pipeline for Vertebral Structural Assessment from medical images under Metastatic Conditions

***B. Gandia Vañó**, J. Navarro Jimenez, E. Arana, E. Nadal Soriano, J. Ródenas García

Shear as Biomarker of Portal Thrombosis Following Liver Partial Resection

***M. Garreau**, A. Vlasceanu, A. Facque, G. Cardillo, A. Barakat, N. Golse, I. Vignon-Clementel

Thu, 23/07/2026 17:00 - 18:30

ICM – 2

MS020G - Large Deformation Beams and Shells: Formulation Advances and Innovative Applications VII

Main Organizer: Prof. Enzo Marino (University of Florence)

Chaired by: Prof. Giovanni Garcea (University of Calabria), Prof. Bastian Oesterle (Hamburg University of Technology)

A General Higher-Order 1D Theory for General Anisotropic Hyperelastic Soft Tubular Structures With Two Families of Fibres

***D. Tiwari**, A. Arbind

A General Higher-Order Shell Theory using Orthonormal Moving Frame and its application to isotropic, transversely isotropic, anisotropic and morphoelastic shell

***A. Arbind**

Joint Positional FEM and Structure Parameter Optimization for Nonlinear Analysis of Curved Beams

***L. Lottici**, P. Valvo, V. Lottici

Isogeometric modelling of the nonlinear dynamics of offshore monopile structures

***C. Chianese**, M. Altosole, C. Lugni

When Interfaces Matter: Nonlinear Mechanics of Biomedical Devices

***R. Pramanik**

Thu, 23/07/2026 17:00 - 18:30

ICM – 3

MS008B - Computational Damage and Fracture Mechanics II

Main Organizer: Prof. Michael Brüning (University of the Bundeswehr Munich)

Chaired by: Dr. Larissa Driemeier (University of São Paulo)

Influence of Stiffeners on Bistability and Interfacial Fracture in Composite Laminates

***A. Schirmer**, M. Hedvard, P. Weißgraeber

Weakest Link Approach for the Estimation of Notch Support Factors

***W. Nöhring**, J. Albiez, J. von Lautz

Thu, 23/07/2026 17:00 - 18:30

ICM – 4a

MS157B - Computational Fluid Dynamics (CFD) and Fluid-Structure Interaction (CFSI): Methods Development and Applications II

Main Organizer: Dr. George Moutsanidis (Rutgers University)

Chaired by: Dr. George Moutsanidis (Rutgers University)

Development of a High-Performance Parallel CFD Platform Based on 6-DOF Fluid-Structure Interaction

***W. Wang**, C. Tsao, Y. Lin, Y. Liu

HyperCODA: Turbine Exhaust Simulation with Adaptive Mesh Refinement

***M. Malvestiti**, M. Höchel, M. Wegener, F. Klöppner, S. Fechter, I. Huisman

Interface-tracking for Large and Complex Domain Movements with Block-structured Meshing

***T. Schalk**, T. Fries

Accelerating Implicit Time Integration for Unsteady Incompressible Flows Using Machine Learning

I. Bannerman, S. Pan, ***L. Zhang**

A Physics-Assisted Geometry-Generalizable Graph Convolutional Network for Fluid Flow

***M. Hasnain**, N. Anand, P. Kumar, A. Srinivasa, S. Ji

Effect of Particle Morphology and Rigidity on Margination and Adhesion in a Constricted Vessel

***R. Dapena García**, V. Pérez Muñuzuri

Thu, 23/07/2026 17:00 - 18:30

ICM – 4b

MS054A - Kernel Approximation Methods I

Main Organizer: Dr. Rüdiger Kempf (University Bayreuth)

Chaired by: Dr. Rüdiger Kempf (University Bayreuth), Dr. Helmut Harbrecht (University of Basel)

Kernel approximation and interpolation in high order Besov spaces **Keynote**

***T. Hangelbroek**, C. Rieger, G. Wright

On the optimal shape parameter for kernel methods: Sharp direct and inverse statements

***T. Wenzel**, G. Santin

Thu, 23/07/2026 17:00 - 18:30

ICM - 5

MS100D - New Trends in Topology Optimization IV

Main Organizer: Prof. Emilio Silva (University of Sao Paulo)

Chaired by: Mr. Rahul Dev Kundu (University of Illinois Urbana-Champaign), Dr. Renato Picelli Sanches (University of São Paulo)

Topology Optimization of a High-Field Superconducting MRI Magnet under Magneto-Mechanical Constraints

J. Le Coz, ***F. Di Paola**, G. Dilasser, G. Le Quilliec, P. Bretkopf, P. Feissel

Topology Optimization of Defect State Phononic Crystal with Craig-Bampton Method

***X. Xu**, K. Nishiguchi, J. Kato

Multiscale Topology Optimization of Electropermanent Magnet Composite for the Design of Magnetic Actuators

***M. Lee**, D. Lee, J. Lee

Relationship Between Linear Buckling, Dynamic, and von Mises Stress Constraints in Structural Topology Optimization

***M. Rey**, I. Couceiro, J. París, L. Ramirez, F. Navarrina

Thu, 23/07/2026 17:00 - 18:30

ICM - 11a

MS219A - Multifidelity and Multilevel Surrogates in Uncertainty Quantification I

Main Organizer: Prof. Francesca Bonizzoni (Politecnico di Milano)

Chaired by: Mr. Fabio Nobile (École Polytechnique Fédérale de Lausanne (EPFL)), Prof. Francesca Bonizzoni (Politecnico di Milano)

Multiscale Scattered Data Approximation in Samplet Coordinates

***S. Avesani**, R. Kempf, M. Multerer, H. Wendland

Multi-fidelity and multi-level Monte Carlo methods for kinetic models of traffic flow

***E. Iacomini**, L. Pareschi

From Local to Global: Multiscale Localized Reduced Basis Methods for Neutron Transport

***F. Silva**, J. Ragusa

A function approximation algorithm using multilevel active subspaces

F. Nobile, ***M. Raviola**, R. Tempone

Thu, 23/07/2026 17:00 - 18:30

ICM - 11b

MS028D - Bridging Disciplines and Scales for Sustainable Cement and Concrete IV

Main Organizer: Prof. Bernhard Pichler (TU Wien)

Chaired by: Prof. Rostislav Chudoba (RWTH Aachen University), Prof. Bernhard Pichler (TU Wien)

Microstructural Characterization and Performance Evaluation of Foamed Concrete with Seashell-Based Aggregates

J. Eor, S. Oh, ***S. Chung**

Simulating the Packing of Adhesive Cementitious Microparticles Considering Surface Forces and Friction

***F. Wiese**, R. Sposito, T. Stengel

Numerical THCM Framework for Assessment of Coupled Degradation Mechanisms in Reinforced Concrete

***G. Wildermann**, R. Patel, F. Dehn

Modeling of Reactive Ion Transport in Porous Materials Based on 4D Imaging Data

***C. Domann**, M. Blaszczyk, R. Jänicke

Multiscale Micromechanical Modeling of Deterioration in Cementitious Materials due to High Temperatures

***K. Miao**, Z. Pan, A. Chen, T. Kränkel, C. Gehlen, J. J. Timothy

Thu, 23/07/2026 17:00 - 18:30

ICM - 12a

MS296B - Auxetic from Lattices to Limits: Design, Simulation, and Realization of Architected Metamaterials II

Main Organizer: Prof. Tim Ricken (University of Stuttgart)

Chaired by: Dr. Seyedmorteza Seyedpour (University of Stuttgart/ Institute of Structural Mechanics and Dynamics in Aerospace Engineering), Prof. Tim Ricken (University of Stuttgart)

Topology Optimization of Auxetic Structures Using Compliant Mechanism Design

***A. Krippner**, G. Stankiewicz, C. Dev, P. Steinmann

Reentrant Substrate-Induced Voltage Enhancement in Piezoelectric Energy Harvesters: Homogenized Numerical Analysis

***R. RAJ**, S. Santapuri, S. Neelakantan

Topology optimization of photonics based on variational principles **Keynote**

***S. Wolf**, D. Jantos, P. Junker

Model Qualification for Auxetic Lattice Structures: Combining Goal-Oriented Adaptive FEM and Experimental Validation

***M. Brodbeck**, N. Grünfelder, F. Bertrand, S. Seyedpour, T. Ricken

Constrained multi-objective Bayesian optimization of novel growth-adaptive auxetic vascular grafts

***V. Zut**, F. Rijnberg, G. Pederzani, M. Hazekamp, G. Zavodszky

Thu, 23/07/2026 17:00 - 18:30

ICM - 12b

MS119B - Computational Mechanics-Inspired Machine Learning for Forward and Inverse Problems II

Main Organizer: Dr. Sourav Saha (Virginia Tech)

Chaired by: Prof. Miguel Bessa (Brown University), Dr. ZHENGTAO GAN (Arizona State University)

Non-iterative full-field material parameter identification using forward neural networks

***S. Brabender**, L. Rose, A. Menzel

Conditional Flow Matching for the Solution of Probabilistic Inverse Problems

***A. Oberai**, A. Fardisi, M. Aminy, B. Binder, B. Shaddy

Differentiable physics for the inverse design of frictional metainterfaces: beyond the hertzian limit

***J. Bilotto**, A. Singhal, G. Cortes, J. Garcia-Suarez, J. Molinari

Physics-Informed Neural Network for Unsteady Flow Simulation and Their Applications to Shape Optimization

A. Hirayama, S. Watanabe, ***Y. Yugeta**, T. Endo, M. Liu, Y. Hasegawa

Leviathan: a Belief-Flow World Model for Forward Prediction and Inverse Control

***R. Batley**, S. Saha

Parameterized Physics-Informed Neural Network for Elastic Material Modeling

***Z. B?dkowska**

Thu, 23/07/2026 17:00 - 18:30

ICM - 13a

MS088C - Advanced Multi-physics CFD Simulations in Science and Engineering III

Main Organizer: Prof. Takahiro Tsukahara (Tokyo University of Science)

Chaired by: Prof. Hiroya Mamori (The University of Electro-Communications), Prof. Takahiro Tsukahara (Tokyo University of Science)

A computational model for two-phase fluid flow, chemical reactions, and heat transfer in LAA-SOFC fuel cell

F. Zhou, Y. Jiang, Y. Shi, ***A. Gelfgat**

A Data-Driven Model for Time-Integrated Wall Heat Flux in Turbulent Flame-Wall Interaction

***Y. Noguchi**, Y. Wang, M. Tanahashi

Hybrid Aeroacoustic Study of Fricative Consonant Production using Complex Flow Simulations in a Simplified Neanderthal Vocal Tract

***H. Bertrand**, A. Belme, A. Vialet, A. Hajczak

2D and 3D Analysis of bubble velocities, trajectories and travelled distances rising in a periodic channel using a highly efficient identification algorithm

***B. Aðalsteinsson**, G. Lupo, Á. Helgadóttir, H. Pálsson, P. Costa

Multi-physics Analysis of Cooling Performance of Direct-Cooling Structures for EV Traction Motors

***C. Park**, E. Kim, J. Yoon, K. Kang, C. Kim

Thu, 23/07/2026 17:00 - 18:30

ICM - 13b

MS095B - Advances and Challenges in Phase-Field Modeling and Computations II

Main Organizer: Prof. Fadi Aldakheel (Leibniz Universität Hannover)

Chaired by: Prof. Fadi Aldakheel (Leibniz Universität Hannover), Dr. Abedulgader Baktheer (Leibniz Universität Hannover)

Benefits of High-Order Phase-Field Models in Fracture Mechanics via Isogeometric Discretization

***L. Greco**, A. Reali

Formation of magnetic zigzag domain walls: a numerical study

***Ç. Y?lmaz**, M. Vorwerk, J. Schröder

Realizing Arbitrarily Complex Cohesion Laws Based on Integral Transform Fracture Phase Field Method: Mathematical Foundation and Numerical Implementation

***X. Guo**, J. Ge, J. Liang

Uncertainty Quantification for Phase-Field Fracture

***H. Verhelst**, L. Greco, A. Reali, H. van Brummelen

A Comparative Study of Phase-Field and Peridynamic Models for Brittle Fracture: Equivalence, Regularization, and Computational Efficiency

***O. Lampron**, P. Diehl, D. Theriault, I. Tabiai

Thu, 23/07/2026 17:00 - 18:30

ICM - 14a

MS031G - Open-Source Software in Mechanics VII

Main Organizer: Dr. Vladislav Yastrebov (MINES Paris, PSL University, CNRS)

Chaired by: Prof. Lukasz Kaczmarczyk (University of Glasgow)

Trilinos Discretization and Analysis Capabilities

***M. Perego**

A Solver Interface between Gridap.jl and Trilinos

***S. Prashanth**, O. Colomés, A. Heinlein

jaxmat: Automated and Differentiable Constitutive Modeling in JAX

***J. Bleyer**, P. Bouteiller

JAX-FEM: A Differentiable Finite Element Solver

***T. Xue**

A high-level interface for transient multiphysics modelling in JAX

***T. Bode**

Building a Composable Simulation Ecosystem in Julia: From Ferrite.jl to Thunderbolt.jl

***D. Ogiermann**

Thu, 23/07/2026 17:00 - 18:30

ICM - 14b

MS154A - The Next AI Frontier: Physics-Informed Models, LLMs, and HPC I

Main Organizer: Dr. M. Giselle Fernández-Godino (Lawrence Livermore National Laboratory)

Chaired by: Prof. Christian Gogu (ISAE-SUPAERO, ICA), Dr. Jonathan Belof (Lawrence Livermore National Laboratory)

Agentic Risk-Aware Set-Based Engineering Design

V. Kumara, *G. Karniadakis

Multi-Agent Orchestration of Optimization Workflows for Richtmyer–Meshkov Instability Studies

*M. Fernandez-Godino, J. Belof, N. Brown, B. Gunnarson, R. Hammond, H. Menon, Y. Li, M. Shachar, D. Sterbetz, S. Thevenin, D. White, C. Jekel, W. Schi;;

Optimization methods for hydrodynamic simulations using machine learning surrogate models and LLMs

*D. Sterbentz, H. Menon, M. Shachar, S. Thevenin, W. Schill, G. Fernández-Godino, K. Korner, J. Belof, C. Jekel

Agentic Workflows for Optimizing Placement of Sensors for Flight Test Objects

*G. Srinivasan, C. Young, S. Anderson, I. Boureima, K. Hodovic, R. Rael

Agentic Computer-Aided Engineering (CAE) for Model-Order Reduction (MOR)

*D. Cadieu, J. Guo, C. Park, W. Liu, D. Qian

Learning-Based Preconditioning: An LLM?Guided Graph Spiking Neural Network Approach for a Preconditioned Conjugate Gradient Solver

*S. Tandale, M. Stoffel

Thu, 23/07/2026 17:00 - 18:30

ICM - 14c

MS133B - Data-Driven Design of Materials – from Performance to Sustainability II

Main Organizer: Prof. Markus Kästner (TU Dresden)

Chaired by: Dr. Karl Kalina (TU Dresden)

Geometric Features Based Machine Learning Modelling And Explainability Analysis Of Advanced Architected Materials

D. Rodopoulos, G. Mermigkis, P. Hadjidakas, *N. Karathanasopoulos

Bayesian-Guided Inverse Design of Hyperelastic Microstructures: Application to Stochastic Metamaterials

*H. Danesh, H. Wessels

Data-Driven Surrogate Modeling of Elasticity and Yield Behavior in Spinodoid Architected Materials

*A. Otto, F. Fritzen, S. Keshav, K. Kalina, M. Kästner

Data Analysis of Architected Structural Geometries with Persistent Homology

*A. Milor, M. Salvalaglio

Use-Inspired Data-Driven-Design of Multi-Material Systems: A Novel Framework and Applications to Metamaterials

*H. Salahshoor

Instabilities and Phase Transformations in Architected Metamaterials: a Gradient-Enhanced Continuum Approach

*S. Joshi, M. Mousavi, C. Hamel, R. Alberdi, S. Gaitanaros, P. Purohit, N. Bouklas

Thu, 23/07/2026 17:00 - 18:30

ICM - B11

MS094B - Integrating Experimental Data and Computational Models in Biomechanics II

Main Organizer: Dr. Silvia Hervas-Raluy (Technical University of Munich)

Chaired by: Dr. Sebastian Brandstaeter (University of the Bundeswehr Munich), Dr. Silvia Hervas-Raluy (Technical University of Munich)

Calibration of a Closed-Loop Model of Porcine Aortic Hemodynamics During Hemorrhage

*S. Sadid, M. Eden, F. Mobin, M. Gomez, S. Januszko, H. Burkart, L. Neff, T. Williams, J. Jordan, E. Rahbar, A. Figueroa

A Multiscale Electromechanical–Contact Framework for Intestinal Motility

*R. Djoumessi, N. Nagahawatte, M. Paggi, L. Cheng, A. Gizzi

Efficient Likelihood-Based Analysis for Constitutive Models with Internal State Variables Using GLUE and Neural Network Surrogates

*H. Xu, E. Hosseini, E. Mazza, A. Ehret

The Illusion of Fit: Identifying Model Error in Elastography

*V. Scholz, P. Koutsourelakis

Proximal Femur Collapse Evaluation by Patient-Specific CT-based FE-Limit Analysis

*P. Fuschi, A. Pisano, C. Falcinelli

Thu, 23/07/2026 17:00 - 18:30

ICM - B12

MS313A - Meshfree and Other Advanced Numerical Methods for Applied Mechanics and Engineering Problems I

Main Organizer: Prof. Lihua Wang (Tongji University)

Lightning Method of Fundamental Solutions for Laplace Problems with Discontinuous Boundary Data

***C. Tsai**, C. Liu, C. Chang

A local correction strategy for unstable intermediate velocities in projection methods

***L. Li**, Z. Fu

Hertzian Contact Simulation Based on PFEM

***Y. Wei**, P. Kadam, L. Scheunemann, K. de Payrebrune

A Deep Boundary Element Method for 3D Nonlinear Heat Conduction

***H. Ma**, Y. Gu, C. Zhang

Research on the inertial characteristics of aircraft fuel based on a high order Riemann SPH method

***C. Xu**, F. Xu, Q. Yang

Thu, 23/07/2026 17:00 - 18:30

ICM - B13

MS231B - Applications of Advanced Numerical Analyses in Oil and Gas Industry II

Main Organizer: Dr. Allan Zhong (Halliburton Company)

Chaired by: Dr. Allan Zhong (Halliburton Company), Dr. Haitao Zhang (SLB)

Sensor placement optimization for leak detection in a gas system installation

***C. MANG**, K. MANTISSA, F. BRISSAUD-DELORD, R. CHEVALLEREAU

A Comparative Study on the Modeling of Nonlinear Dampers Using Modal Analysis and Frequency Response Analysis

***P. Clasen**, P. Thunich, Z. Fu, H. Reckmann, M. Müller

Integrity Assessment of Well Tubulars with Localized and Uniform Corrosion Using 3D FEA and Ultrasonic Inspection Data

L. Gouveia, D. Moreira, D. Teles, ***E. Lima Junior**, A. Abrego, C. Cisneiros, D. Colombo

Reduced-Order Models (ROMs) for Downhole Shock and Vibration Assessment

***V. NGUYEN**, J. JITH, S. SHARMA

FEA-Based Cable Slack Modelling and Surrogate Depth Correction for DAS Wireline VSP

R. Ji, R. Guerra, H. Zhang, ***A. Battentier**

Physics-Informed Shale Shaker Screen Life Prediction: A Reduced-Order FEA Approach for Screen Design Optimization

***H. Zhang**, E. Cady

Thu, 23/07/2026 17:00 - 18:30

ICM - B21

MS123A - Chemo-Mechanical Coupling Phenomena in Solids I

Main Organizer: Prof. Thomas Antretter (Montanuniversität Leoben)

Chaired by: Prof. Thomas Antretter (Montanuniversität Leoben), Dr. Manuel Petersmann (Infineon Technologies Austria)

High-Pressure Mechanochemistry: Four-Scale Theory, Simulations, and Experimental Confirmations [Keynote](#)

***V. Levitas**

Damage evolution in lead-free solder joints: Industrial setting, computational mechanics and data perspective

***M. Petersmann**, W. Flachberger, S. Leitner, J. Svoboda, S. Gaddikere-Nagaraja, T. Antretter

Thu, 23/07/2026 17:00 - 18:30

ICM - B22

MS207A - Recent advances in polytopal element methods, from theory to applications I

Main Organizer: Prof. Ilario Mazzieri (Politecnico di Milano)

Chaired by: Prof. Ilario Mazzieri (Politecnico di Milano), Dr. Franco Dassi (University Milano Bicocca)

Towards Virtual Element Methods for Moving Domain Problems [Keynote](#)

L. Beirao da Veiga, C. Canuto, R. Nochetto, G. Vacca, ***M. Verani**

Conforming lifting and adjoint consistency for the Discrete de Rham complex of differential forms

D. Di Pietro, J. Droniou, ***S. Pitassi**

Virtual Element Method for Nonlocal Diffusion Problems

L. Lopez, ***S. Pellegrino**, G. Vacca

Analysis of the Virtual Element Approximation for the Smagorinsky turbulence model

***K. Cascavita**, F. Marcon, M. Strazzullo

Thu, 23/07/2026 17:00 - 18:30

ICM - 21a

MS236C - Peridynamic Theory and Nonlocal Continuum Models: Methods and Applications III

Main Organizer: Prof. Erkan Oterkus (University of Strathclyde)

Chaired by: Prof. Erdogan Madenci (University of Arizona), Prof. Erkan Oterkus (University of Strathclyde)

Displacement and Strain Fields from Sparse Sensor Data Using Peridynamics

***H. Camuz**, M. Dorduncu, E. Madenci

GPU-accelerated Updated Lagrangian Particle Hydrodynamics(ULPH) modeling of Heat Conduction and Convection Problems

A. Wang, ***X. Lai**, J. Yan, L. Liu

A Three-Dimensional Peridynamic Model for Isotropic and Orthotropic Materials with Uniform or Non-uniform Discretization

***Q. Wang**, Y. Yu, Y. Hu

Analysis of Discontinuities in Nonlocal Models

***B. Alali**, N. Albin, T. Dang

Peridynamic Modelling of Thermo-Mechanical Behaviour of Encapsulated Phase Change Materials

***J. Zheng**, P. Nikolaev, M. Sedighi, X. Xu

Thu, 23/07/2026 17:00 - 18:30

ICM - 21b

MS042C - Numerical Analysis on Polytope Meshes: Geometry Processing, SBFEM, VEM and beyond III

Main Organizer: Prof. Carolin Birk (Universität Duisburg-Essen)

Chaired by: Prof. Carolin Birk (Universität Duisburg-Essen)

A Family of Stable u-p Elements based on the Scaled Boundary Finite Element Method **Keynote**

***C. Song**, E. Ooi

Construction of Parent Elements in 3D Based on an Isoparametric Formulation of the Scaled Boundary Finite Element Method

***E. Ooi**, Y. Cui, Y. Zhan, S. Gautam, S. Natarajan, C. Song

A Time-Adaptive Scaled Boundary Finite Element Method for Large-Scale 3D Wave Propagation

***J. Zhang**, P. Liu, H. Fan, Z. Li

Explicit Dynamics with Mass Lumping using the Scaled Boundary Finite Element Method

***J. Bulling**, H. Gravenkamp, C. Birk

Direct computation of critical speeds in mechanical systems using semi-analytical methods

***H. Gravenkamp**, X. Liu

Thu, 23/07/2026 17:00 - 18:30

ICM - 22a

MS238A - Mechanics of Soft Solids: Perspectives on Inelasticity and Failure I

Main Organizer: Dr. Miguel Angel Moreno-Mateos (Friedrich-Alexander-Universität Erlangen-Nürnberg (FAU))

Chaired by: Dr. Miguel Angel Moreno-Mateos (Friedrich-Alexander-Universität Erlangen-Nürnberg (FAU)), Dr. Michele Terzano (Graz University of Technology)

A Non-affine Microsphere-Informed Phase-field Model for Fracture in Strain-Crystallizing Polymers **Keynote**

***C. Linder**, P. Arunachala

A Precise, Efficient and Flexible Physics-Augmented Neural Network Model for Strain-Induced Crystallization

***K. Friedrichs**, F. Dammaß, K. Kalina, M. Kästner

A numerical investigation of geometrical imperfections in tendon inspired soft fiber reinforced composites: Instability cascades and bifurcation analysis

***D. Iordanidis**, F. Fontenele, K. Poullos, M. Agoras, N. Bouklas

Prediction of Crack Propagation Direction in Soft Fibrous Scaffolds

***M. Terzano**, R. Macaluso, G. Holzapfel, A. Spagnoli

Thu, 23/07/2026 17:00 - 18:30

ICM - 22b

MS078B - Modeling and Simulations of Additively Manufactured Metamaterials II

Main Organizer: Dr. Massimo Carraturo (University of Pavia)

Chaired by: Dr. Massimo Carraturo (University of Pavia), Prof. Ferdinando Auricchio (Universita' di Pavia)

Test-Model Correlation Strategies for Finite Element Validation of 3D- Printed Architected Structures

***C. BRIOT**, M. OUISSE, R. TELOLI, M. CAPURRO, A. DAULNY

Additive Manufacturing Imperfections in Lattice Metamaterials for Wave Attenuation

***R. Zuppi**, R. Cottureau, A. Paoloni, L. Parente, D. Addressi

Design and Optimization of Tunable 3D Chiral Metamaterials Through FEM and Data-Driven Methods

***M. Khodabakhshi**, S. Khakalo

Controlled Auxetic-Isotropic Metamaterials produced via Material-Extrusion Additive Manufacturing

F. Trovatielli, M. Betti, ***B. Pintucchi**, S. Monchetti, N. Zani

Additively Manufactured Lattice-Core Surfboard Fins for Tunable Flex and Vibrational Response

***S. Annunziata**, M. in het Panhuis, A. Manes, L. Lomazzi

Experimental and numerical investigation of the fatigue behaviour of AISi10Mg lattice structures under cyclic alternating loading

***M. Greiner**, A. Kappel, C. Mittelstedt

Thu, 23/07/2026 17:00 - 18:30

ICM - 41 (Ostersee A)

MS396A - Computational Approaches and Structural Engineering Solutions for Prototype and Industrial Facilities I

Main Organizer: Phd. Michele Angiolilli (Gran Sasso Science Institute)

Chaired by: Phd. Michele Angiolilli (Gran Sasso Science Institute)

Mechanical Analysis and Design of Large-Scale Cryogenic Systems and Cryostats for Noble Liquid Detectors

***T. Baroncelli**, J. Bremer, C. Fabre, F. Lanni, F. Resnati, G. Buccino, A. Rigamonti, D. Mladenov, O. Beltramello, J. Hrivnak, M. Nanzer, M. Nessi

Computational Structural Analysis of the Cryostat and Auxiliary Infrastructures of DarkSide-20k

***M. Angiolilli**

FE modelling of concrete biological shield exposed to neutron radiation

***J. Kovar**, J. Cervenka, Y. Khmurovska, P. Stemberk

Development of a Predictive Numerical Model for the Introduction of Specific Residual Stress Profiles in Stainless Steel Pipes

***R. De Bosscher**, C. Jacquemoud, C. Gourdin, C. Gardin

Thu, 23/07/2026 17:00 - 18:30

ICM - 42 (Ostersee B+C)

MS373C - Innovative Materials and Smart Structures: Analysis, Computation, and Experiment III

Main Organizer: Prof. Mieczyslaw Kuczma (Poznan University of Technology)

Chaired by: Dr. Michael Kaliske (Technische Universität Dresden), Prof. Mieczyslaw Kuczma (Poznan University of Technology)

Kriging-Based Interval Analysis of Dynamic Characteristics for Systems with Viscoelastic Elements under Uncertain Parameters

***M. ?asecka-Plura**, J. Porysek

Analyzing the Impact of Idealized and Realistic Manufacturing Deviations on the Performance of Mesoscale Bidirectional Piezoelectric Motors

P. Marter, R. Orszulik, D. Juhre, ***S. Eisenträger**

Directional Topology for Young's Modulus Prediction in Porous Solids

***R. Topolnicki**, M. Bogdan, J. Malinowski, B. Naskr?cki, P. D?otko

Modeling of Heat Transfer Across Graphene–Copper Interfaces

***L. van Goor**, W. Edeling, D. Jafari, H. Lee, A. Lyulin, W. Wits, B. Geurts

Simulation of Thermal History and Prediction of Mechanical Properties of Contact Interfaces in the Fused Filament Fabrication Process

***J. Klingenberg**, A. Lion, M. Johlitz

Influence of Building Angle on the Morphology of Ball-Like Features and Their Effect on Metal-Polymer Adhesion Strength

***M. Aladag**, E. Tek, M. Akeloglu, M. Kalkan, I. Zglobicka, O. Eyercioglu, N. Yilmaz, K. Kurzydowski

Thu, 23/07/2026 17:00 - 18:30

ICM - 43 (Eibsee)

MS158A - Fracture in Porous Media under Multiphysical Coupling I

Main Organizer: Dr. Tao You (Montanuniversität Leoben)

Chaired by: Dr. Tao You (Montanuniversität Leoben), Prof. Keita Yoshioka (Montanuniversität Leoben)

Numerical simulation of hydraulic fracture-bedding plane interaction in shale reservoir with hydromechanical irreversible sliding interface

***Z. Zhang**, W. Xiao

A mixed phase-field method for simulating high ?temperature true triaxial compression fracture in heterogeneous brittle rocks

***M. Wu**, Z. Yu, Z. Liu

An RBSP–MD–FEM Computational Framework for HM–Coupled Fracture Evolution in Anisotropic Rock Masses

***C. He**, Z. Yu, Y. Sun, J. Shao

Thermodynamically Consistent Computation of J-Integral in 3D Thermo–Hydro–Mechanical Fracture

***S. Saeedmonir**, A. Paluszny, R. W. Zimmerman

Effects of Boundary Conditions and Heating Rate on Concrete Spalling under High Temperature: A Coupled Thermo-Hygro-Mechanical Phase-Field Study

***P. Cheng**, H. Zhu, Z. Yan, G. Lou

Thu, 23/07/2026 17:00 - 18:30

ICM - 44 (Schliersee)

MS269A - Electrochemical System Modeling and Computation: From Material to Device I

Main Organizer: Prof. Jun Xu (University of Delaware)

Chaired by: Prof. Wei Lu (University of Michigan)

Integrating Machine Learning and Physics-Based Models for Battery Design Optimization

***W. Lu**

Modelling of Coupled Electro-Chemo-Mechanical Effects in Lithium-Ion Batteries

***D. Carlstedt**, A. Chetry, F. Larsson

Multiscale Modelling and Calibration Framework for Estimating the Mechanical Response of Li-ion Batteries

***A. Chetry**, D. Carlstedt, L. Asp, F. Larsson

Direct numerical simulations of bubbles growing on electrodes during water electrolysis

***M. Huang**

Thu, 23/07/2026 17:00 - 18:30

ICM - 31 (Zugspitze)

MS292B - Large-Scale Applications in Scientific Machine Learning II

Main Organizer: Dr. Fanny Lehmann (ETH Zurich)

Chaired by: Prof. Stefania Fresca (University of Washington), Dr. Filippo Gatti (CentraleSupélec, Université Paris-Saclay, CNRS, ENS Paris-Saclay)

Anchored Branched Steady-state Wind Flow Transformer (AB-SWIFT): a metamodel for 3D atmospheric flow in urban environments

***A. de Villeroché**, V. Le Guen, R. Mouradi, P. Massin, S. Cheng, M. Bocquet, A. Farchi, P. Armand

Accuracy–Efficiency Trade-offs in Thermal Simulation of Wire-arc Directed Energy Deposition using Physics-informed Neural Networks

***M. Baqershahi**, M. Ryan, H. Moshayedi, E. Ghafoori

Application of Shallow Recurrent Decoder Networks for parametric state reconstruction of magnetohydrodynamic flows in liquid metal blankets of fusion reactors

***M. Lo Verso**, C. Introini, S. Riva, J. Kutz, A. Cammi

Robust Monitoring of Nuclear Reactors from Sparse Sensors using Shallow Recurrent Decoders

***S. Riva**, C. Introini, M. Lo Verso, J. Kutz, A. Cammi

Advancing Deep Reinforcement Learning Strategies for Active Flow Control in Wings

***R. Montalà**, B. Eiximeno, B. Font, A. Miró, O. Lehmkuhl, I. Rodríguez

Thu, 23/07/2026 17:00 - 18:30

ICM - 32 (Watzmann)

MS102A - Multiphase processes in porous media I

Main Organizer: Prof. Yousef Heider (Universität Kassel)

Chaired by: Prof. Yousef Heider (Universität Kassel), Dr. Rodolfo Javier Williams Moises (University of Kassel)

Finite-strain poromechanical modeling of foams with application to Porous Transport Layers in water electrolysis

Keynote

***G. Xotta**, F. Aldakheel, A. Antonini, V. Salomoni

Computational Homogenization of Hydraulic and Chemical Transport in Deformed Porous Media

***M. Blaszczyk**, U. Buegger, T. Tofeti-Lima, D. Rollin, R. Jänicke

Microstructure-Based Multifield Modeling of Solid Oxide Fuel Cells

***E. Langner**, A. Semenov, P. Gebhart, T. Wallmersperger

Modeling Reaction and Shrinkage of Porous Particles with Phase-Change: An Application to Biomass Particle Pyrolysis and Oxidation

***R. Caraccio**, E. Cipriano, A. Frassoldati, T. Faravelli

A Multiphysics Corrosion Prediction Model of Zone-Dependent Steel Pipe Piles (SPPs) in Offshore Engineering

***L. Jiang**, S. Shi, X. Liu, L. Zhang

Thu, 23/07/2026 17:00 - 18:30

BrainLab - Auditorium

MS032C - Exploring Brain Mechanics III

Main Organizer: Prof. Silvia Budday (Friedrich-Alexander-Universität Erlangen-Nürnberg)

Chaired by: Prof. Silvia Budday (Friedrich-Alexander-Universität Erlangen-Nürnberg)

From Atlas to Individual: A Reproducible MRI-to-FE Head Modelling Pipeline

Keynote

C. Saludar, M. Tayebi, A. Wang, J. Fernandez, J. McGeown, S. Holdsworth, E. Kwon, ***V. Shim**

Subject-specific brain biomechanical models using in-vivo imaging

***N. Tueni**, B. Rauh, J. Hinrichsen, S. Rampp, S. Budday

Mechanics-based modeling of white matter hyperintensities in aging and sports-related injury

***L. Cunniff**, J. Weickenmeier

Linking viscoelastic Characteristics of 17 Human Brain Regions with their Microstructural Composition

***N. Reiter**, J. Hinrichsen, L. Hoffmann, J. Vorndran, I. Blümcke, L. Bräuer, F. Paulsen, S. Budday

Beyond Fibers: Micromechanical Modeling of Axon–Glial Interconnections in Brain White Matter

***F. Atashgar**, M. Shafieian, D. Schillingner

Thu, 23/07/2026 17:00 - 18:30

NM - 1 (Multimedia Saal)

MS063B - Neural Network Solvers for PDEs: Bridging Theory and Practice in Scientific Computing II

Main Organizer: Dr. Jooyoung Hahn (Czech Technical University in Prague / Faculty of Nuclear Sciences and Physical Engineering)

Chaired by: Dr. Alexander Heinlein (TU Delft), Dr. Jooyoung Hahn (Czech Technical University in Prague / Faculty of Nuclear Sciences and Physical Engineering)

Randomized Neural Networks for Solving PDEs

Keynote

***F. Wang**

Frozen-PINNs: Can We Make Physics-Informed Neural Networks Fast, Accurate, and Causal?

***C. Datar**, A. Rahma, F. Dietrich

Adding Constraints to Neural Networks: Applications to the Solution of PDEs

***D. De Falco**, F. Calabrò

Accurate Physics-Informed Neural Networks for Fluid Dynamics: an Approximate Gram-Gauss-Newton Approach

***M. Tiritera**, C. Josserand, M. Rodio

Domain-decomposition inspired parallel training algorithms for scientific machine-learning

***A. Kssim**, S. Gratton, A. Kopaniřáková

Thu, 23/07/2026 17:00 - 18:30

NM - 2 (Salzburg)

STS425B - Disruptive Aircraft's Wing design through innovative Electroactive Morphing towards sustainable aviation II

Main Organizer: Ms. Marianna Braza (INPT)

Chaired by: Ms. Marianna Braza (INPT), Mr. Yannick Hoarau (University of Strasbourg)

Numerical study of a Pitching Aerofoil with a Morphing Leading- and Trailing-Edge Section for Improved Aerodynamic Performance

***F. Madi**, Y. Yao, M. O'Donnell, S. Naung

Analysis of travelling and standing wave morphing around an A320 wing prototype in the subsonic regime using POD and SPOD

R. El Akoury, I. Asproulis, ***N. Maynard**, J. Abou Khalil, X. Delon, A. Marouf, Y. Hoarau, J. Rouchon, M. Braza

POD and Machine Learning based Reduced Order Modelling for Wave Morphing Actuators on an A320 Wing Prototype

***N. Maynard**, A. Marouf, J. Abou Khalil, X. Delon, R. El Akoury, Y. Hoarau, J. Rouchon, M. Braza

Aerodynamic performance gains in transonic regime on an A320 morphing wing at Reynolds number of 4.5 million through numerical simulation

***J. Abou Khalil**, I. Asproulis, A. MAROUF, N. Maynard, X. Delon, R. El Akoury, Y. Hoarau, J. Rouchon, M. Braza

Thu, 23/07/2026 17:00 - 18:30

NM - 4 (Hamburg)

STS399B - Advances in scale-resolving simulation for turbomachinery II

Main Organizer: Dr. Oriol Lehmkuhl (Barcelona Supercomputing Center (BSC))

Chaired by: Dr. Oriol Lehmkuhl (Barcelona Supercomputing Center (BSC))

Communication-Hiding Strategies for Enhanced Parallel Performance of the CFD Solver SOD2D

***J. Muela**, O. Lehmkuhl

Characterization of the transonic flow in a diffusive passage

***C. Espinós-Garcia**, J. Twaddle, G. Paniagua, O. Lehmkuhl

Conforming Adaptive Hexahedral Mesh Refinement for Spectral-Element Simulation of Turbulent Flows

***S. Gómez**, J. Muela, A. Gargallo-Peiró, O. Lehmkuhl

Assessment of Numerical Approaches for the Prediction of Large-scale Flow Structures on Separated Flows Using Resolvent Analysis

M. Alonso-Rámila, ***I. Padilla-Montero**, M. Chávez-Módena, D. Rodríguez, E. Valero

Assessment of Wall-Modeled LES for Film-Cooling Flows on Nozzle Guide Vanes

***T. Karpowski**, C. Hasse

Development of Scale-Resolving Simulation Capabilities for Turbomachine Blade Design

A. Bilocq, M. Boxho, O. Coulaud, G. De Cosmo, N. Goffart, K. Hillewaert, M. Rasquin, L. Taguema, ***T. Toulorge**

Thu, 23/07/2026 17:00 - 18:30

NM - 5 (KK)

MS195C - Computational Methods in Environmental Fluid Mechanics III

Main Organizer: Prof. Eirik Valseth (Norwegian University of Life Sciences)

Chaired by: Prof. Kazuo Kashiya (Chuo University), Prof. Ethan Kubatko (The Ohio State University)

Multiscale Finite Element Method for Non-Linear Transport-Dominated Systems

***J. Behrens**, M. Gabsi

Large-Eddy Simulations of Transport and Turbulence Dynamics in Intrusive Gravity Currents at Channel Confluences

***C. Wu**

Modeling Dense Wastewater Dispersion in a Crossflow with Lattice Boltzmann Methods

***M. Giordano**, J. Jacob, D. Malcangio

A Discontinuous Galerkin Morphodynamic Model with Orthogonal Bubble Function Boundary Treatment for River Flows

***G. LING**, R. Matsumoto, S. Tanaka, M. Asai, A. Shiraishi, Y. Takase

Block-Structured Grids for Coastal Ocean Simulation

***J. Schmalfuß**, J. Stahl, R. Grosso, V. Aizinger

Thu, 23/07/2026 17:00 - 18:30

NM - 3 (BB)

MS179C - Advanced Space-Time Methods III

Main Organizer: Prof. Thomas Elguedj (INSA-Lyon / Lamcos)

Chaired by: Prof. Thomas Wick (Leibniz Universität Hannover (LUH)), Prof. Mattia Tani (University of Pavia)

A Robust and Time-Parallel Preconditioner for Parabolic PDE-Constrained Optimization Problems

Keynote

K. Mardal, J. Sogn, ***S. Takacs**

A Thermodynamically Consistent Space-Time Framework for Non-Newtonian Fluids with Internal Variables

***Y. Choi**, M. Soleimani, T. Wick, P. Junker

Numerical Modeling of Surface Erosion in Earthen Dams by Surface-Subsurface Coupled Flow Analysis and Multiscale Space-Time Finite Element Method

***V. Sharma**, K. Fujisawa

A Posteriori Error Estimators and Adaptivity for CO₂ Sequestration

E. Flaureaud, ***I. Lannabi**, M. Vohralík, S. Yousef

Liquid-fueled Detonation Induced by Transverse Liquid Jets in a Space Confined Combustor

W. Wang, ***Z. Hu**, P. Zhang

Thu, 23/07/2026 17:00 - 18:30

H4 - 1 (Ludwig)

MS253F - Computational Geomechanics VI

Main Organizer: Prof. Jinhyun Choo (Seoul National University)

Chaired by: Prof. Jinhyun Choo (Seoul National University), Prof. Jidong Zhao (Hong Kong University of Science and Technology, Hong Kong)

Phase-field model for viscous dominated hydraulic fracturing Keynote

***K. Yoshioka**, T. You

Pore-Scale Simulation of Shear-Thinning Polymer Fluid Flow in Ordered Sphere Packings: Effects of Void Ratio and Pore-Throat Topology

***S. Shivaeei**, M. Salimi, T. Wichtmann

ANNA: a finite element toolbox for Newtonian Noise Analysis

X. Kuci, P. Reumers, S. François, ***G. Degrande**

GEOMRI: High-performance computing technology for determining mechanical behaviour of soils and rock masses

***E. Godoy**, M. Durán, P. Toledo, M. Bustamante

An implicit multi-material Eulerian formulation for geomechanical flows

***D. Aubram**

Thu, 23/07/2026 17:00 - 18:30

H4 - 2 (Leopold)

MS089C - Advanced Computational Modelling of Wood, Wood-Based Products, Biocomposites, and Timber Structures III

Main Organizer: Dr. Markus Lukacevic (TU Wien/CD-Labor Lukacevic)

Chaired by: Prof. Thomas K. Bader (Linnaeus University), Dr. Markus Lukacevic (TU Wien/CD-Labor Lukacevic)

FE-analysis of Wooden Cultural Heritage Objects at Transient Hygro-mechanical Long-term Loading Using Time Homogenisation

***D. Konopka**, M. Kaliske

Buckling Resistance of Multilayered Orthotropic Timber Columns

P. Kožman, ***S. Hu?**

Validation of Timber Structure with Applied Element Method

***B. Huang**, H. Valipour

Predicting the Bending Strength of Douglas Fir Beams Using 2D Digital Twins: Sobol Analysis of Nonlinear Model used for Failure

***P. Bigay**

Predicting Long-Term Durability of Cross-Laminated Timber Using Accelerated Aging Tests

***M. Raj**, P. McGetrick

Numerical modelling of the effect of lamella thickness variation on clamping pressure redistribution transfer in cross laminated timber

***S. Idoghor**, L. Muszynski, J. Nairn, F. Rezaei

Thu, 23/07/2026 17:00 - 18:30

H4 - 3 (Franz)

MS251B - Optimal Control and Sensitivity Analysis II

Main Organizer: Dr. Jose Munoz (Universitat Politècnica de Catalunya)

Chaired by: Prof. Peter Betsch (Karlsruhe Institute of Technology (KIT))

On the Use of Adjoint Gradients for Time-Optimal Control Problems Regarding a Discrete Control Parameterization: Extension for the Final Time Update

***P. Zallinger**, L. Buchner, W. Steiner, K. Nachbagauer

Symplectic Time-integration of optimal control problems with free end-time

***J. Munoz**

Identification of the Dynamic Material Behaviour of Vibration Mounts

***B. Vergouwen**, S. Vanpaemel, F. Naets

Nonlinear Feedback Control in High Dimensions using the Polynomial-Polynomial Regulator

***N. Corbin**, B. Kramer

Design Method of Wide-Speed-Range Two-Dimensional Intake with Motion/Control Coupling

***C. Hao**, J. Zhu

Thu, 23/07/2026 17:00 - 18:30

H4 - 4 (Alois)

MS106C - Advances in Model Order Reduction: Bridging Physics and Machine Learning III

Main Organizer: Dr. Youngsoo Choi (Lawrence Livermore National Laboratory)

Chaired by: Prof. Masayuki Yano (University of Toronto), Prof. NAWFAL BLAL (INSA Lyon)

Multilinear Surrogates Modeling Wave-Type Phenomena

***A. Gruber**, E. Cyr, A. Vijaywargia

Self-Adaptive Model Order Reduction for Shock-dominated Problems

A. Mohaghegh, ***C. Huang**

Structure-preserving Lift & Learn: Scientific machine learning for nonlinear conservative partial differential equations

H. Sharma, J. Draxl Giannoni, B. Krämer

Registration in bounded domains for model reduction of parametric conservation laws

***T. Taddei**

Interpretable Physics-Informed Reduced Order Modeling: Closing the Simulation-to-Data Gap

***H. Salehipour**, N. Kutz, A. Butscher

Thu, 23/07/2026 17:00 - 18:30

H4 - 5 (Xaver)

MS282A - Multiscale and Multiphysics Modeling Across Synthetic, Natural, and Biological Materials. I

Main Organizer: Prof. Francesco Pasqualini (University of Pavia)

Chaired by: Prof. Francesco Pasqualini (University of Pavia), Dr. Payam Poorsolhjouy (Eindhoven University of Technology)

Atomistic Framework for Glassy Polymer Mechanics Across 20 Frequency Decades

***A. Zaccone**

A Diffusion-Mechanical Interface Damage Model for Numerical Simulation of Fracture in Historical Paintings

***P. Pirmoradi**, E. Bosco

On the Nonlinear Mechanical Response of Textile Composite under In-plane and Out-of-plane Loadings

***Z. Chen**, E. Bosco, P. Poorsolhjouy

A 3D Computational Study of Mucociliary Clearance Incorporating Realistic Ciliary Kinematics and Mucus Rheology

***M. Sedaghat**, P. Anagnostopoulou, J. Nawroth, F. Ling, L. Müller, A. Pukaluk, S. Kassinos

Thu, 23/07/2026 17:00 - 18:30

H4 - 6 (Sissi)

MS114A - Fine-Scale Simulation of Architected Materials and Structures I

Main Organizer: Prof. Robin Bouclier (INSA Toulouse, France)

Chaired by: Prof. Robin Bouclier (INSA Toulouse, France)

Randomized Local Model Order Reduction for Shape Optimization of Lattice Structures

***P. Diercks**, K. Veroy, A. Robens-Radermacher, J. Unger

Isogeometric model order reduction and shape optimization of lattice structures

***T. Hirschler**, M. Chasapi, P. Antolin, A. Buffa

Optimization of Lattice Structures for a Morphing Wing Using Neural Implicit Geometry

***M. Kofler**, S. Elgeti

eCNTO: An element-based ConvNet for accelerating topology optimization

***S. Lu**, X. Wei

Thu, 23/07/2026 17:00 - 18:30

H4 - 7 (Maximilian)

MS369A - Forward and Inverse Modeling in Biomechanics I

Main Organizer: Dr. Felipe Galarce (Pontificia Universidad Católica de Valparaíso)

Chaired by: Dr. Alfonso Caiazzo (WIAS Berlin)

A Differentiable Solver for Myocardial Perfusion Modeling

***R. Sallé de Chou**, L. Najman, H. Talbot, I. Vignon-Clementel

Optimizing Input Design for Deep Learning-based Wall Shear Stress Prediction in Abdominal Aortic Aneurysms

***J. You**, C. Lee

Improving the quality of 4D-Flow MRI data by Physics-informed neural networks

***H. Carrillo Lincopi**

Virtual Fields Method to Characterize Arterial Wall Mechanical Behavior at Health and Disease: From Anisotropic Homogeneity to Spatial Heterogeneity

***Y. Liu**, R. van den Berg, F. Gijssen, S. Avril, A. Akyildiz

Flow Reconstruction from 4D-Flow MRI Data

***R. Lemore**, Y. Zhou, O. Bouchot, A. Lalande, J. Christophe, D. Lombardi, M. Fernández

Incorporating the Influence of Cerebrospinal Fluid on the Viscoelastic Wave Propagation in Brain MR-Elastography through a Finite Element framework

***D. Rodopoulos**, F. Galarce, A. Caiazzo, I. Sack, V. Vavourakis

Thu, 23/07/2026 17:00 - 18:30

H4 - 8 (Eventcenter)

MS320A - Artificial intelligence, digital twins and geomechanics for natural hazards and geosystem I

Main Organizer: Prof. Shabnam Semnani (University of California, San Diego)

Chaired by: Prof. Shabnam Semnani (University of California, San Diego), Prof. Jiun-Shyan Chen (University of California, San Diego)

Advancing Coastal Resilience in Hong Kong: Challenges and Progress in Digital Twin Development Keynote

*J. Zhao, X. Shang

Challenges and Opportunities of Reduced Order Modeling for Digital Twins of Geosystems

*D. Degen, Y. Gruzdeva, N. Hayek, M. Faber, C. Siegel, M. Cacace

Actionable Digital Twins for Risk Management in Geohazards

A. Yildiz, *J. Kowalski

AI-Driven Optimization of Microfluidic Cooling Design Using CNN-Guided Reinforcement Learning

*M. Friyadi, C. Yu, W. Wu, H. Huang, C. Wang, C. Hun

Thermodynamics-Informed Digital Twins For Fracture Prediction In Reinforced Concrete Infrastructures

*M. Alim, X. He, J. Chen, C. Yu

Thu, 23/07/2026 17:00 - 18:30

BrainLab - Training

MS249C - Uncertainty Quantification in Structural Mechanics III

Main Organizer: Dr. Marc Fina (Karlsruhe Institute of Technology)

Chaired by: Dr. Marc Fina (Karlsruhe Institute of Technology), Prof. Steffen Freitag (Karlsruhe Institute of Technology (KIT))

Vibration and Sensitivity Analysis of a Rotating Machine under Uncertainties with Gaussian Processes Surrogates

*E. Dehillerin, E. Denimal Goy, J. Sinou

Computing Upper Probabilities of Failure Using Global Optimization Algorithms Together With Importance Sampling, Reweighting, and Partitioning

*T. Fetz, M. Oberguggenberger

Uncertainty quantification for fatigue life of engine turbine blade based on direct probability integral method

*G. Chen, D. Yang, H. Li

Composite Strength Analysis under Random Loading

*S. Thelemann, M. Schatz, F. Duddeck

Physics-Constrained Adaptive Polynomial Chaos Expansion for Multi-Output Surrogate Modeling

*Q. Lu, L. Novak

Thu, 23/07/2026 17:00 - 18:30

NM - 6 (Munich)

MS030A - Mini Symposium: methodological aspects of machine learning for PDE ASPECTS OF MACHINE LEARNING FOR PDE I

Main Organizer: Dr. emmanuel Franck (INRIA)

Chaired by: Prof. bruno despres (Sorbonne University/LJLL)

Non-linear control variate in ρ methods using symplectic neural networks

M. Campos-Pinto, *V. Fournet, E. Franck, V. Michel-Dansac

Greedy Methods for Neural Network and Application to a Semi-Lagrangian Scheme

V. Ehrlicher, E. Franck, V. Michel-Dansac, L. Navoret, *F. Salin

A Theoretical Analysis of the Neural Approximated Virtual Element Method

S. Berrone, *M. Pintore, G. Teora

Lloyd's algorithm and quasi-uniform Voronoi tessellations for particle schemes

*B. Geshkovski, B. Després

Progressive Layer Enrichment with Guaranteed Error Reduction in Scientific Machine Learning

*B. Poulleau, G. Poëtte, R. Turpault

Acceleration of Bayesian calibration of fast dynamic models via machine learning based surrogate models

*G. poette

Thu, 23/07/2026 17:00 - 18:30

NM - 7 (Venice)

MS344G - Agentic AI and Physics-Informed Machine Learning for Next-Generation Design and Manufacturing VII

Main Organizer: Prof. Seunghwa Ryu (KAIST)

Chaired by: Prof. IKJIN LEE (KAIST), Prof. Jaewook Lee (Gwangju Institute of Science and Technology (GIST))

Knowledge-Guided Conditional Generation of Double Perovskites via Language Model Feedback

***I. Lee**, J. Lee, J. Park, K. Lim, S. Ryu

Mechanical Property Prediction in Two-Dimensional Materials Based on Language Models with Graph-Structured Crystal Representations

***M. Lee**, J. Park, K. Min, S. Lee

Bayesian Optimization of Lattice-Truss Structures with Ultrawide Phononic Bandgaps

***H. Yoon**, C. Park, T. Lee, W. Choi, S. Lee

Toolpath Planning for Bed-Based Additive Manufacturing using Reinforcement Learning

***R. Schmeitz**, R. Wolfs, J. Remmers

Design Optimization of Electric Motors with Variable Topologies via Incremental Learning Strategy

***S. Hong**, D. Lee, M. Kim, J. Lee

AI-Based Shape Optimization of Dryer Pipe Geometry

***S. Lee**, M. Kim, H. You, S. Kim, M. Pak, S. Lee

Thu, 23/07/2026 17:00 - 18:30

ICM - 50 (Seeblick)

ERC001 - European Research Council (ERC): Funding opportunities

Main Organizer: Dr. Georgios Symeonidis (European Research Council Executive Agency (ERCEA))

Thu, 23/07/2026 19:30 - 21:30

ICM - B0 (Ground Floor)

Congress Dinner

Thu, 23/07/2026 21:30 - 23:00

ICM - B0 (Ground Floor)

After Dinner "Party"

Friday, 24/07/2026

Fri, 24/07/2026 08:30 - 12:00 Registration Congress Registration - ICM FOYER Ground floor	ICM - FOYER Ground floor
Fri, 24/07/2026 09:00 - 17:00 CFCE - Career Fair in Computational Engineering (CFCE) Where Talent Meets Innovation	ICM - FOYER Ground floor
Fri, 24/07/2026 09:15 - 09:45 Coffee Break	
Fri, 24/07/2026 09:45 - 11:15 MS348B - Biomedical Digital Twins - Science and Clinical Application II Main Organizer: Prof. Charles Taylor (University of Texas at Austin) Chaired by: Prof. Charles Taylor (University of Texas at Austin), Prof. Marek Behr (RWTH Aachen University) Computational Prediction of Hemolysis: Supplementing Mathematical Models with Experimental Data for Uncertainty Quantification *N. Dirkes, V. Kumar, A. Correa, J. Kowalski, M. Behr Identification of Spatially Varying Myocardial Fiber Direction and Active Stress from Full-Field Displacement Data *T. Arjoun, X. Zhong, C. Meierhofer, H. Stern, P. Ewert, M. Gee Towards a Patient-Specific Framework for In-Stent Restenosis Prediction: from OCT Imaging to Risk Factor Assessment *A. Ranno, K. Linka, F. Vogt, M. Behr Towards a Physics-Based Computational Model for Analyzing Mechanical Ventilation in Preterm Lungs *B. Goderbauer, M. Klemme, A. Flemmer, W. Wall A Large-Scale Comparison of 1D and 3D Coronary Hemodynamics on FAME 2 Geometries *F. Sala, F. Marcinnò, A. Buffa, S. Deparis	ICM - 1 Auditorium
Fri, 24/07/2026 09:45 - 11:15 MS020H - Large Deformation Beams and Shells: Formulation Advances and Innovative Applications VIII Main Organizer: Prof. Enzo Marino (University of Florence) Chaired by: Dr. Domenico Magisano (Università della Calabria), Prof. Enzo Marino (University of Florence) Free vibration analysis of angle-ply laminated beam-type structures *G. Štimac Rončević, D. Banić, G. Turkalj Post-Buckling Bifurcation Analysis of Multi-stable Kirigami *Y. Du, R. Groh Fourier-Enhanced, Nondimensionalized PINNs for Large-Deflection Föppl-von Kármán Plates *S. Yuan, Y. Zhang	ICM – 2
Fri, 24/07/2026 09:45 - 11:15 MS008C - Computational Damage and Fracture Mechanics III Main Organizer: Prof. Michael Brüning (University of the Bundeswehr Munich) Chaired by: Prof. Michael Brüning (University of the Bundeswehr Munich) Enhancing performance of auxetic structures at low velocity impact through metamodeling optimization E. Alves Costa, *L. DRIEMEIER A unified multi-perspective quadratic manifold for mitigating the Kolmogorov barrier in multiphysics damage *Q. Zhang, T. Brepols, S. Reese Fracture Mechanics Analysis of Functionally Graded Materials Using an Interpolating Modified Moving Least Squares–Based Element-Free Galerkin Method A. BHAT, S. Lohit, *A. GAONKAR Nonlinear PINN–RVE Framework for Hydride-Induced Degradation in Zirconium-based Alloys *Y. Shin, Y. Chang An Enhanced Gradient Regularization of a Damage Model for Elastomers Based on Chain Scission *P. Wang, T. Tang A Singular-Element-Free Approach to Contour Integral Evaluation Using Adaptive Remeshing *V. Rajendran, M. Lang, R. Afsharnia, G. Pinter, P. Fuchs	ICM – 3

Fri, 24/07/2026 09:45 - 11:15

ICM – 4a

MS157C - Computational Fluid Dynamics (CFD) and Fluid-Structure Interaction (CFSI): Methods Development and Applications III

Main Organizer: Dr. George Moutsanidis (Rutgers University)

Chaired by: Dr. George Moutsanidis (Rutgers University)

IBflows: a New Open-source Multi-GPU FSI software based on the Immersed Boundary method

***M. Scarpolini**, G. Vagnoli, F. Guglietta, R. Verzicco, F. Viola

VIPERFSI: A Fast and Efficient Fluid-Structure Interaction Method for Blast that Utilises Immersed Boundaries

***J. Wurster**, P. McDonald, A. Nicholson

Simulation of Fluid-Structure-Interaction using FVPM and PUM

***O. Elgeti**, F. Breiden, M. Schweitzer

Simulation of Leidenfrost Effect on Soft Substrates

***C. Miao**, F. Kummer

Fri, 24/07/2026 09:45 - 11:15

ICM – 4b

MS054B - Kernel Approximation Methods II

Main Organizer: Dr. Rüdiger Kempf (University Bayreuth)

Chaired by: Dr. Rüdiger Kempf (University Bayreuth), Dr. Helmut Harbrecht (University of Basel)

Kernel Method for Parametric PDE with Many Parameters **Keynote**

***I. Sloan**

Filtered Kernel Interpolation for the Approximation of Higher-Dimensional Periodic Functions with good lattice points

***M. Griebel**

The dimension weighted fast multipole method for scattered data approximation

H. Harbrecht, M. Multerer, ***J. Quizi**

Physics-informed Gaussian processes for parametric partial differential equations

***T. El Ahmad**, T. Sullivan, A. Teckentrup

Product kernels are efficient and flexible tools for high-dimensional scattered data approximation

***A. Iske**

Fri, 24/07/2026 09:45 - 11:15

ICM - 5

MS100E - New Trends in Topology Optimization V

Main Organizer: Prof. Emilio Silva (University of Sao Paulo)

Chaired by: Prof. Shinji Nishiwaki (Kyoto University), Mr. Rahul Dev Kundu (University of Illinois Urbana-Champaign)

The Adaptive Joint-driven Moving Morphable Component Method on 3D Topology Optimization **Keynote**

***J. Xu**, C. He, C. Liu, T. Cui, X. Guo

Geometric Topology Optimization Under Residual Stresses For Machining

***A. De Biasio**, C. Gogu, K. Moussaoui, F. Ortman

A Hyperparameter-Free Moving Morphable Component Method via Ana-lytical Density Integration

***X. li**, C. Liu, X. Guo

On the Simultaneous Topology and Orientation Optimization via Tensor Field Parameterization and Eigenvalue Decomposition

***T. Yamaguchi**, N. Ishida, T. Kondoh, K. Furuta, K. Izui, S. Nishiwaki

Fri, 24/07/2026 09:45 - 11:15

ICM - 11a

MS219B - Multifidelity and Multilevel Surrogates in Uncertainty Quantification II

Main Organizer: Prof. Francesca Bonizzoni (Politecnico di Milano)

Chaired by: Prof. Francesca Bonizzoni (Politecnico di Milano), Mr. Fabio Nobile (École Polytechnique Fédérale de Lausanne (EPFL))

Kernel interpolation on generalized sparse grids

M. Griebel, ***H. Harbrecht**, M. Multerer

Library-Based Nonlinear Reduced Modeling for Parametric/Random PDEs

M. Barakat, ***D. Guignard**, O. Mula

Low-rank approximation to solutions of a class of parametrized nonlinear equations

M. Sutti, ***T. Vanzan**

Sparse Rational Multilevel Approximation for Parametric Frequency-Domain Problems

***U. Römer**, R. Eßling

Fri, 24/07/2026 09:45 - 11:15

ICM - 11b

MS221A - Modelling, Simulation, and AI for NDT and SHM I

Main Organizer: Dr. Fangsen Cui (Institute of Advanced Intelligence and Computing, Agency for Science, Technology and Research)

Chaired by: Dr. Fangsen Cui (Institute of Advanced Intelligence and Computing, Agency for Science, Technology and Research), Dr. Menglong Liu (Harbin Institute of Technology (Shenzhen))

Laser Ultrasound-Driven Safety Quantification for Lithium-Ion Batteries: A Data-Driven Grading Framework for Structural Defect Risks

*F. Cui, L. Zhang

AI-Driven Early Evaluation Of Earthquake-Damaged Masonry Structures

F. Fraternali, *H. Etteyeb, A. Lato, R. Nazifi Charandabi, C. Olivieri, F. Fabbrocino, A. Amendola

Car-Following Model for Vehicle Velocity Control in Vehicular Platoon

Y. Ofuji, *E. Kita, A. Miki

Intra-comparison of time-Fourier analysis approaches for structural health monitoring applications

*M. Miah, W. Lienhart

Efficient Layerwise Model for Composites with Shear-mode Piezoelectric Transducers Satisfying Continuity

*P. Tripathi, S. Kapuria

Fri, 24/07/2026 09:45 - 11:15

ICM - 12a

MS189A - Multiphysical modeling and characterization of ferroelectric materials – state of the art and new challenges I

Main Organizer: Dr. Felix Sutter (Physik Instrumente (PI) SE & Co. KG)

Chaired by: Mr. Marc Kamlah (Karlsruhe Institute of Technology), Dr. Andreas Warkentin (University Kassel)

Mechanics of Multifunctional Composite Materials **Keynote**

*C. Lynch, R. Collet

Effective Properties of 2D and 3D Porous Ferroelectric Composites

*V. Myroshnychenko, O. Abdelnabi Mohamed, C. Spieker, P. Mulavarickal Jose, H. Farheen, S. Ejaz, C. Brosseau, J. Förstner

Ferroelectric Ceramics for Actuators: Finite-Element-Modeling of Lead-Free Composites and of Electrode Configurations for the Flexoelectric Effect

F. Sutter, F. Streich, *M. Kamlah

Evaluation of piezoelectric properties of PZT thin films for piezoMEMS applications

*I. Kanno, S. Kweon

Structure-Engineered Epitaxial PZT Thin Films on Silicon for High Piezoelectric Performance

*S. Kweon, I. Kanno

Fri, 24/07/2026 09:45 - 11:15

ICM - 12b

MS218A - Structure preserving numerical methods for nonlinear hyperbolic systems I

Main Organizer: Dr. Vincent Perrier (INRIA)

Chaired by: Dr. Maria Han Veiga (Ohio State University)

A Reynolds-semi-robust H-div conforming method for unsteady incompressible power-law flows **Keynote**

*L. Beirao da Veiga, D. Di Pietro, K. Haile

A Positivity-Preserving Discontinuous Galerkin Method over Polytopal Grids for a Modified Fisher-Kolmogorov Model

*N. De March, P. Antonietti, F. Regazzoni, M. Corti

Hybrid Methods for Friedrichs Systems with Application to Scalar and Vector Diffusion-Advection Problems

*A. Spadotto, D. Di Pietro

How to preserve a curl or a divergence constraint with the discontinuous Galerkin method

J. Jung, *V. Perrier

From Deterministic to Stochastic: Numerical Methods for the Stochastic Euler Equations

D. Breit, T. Moyo, *P. Öffner

Fri, 24/07/2026 09:45 - 11:15

ICM - 13a

MS088D - Advanced Multi-physics CFD Simulations in Science and Engineering IV

Main Organizer: Prof. Takahiro Tsukahara (Tokyo University of Science)

Chaired by: Prof. Hiroya Mamori (The University of Electro-Communications), Prof. Takahiro Tsukahara (Tokyo University of Science)

Investigating atmospheric boundary layer stability effects on urban flow dynamics

***J. Duró**, E. Mestres, F. Hernandez, A. Miro, O. Lehmkuhl, I. Rodriguez

Hippo: a multiphysics tool coupling MOOSE and OpenFOAM for nuclear fusion applications

***M. Falcone**, H. Saunders, K. Collie, K. Damm, S. Powell, A. Dubas, A. Davis

LES of Compressible Round Jets with Far-field Noise Computation using a Two-way Coupling Approach

***A. Rahatgaonkar**, S. Ghosh

Simultaneous Enhancement of Mixing and Suppression of Heat Transfer in an Impinging Jet with Parametrically Designed Ribbed Micro-Structured Walls

***Y. Daikuhara**, A. Murata, K. Iwamoto

DNS Study of Distributed Roughness Effects on Laminar-Turbulent Transition in a Three-Dimensional Boundary Layer

***K. Nakagawa**, A. Yakeno

Comparative Study of the Aero-Hydrodynamic Performances of a Maritime Vector between using CFD and Semi-Empirical Approaches with Maxsurf

***M. Mohammed**, B. Mohamed Zakaria Ouassim

Fri, 24/07/2026 09:45 - 11:15

ICM - 13b

MS095C - Advances and Challenges in Phase-Field Modeling and Computations III

Main Organizer: Prof. Fadi Aldakheel (Leibniz Universität Hannover)

Chaired by: Prof. Fadi Aldakheel (Leibniz Universität Hannover), Dr. Til Gärtner (Leibniz Universität Hannover)

Micromagnetic simulations driven by the magnetic Gauss's and Ampère's laws

***M. Vorwerk**, J. Schröder

Phase-Field based Multiscale Analysis to simulate Pressurized Fractures in Heterogeneous Material

H. Leão, E. Ferreira, ***R. Pitangueira**, L. Gori

A Coupled Phase-Field-Mechanical Framework for Microstructural Evolution in Solid-State Sintering

***V. Ivannikov**, P. Munch, C. Cyron

Phase-Field Fracture Models based on Molecular Simulations of monocrystalline Silicon

***R. Denzer**, P. Hiremath

Phase-Field-Based Machine Learning Surrogates for Multiscale Analysis of Heterogeneous Quasi-Brittle Materials

***S. Castro**, H. Leão, E. Ferreira, R. Pitangueira

A multi-field analysis of Heusler alloys: Phase-field based simulations of magnetic domains

***M. Alaeddini**, J. Schröder, M. Vorwerk

Fri, 24/07/2026 09:45 - 11:15

ICM - 14a

MS031H - Open-Source Software in Mechanics VIII

Main Organizer: Dr. Vladislav Yastrebov (MINES Paris, PSL University, CNRS)

Chaired by: Dr. Vladislav Yastrebov (MINES Paris, PSL University, CNRS)

Some applications of the first-optimize-then-discretize strategy to solve elliptic optimal control problems

***J. Aguayo**

TensOpSciML: A Python Framework for Tensor-Based Differential Operators with Applications in Scientific Machine Learning

***R. Muñoz-Sierra**, J. Ayensa-Jiménez, M. Doblaré

Top6Meta Studio: A Unified Python-Based Software Framework for Generating Architected Materials and Metastructures

***A. Singh**, G. Mermigkis, P. Hadjidakas, N. Karathanasopoulos

scBESO: An In-House Topology Optimization Software Integrating Open-Source Tools

***H. Sakai Idagawa**, R. Ludwig Pilan

Struphy - HPC for Plasma Physics with Python

***S. Possanner**, M. Lindqvist, B. Na

Development of high resolution reacting-turbulent flow solver OpenCFD-Comb and DNS of high-enthalpy turbulent boundary layers

***X. LI**, H. LIU

Fri, 24/07/2026 09:45 - 11:15

ICM - 14b

MS154B - The Next AI Frontier: Physics-Informed Models, LLMs, and HPC II

Main Organizer: Dr. M. Giselle Fernández-Godino (Lawrence Livermore National Laboratory)

Chaired by: Dr. Jonathan Belof (Lawrence Livermore National Laboratory), Prof. Christian Gogu (ISAE-SUPAERO, ICA)

Rotational Data Augmentation for DeepSDF-based 3D Generative AI for Industrial Structures

***K. Nakaya**, K. Nishiguchi, H. Odawara, Y. Ozaki, J. Kato

Towards Uncertainty Quantification of Diecast Structures using Eulerian Structural Simulation and DeepSDF-based 3D Generative AI

***Y. Ozaki**, K. Nishiguchi, J. Kato

Enhancing 3D Spatial Understanding in Large Language Models: An Approach Using DeepSDF for Mechanical Inference

***S. Ito**, K. Nishiguchi, K. Nakaya, Y. Ozaki, H. Kanamori, S. Noritake, H. Tanaka

Physics-Informed Sinusoidal Networks for Ultrasonic Lamb Wave Reconstruction from Sparse Data

***L. Jilke**, N. Hosters, F. Raddatz, M. Behr, W. Gerko

Design Parameter-Controlled Generation of Thin-Walled Structures Using Latent Diffusion Models

***S. Takanezawa**, K. Nishiguchi, J. Kato

Hybrid Training of Physics-Informed Neural Networks: Integrating Physics-Informed Sampling and Adaptive Loss Balancing for Linear Elasticity

***M. Dadura**, D. Szeliga, L. Sztangret

Fri, 24/07/2026 09:45 - 11:15

ICM - 14c

MS133C - Data-Driven Design of Materials – from Performance to Sustainability III

Main Organizer: Prof. Markus Kästner (TU Dresden)

Chaired by: Prof. Markus Kästner (TU Dresden)

Universal Microstructure-Design for Target Elasticities by Inverse Neural Networks

***B. Eidel**, A. Neelakandan

Phase-field modeling of fracture in recycled aluminum alloys: Impact of scrap-induced particles on crack behavior

***T. Schneider**, W. Mohammed, D. Raabe, M. Kästner

Efficient Virtual Workflow for Optimizing the Indentation Resistance of Tool Steels Through Inverse Microstructure Design Using Compact Descriptors

***Y. Nishizawa**, N. Miska, D. Balzani

Data-Driven Microstructure Optimization of High-Fe Secondary Aluminum Alloys via Phase-Field Fracture Simulation and Inverse Design

W. Chen, ***B. Xu**

Trustworthy Deep Surrogates for Inverse Materials Design with Calibrated Uncertainty

***H. Teh**, T. Iraki, S. Sandfeld

From Virtual Design to Experimental Synthesis: Comparative Analysis of Graph-Based and Generative Latent Representations for Inverse Structure-Process Linkages

***M. Guru**, J. Bohlen, R. Aydin, N. Ben Khalifa

Fri, 24/07/2026 09:45 - 11:15

ICM - B11

MS094C - Integrating Experimental Data and Computational Models in Biomechanics III

Main Organizer: Dr. Silvia Hervas-Raluy (Technical University of Munich)

Chaired by: Dr. Silvia Hervas-Raluy (Technical University of Munich), Dr. Sebastian Brandstaeter (University of the Bundeswehr Munich)

Multiscale Mechanical Modelling of Medical Textile for Female Pelvic Organ Repair

***R. Madke**, A. Mziou, A. Arwany, F. Turquier

Changes in Mass and Mechanical Properties of Biodegradable PLLA Material Under Different Load Cases

***N. Pintari?**, L. Virag, I. Karšaj

Study and Modelling of the Interaction between Human Soft-Tissue and Filling Materials for the Treatment of Chronic Deep Wounds

***C. Staub--Milants**, G. Chagnon, N. Briot, L. Pasquinet, Y. Payan

Fri, 24/07/2026 09:45 - 11:15

ICM - B12

MS313B - Meshfree and Other Advanced Numerical Methods for Applied Mechanics and Engineering Problems II

Main Organizer: Prof. Lihua Wang (Tongji University)

Shooting and Arc-length Method for Frequency Response Curves of Thickness-shear Quartz Resonators

***L. Xie**, C. Zhang, M. Chang

Spectral element methods for the analysis of multifunctional materials and structures

Y. Gu, L. Xie, E. Perras, M. Mellmann, ***C. Zhang**

Influence of Inclination and Dip Geometry on Natural Convection and Entropy Generation in Porous Cavities Using a Local RBF Method

***A. Yadav**, S. VSS Yedida

Meshfree Stabilized Collocation Method (SCM): simulations of extreme large deformation, fluid-structure interaction and explosion

***L. Wang**

Adaptive Upwind Multi-Stencil Scheme for Meshless Flux-Vector-Splitting Methods in Compressible Flow Simulation

***T. Zhang**, X. Zhou

Physics-Guided Machine Learning in Structural Mechanics

***S. Ullah**, C. Zhang

Fri, 24/07/2026 09:45 - 11:15

ICM - B13

MS235A - Advances in high-order discretization methods and reduced-order models for complex engineering systems I

Main Organizer: Dr. Michele Giuliano Carlino (ONERA/INRIA)

Chaired by: Prof. tommaso taddei (Sapienza University of Rome), Phd. Alessia Del Grosso (Inria Bordeaux)

Adaptive goal-oriented high-order method and nonlinear model reduction with applications to parametrized transonic aerodynamic flows

Keynote

***M. Yano**, A. Razavi

Consistent Parametric Model Order Reduction by Matrix Interpolation for Varying Underlying Meshes

***S. Resch-Schopper**, R. Rumpel, G. Müller

Efficient multi-frequency boundary element viscothermal acoustics via model order reduction

***D. Sales**, S. Preuss, D. Panagiotopoulos, E. Deckers, V. Cutanda Henriquez, S. Marburg

Structure-Preserving POD Reduced Models for Nonlinear Hyperbolic Parametric Problems

***I. Gómez-Bueno**, E. Fernández-Nieto, S. Rubino

Multi-dimensional Moving Equilibria Preservation for hyperbolic balance laws with immersed boundaries

***D. Torlo**, M. Ciallella, M. Ricchiuto

Fri, 24/07/2026 09:45 - 11:15

ICM - B21

MS123B - Chemo-Mechanical Coupling Phenomena in Solids II

Main Organizer: Prof. Thomas Antretter (Montanuniversität Leoben)

Chaired by: Prof. Ewald Werner (Montanuniversität Leoben), Prof. Valery Levitas (Iowa State University of Science and Technology)

Constitutive Coupling of Dynamic Precipitation and Full-Field Crystal Plasticity for Large-Strain Deformation

***A. Safi**, V. Nanayakkara, R. Chafle, B. Klusemann

Thermo-kinetic Model of Creep Controlled by Thermally Activated Detachment of Dislocations from Nano-oxides Revisited

***J. Svoboda**, G. Zickler, P. Dymacek, G. Ressel

XRD-FEM Coupled Hydrogen Diffusion Analysis Within Duplex Steel Microstructure

C. Posch-Peperkorn, J. Todt, P. Hammer, ***T. Antretter**, J. Keckes, V. Razumovskiy

Microcrack based Failure Modelling of Brittle-Ductile Dual-Phase Microstructures using a Phase Field Approach for Damage

***J. Huber**, E. Werner

Phase-field Modeling of Void Formation: Non-Classical Nuclei and the Role of Plastic Flow

***K. Pendl**, T. Hochrainer

Thermodynamic Theory of Dislocation-Mediated Plasticity

***A. Umantsev**

Fri, 24/07/2026 09:45 - 11:15

ICM - B22

MS207B - Recent advances in polytopal element methods, from theory to applications II

Main Organizer: Prof. Ilario Mazzi (Politecnico di Milano)

Chaired by: Phd. Andrea Borio (Politecnico di Torino), Mr. Giuseppe Vacca (Università degli Studi di Bari)

Adaptive Consistency in Mimetic Finite Difference Schemes: A Residual-Based Criterion for K-orthogonal Cell Classification

***Y. Cha**, O. Duran, N. Castelletto, H. Tchalepi

Error estimates for a general second order eigenvalue problem on polytopal meshes

***M. Munar**, I. Velasquez, G. Rivera

Discontinuous in time Virtual Element method for Darcy equations coupled with Multi Species Transport with First Order Reaction Network

***R. Caraballo Diaz**, F. Dassi

Efficient Algebraic Solvers for the Pseudo-Stress Stokes Problem on Polytopal Grids

***A. Cancrini**, G. Ciaramella, P. Antonietti

An adaptive virtual element method on polytopal meshes for a fourth-order PDEs

***I. Velásquez**, F. Dassi

The Zipped Finite Element Method: High-order Shape Functions for Polygonal Elements

***S. Berrone**, L. Neva, M. Pintore, G. Teora, F. Vicini

Fri, 24/07/2026 09:45 - 11:15

ICM - 21a

MS333A - Advances in Automatic Differentiation in Mechanics I

Main Organizer: Dr. Jack S. Hale (University of Luxembourg)

Chaired by: Dr. Jack S. Hale (University of Luxembourg), Dr. Jeremy Bleyer (Ecole nationale des ponts et chaussées)

A Simple, Scalable Energy-based Differentiable FEM Framework

***M. Pundir**, F. Lorez, D. Kammer

Handling Multi-Point Constraints through Static Condensation via Global Automatic Differentiation

***F. Lorez**, M. Pundir, D. Kammer

Automatic Differentiation in High Performance Hydrodynamic Simulation

***K. Korner**, B. Talamini, J. Andrej, M. Tupek, T. Stitt, D. Tortorelli, R. Rieben, T. Kolev, J. Bramwell, D. White, J. Belof, W. Schill

JAX for Flexible Constitutive Modelling and its Integration into Finite Element Solvers

A. Latyshev, J. Dokken, J. Bleyer, C. Maurini, ***J. Hale**

A Generalizable Data-Driven Turbulence Closure Framework for Separated Flows via Differentiable Physics

***H. Kim**, R. Maulik

NN-PGD: A Hybridisation of Finite Element Neural Networks and the Proper Generalised Decomposition

***A. Daby-Seesaram**, K. Skardova, M. Genet

Fri, 24/07/2026 09:45 - 11:15

ICM - 21b

MS042D - Numerical Analysis on Polytope Meshes: Geometry Processing, SBFEM, VEM and beyond IV

Main Organizer: Prof. Carolin Birk (Universität Duisburg-Essen)

Chaired by: Dr. Ean Tat Ooi (Federation University Australia), Dr. Hauke Gravenkamp (Otto von Guericke University Magdeburg)

Flexible Adaptive Refinement of Polygonal Meshes with Quality Control

***P. Meyer**, A. Rozdestvenskyte, L. Kobbelt

Metric-Driven Polytopal Mesh Adaptation

***M. Badri**

A Dual-Grid Scaled Boundary Finite Element Strategy for Efficient Solution of Semilinear Partial Differential Equations

***S. Vishwa**, M. Arrutselvi, S. Natarajan, E. Ooi

Application of SBFEM for Polycrystal RVEs: a Comparison With Conventional FEM

***S. Gaddam**, S. Natarajan, A. Kanjarla

Sloshing Dynamics in Tanks with Porous Baffles under a Nonlinear Boundary Condition Using SBFEM

***A. Choudhury**, K. Vijay, E. Ooi, S. Natarajan

Multiscale quadtree/octree scaled boundary finite element method

***Y. He**, H. Yang

Fri, 24/07/2026 09:45 - 11:15

ICM - 22a

MS238B - Mechanics of Soft Solids: Perspectives on Inelasticity and Failure II

Main Organizer: Dr. Miguel Angel Moreno-Mateos (Friedrich-Alexander-Universität Erlangen-Nürnberg (FAU))

Chaired by: Dr. Franz Dammass (TU Dresden), Dr. Miguel Angel Moreno-Mateos (Friedrich-Alexander-Universität Erlangen-Nürnberg (FAU))

A Simple Finite Element Framework for Crack Path Estimation During Needle Insertion Into Soft Tissue

***S. Kogler**, M. Terzano, G. Holzapfel

Mechanics of Cutting in Soft Matter

***M. Moreno-Mateos**, P. Steinmann

A Computational Framework for Self-healing Vitrimers: a Constitutive Model

***A. Caggiano**, F. Otero, E. Comellas

A Computational Framework for Self-healing Vitrimers: Finite Element Implementation and Numerical Validation

A. Caggiano, F. Turon, F. Otero, ***E. Comellas**

Elastoplasticity Enhanced by Strain Gradients: Model Formulation, Mixed FEM, and Applications

***L. Nazarenko**, A. Chirkov, H. Altenbach

Fri, 24/07/2026 09:45 - 11:15

ICM - 22b

MS096A - Uncertainty Quantification in Materials Science and Computational Mechanics I

Main Organizer: Dr. Florent Pled (Univ Gustave Eiffel)

Chaired by: Dr. Florent Pled (Univ Gustave Eiffel), Dr. Gabriele La Valle (Université Gustave Eiffel, MSME UMR 8208)

Nonlocal elastic modeling and stochastic analysis of particle-based materials with wave-based identification

***G. La Valle**, C. Soize

Bayesian SPDE-Based Modelling of Manufacturing-Induced Temperature Random Fields Across Scales

***A. Yuksel**, S. Mohanty

Uncertainty Quantification and Propagation of Data-Based Interatomic Potentials via Embedded Model Error

***C. Lacey**, M. Cusentino, H. Najm, K. Sargsyan

Phase-Field Modeling of Self-Healing Materials with Uncertainty Quantification on Healing Operators

***H. Gia Khai**, C. Desceliers, F. Fled

Fri, 24/07/2026 09:45 - 11:15

ICM - 41 (Ostersee A)

MS396B - Computational Approaches and Structural Engineering Solutions for Prototype and Industrial Facilities II

Main Organizer: Phd. Michele Angiolilli (Gran Sasso Science Institute)

Chaired by: Phd. Michele Angiolilli (Gran Sasso Science Institute), Phd. Marta Galuppi (istituto nazionale fisica nucleare)

Numerical Modelling and Experimental Seismic Response Assessment of Piping Networks in Industrial Facilities

***A. Marino**, D. Perrone, C. Miglietta, M. Ciucci

Towards robust pipe design using dynamic model reduction in power generation applications

***W. HIEN**, A. Mercier, O. Dessombz, J. Boudot, L. Jezequel, T. Nouri Baranger

GENVIA Electrolyzer System Static Model methodologies.

S. Salvadori Velu, ***T. Skler**, P. Leducq

CFD Modeling of Airflow and Contaminant Transport for the Optimization of the DarkSide-20k Cleanroom Design

***M. Galuppi**, M. Angiolilli, M. Carlini, V. Di Marcello, C. Panetta, L. Pietrofaccia, R. Tartaglia, A. Zani

Fri, 24/07/2026 09:45 - 11:15

ICM - 42 (Ostersee B+C)

MS395A - Advanced Structure-preserving Moment Methods and Numerics of Kinetic Equations I

Main Organizer: Dr. Qian Huang (Universidad Carlos III de Madrid)

Chaired by: Dr. Zhenning Cai (National University of Singapore), Prof. Hui Yu (Xiangtan University)

High-Order Micro-Macro Decomposition Schemes for Kinetic Plasma Models

***J. Rossmanith**, J. Held

Closure approximation by quasi-entropy

***J. Xu**

A Convergence Study of the Method of Moments in Kinetic Theory

***T. Pichard**

Model-Adaptive Microchannel Flow Simulations using Linearized Hierarchical Moment Equations

***M. Geratz**, M. Torrilhon

Extracting interaction kernels for many-particle systems by a two-phase approach

Y. Shi, ***W. Yang**, L. Hong

Fri, 24/07/2026 09:45 - 11:15

ICM - 43 (Eibsee)

MS160A - Efficient Modeling of Building Materials: Constitutive Laws & Multiphysics Applications Across Scales I

Main Organizer: Dr. Beatrice Pomaro (University of Padova: Università degli Studi di Padova)

Chaired by: Dr. Beatrice Pomaro (University of Padova: Università degli Studi di Padova), Dr. Gabriel Barbat Vlad (CIMNE)

Adaptive Formulation Refinement for the Mesh Objective Numerical Analysis of Localized Structural Failure

***G. Barbat**, M. Cervera, H. Venghaus, M. Chiumenti

Steel Fiber-Reinforced Concrete in Mesoscale through a Combined DEM-FEM Approach

***R. Lando**, B. Pomaro, G. Barbat, V. Salomoni, G. Mazzucco

AutoFEA: Retrieval-Augmented Multi-Agent Abaqus Automation with Requirement-Complete Auditing

***L. Zhang**, Z. Wei

Irradiation-Induced Damage in VCI Deposited Surface: Insights from Molecular Dynamics Simulation

***Q. Xu**, H. Liu, Z. Wei

Long-terms Loading in Concrete Media at Meso-Scale

***G. Mazzucco**, R. Lando, B. Pomaro, V. Salomoni

A Data-Driven Approach for Residual Strength Evaluation of Damaged Concrete Structures for Post-Disaster Structural Assessment

J. Zhang, L. Zhang, ***B. Pomaro**, Z. Wei, G. Mazzucco

Fri, 24/07/2026 09:45 - 11:15

ICM - 44 (Schliersee)

MS065A - EU-MATHS-IN -- Mathematics for Innovation: Success Stories & Support for European Industries I

Main Organizer: Prof. Matthias Ehrhardt (University of Wuppertal)

Chaired by: Prof. Matthias Ehrhardt (University of Wuppertal)

KeyNote: EU-MATHS-IN -- Mathematics for Innovation: Success Stories & Support for European Industries

***M. Ehrhardt**, M. Cruz

Digital Validation of Cable System Layouts in Automotive Industry using Coupled Systems of Geometrically Exact Rods as Grey Box Models

***J. Linn**, T. Hermansson, F. Schneider-Jung

Absolute lifetime estimations for automotive cables

***F. Schneider-Jung**, M. Speckert, K. Dreßler

Numerical Simulation of Asphalt Solar Collector Systems

***L. Escudero Sartages**, D. Romero i Sánchez

Multiscale Modeling of Competitive Polymer Adsorption and Exchange Mechanisms at Solid Interfaces

***N. Patsalidis**, A. Hazirakis, A. Tomilio, V. Harmandaris

Interactive Real-Time Simulation of Flexible Surface-Like Parts for Assembly Planning Using Reduced Shell Models

***M. Roller**, S. Lorin, J. Ljunglide, J. Linn

Fri, 24/07/2026 09:45 - 11:15

ICM - 31 (Zugspitze)

MS292C - Large-Scale Applications in Scientific Machine Learning III

Main Organizer: Dr. Fanny Lehmann (ETH Zurich)

Chaired by: Dr. Filippo Gatti (CentraleSupélec, Université Paris-Saclay, CNRS, ENS Paris-Saclay), Dr. Fanny Lehmann (ETH Zurich)

Tadpole: Autoencoders as Foundation Models for 3D PDEs with Online Learning

***Q. Liu**, F. Koehler, B. Holzschuh, N. Thuerey

On Large-Scale PDE Foundation Models

***M. Herde**

Scaling Neural Surrogates for 3D Physics Simulations via Cropped Pretraining

***B. Holzschuh**, G. Kohl, F. Redinger, N. Thuerey

Dynamic Multi-Scale Graph Embeddings For Cross-Modal Representation of Physical Fields

***C. Millet**, X. Cassagnou, M. Mougeot

KolmoGraph: A Multi-Scale Energy Conservative Graph Neural Network for Variable Closure Fluid Modelling

***M. Garcia**, S. Brunton, J. Rowbottom, M. Wahib

Towards Parallel Compiled GPU-Accelerated Reduced Order Models

***B. Eiximeno**, A. Miró, J. Kutz, I. Rodríguez, O. Lehmkuhl

Fri, 24/07/2026 09:45 - 11:15

ICM - 32 (Watzmann)

MS102B - Multiphase processes in porous media II

Main Organizer: Prof. Yousef Heider (Universität Kassel)

Chaired by: Dr. Alberto Antonini (Leibniz University Hannover), Prof. Yousef Heider (Universität Kassel)

From dendrites to floes: Multi-X Modeling of Sea Ice Evolution

***R. PATHAK**, S. SEYEDPOUR, B. KUTSCHAN, S. THOMS, T. RICKEN

Computational modeling of ice lens formation in porous geomaterials subjected to freezing

***R. Williams Moises**, Y. Heider

Dynamics of multiphase flow in deformable porous media: towards numerical modeling of magma transport in lithospheric rocks

***N. Hosseini**, J. Afonso, S. Zlotnik, A. García-González

Comparative Analysis of CNN and GAN-Based Super-Resolution Models for 3D Porous Microstructures

***R. Saxena**, T. Carraro

Multi-Zone Heat and Mass Transfer Modeling Coupled with ANN Product Prediction

A. Raghuraman, A. Mishra, ***R. Anapagaddi**, N. Singa, R. Kaluri

Fri, 24/07/2026 09:45 - 11:15

BrainLab - Auditorium

MS176A - Endovascular devices for intracranial aneurysms: modeling, experiments, and flow analysis I

Main Organizer: Dr. Ratnadeep Pramanik (Institute for Mathematics and Computer-Based Simulation, University of the Bundeswehr Munich)

Chaired by: Dr. Ratnadeep Pramanik (Institute for Mathematics and Computer-Based Simulation, University of the Bundeswehr Munich)

Numerical Investigation of Aneurysm Initiation and Hemodynamics Associated with Vascular Anastomosis Direction in a Rat Model

***T. Hirabayashi**, H. Koseki, S. Fujimura, K. Hoshino, M. Kurita, H. Takao, Y. Murayama, M. Yamamoto

Investigating the effect of structural complexity on the hemodynamics in 3D printed patient specific intracranial aneurysm models.

***H. Prabhakaran**, F. Gießler, A. Atici, T. Matern, J. Bernd Hövener, O. Jansen, S. Saalfeld, N. Larsen, M. Pravdivtseva

Location-Dependent Role of CFD-Based Hemodynamic Factors in Intracranial Aneurysm Rupture Prediction

***S. Fujimura**, Y. Watase, G. Kudo, S. Hataoka, G. Nagayama, N. Kato, H. Takao, H. Ohwada, T. Ishibashi, Y. Murayama, M. Yamamoto

Quantitative Evaluation of Flow Diversion in Intracranial Aneurysms Using DSA-Derived Intensity Metrics

S. Voß, S. Klebingat, S. Feierabend, ***B. Dodawatta**, J. Stahl, R. Schwab, M. Kruse, G. Janiga, D. Behme, P. Berg

Enabling In Silico Trials: A High-Fidelity Simulation Framework for Predicting Device Deployment and Hemodynamic Outcomes in Intracranial Aneurysms

***G. Závodszy**, B. Csipka, M. Németh, F. Otto, L. Sándor, D. Vitéz

3D-Printing and In Vitro Flow Experiments for Assessment of Aneurysm Treatment with Contour Neurovascular System

***M. Pravdivtseva**, J. Korte, F. Gaidzik, P. Berg, F. Wodarg, J. Hövener, N. Larsen, O. Jansen

Fri, 24/07/2026 09:45 - 11:15

NM - 1 (Multimedia Saal)

MS063C - Neural Network Solvers for PDEs: Bridging Theory and Practice in Scientific Computing III

Main Organizer: Dr. Jooyoung Hahn (Czech Technical University in Prague / Faculty of Nuclear Sciences and Physical Engineering)

Chaired by: Dr. Jooyoung Hahn (Czech Technical University in Prague / Faculty of Nuclear Sciences and Physical Engineering), Dr. Alexander Heinlein (TU Delft)

Using Neural Physics for Constructing Finite Element Solution Methods: NN4FEM

***T. Yang**, J. Xiang, B. Chen, C. Pain

A Learnable Multigrid Framework via Graph Convolutions

***X. Wang**, L. Luo

Improving the stability and accuracy of discontinuous Galerkin schemes using neural networks

L. Bois, E. Franck, V. Michel-Dansac, ***L. Navoret**, V. Vigon

Coupling Physically Informed Graph Neural Networks with External Solvers

***N. Picchiarelli**, R. Halder, G. Stabile

NewPINNs: Solver-Guided Training of Neural Networks for Differential Equations

S. Chandran, M. Makki, R. Narkhede, M. Raissi, A. Grenier, ***B. Mohebbi**

Partitioned neural network approximation to PDEs with a Robin interface condition

***H. Kim**, Y. Jeon

Fri, 24/07/2026 09:45 - 11:15

NM - 2 (Salzburg)

MS209A - Adaptive Physics-Aware Models for Engineering Decision Support I

Main Organizer: Dr. Konstantinos Vlachas (ETH ZURICH)

Chaired by: Dr. Rui Zhang (ETH zurich), Dr. Konstantinos Vlachas (ETH ZURICH)

Probabilistic Rectification of High-Dimensional Structural Digital Twins Using Adaptive Physics-Aware Model

***R. Thorat**, R. Nayek

Probabilistic Virtual Sensor Design Using Physics-Based Modeling and Gaussian Process Regression

***S. Brandstaeter**, B. Maradni, A. Popp

Grey-box Models Using Physics-informed Gaussian Process Regression in Turning Machining

***Y. Wu**, D. Höche, S. Götschel, J. Zemke

Gaussian Processes over Graphs for Layout-Agnostic Power and Load Inference for Control and Decision Support of Wind Farms

***L. Kalathiparambil Kennedy**, G. Duthé, G. Arcieri, E. Chatzi

Transdimensional Methods for Adaptive Parametrization

***A. Dols**, M. Amaya, P. Díez, S. Zlotnik

Fri, 24/07/2026 09:45 - 11:15

NM - 4 (Hamburg)

MS205A - Computational Material Design Via Mechanics or Machine Learning Approaches I

Main Organizer: Dr. Wei Tan (Queen Mary University of London)

Chaired by: Dr. Wei Tan (Queen Mary University of London), Dr. Ajit Panesar (Imperial College London)

Deep Mechanician: Physics-Aware Constitutive Modeling via LLMs

***H. Li**, B. Liu, S. Ghosh, T. Sohail

Multi-Fidelity Bayesian Optimisation for Inverse Design of Cellular Composites

H. Kansara, ***W. Tan**

Achieving Target Deformation Profile through Architected Curved Strut Metamaterials Employing Graph Neural Network

***J. Wang**, A. Panesar

Mesoscale Modelling and Experimental Validation of the Thermal Behaviour of Lightweight Aggregate Concrete

B. Marcos, L. Silva-Klein, ***A. Lezcano-Betegon**, A. Mar

Efficient Numerical Modelling of Radiative Heat Transfer in Phase-Change Materials: Application to Molten Salt Thermal Energy Storage

***Y. Belhamadia**, M. Seaid

Fri, 24/07/2026 09:45 - 11:15

NM - 5 (KK)

MS195D - Computational Methods in Environmental Fluid Mechanics IV

Main Organizer: Prof. Eirik Valseth (Norwegian University of Life Sciences)

Chaired by: Prof. Eirik Valseth (Norwegian University of Life Sciences), Prof. Ethan Kubatko (The Ohio State University)

Parallel Finite Element Analysis of Multiphase Flows using a Multi-Phase-Field Model

***J. Matsumoto**

Atmospheric pollutant dispersion based on lattice Boltzmann simulation and Eulerian aerosols models

***J. Jacob**

A Unified Tropical Cyclone Rainfall Model for Enhanced Storm Surge and Compound Flood Modeling

***S. Nepal**, E. Kubatko

High order finite element discretization of the shallow water equations with irregular sub-grid bathymetry

***L. Arpaia**, L. Bonaventura, G. Orlando

Computational Lagrangian Methods for Transport Analysis in Environmental Fluid Flows

***J. Curbelo**

Fri, 24/07/2026 09:45 - 11:15

NM - 3 (BB)

MS387A - Compressible Multi-material Mechanics I

Main Organizer: Prof. Damien Violeau (EDF)

Chaired by: Prof. Damien Violeau (EDF), Dr. Sébastien Boyaval (Ecole nationale des ponts et chaussées)

Comparison of Two-Phase Models: Sharp-Interface Euler Model vs. Baer-Nunziato Model

M. Hantke, ***S. Müller**, A. Sikstel, T. Ferdinand

An Updated-Lagrangian Method For Hyperelasto-Plastic Materials And Fluid-Structure Interaction

***T. Chantrait**, A. Gangloff, E. Labourasse, C. Serraille

An All-topology Two-fluid Model for Two-phase Flows Derived from Stationary Action Principle

***W. Haegeman**, G. Orlando, S. Kokh, M. Massot

A Study of Staggered Schemes for Euler Equations Applied to Highly Compressible Regime Flows

J. Zhu, ***R. Chauvin**, J. Francescatto, T. Goudon, S. Minjeaud

A multiphase compressible flow model including elasto-viscoplastic solids with irreversible compaction

***N. Favrie**, K. Schmidmayer

Fri, 24/07/2026 09:45 - 11:15

H4 - 1 (Ludwig)

MS139A - Optimization under Uncertainty I

Main Organizer: Dr. Oindrila Kanjilal (Georg Nemetschek Institut - AI for the Built World, TU Munich)

Chaired by: Prof. Boris Kramer (University of California San Diego), Dr. Pablo G. Morato (Technical University of Munich)

ANOVA-Based sparse Proper Generalized Decomposition for Surrogate Modelling with High-Dimensional Inputs

*D. Jang, D. Lee

Stochastic Topology Optimization for Fracture-Resistant Structures under Random Defects

*Z. Li, J. Yvonnet, C. Desceliers

Interpretable RL Decision Support for Road and Bridge Network Maintenance

*A. Sterrenberg, C. Andriotis, J. Stoter

Adaptive Ensemble Surrogate Modelling with Local Error Measures for Reliability-Based Design Optimization

*L. Vásquez Estepan, Y. Aoues, O. Sánchez Jimenez, E. Pagnacco

Stochastic Design Optimization of Structures Subjected to Random Vibrations through Explicit Failure Domain Approximation

L. Ballesteros, *S. Missoum

Bayesian Optimization of Susceptor Heating Coil Geometries for Improved Thermal Uniformity

H. Lee, H. Park, *K. Yun

Fri, 24/07/2026 09:45 - 11:15

H4 - 2 (Leopold)

MS089D - Advanced Computational Modelling of Wood, Wood-Based Products, Biocomposites, and Timber Structures IV

Main Organizer: Dr. Markus Lukacevic (TU Wien/CD-Labor Lukacevic)

Chaired by: Dr. Royson Dsouza (VTT Technical Research Centre of Finland Ltd), Dr. Markus Lukacevic (TU Wien/CD-Labor Lukacevic)

Compressive Contact Interactions Between Surfaces with Parallel Wood Fibres: Micromechanical and Structural-scale Modelling

*M. Tavares da Costa, J. Vessby

Damage Modelling of Splitting in Glue Laminated Timber for Dovetail Timber–Concrete Connections

*D. Sibé, P. Galimard, A. Rebhi, J. Coureau

Numerical Simulation of Large Displacement Effects in Dowel-type Timber Connections

*T. Bader, F. Körner, M. Schweigler

Numerical simulation of butt joints in cross-laminated timber structures

*C. Broberg, E. Halilovic, M. Schweigler, T. Bader

Fri, 24/07/2026 09:45 - 11:15

H4 - 3 (Franz)

MS251C - Optimal Control and Sensitivity Analysis III

Main Organizer: Dr. Jose Munoz (Universitat Politècnica de Catalunya)

Chaired by: Dr. Karin Nachbagauer (University of Applied Sciences)

On the Use of Interpolation-Based Quadrature Rules in the Discrete Adjoint Sensitivity Analysis of Multibody Systems

*M. Keller, R. Seifried

An Input-Rejection Filter for State Estimation Using Output-Only Measurements

*M. Hoda, S. Hoda, M. Ebrahimzadeh Hassanabadi, S. Eftekhari Azam, B. Bhattacharyya

Constrained Motion Planning for Nonholonomic Attitude Reorientation of Free-floating Humans

*Y. Kubo

An Optimized Ensemble-Averaged Adjoint Sensitivity Analysis Framework and Its Validation in Heavy Rain Fall Modification

*S. Jiang, T. Nagata, M. Watanabe, Y. Sasaki, H. Naruse, T. Nonomura

Fri, 24/07/2026 09:45 - 11:15

H4 - 4 (Alois)

MS106D - Advances in Model Order Reduction: Bridging Physics and Machine Learning IV

Main Organizer: Dr. Youngsoo Choi (Lawrence Livermore National Laboratory)

Chaired by: Dr. Youngsoo Choi (Lawrence Livermore National Laboratory), Dr. Siu Wun Cheung (Lawrence Livermore National Laboratory)

Adaptive Hybrid Domain Decomposition-Based Modeling via Operator Inference and the Schwarz Alternating Method

*I. Tezaur, E. Parish, A. Gruber, I. Moore, C. Wentland, A. Mota

A Reduced-Order Domain Decomposition Strategy for Thermomechanical Simulations of Microelectronics Interconnects

*T. Luong, A. Gravouil, N. Blal, T. Elguedj, C. Sart

Graph-Based Hierarchical Reduced-Order Modeling for Large-Scale Electromagnetic Field Analysis

*K. Shintate, N. Morita, S. Kaneko, A. Takei, N. Mitsume

Model Order Reduction for Quantum Molecular Dynamics

*S. Cheung, Y. Choi, J. Fattebert, D. Osei-Kuffuor

Physics-informed Variational Operator Learning for Multiscale Phase-field Fracture in Composites

*H. Kim, H. Cho

Fri, 24/07/2026 09:45 - 11:15

H4 - 5 (Xaver)

MS282B - Multiscale and Multiphysics Modeling Across Synthetic, Natural, and Biological Materials. II

Main Organizer: Prof. Francesco Pasqualini (University of Pavia)

Chaired by: Dr. Payam Poorsolhjoui (Eindhoven University of Technology), Prof. Francesco Pasqualini (University of Pavia)

"Bio-metals": Uncovering ancient biological materials with nanoindentation size effects arising from manifold micromechanics

L. Zelaya-Lainez, F. Schuster, S. Manhartseider, ***M. Landegger**, K. Ikeda, F. Raible, O. Lahayne, S. Scheiner, C. Hellmich

Structural Curl in Paper Sheets: A Multiscale Analysis of Moisture-Induced Deformation

***E. D'Allestro**, A. Brandberg, U. Hirn, A. Kulachenko

Data-Driven Multiscale Constitutive Mapping for Failure in Granular Materials

J. Han, B. Bahmani, ***P. Poorsolhjoui**

Deep Sequence Models for 5G Downlink Bitrate Forecasting on srsRAN Synthetic Traces

S. Aibagarov, Y. Nurakhov, ***A. Mukhanbet**, T. Imankulov

Fri, 24/07/2026 09:45 - 11:15

H4 - 6 (Sissi)

MS114B - Fine-Scale Simulation of Architected Materials and Structures II

Main Organizer: Prof. Robin Bouclier (INSA Toulouse, France)

Chaired by: Dr. Thibaut Hirschler (Université de Technologie de Belfort Montbéliard)

Steady-State Isogeometric Analysis of Lattice Structures

***L. Dupeuble**, T. Hirschler, D. Chamoret

Modelling the mechanics of lattice-skin structures using parametric beam-shell simulations and experimental insights

***H. Iteney**, C. Huchette, C. Julien, J. Garcia, F. Irisarri

Microcontact Interactions in Architected Interfaces: A Fine-Scale Finite Element Modeling

D. Zeka, N. Blal, ***F. Fekak**, A. Duval, A. Gravouil, J. Scheibert

Thermal and Mechanical Homogenization of Architected Interpenetrating Composites using a Voxel-Based Fast Fourier Solver

***S. Klinder**, K. Schulz

Efficient Fine-Scale Isogeometric Simulation of Architected Metamaterials

C. Guillet, T. Hirschler, P. Jolivet, P. Antolin, ***R. Bouclier**

Fri, 24/07/2026 09:45 - 11:15

H4 - 7 (Maximilian)

MS369B - Forward and Inverse Modeling in Biomechanics II

Main Organizer: Dr. Felipe Galarce (Pontificia Universidad Católica de Valparaíso)

Data-driven Neural Networks for Windkessel Parameter Calibration

***B. Hoock**, T. Köppl

Handling Shape Variability in Surrogate Cardiovascular Models

F. Romor, F. Galarce, ***A. Caiazzo**

Data-Driven Surrogate Models for Aortic Hemodynamics Under Shape Variability

***R. Schussnig**, F. Romor, A. Caiazzo, G. Holzapfel

Wave Inversion for Magnetic Resonance Elastography Using Physics-Trained Neural Networks

***H. Bustin**, T. Meyer, J. Jordan, L. Walczak, H. Tzschätzsch, I. Sack, A. Hennemuth

Fast and Accurate Reconstruction of 3D Cardiac Displacement Fields from Sparse MRI-like Data via PBDW

***F. Mantegazza**, F. Caforio, M. Gsell, C. Augustin, G. Haase, E. Karabelas

Fri, 24/07/2026 09:45 - 11:15

H4 - 8 (Eventcenter)

MS320B - Artificial intelligence, digital twins and geomechanics for natural hazards and geosystem II

Main Organizer: Prof. Shabnam Semnani (University of California, San Diego)

Chaired by: Prof. Jiun-Shyan Chen (University of California, San Diego), Prof. Kuan-Chung Lin (National Cheng Kung University)

Multi-hazard Risk Assessment for Climate influenced Hazards under Changing Environmental Conditions

Keynote

***S. Semnani**

An AI- and GPU-Accelerated Framework for Preliminary Estimation of Landslide Failure Surfaces and Subsequent Flow Paths

***Y. Tai**, H. Wong, K. Lin, G. Chu

An accelerated meshfree computational framework with machine learning classification for multi-phase modeling of landslide

***K. Lin**, Y. Tai, P. Lee, H. Wong, Y. Wang, Y. Lu, J. Chen

AI-for-Science in Earth Science by Integrations of Simulations/Data/Learning on Heterogeneous Supercomputers

***K. Nakajima**, T. Furumura, H. Tsuruoka, T. Arakawa, S. Sumimoto, K. Yamazaki, H. Yashiro

TsunamiCast : Digital Twin for Tsunami Disaster Resilience with Real-time Impact-based Tsunami Forecast Facility

***S. Koshimura**, Y. Tanioka

Fri, 24/07/2026 09:45 - 11:15

BrainLab - Training

MS084A - Integrating HPC and AI for Real-World Applications I

Main Organizer: Prof. Makoto Tsubokura (RIKEN R-CCS/Kobe University)

Chaired by: Prof. Makoto Tsubokura (RIKEN R-CCS/Kobe University)

Two-stage multi-objective shape optimization for SUV design considering aerodynamic performance and noise

***T. Nakashima**, Y. Takiteru, K. Shimizu, R. Bale

Containerizing CODA: Deployment and Performance of Large Industrial HPC Workflows

***M. Wagner**, J. Gobran-Fenske, I. Huismann, R. Tschüter

Development of a Shape Modification AI Model to Improve Aerodynamic Performance for Realistic Vehicle Shapes

***M. Ikeda**, T. Okamoto, J. Miao, B. Raytchev, T. Nakashima

Prediction Of Near-Optimal Anisotropic Mesh Spacing For CFD Simulations

C. Lock, ***R. Sevilla**, O. Hassan, J. Jones

LES on the Effect of Vehicle Motion and Driver Response on Aerodynamic Drag under Wind Fluctuations

***K. Narita**, B. Rahul, T. Shimada, K. Yoshitake, F. Nucera, T. Yoshino, N. Yatsukura, M. Tsubokura

Fri, 24/07/2026 09:45 - 11:15

NM - 6 (Munich)

MS411A - Energy Dissipation Systems: Mechanics, Design, and Applications I

Main Organizer: Prof. Resat Oyguc (Istanbul Technical University)

Design Parameter Tuning of Rolling Particle Dampers for Structural Vibration Mitigation

T. Nakamura, ***M. Saeki**

Influence of the type of seismic source on the optimal distribution of viscous dampers in multi-story buildings

***O. Contreras-Bejarano**, D. Lopez-Garcia, J. Villalba-Morales, D. De Domenico

From Art to Engineering: Energy Dissipation using Metallic Kirigami

***S. Khalilzadeh Tabrizi**, I. Mohagheghian, M. Walker

Fri, 24/07/2026 09:45 - 11:15

NM - 7 (Venice)

MS007A - Synthesizing Experimental and Computational Perspectives in Mechanics/Mechanobiology of Soft Tissues: Dialogue Towards Mechanistic Insight I

Main Organizer: Prof. David Pierce (University of Connecticut)

Chaired by: Prof. Stéphane Avril (Mines Saint-Etienne)

A physics-guided approach to recover residual stress fields in tissues driven by experimental data Keynote

***J. Sanz-Herrera**, A. Goriely

Using Neural Networks to Determine Constitutive Model Forms for Solid Soft Tissue under Full 3D Deformations

***M. Sacks**

Experiment–Driven Parameter Identification and Validation of Constitutive Model for Cartilage

***F. Egli**, M. Seyedpour, M. Pachenari, D. Pierce, T. Ricken

Topology-aware Constitutive Models for Extracellular Fiber Network Mechanics

***S. Cardona**, B. Alheit, S. Kumar, B. Fereidoonhezad, M. Peirlinck

Implications of Geometric Scaling in Poroelastic Materials

***M. Dorsey**, M. Fraldi, S. Amini, R. Weinkamer, P. Fratzl

Fri, 24/07/2026 11:15 - 11:30

Short Break

Fri, 24/07/2026 11:30 - 13:00

ICM - 1 Auditorium

MS348C - Biomedical Digital Twins - Science and Clinical Application III

Main Organizer: Prof. Charles Taylor (University of Texas at Austin)

Chaired by: Prof. Charles Taylor (University of Texas at Austin), Prof. Mona Eskandari (University of California Riverside)

A Respiratory Digital Twin for Intervention-Specific Prediction of Lung Ventilation and Aerosol Deposition Validated against Multi-Modal Clinical Data

***M. Rixner**, M. Grill, J. Richter, M. Brei, M. Wachter, I. Frerichs, A. Sablweski, D. Schädler, T. Becher, S. Katayama, M. Ludwig, W. Wall, K. Wichmann, K. Müller, J. Biehler

In-Silico Assessment of Catheter-Tissue Contact Force in Monopolar Pulsed Field Ablation

***L. Pasini**, G. Amorós-Figueras, Z. Moreno Weidmann, T. García-Sánchez, D. Viladés Medel, A. Neic, E. Vigmond, A. Ivorra, J. Guerra, L. Gerardo-Giorda, A. Petras

Data-Model Integration in Personalized Computational Medicine

***S. Pagani**, A. Corda, M. Corti, P. Antonietti, C. Vergara

A Mixed-dimensional Multiphase Porous Media Framework for Modeling the Respiratory and Circulatory System of the Human Lungs Including Gas Exchange

***L. Köglmeier**, B. Temür, B. Wirthl, W. Wall

Recruitment–Derecruitment in Patient-Specific Respiratory Digital Twins: A Prospective Clinical Validation Study

***M. Ludwig**, A. Sablewski, C. Eichinger, M. Lindner, I. Frerichs, P. Langguth, D. Schädler, M. Rixner, J. Biehler, K. Tonai, S. Katayama, T. Becher, W. Wall

MS131A - Mathematics of Digital Twins: Challenges, Methods, and Applications I**Main Organizer:** Dr. Maria Han Veiga (Ohio State University)**Chaired by:** Dr. Maria Han Veiga (Ohio State University), Prof. Christian Linder (Stanford University)Enabling Real-Time Simulation and Control of Digital Twins **Keynote*****D. Xiu**

Towards Digital Twins for Control of Soft Robots

***B. Kramer**, H. Sharma, I. Adibnazari, J. Cervera-Torralba, M. Tolley

Neural Expectation–Maximization for Learning and Control of Actuated Nonlinear Dynamics under Partial Observation

S. Rajkumar, S. Narayanan, S. Otto, ***D. Goswami**

Parameter-Varying Control Using Reinforcement Learning

***L. Meena**, M. Han Veiga, X. Liu

A Digital Twin for the Optimal Treatment of Occluded Carotid Arteries

R. Ashraf, D. Oberio, G. d'Inverno, ***M. Tezzele**, A. Veneziani, G. Rozza**MS008D - Computational Damage and Fracture Mechanics IV****Main Organizer:** Prof. Michael Brüning (University of the Bundeswehr Munich)**Chaired by:** Dr. Larissa Driemeier (University of São Paulo)

A Spatio-Temporally Adaptive Phase Field Model of Dynamic Fracture using Asynchronous Variational Time Integration

***D. Jadhav**, D. Phansalkar, W. Dornisch, K. Weinberg, M. Ortiz, S. Leyendecker

Fourth Order Phase Field Modeling of Impact Induced Fracture Using Eulerian SPH

***V. Singh**, M. Islam

Non-local damage model for 3D woven composites exhibiting size effect

***A. Montazel**, F. Laurin, J. Rannou, S. Mousillat, J. Yvonnet

Nonlocal Continuum Modelling of Impact Response in Ductile Solids

***A. Kaithavalappil**, S. Sarkar

An Anisotropic and Gradient-Enhanced Damage Model for High-Cycle Fatigue

K. Feike**, P. Kurzeja, J. Mosler**MS157D - Computational Fluid Dynamics (CFD) and Fluid-Structure Interaction (CFSI): Methods Development and Applications IV*Main Organizer:** Dr. George Moutsanidis (Rutgers University)**Chaired by:** Dr. George Moutsanidis (Rutgers University)

A Data-Assimilated FSI Framework for Pulmonary Artery Banding in Neonates

***Y. Wang**

The Impact of Vessel Tortuosity and Hemodynamic Forces on Mechanical Thrombectomy Outcomes

***N. Ruseckaite**, A. Ashok, T. Matys, Y. Joshi, R. Mudkavi, G. Toumbas, J. Kaggie, N. Evans, S. Singh-Gryzbon

Assessing Thin-Gap Assumptions for Soft Particle Deformation in Microfluidic Extensional Flows

***B. Kaya**, M. Zakhari, M. Abdelmalik

Finite Volume Mesh-Tying Applied to Transitional Flows in Rotor-Stator Configurations

K. Karimian**, F. Sewerin**MS054C - Kernel Approximation Methods III*Main Organizer:** Dr. Rüdiger Kempf (University Bayreuth)**Chaired by:** Dr. Rüdiger Kempf (University Bayreuth), Dr. Helmut Harbrecht (University of Basel)Sampling Inequalities for Tensor Product Sobolev Spaces **Keynote*****H. Wendland**

Kernel-based Interpolation of Manifold-Valued Functions

***D. Fischer**, H. Wendland

Kernel-based Bayesian Inference for Paleo-Climate Reconstruction

K. Shaju, N. Hirsch, T. Laepple, ***P. Zaspel**

Multilevel Solution Procedure for Oversampled RBF-FD

***B. Mavri?**, T. Kandu?, T. Dobravec, K. Tr?ek, L. Kos, E. Larsson

New representations for positive definite (spherical) kernels

S. Hubbert, ***J. Jäger**

Fri, 24/07/2026 11:30 - 13:00

ICM - 5

MS100F - New Trends in Topology Optimization VI

Main Organizer: Prof. Emilio Silva (University of Sao Paulo)

Chaired by: Prof. Shinji Nishiwaki (Kyoto University), Prof. Emilio Silva (University of Sao Paulo)

A density-based topology optimization on a deformable triangular mesh

K. Jung, ***D. Kim**

Development and Topology Optimization of a Sandwich Leaf Spring for Heavy Commercial Vehicles

***E. Miorelli Rech**, I. Iturrioz, D. de Leon

A Concurrent Material-Structure Optimization Framework for Bone Remodelling Across Hierarchical Scales

A. Modak, A. Sau, R. Chowdhury, ***T. Gangwar**

Multi-objective topology optimization of geotechnical structures using the floating projection method

***A. Siqueira**, X. Huang, J. Labaki

Differential Evolution-based Topology Optimization of Turbulence Using End-Constrained Spline Curves with Variable Width

***S. Mineno**, T. Sasaki, K. Furuta, K. Izui, S. Nishiwaki

Fri, 24/07/2026 11:30 - 13:00

ICM - 11a

MS219C - Multifidelity and Multilevel Surrogates in Uncertainty Quantification III

Main Organizer: Prof. Francesca Bonizzoni (Politecnico di Milano)

Chaired by: Mr. Fabio Nobile (École Polytechnique Fédérale de Lausanne (EPFL)), Prof. Francesca Bonizzoni (Politecnico di Milano)

Multilevel randomized quasi-Monte Carlo estimator for nested integration

A. Bartuska, A. Carlon, L. Espath, ***S. Krumscheid**, R. Tempone

Shape Uncertainty Quantification for Partial Differential Equations on Moving Domains

D. Lombardi, ***L. Scarabosio**

RANS-LES Jet Flow Predictions using Multi-Fidelity Autoencoders

E. Saetta, M. Massa, R. Tognaccino, ***G. Iaccarino**

Adaptive Multifidelity Gaussian Process Surrogate Model with Applications in Aeroelastic Flutter Uncertainty Quantification

***G. Lu**, A. Fereidooni, A. Grewal, M. Yano

Fri, 24/07/2026 11:30 - 13:00

ICM - 11b

MS221B - Modelling, Simulation, and AI for NDT and SHM II

Main Organizer: Dr. Fangsen Cui (Institute of Advanced Intelligence and Computing, Agency for Science, Technology and Research)

Chaired by: Dr. Menglong Liu (Harbin Institute of Technology (Shenzhen)), Dr. Fangsen Cui (Institute of High Performance Computing (IHPC), Agency for Science, Technology and Research (A*STAR))

Computation of Leaky Modes of Guided Wave in Open Waveguides Using the SAFE-PML Method **Keynote**

***M. Liu**, X. Wang, F. Cui

Frequency-Domain Machine Learning for Bolt-Loosening Detection in Offshore Wind Jacket Structures Using Windowed Vibration Data

M. González Niño, O. Sierra-Herrera, ***J. León-Medina**, W. Pineda Muñoz, F. Pozo Montero

Configuration Reconstruction of Assembled System of Flexible Modules based on Substructural Modes

***Y. LIN**, K. Luo, Q. Tian

High-Fidelity Reconstruction of Tunnel Profiles for Deformation Measurement: A 3D Laser Scanning System

K. Gu, X. Liu, B. Cao, ***Z. Liu**

MeshGraphNet-Transformer: Scalable Mesh-Based Learning for Solid Mechanics Simulations

***M. M Iparraguirre**, I. Alfaro, D. Gonzalez, E. Cueto

Fri, 24/07/2026 11:30 - 13:00

ICM - 12a

MS189B - Multiphysical modeling and characterization of ferroelectric materials – state of the art and new challenges II

Main Organizer: Dr. Felix Sutter (Physik Instrumente (PI) SE & Co. KG)

Chaired by: Dr. Felix Sutter (Physik Instrumente (PI) SE & Co. KG)

Data-Driven Modeling of Nonlinear Ferroelectric Behavior Using Micromechanics-Based Multiscale Models with Internal Variables

***A. Warkentin**, S. Hildebrand, S. Klinge, A. Ricoeur

Mixed Finite Element Methods for Simulating the Ferroelectric Polarization Process

***A. Pechstein**, A. Humer, M. Krommer

Parametrization of Ferroelectric Phase-Field Model based on Static and Dynamic Atomistic Simulation Data

***F. Wendler**, X. Wang, X. Tan, M. Zaiser, H. Azuma, T. Ogawa, R. Kobayashi, M. Uraganase, T. Tsuzuki, S. Ogata

Structural insights through phase-field simulations on ferroelectrics

***M. Hinterstein**, L. Fan, D. Schneider

Analytical and Phase-Field Study of Anomalous Electromechanical Behaviors in NBT--xST

***Y. Zhou**, K. Wang, B. Xu

3D Simulation of Niobium-based Ferroelectric Materials with Precipitation Hardening

***M. Bohnen**, R. Müller

Fri, 24/07/2026 11:30 - 13:00

ICM - 12b

MS218B - Structure preserving numerical methods for nonlinear hyperbolic systems II

Main Organizer: Dr. Vincent Perrier (INRIA)

Chaired by: Dr. Vincent Perrier (INRIA)

Semi-Lagrangian methods for a plasma hybrid model with multi-species kinetic ions and massless electrons

***Y. Li**, P. Morrison, E. Sonnendruecker

An Energy- and Charge-Conserving 5-moment Fluid Plasma Model

***B. Reuter**, C. Logemann, E. Cyr, G. Yalla

High-Order Structure Preserving Hybrid Methods for Compressible MHD

***F. Fambri**, E. Sonnendrücker

An IMEX CG/DG approach for the simulation of plasma turbulence

A. Buffa, ***V. Carlier**, M. Picasso, M. Renoldner, P. Ricci

Fri, 24/07/2026 11:30 - 13:00

ICM - 13a

MS088E - Advanced Multi-physics CFD Simulations in Science and Engineering V

Main Organizer: Prof. Takahiro Tsukahara (Tokyo University of Science)

Chaired by: Prof. Ryo ONISHI (Institute of Science Tokyo), Prof. Takahiro Tsukahara (Tokyo University of Science)

Investigation of Powder Flight Behavior in Direct Energy Deposition Using Large-Eddy Simulation: Substrate and Inflow Effect

***Z. Yeh**, Y. Lai, Y. Chou

Characterisation of an Ionic-Wind Propulsion System in a Free Air Stream

***M. Stenech**, J. Aigner, T. Hofer, G. Brenn, C. Irrenfried

Hybrid Inference on Heterogeneous Architectures for ANN Chemistry Surrogate Modeling in Reactive CFD

***N. Eckel**, F. Orland, T. Karpowski, A. Scholtissek, C. Terboven, C. Hasse

Effects of Disturbances on Flow Transition over the Swept NLF(2)-0415 Airfoil: Combined DNS and NPSE Analysis

***K. Tamazaki**, T. Ishida, K. Ohira, T. Tsukahara, N. Tokugawa

Far-Field Real-Gas Effects in Cryogenic Hydrogen Jets: Validation with a Double-Flux LES Solver

***N. Kourvisianou**, J. Karpowski, A. Miro, D. Mira, M. Soria, C. Hasse

Heat Transfer Characteristics of Jet Impingement on a Rib-Roughned Flat Plate

***R. D'Addio**, A. Mezzacapo, G. De Stefano

Fri, 24/07/2026 11:30 - 13:00

ICM - 13b

MS095D - Advances and Challenges in Phase-Field Modeling and Computations IV

Main Organizer: Prof. Fadi Aldakheel (Leibniz Universität Hannover)

Chaired by: Prof. Jörg Schröder (University Duisburg-Essen), Prof. Fadi Aldakheel (Leibniz Universität Hannover)

A Dual Phase-Field Framework for Coupled Stress Corrosion Cracking and Fatigue in Metallic Materials

***G. Kenjo**, M. Gopakumar, A. Tragoudas, A. Baktheer, F. Aldakheel

The influence of water content on the dynamic fracture of hydrogels

R. Lin, J. Wang, ***S. Zheng**

Hydro-mechanical phase-field modeling of fluid-driven fracture in diamond-olivine systems: Reassessing the role of time-dependent inelastic deformation

***B. Puhon**, M. Alvaro, A. Patton, M. Mazzucchelli, A. Reali, S. Morganti

Fire-Structure Interaction: Toward a Hybrid Coupled Simulation Using Phase-Field for Unreinforced Concrete Under Fire

***C. Kandekar**, A. Palani, M. Breuer, W. Weber

From creep testing to structural response: phase-field modeling of polymer fibre-reinforced concrete

***M. Margalho de Barros**, O. Taheri, G. Gebuhr, D. Brands, S. Anders, J. Schröder

Working towards a modular, fully-coupled phase field fracture model integrating elasticity, plasticity, and damage

***C. Nataraj**, A. Stershic

Fri, 24/07/2026 11:30 - 13:00

ICM - 14a

MS316A - Fundamental Concepts in Scientific ML I

Main Organizer: Prof. Arif Masud (University of Illinois Urbana-Champaign)

Chaired by: Prof. Arif Masud (University of Illinois Urbana-Champaign), Prof. Assad Oberai (University of Southern California)

Smoother or rougher: how to generate data to learn operators? **Keynote**

*Y. Yu, J. Wang, F. Lu

Operator Learning for Inelastic Homogenization

K. Bhattacharya, *L. Cao, G. Stepaniants, A. Stuart, M. Trautner

Hyperbolic State-Space Models for Hierarchical Representation Learning

S. Patil, A. Pandey, I. Koutis, *M. Xu

Automatic discovery of optimal meta-solvers via multi-objective optimization

Y. Lee, S. Liu, *J. Darbon, G. Karniadakis

State-dependent temperature control in Langevin diffusions using numerical exploratory Hamiltonian-Jacobi-Bellman equations

T. Wang, X. Li, G. Wang, *Z. Zhang

Fri, 24/07/2026 11:30 - 13:00

ICM - 14b

MS154C - The Next AI Frontier: Physics-Informed Models, LLMs, and HPC III

Main Organizer: Dr. M. Giselle Fernández-Godino (Lawrence Livermore National Laboratory)

Chaired by: Dr. M. Giselle Fernández-Godino (Lawrence Livermore National Laboratory), Prof. Christian Gogu (ISAE-SUPAERO, ICA)

Some Advances in Foundation Models for Physics **Keynote**

E. Lawrence, M. Rautela, S. Mansingh, J. Amarel, A. Most, R. Arnab, A. Mohan, G. Kunde, B. Migliori, E. Casleton, B. Love, A. Biswas, D. Oyen, *N. DeBardeleben

Advancing LLM-Based Expert Systems for Specialized Domain Knowledge

*Y. Chen

Bridging the Semantic Gap in Open RAN: A Hybrid Retrieval-Augmented Generation Framework for Dual-Domain 5G Engineering

*D. Marlambekov, A. Mukhanbet, Y. Nurakhov

Predicting Casting-Induced Shape Distortion Using Hybrid Physics-Informed Neural Networks in Low-Pressure Die Casting

S. Adhikari, *G. Noorsumar, D. Mortensen, T. Celik, R. Babaei

Exploring the Effect of Draft Distribution in Physics-Informed and Knowledge Guided Neural Networks for Vessel Power Prediction

*O. Bourchas, N. Silionis, K. Anyfantis, G. Papalambrou

Fri, 24/07/2026 11:30 - 13:00

ICM - 14c

MS133D - Data-Driven Design of Materials – from Performance to Sustainability IV

Main Organizer: Prof. Markus Kästner (TU Dresden)

Chaired by: Ms. Alexandra Otto (Dresden University of Technology)

From Properties to Structure: Data-Driven Insights for Inverse Materials Design

*M. Kästner, A. Otto, A. Raßloff, M. Rosenkranz, T. Schneider

Uncertainty-Aware Inverse Design of Architected Spinodoid Materials via Bayesian Optimization and Inversion

*M. Chiappetta, M. Carraturo, A. Raßloff, M. Kastner, F. Auricchio

Composite Bayesian Optimisation for Inverse Problems and Design of Materials and Structures

*R. Cardoso Coelho, F. Andrade Pires

TextureFlow: Learning Crystallographic Texture via Normalizing Flow on SO(3) Manifold

*G. Nimmal Haribabu, T. Ramgopal, S. Kumar

Data-Driven Quantification and Tessellation-Based Modeling of Anisotropy in Polycrystalline Alloys

*L. Schröder, U. Aziz, A. Safi, L. Fuchs, U. Suhuddin, B. Klusemann, V. Schmidt

Ultra-efficient stochastic reconstruction of multiscale porous media using transdimensional generative networks

*J. Chen, H. Yu

Fri, 24/07/2026 11:30 - 13:00

ICM - B11

MS094D - Integrating Experimental Data and Computational Models in Biomechanics IV

Main Organizer: Dr. Silvia Hervas-Raluy (Technical University of Munich)

Chaired by: Dr. Sebastian Brandstaeter (University of the Bundeswehr Munich), Dr. Silvia Hervas-Raluy (Technical University of Munich)

Multiscale Graph-Informed Mechanochemical Modeling of Vascular Inflammation **Keynote**

A. Mastrofini, *M. Marino

From a reduced-order model to reliable digital twins - a modeling framework for cirrhotic hemodynamics

*F. Schäfer, P. Varsos, C. Ripoll, N. Golse, I. Vignon-Clementel

Biomechanical Characterization of the Effect of Intermittent Hypobaric Hypoxia on Rodent Carotid Arteries

*F. Montecinos, C. García, A. Valencia

Meso-Structural Characterization and Modeling of Arterial Tissue Subjected to intermittent hypobaric Hypoxia

*C. C. Pozo, C. García-Herrera, F. Álvarez-Carrasco, Á. Navarrete, D. Celentano, E. Alberto Fancello, V. Cornejo, E. Herrera

Improved In Vivo Arterial Stiffness Estimation

*L. Virag

Fri, 24/07/2026 11:30 - 13:00

ICM - B12

MS137A - Recent Advances in Numerical Methods for Mixed-Dimensional PDEs I

Main Organizer: Phd. Oriol Colomés (Delft University of Technology)

Chaired by: Phd. Oriol Colomés (Delft University of Technology)

Unified Mixed-Dimensional Beam-Shell-Solid Modelling in Finite Cosserat Elasticity Via TDC

***A. Sky**

Computational Modeling of Cell Migration in a Viscous Fluid Using Unfitted Finite Element Methods

***M. Gatti**, E. Neiva, H. Turlier

A Novel ALE Finite Element Formulation for Frictionless Beam-to-Solid Contact via Kinematic Mesh Control

***T. Yamada**

Fri, 24/07/2026 11:30 - 13:00

ICM - B13

MS235B - Advances in high-order discretization methods and reduced-order models for complex engineering systems II

Main Organizer: Dr. Michele Giuliano Carlino (ONERA/INRIA)

Chaired by: Dr. Michele Giuliano Carlino (ONERA/INRIA), Prof. tommaso taddei (Sapienza University of Rome)

Non linear model order reduction for the prediction of environmental flows

***G. Stabile**

An online spatio-temporal adaptive reduced basis element method for parameterized component-based nonlinear dynamical systems

***M. Ebrahimi**, M. Yano

Dynamical Reduced Order Approximation of Wasserstein Gradient Flows

***I. Gonnella**, F. Pichi, R. Bailo, O. Mula, G. Rozza

Development of a Primal Substructuring–Based Method Using Reduced-Order Models for Selected Components of an Assembly Structure

***T. Miyamura**, Y. Yusa, T. Saito

Data-Driven Adaptive Gradient Recovery for Unstructured Finite Volume Computations

***G. de Romémont**, F. Renac, F. Chinesta

Fri, 24/07/2026 11:30 - 13:00

ICM - B21

MS123C - Chemo-Mechanical Coupling Phenomena in Solids III

Main Organizer: Prof. Thomas Antretter (Montanuniversität Leoben)

Chaired by: Prof. Ernst Kozeschnik (TU Wien), Prof. Bjoern Kiefer (TU Bergakademie Freiberg)

Variational Formulations and Computational Frameworks for Chemo-Mechanical Coupling in Solids

***B. Kiefer**, S. Roth, S. Prüger

Linking Molecular-Scale Shear Transformations to STZ Continuum Models in Epoxy Thermosets

***M. Schramm**, J. Torgersen, C. Krempaszky

Coherent Phase Transitions in Solids: Continuum Mechanics Models

***N. Madeiros**, F. Duda, A. Souza

Mechanical Read-out of Chemo-Driven Microstructure Evolution: In-situ Kinetics of Precipitation and Static Recrystallization via Elastic Moduli

***T. Obermayer**, C. Krempaszky, E. Werner

Modelling the Solute-Defect Interaction in Metals and its Application to Grain Boundary Segregation

Y. Shan, L. Solyom, P. Retzl, ***E. Kozeschnik**

Reproducing Biological Catch Bonds in Simple Newtonian Mechanical Systems

***K. Dansuk**

Fri, 24/07/2026 11:30 - 13:00

ICM - B22

MS197A - Advances in Modeling Damage, Fracture, and Multiphysics I

Main Organizer: Dr. Mostafa Mobasher (New York University Abu Dhabi)

Chaired by: Dr. Mostafa Mobasher (New York University Abu Dhabi), Prof. Lampros Svolos (University of Vermont)

On the Origin of Crack Bifurcation in Dynamic Brittle Fracture

***S. Kumar**, A. Udupa

The Explicit Nonsmooth Newmark- γ Scheme for Dynamic Fragmentation Simulations

***T. Ghesquière-Diéricks**, G. Anciaux, V. Acary, J. Molinari

3D XFEM for fluid-driven fracturing of layered anisotropic rock

***X. Chen**, H. Yu

Deciphering the Interplay Between Wetting and Chemo-Mechanical Fracture in Lithium-Ion Battery Cathode Materials

***W. Chen**, S. Banerjee, B. Xu

Fri, 24/07/2026 11:30 - 13:00

ICM - 21a

MS164A - Computational geomechanics, geophysics and geohazards I

Main Organizer: Dr. Yunteng Wang (Universitat fur Bodenkultur Wien)

Chaired by: Dr. Yunteng Wang (Universitat fur Bodenkultur Wien), Prof. Zhennan Zhang (Shanghai Jiao Tong University)

A Fully Coupled THMC Numerical Framework for CO₂ Mineral Sequestration: A Case Study of Basalt Formations in the Shanghai Region

***H. Zhang,** F. Zhang, W. Ouyang

Analysis of the Failure Mechanism of Sandy Bed Soils due to Pipeline Leaks using a LES-DEM method

***S. Avendaño**

Deviatoric-Plane Strength and Controlling Mechanisms of Layered Rock Masses with Persistent Bedding

***X. Wei,** W. Cai, H. Zhu, W. Liang

The peridynamic Cam-clay model for strain localization in geomaterials

***J. Liu,** Y. Wang, W. Wu

Fri, 24/07/2026 11:30 - 13:00

ICM - 21b

MS124A - Advanced Methods for High-Fidelity Digital Twins I

Main Organizer: Prof. Roland Wüchner (Technical University of Munich (TUM))

Chaired by: Prof. Roland Wüchner (Technical University of Munich (TUM)), Dr. Ihar Antonau (Technical University of Munich)

Determining Weaknesses in Structures from Fiber-Optic Measurement Devices

***R. Lohner,** T. Ansari, H. Antil, S. Warnakulasuriya, I. Antonau, R. Wuechner

Variational Design Sensitivity Analysis for Gradient-Enabled Digital Twins: A Practical Framework

***J. Liedmann**

Numerical benchmarks for High-Fidelity Digital Twins: damage localization

***I. Antonau,** S. Warnakulasuriya, T. Ansari, R. Löhner, H. Antil, R. Wüchner

Between Computational Efficiency, High Fidelity and Optimal Model Complexity for Digital Twins in Neurology

***X. Kobeleva**

Virtual sensing of coupled interior/exterior vibro-acoustic systems

***Y. Cai,** E. Deckers

Optimal Sensor Placement for Damage Localization in High-Fidelity Digital Twins: Development of Benchmark Scenarios

***S. Warnakulasuriya,** I. Antonau, T. Ansari, R. Löhner, H. Antil, R. Wüchner

Fri, 24/07/2026 11:30 - 13:00

ICM - 22a

MS238C - Mechanics of Soft Solids: Perspectives on Inelasticity and Failure III

Main Organizer: Dr. Miguel Angel Moreno-Mateos (Friedrich-Alexander-Universität Erlangen-Nürnberg (FAU))

Chaired by: Dr. Michele Terzano (Graz University of Technology), Dr. Franz Dammass (TU Dresden)

Modeling Hygro-Thermo-Mechanical Degradation of Adhesive Bonds

***M. Rodschi,** G. Possart, J. Mergheim

Efficient Modelling of Rubber Fracture Combining Phase-Field and Neural Networks

***F. Dammaß,** K. Friedrichs, K. Kalina, M. Kästner

A Phase-field Approach to Thrombus Fracture

***A. Ruzzier,** K. Bein Snee, P. McGarry, F. Gijzen, B. Fereidoonzhad

From Softening to Stiffening: Rupturing a Generalized Mooney-Rivlin material

***R. Lazo-Molina,** M. Adda-Bedia, M. Pundir, D. Kammer

Fri, 24/07/2026 11:30 - 13:00

ICM - 22b

MS096B - Uncertainty Quantification in Materials Science and Computational Mechanics II

Main Organizer: Dr. Florent Pled (Univ Gustave Eiffel)

Chaired by: Dr. Gabriele La Valle (Université Gustave Eiffel, MSME UMR 8208), Dr. Florent Pled (Univ Gustave Eiffel)

Uncertainty Quantification Framework for Multiscale Simulations of Short Fiber Reinforced Polymers

***V. Hauschel,** J. Kaiser, A. Rodriguez Sanchez, T. Böhlke

Uncertainty Quantification of Effective Material Properties in Three-Dimensional Carbon/Carbon Composite Models

***B. Fric,** J. Kauffman, M. Cagle, B. Wasistho

Uncertainty Quantification and Inverse Identification for Virtual Testing of Plate-Based Wood Furniture under Static Loading

***F. Pled,** Z. Chen, L. Chevalier, E. Launay

Statistical Modeling and Uncertainty Quantification of Laser Micromachining of WC-Metal and DLC Coatings on Steel Substrate

***J. Pietraszek,** N. Radek, R. Dwornicka, A. G?dek-Moszczak

Uncertainty Quantification Sampling Approaches for Heat Transport in Groundwater

***A. Melchinger,** M. Schulte

Fri, 24/07/2026 11:30 - 13:00

ICM - 41 (Ostersee A)

MS036A - Integration of Computational Tools for Materials Innovation, Characterisation, Modelling, and Manufacturing I

Main Organizer: Prof. Eric Li (Teesside University)

Chaired by: Prof. Eric Li (Teesside University), Dr. Yi WU (University of Science and Technology Beijing)

Micromechanical finite element modelling of cold compaction in Zr-Nb powder mixtures

***D. Ben-Shabat**, R. Shneck, E. Priel

An Integrated Design Approach for Rim-Driven Motor-Rotors and Impeller-Machinery Based on Closed Impellers

***C. JIANG**, Z. TONG, X. YAO, J. XU, A. WANG

Geometric-algorithmic Generation of Dense 3D Curved Fiber Composites

***D. Ngouloubi**

Dynamic Topology Optimization of Rate-Dependent Elastoplastic Structures

***Z. Wang**, Y. Wu, B. Liu

From Bio-Inspired Hierarchy to Self-Similar Thin-Walled Tubes: Computational Crashworthiness Design and Optimisation

***Y. Zhang**

Fri, 24/07/2026 11:30 - 13:00

ICM - 42 (Ostersee B+C)

MS395B - Advanced Structure-preserving Moment Methods and Numerics of Kinetic Equations II

Main Organizer: Dr. Qian Huang (Universidad Carlos III de Madrid)

Chaired by: Prof. James Rossmann (Iowa State University)

A shallow water moment model in local curvilinear coordinates

***S. Valiente Ávila**, C. Caballero Cárdenas, I. Gómez Bueno, T. Morales de Luna

A Finite Element Method for Linearized Regularized 13-Moment Equations

***Z. Cai**

A Coupled IMEX Domain Decomposition Method for High-Order Time Integration of Stiff Boltzmann-type Equations

***T. Tenna**, D. Caparello

Solving Random Hyperbolic Conservation Laws Using Linear Programming

***S. Chu**, M. Herty, M. Lukacova-Medvidova, Y. Zhou

Numerical Stability of Hermite moments system coupled to the Poisson equation.

***S. Dupuy**, A. Alvarez Laguna, T. Pichard

H^m Non-Conforming Finite Element Spaces on Polygonal Meshes in Arbitrary Dimensions

L. Chen, X. Huang, ***Y. Sun**, S. Tian

Fri, 24/07/2026 11:30 - 13:00

ICM - 43 (Eibsee)

MS241A - Mortar Methods for Coupling Non-Conforming Grids in Multi-Physics and Multi-Domain Simulations I

Main Organizer: Dr. Andrea Franceschini (University of Padova)

Chaired by: Dr. Andrea Franceschini (University of Padova), Prof. Massimiliano Ferronato (University of Padova)

On the Simulation of Rotating Devices using the Mortar Element Method and a Coupled Continuous-Discontinuous Galerkin Formulation

***B. Campos**, P. Munch, V. Oliveira Ferreira, B. Blais

A Coupled Mathematical and Numerical Model for Protein Spreading and Tissue Atrophy applied to Alzheimer's Disease

***V. Pederzoli**, M. Corti, D. Riccobelli, P. Antonietti

A Parallel SEM-DRM Model in SPEED for Seismic Soil-Structure Interaction with Realistic Topographies

***S. Brunati**, I. Mazziere

A Structural-Based Mortar Method using the Arlequin Framework for Non-Matching Meshes

***D. Portillo**, N. Rossi, I. Romero

Exploring Mortar-Inspired Feature-Weighted Immersed Coupling for Fluid-structure Interaction with Sharp Features

***G. Marchi**, H. Yang, P. Zulian

Quantitative Tracking and Constitutive Analysis of Multi-domain Dynamics in Epitaxial PZT Thin Films under Substrate Clamping

***X. Sun**, N. Zhang, S. Kweon, Y. Liu, I. Kanno

Fri, 24/07/2026 11:30 - 13:00

ICM - 44 (Schliersee)

MS329A - Mechanics of Entangled Networks: Woven, Knitted, Knotted, Polycatenated, and Fibrous Materials I

Main Organizer: Mr. Elias Pesciulli (ETH Zurich)

Chaired by: Mr. Elias Pesciulli (ETH Zurich), Mr. Raymond Lennon (Massachusetts Institute of Technology)

Topological Mechanics of Entangled Polymer Networks

J. Huang, J. Liu, ***S. Lin**

Finite-deformation fracture of truss architected networks under impact loading

S. Kota, S. Kumar, ***B. Giovanardi**

A Quantitative Comparison of Modeling Approaches for Truss Metamaterials

***B. Tallapragada**, S. Kumar, B. Giovanardi

Geometric quantification for nonlinear deformation in knitted fabrics

***X. Ding**, G. Choi

Fri, 24/07/2026 11:30 - 13:00

ICM - 31 (Zugspitze)

MS025A - Numerical Analysis of Lightweight Composite Structures: Classical Computational Approaches and Novel AI-based Strategies I

Main Organizer: Dr. Giovanni Zucco (University of Limerick)

Chaired by: Dr. Giovanni Zucco (University of Limerick), Dr. Rainer Groh (University of Bristol)

Stroh-Trefftz finite element method for boundary-value problems of anisotropic elastic solids

***C. Hwu**, C. Tao, J. Hsu

Thermally-induced nonlinear bifurcation of temperature-dependent variable-angle-tow composite structures with cutouts via robust isogeometric analysis framework with path-following and branch-switching

***X. Chen**

Buckling Characteristics of the Variable Stiffness Cylindrical Shells Under Impulsive Loads

***Y. Guo**

Coupled Stretching-Bending-Torsional Analysis with Warping Effect of Composite Beams

***Y. Wei**, C. Hwu

Fri, 24/07/2026 11:30 - 13:00

ICM - 32 (Watzmann)

MS384A - Novel Insights and Practical Advances in Boundary Element Methods I

Main Organizer: Dr. Toru Takahashi (Nagoya university)

Chaired by: Dr. Toru Takahashi (Nagoya university)

An Arbitrary Polygonal Hole in Anisotropic Magneto-Electro-Elastic Media: Analytical Solutions and Boundary Element Analysis

***Y. Chuang**, C. Hwu

Inverse Laplace-Domain Boundary Element Analysis of Non-Fourier Bioheat Transfer for Thermal-Dose-Controlled Focused Ultrasound Neuromodulation

***M. Fahmy**

2D Pure Anti-Plane Anisotropic Elastic Wave Scattering Using PINNs and Validation by the Boundary Element Method

***T. Saitoh**, A. Furukawa

Fri, 24/07/2026 11:30 - 13:00

BrainLab - Auditorium

MS378A - Isogeometric Methods I

Main Organizer: Prof. Trond Kvamsdal (Norwegian University of Science and Technology (NTNU))

Chaired by: Prof. Trond Kvamsdal (Norwegian University of Science and Technology (NTNU)), Prof. Giancarlo Sangalli (University of Pavia, Italy)

Isogeometric analysis with lattice hierarchical B-splines [Keynote](#)

C. Bracco, ***C. Giannelli**, T. Kandu?, H. Verhelst

Adaptive Isogeometric Analysis of the Cahn--Hilliard Equation with THB-splines

***L. Venta Viñuela**, H. Verhelst, A. Mantzaflaris, C. Giannelli, A. Reali

Integration of Adaptive Re-parametrization and Isogeometric Shape Optimization for Complex Single-patch Shells

***L. Nikoli?**, I. Marini?-Kragi?, Ž. Lozina

Collocation Points for Optimal-Order Convergence in Isogeometric Analysis

***M. Belardo**, F. Calabrò

A Spline-Based Stress Function Technique for Efficient Solid Mechanics Solutions

***F. Key**, L. Freinberger

Fri, 24/07/2026 11:30 - 13:00

NM - 1 (Multimedia Saal)

MS063D - Neural Network Solvers for PDEs: Bridging Theory and Practice in Scientific Computing IV

Main Organizer: Dr. Jooyoung Hahn (Czech Technical University in Prague / Faculty of Nuclear Sciences and Physical Engineering)

Chaired by: Dr. Jooyoung Hahn (Czech Technical University in Prague / Faculty of Nuclear Sciences and Physical Engineering), Dr. Alexander Heinlein (TU Delft)

Neural Surface Reconstruction from Raw Point Clouds

***M. Kang**

Reducing Requirements on Data by Incorporating Structure

***B. Brantner**, T. Tyranowski, M. Kraus

Nonlinear Variational Integrators

***Z. Li**, M. Kraus

Neural Oscillator for Improving Generalization in Physics-Informed PDE Solvers

***T. Kapoor**

Neural Network-Based Singularity Detection and its Application to the Solution of PDEs

***N. Derevianko**, I. Kevrekidis, F. Dietrich

Pareto Trade-offs in Physics-Constrained Generative Modeling

***G. Baldan**, Q. Liu, N. Thuerey

Fri, 24/07/2026 11:30 - 13:00

NM - 2 (Salzburg)

MS209B - Adaptive Physics-Aware Models for Engineering Decision Support II

Main Organizer: Dr. Konstantinos Vlachas (ETH ZURICH)

Chaired by: Dr. Konstantinos Vlachas (ETH ZURICH), Dr. Rui Zhang (ETH zurich)

Design Choices in Physics-Informed Neural Networks for Inverse Problems in Structural Dynamics

R. Sai-Obodai, B. Afutu, ***R. Zhang**, E. Chatzi

Physics-Informed Inverse Learning for Drive-By Bridge Damage Localisation and Quantification

***E. Atroshchenko**, M. Makki Alamdari

Exploring Test-Time Reduced Order Model Adaptation for Response Prediction in Changing Environments

***K. Vlachas**, E. Chatzi

Large Engineering Models: Data-driven Simulators for Injection Moulding, Power Transformers and Hypersonic Flows

***S. Kaltenbach**

Eco-Routing in Urban Networks: A Comparative Study of A* and Dijkstra on Ecology-Aware and Fastest Objectives

***F. Siratuti**, H. Marques

Fri, 24/07/2026 11:30 - 13:00

NM - 4 (Hamburg)

MS205B - Computational Material Design Via Mechanics or Machine Learning Approaches II

Main Organizer: Dr. Wei Tan (Queen Mary University of London)

Chaired by: Dr. Ajit Panesar (Imperial College London), Dr. Wei Tan (Queen Mary University of London)

Generative AI for materials design at multiple scales

***X. Zheng**

Computational Design of Bioinspired Structures for Customized Multifunctional Performance

***J. Fu**, X. Zhuang, W. Tan

Data-Driven Multiscale and Multi-Material Topology Optimisation of Graded Lattice Structures

***X. Yu**, A. Panesar

Multi-Fidelity Data-Driven Design of Lattice Structures via Transfer Learning

***X. Peng**, B. Xu

Fri, 24/07/2026 11:30 - 13:00

NM - 5 (KK)

MS022A - Advanced Physics-based and Data-driven Modeling for Biomedical Digital Twin I

Main Organizer: Dr. Dongwei Ye (Xi'an Jiaotong-Liverpool University)

Chaired by: Dr. Elena Zappon (Medical University of Graz), Dr. Yidan Xue (The University of Manchester)

Optimization Strategies Comparison for ECG-Based Ventricular His-Purkinje Root Node Inference

Keynote

***G. García-Isla**, S. Perez-Herrero, J. Sánchez, J. Saiz, G. Plank, E. Zappon

A Synthetic 3D Biatrial Benchmark for Validating Anisotropic Conduction Estimation

***S. Appel**, T. Gerach, C. Barrios Espinosa, C. Wieners, A. Loewe

From Perlin Noise to SPDEs: a stochastic framework for modeling fibrotic heterogeneity in cardiac tissue

***E. Ottavi**, E. Zappon, V. Goncalves Marques, U. Schotten, S. Pezzuto

Meshless, Shape-Aware Surrogate Models for Cardiac Mechanics

***D. Carrara**, M. Hirschvogel, F. Bonizzoni, S. Pezzuto, F. Regazzoni, S. Pagani

Bayesian Parameter Inference and Uncertainty-Informed Sensitivity Analysis in a 0D Cardiovascular Model for Intraoperative Hypotension

***J. Thiel**, M. Zlicar, U. Steinseifer, B. Kirn, M. Neidlin

Fri, 24/07/2026 11:30 - 13:00

NM - 3 (BB)

MS149A - Uncertainty, Monitoring & Physics-Enhanced Machine Learning in Computational Mechanics I

Main Organizer: Prof. Luca Rosafalco (Politecnico di Milano)

Chaired by: Prof. Andrea Manzoni (Politecnico di Milano), Prof. Attilio Frangi (Politecnico di Milano)

NF-SINDy for discovering partially or indirectly observed microsystems

Keynote

***L. Rosafalco**, A. Colombo, A. Frangi, ***A. Vizzaccaro**

PHDME: Physics-Informed Diffusion Models without Explicit Governing Equations

K. Tan, K. Givens, P. Li, ***T. Beckers**

Physics-Informed Neural Networks for Joint State and Parameter Inference in Nonlinear Dynamical Systems: Application to Microbial Community Dynamics

***L. Sala**

SRUKF for the Calibration of the Sensitivity in MEMS Accelerometers

L. Vergata, L. Rosafalco, A. Manzoni, ***A. Frangi**

Estimating beam boundary stiffness using a physics-informed neural network

***M. Brøns**, M. Alexander-Haywood, E. Chatzi

Fri, 24/07/2026 11:30 - 13:00

H4 - 1 (Ludwig)

MS139B - Optimization under Uncertainty II

Main Organizer: Dr. Oindrila Kanjilal (Georg Nemetschek Institute - AI for the Built World, TU Munich)

Chaired by: Dr. Charalampos Andriotis (Delft University of Technology), Prof. Daniel Straub (Technische Universität München)

Bayesian optimization for selecting risk reduction strategies

***M. Ruf**, D. Straub

Scalable reliability-based design optimization using stochastic surrogate models

***M. Moustapha**, J. Bel Houari-Durand, B. Sudret

Optimization of Ship Weight Distribution Considering Long-Term Risk

***T. Takami**, M. Kitahara, U. Nielsen

Topology-Aware Multi-Agent Reinforcement Learning for Scalable Infrastructure Management via Zero-Shot Graph Transfer

***G. Arcieri**, G. Duthé, L. Kalathiparambil Kennedy, L. Boggia, K. Papakonstantinou, D. Straub, E. Chatzi

Probabilistic ML-Based Inverse Design of Shape-Morphing Elements under Uncertainty

***S. Monchetti**, M. Betti, R. Brighenti

Fri, 24/07/2026 11:30 - 13:00

H4 - 2 (Leopold)

MS089E - Advanced Computational Modelling of Wood, Wood-Based Products, Biocomposites, and Timber Structures V

Main Organizer: Dr. Markus Lukacevic (TU Wien/CD-Labor Lukacevic)

Chaired by: Dr. Markus Königsberger (TU Wien), Dr. Markus Lukacevic (TU Wien/CD-Labor Lukacevic)

Acoustic analysis of wood cell structures

B. Yang, K. Gamstedt, ***M. Mousavi**

Permeability homogenization of wood: Experimental validation and utilization for assessing the infiltration capacity of delignified wood

***S. Scheiner**, M. Königsberger, C. Hellmich, J. Füssl

An orthotropic visco-elastic, orthotropic visco-plastic model with plasticity-induced evolution of orthotropy applied to flax fibres at finite strains

***M. Ulz**, C. Czibula, C. Celigoj

Deep Learning-Enhanced Continuum Micromechanics Framework for Nonlinear Homogenization of Wood-Based Biocomposites with Complex Inclusion Morphologies

***M. Lukacevic**, M. Schwaighofer, M. Königsberger, D. Kratzer, J. Füssl

Enabling High-Velocity Impact Resistance in Nacre-Like Ceramic-Metal Composites

***W. Raza**, K. Wu, Z. Wang, L. He, N. Yong

Age-Induced Disruption of Hierarchical Structure and Mechanical Gradients in Mouse Teeth

***X. Gu**, J. Chen, J. Zhou, S. Amini

Fri, 24/07/2026 11:30 - 13:00

H4 - 3 (Franz)

MS210A - Advances In The Design Of Architected Metamaterials I

Main Organizer: Prof. Maria Laura De Bellis (University of Chieti-Pescara)

Chaired by: Prof. Maria Laura De Bellis (University of Chieti-Pescara), Eng. Paolo Badino (University of Genoa)

Exploring Metamaterials for Mechanical and Acoustic Applications **Keynote**

***S. Morganti**, D. Castello, A. Bacigalupo, M. De Bellis, F. Auricchio

Impedance-valley architected material achieving energy-trap mechanism for impulse loading mitigation

***Y. Zhang**, Z. Yang, Z. Liu

Synthesis of a Fully Mechanical Stiffness-Tunable Chiral Waveguide for Controlled Bloch Wave Propagation

***C. Boni**, A. Bacigalupo

Elastic Wave Mode Conversion Exploiting Anisotropic Locally Resonant Metamaterials

***D. Faraci**, C. Comi

Spinodal Topology-Based Aperiodic Architected Materials: Mechanical Property Prediction, Inverse Design, and Applications

***Z. liu**

Fri, 24/07/2026 11:30 - 13:00

H4 - 4 (Alois)

MS106E - Advances in Model Order Reduction: Bridging Physics and Machine Learning V

Main Organizer: Dr. Youngsoo Choi (Lawrence Livermore National Laboratory)

Chaired by: Prof. NAWFAL BLAL (INSA Lyon), Dr. Youngsoo Choi (Lawrence Livermore National Laboratory)

Prior-Fitted Foundation Models: From PDE Solvers to Nowcasting

***Y. Hong**

Collocation-based model order reduction: analysis and applications

M. Carlino, ***A. Del Grosso**, A. Iollo, D. Sipp

Nonlinear approximation manifold by Collocation-based Reduced Order Model (cROM)

***M. Carlino**, A. Iollo

Discontinuous Galerkin Trefftz Methods and Model Order Reduction

***T. Born**, K. Urban

Selective Boundary Condition Reduction via Learned Error Gating

***D. Fernández**, D. Penk, D. Riedelbauch

Fri, 24/07/2026 11:30 - 13:00

H4 - 5 (Xaver)

MS005A - Vehicle-Bridge Interaction and Its Applications I

Main Organizer: Prof. Judy Yang (National Yang Ming Chiao Tung University)

Chaired by: Prof. Judy Yang (National Yang Ming Chiao Tung University), Dr. Shota Urushadze (Institute of Theoretical and Applied Mechanics of the Czech Academy of Sciences)

Bridge Frequency Identification Using a Multi-DOF Test Vehicle by Nodal Distribution Method and Enhanced Integration Algorithm

***Y. Yang**, X. Mo, K. Shi

Mitigation strategy for resonance of railway bridges under high-speed trains

***J. YAU**, S. Urushadze

Collapse Simulation of a Highway Tied-Arch Bridge with Material Deterioration and Moving Loads

***T. Lee**, M. Rofiq, J. Yau

Analytical Study of Vehicle-Bridge Interaction for Frequency Identification in Two-Span Continuous Bridges

***J. Yang**, L. Chen

Fri, 24/07/2026 11:30 - 13:00

H4 - 6 (Sissi)

MS170A - Operator Methods in Engineering: Computation and Verification I

Main Organizer: Prof. Oliver Junge (Technical University of Munich)

Chaired by: Prof. Oliver Junge (Technical University of Munich)

Data-driven Computation of Nonlinear Normal Modes via Analytic Extended Dynamic Mode Decomposition

***A. Mauroy**

Operator-Theoretic Dynamic Programming Methods for Data-Driven Optimal Control

***B. Houska**

Exploiting Nonlinearity in Transfer Operator Approaches to Achieve more Robust Data-Driven Predictors

***A. Herwig**, M. Colbrook, N. Kutz

Equivariant Koopman Analysis of Dislocation Data Accounting for Translational and Crystal Symmetry

***T. Hochrainer**, N. Heinemann, B. Heiningner

Optimization of Randomized Neural Networks for Transfer Operator Approximation

***M. Tabish**, S. Klus

Accurate and Robust Analysis of Molecular Kinetics with Koopman Operators and Random Features

H. Sprink, Y. Zhu, A. Mey, ***F. Nüske**

Bayesian Transfer Operators in Reproducing Kernel Hilbert Spaces

***S. Boshoff**, S. Klus, S. Peitz

Fri, 24/07/2026 11:30 - 13:00

H4 - 7 (Maximilian)

MS374A - Data-Driven Strategies for Dimension and Data Reduction in Computational Science and Engineering I

Main Organizer: Dr. Gianluca Geraci (Sandia National Laboratories)

Chaired by: Dr. Owen Davis (Sandia National Laboratories), Dr. Hemanth Kolla (Sandia National Laboratories)

Predicting the Evolution of Orientation Dependent Damage Caused by Voids Using Deep Learning

***D. Montes de Oca Zapiain**, N. Aragon, H. Lim

Data Reduction with Low-Rank Tensor Decompositions that Preserve Scientific Quantities of Interest

D. Dunlavy, E. Phipps, ***H. Kolla**, R. Murray, J. Shadid, E. Phillips

Nonlinear data compression via image registration

***R. Van Heyningen**, P. Blonigan, D. Ridzal, P. Bochev

Towards the Construction of Inverse Triangular Transport Maps from Federated Multifidelity Information

***O. Davis**, G. Geraci

AI-Driven Density-Based Clustering for Large-Scale GPS Data Analysis

***E. Chehoudi**, C. Ahabchane, H. Mrad

Dimension Reduction from Shapes as Subspaces using Subspaces of Shapes

***Z. Grey**

Fri, 24/07/2026 11:30 - 13:00

H4 - 8 (Eventcenter)

MS320C - Artificial intelligence, digital twins and geomechanics for natural hazards and geosystem III

Main Organizer: Prof. Shabnam Semnani (University of California, San Diego)

Chaired by: Prof. Kuan-Chung Lin (National Cheng Kung University), Prof. Shabnam Semnani (University of California, San Diego)

Development of a 5D Digital Twin Platform Integrating Structural Safety and Water Level for Bridges

***R. Wang**, C. Chen, F. Ko

Real-Time Inverse Finite Element-Based Structural Response Reconstruction of Steel Structures under Seismic Loading

***M. Dai**, C. Chen

Wellbore Integrity Analysis Using the Phase-field Fracture Method

***T. Sachithanantham**, W. Munshi, C. Annavarapu, B. Jha

City-Scale Seismic Risk Assessment Using Optimized Sensor Placement and Sequential Bayesian Updating

***D. Tang**, N. Sukulthanasorn, R. Nomura, J. Guo, S. Ohno, K. Nojima, A. Mori, S. Sato, M. Sakuraba, K. Terada, S. Moriguchi

Sequential Identification of Rock Mass Discontinuities from Tunnel Face Point Clouds: A Dynamic Update Framework for Digital Twins

***B. Pan**, W. Wu, M. Zhu, H. Zhu

Fri, 24/07/2026 11:30 - 13:00

BrainLab - Training

MS084B - Integrating HPC and AI for Real-World Applications II

Main Organizer: Prof. Makoto Tsubokura (RIKEN R-CCS/Kobe University)

Chaired by: Dr. Takuji NAKASHIMA (Hiroshima University)

Quantifying Infection Risks Through Multi-Physics Flow Simulations

***O. Krochak**, M. Rüttgers, A. Lintermann

Physics-Informed Neural Network Modeling and Optimization of Fin-Embedded Heat Sink Performance Using NVIDIA PhysicsNeMo

***E. Teng**, C. Li, H. Kan

Toward Efficient Ventilation Optimization via Physics-Informed Deep Operator Networks

***J. Onishi**, T. Tanaka

AI-based sub-grid scale closure with Super Resolution Network for Large Eddy Simulations in the human larynx

P. Rathore, R. Sarma, ***L. Cifuentes**, A. Abdelsamie, C. Chi, A. Lintermann, D. Thévenin

LES Analysis of Combustion Instabilities in Aircraft Gas Turbine Combustor: Toward the Utilization of Sustainable Aviation Fuel (SAF)

***Y. Cho**, J. Xing, R. Kurose

Numerical Study on Modelling Fire Suppression of Full-scale Car Carrier with Carbon Dioxide Fire Extinguishing System

***S. Kim**, A. Takii, M. Kubo, S. Kawamura, H. Onishi, Y. Fujii, Y. Higuchi, Y. Otani, K. Tsumuraya, M. Hirano, N. Murakoso, Y. Tarao

Fri, 24/07/2026 11:30 - 13:00

NM - 7 (Venice)

MS007B - Synthesizing Experimental and Computational Perspectives in Mechanics/Mechanobiology of Soft Tissues: Dialogue Towards Mechanistic Insight II

Main Organizer: Prof. David Pierce (University of Connecticut)

Chaired by: Prof. Corey Neu (University of Colorado Boulder), Prof. Stéphane Avril (Mines Saint-Etienne)

Ex vivo experimental investigations and modelling of visco-hyperelastic behaviour of the human facial tissues

E. Awad, N. Briot, G. Chagnon, D. Peric, ***M. Hossain**

Microstructure-Informed Achilles Tendon Modelling: Absolute Nodal Coordinate Formulation Approaches

***A. Ghasemkhani**, A. Harish, M. Matikainen, P. Mandal, T. Shearer

Towards Validated Cardiac Electromechanics: Utilizing Imaging Data to Inform and Validate Active Heart Contraction Models

***D. Ogiermann**, U. Weerasinghe, A. Fathy, L. Perotti, D. Balzani

A Multi-scale Framework for Electromechanical Simulations of Skeletal Muscle

***C. Homs-Pons**, M. Schulte

Structural Changes in Postnatal Mouse Lung Microstructure Induced by Internal Pressure: Synchrotron Micro-CT Imaging and Computational Mechanics Analysis

***K. Koshiyama**, T. Yasukawa, S. Yoshitomi, S. Yoshitomi, T. Sera

Exploring Vascular Wall Fracture – From laboratory experiment to phase-field modelling

***T. Gasser**, M. Alloisio, F. Aldakheel

Fri, 24/07/2026 13:00 - 14:00

Lunch Break

Fri, 24/07/2026 14:00 - 14:45

ICM - 1 Auditorium

PL06A - Plenary Lecture - Eleni Chatzi

Chaired by: Prof. Elías Cueto (Universidad de Zaragoza)

From Models to Twins: Leveraging Inductive Bias for Adaptive Intelligence

***E. Chatzi**

Fri, 24/07/2026 14:00 - 14:45

ICM - 14b

PL06B - Plenary Lecture - Antonio Huerta

Chaired by: Prof. Wolfgang A. Wall (Technical University of Munich)

Breaking the Mesh Bottleneck: From Robust Low-Order Schemes to High-Order Immersed Methods

***A. Huerta**

Fri, 24/07/2026 14:00 - 14:45

ICM - 14a

PL06C - Plenary Lecture - Mats G. Larson

Chaired by: Prof. Trond Kvamsdal (Norwegian University of Science and Technology (NTNU))

Finite Elements in the AI Era — Differentiable Simulation, Operator Learning, and Inverse Problems

***M. G. Larson**

Fri, 24/07/2026 14:00 - 14:45

ICM - 14c

PL06D - Plenary Lecture - Lisa Scheunemann

Chaired by: Prof. Stefan Löhnert (TUD Dresden University of Technology)

Reduced Multiscale Modeling of Microstructures Material - Bridging Complexity and Efficiency

***L. Scheunemann**

Fri, 24/07/2026 14:45 - 15:00

Short Break

MS048A - Computational Design of Materials and Structures I**Main Organizer:** Prof. Chenfeng Li (Swansea University)**Chaired by:** Prof. Chenfeng Li (Swansea University)

Context-Aware Deep Reinforcement Learning for Adaptive Material Topology Optimization

***V. Würz**, C. Weißenfels

Numerical Modelling of Tunable Spinodal Microstructures for Biomimetic Design

***L. Latussek**, H. Le Clézio, D. Kochmann

Computational Simulation in Design of Wearable and Flexible Electronics

***Z. Liu**

Predicting the Properties of Carbon-Black Filled Rubber Compounds Using a Micro-Structural Simulation Program

***H. Wulf**, J. Ihlemann

Microstructure Evolution–Driven Computational Design of Random Architected Materials under Nonlinear Mechanical Constraints

Z. Yan**, X. Li, Z. Liu, Z. Zhuang**MS131B - Mathematics of Digital Twins: Challenges, Methods, and Applications II*Main Organizer:** Dr. Maria Han Veiga (Ohio State University)**Chaired by:** Prof. Boris Kramer (University of California San Diego), Dr. Maria Han Veiga (Ohio State University)

A probabilistic graphical model for multi-resolution digital twins

***S. Pyrialakos**, A. Chaudhuri, K. Willcox

Digital twinning for dynamically operated Power-to-X reactors

L. Peterson, A. Geschke, ***I. Gosea**, P. Goyal, J. Bremer, R. Zimmermann, P. Benner, K. Sundmacher

Physics-Based State Estimation for Tracking Lagrangian Devices in Multiphase Chemical Reactors

***V. Rathi**, F. Sehar, F. Sommer, D. Ruprecht

Statistical finite elements for sequential data synthesis in structural dynamics

Y. Jetti**, I. Kavrokav, A. Oguzhan Yuksel, F. Cirak**MS008E - Computational Damage and Fracture Mechanics V*Main Organizer:** Prof. Michael Brüning (University of the Bundeswehr Munich)**Chaired by:** Prof. Michael Brüning (University of the Bundeswehr Munich)

Corrosion fatigue of 304L stainless steel in simulated LWR water environment

***M. Subasic**, C. Dahlberg, P. Efsing

A Computational Fatigue Indicator Parameter for Crack Incubation Prediction in A Nickel Titanium Alloy

***J. Moore**, P. Shabani Nezhad, J. Rusch, P. Kenesei, J. Park, H. Sharma, D. Erdeniz

Investigating crystal orientation dependent fracture behavior in Ni single crystals

***H. Lim**, K. Fitzgerald, A. Rezwan, W. Gilliland, J. Carroll

Revealing fracture-resistant design principles in harmonic-structured high-entropy alloys using quasi in-situ experiments and integrated modeling

***T. Gu**, R. Yuan, Y. Jia

Simulation of the Microstructure-Sensitive Thermo-Mechanical Fatigue Degradation Behavior of Polycrystalline Thin Metal Films

P. Paul Hoffmann, M. Petersmann, M. Nelhiebel, H. Pettermann, ***M. Todt**

Hydrogen-Assisted Fracture Through a Coupled Continuum Mechanics Framework

***D. Cachulo**, A. de Jesus, L. Malcher, R. Amaro, J. Pereira, A. Figueiredo

Fri, 24/07/2026 15:00 - 16:30

ICM – 4a

MS157E - Computational Fluid Dynamics (CFD) and Fluid-Structure Interaction (CFSI): Methods Development and Applications V

Main Organizer: Dr. George Moutsanidis (Rutgers University)

Chaired by: Dr. George Moutsanidis (Rutgers University)

A Shifted Boundary Strategy to Simulate Compressible Turbulent Flows with a Discontinuous Galerkin Scheme

M. Errante, A. Ferrero, F. Piersimoni, ***W. Cherkaoui**, G. Scovazzi

FSI Analysis of Periodic Flat Membrane Humidifier Segment including Transmembrane Water Transport for PEM Fuel Cells Applications

***Z. Mahmood**, C. Mehring

An Equilibrium Finite Element Method for Steady--Stokes Flows and Fluid--Structure Interaction

***M. TCHATO**, M. Ferradi

Influence of real gas equations on the numerical modeling of porous aerostatic air bearings

***L. Stellmach**, S. Nitzschke, E. Woschke

Experimental Investigation of Fluidelastic Instability in Stright Tube and Helically Coiled Tube Bundles in Single Phase Crossflow

***H. kang**, K. LEE, T. KWON, W. KIM

Simulating Soil-Structure Interaction for Induced Seismicity: A Substructure Method Application

***F. Taddei**

Fri, 24/07/2026 15:00 - 16:30

ICM – 4b

MS054D - Kernel Approximation Methods IV

Main Organizer: Dr. Rüdiger Kempf (University Bayreuth)

Chaired by: Dr. Helmut Harbrecht (University of Basel)

Lagrange Bases for Kernel-Based Multiscale Approximation

L. Gollwitzer, ***R. Kempf**, H. Wendland

Multiscale Kernel-Based Operator Learning

***V. Shankar**

Objective-Aware Pivoted Cholesky for Gaussian Processes

***L. Schaub**, P. Zaspel

Smoothed Analysis of Rank Growth in Kernel Matrices with Randomized Particle Distributions

***S. SINGH**, S. AMBIKASARAN

Fri, 24/07/2026 15:00 - 16:30

ICM - 5

MS100G - New Trends in Topology Optimization VII

Main Organizer: Prof. Emilio Silva (University of Sao Paulo)

Chaired by: Prof. Emilio Silva (University of Sao Paulo), Prof. Shinji Nishiwaki (Kyoto University)

Problem Independent Machine Learning ?PIML? - a new paradigm for AI-enhanced structural analysis and optimization

Keynote

***X. Guo**, Y. Guo, C. Liu, Z. Du

Scalable Control-Volume-Based Length-Scale Constraints for Thermofluid Topology Optimization

***L. Barbeau**, M. Larmarche-Gagnon, F. Ilincă

Topology Optimization Method for Dispersed Bubbly Flow

***T. Faccioli**, F. Sacomano, E. Silva

Topology Optimization of Turbulent Flows Using a Parametric Level-Set Method with Implicit Wall Functions

***H. Lei**, S. Yao, A. Bayata, H. Li, J. Alexandersen

On Topology Optimization for Thermal Radiative Devices Using a Ray-tracing Approach

***S. Noguchi**, N. Ishida, T. Yamaguchi, K. Izui, S. Nishiwaki

Fri, 24/07/2026 15:00 - 16:30

ICM - 11a

MS111A - Meshfree Particle Methods for Multi-Phase, Multi-Scale and Multi-Physics Problems I

Main Organizer: Prof. Mostafa Safdari Shadloo (INSA Rouen Normandy)

Chaired by: Prof. Mostafa Safdari Shadloo (INSA Rouen Normandy), Dr. Alessio Alexiadis (University of Birmingham)

Multiscale SPH Modelling of Deformable Plastic Microfiber Aggregation in Shear Flow

***A. Rahmat**

Multi-Rate Time Integration for Weakly Compressible Smoothed Particle Hydrodynamics

***F. Thiery**, N. Adams, S. Adami

Inflow and Outflow Boundary Conditions for Blood Flow Simulations with GPU-accelerated Dissipative Particle Dynamics Solver

***S. Tomizawa**, H. Nakajima, Z. Li, Y. Hasegawa

Learning Mesh-Free Discrete Differential Operators with Self-Supervised Graph Neural Networks

***L. Gerken Starepravo**, G. Fourtakas, S. Lind, A. Harish, T. Tang, J. King

Efficient Parallel Tree-based Finite Volume Particle Method

***F. Breiden**, M. Schweitzer

Why Particle-Based Models Are Uniquely Suited for Physics-Informed Machine Learning

***A. Alexiadis**

Fri, 24/07/2026 15:00 - 16:30

ICM - 11b

MS202A - Next-Generation Paradigms for CFD I

Main Organizer: Prof. Nikolaus Adams (Munich Institute of Integrated Materials, Energy, and Process Engineering)

Chaired by: Prof. Nikolaus Adams (Munich Institute of Integrated Materials, Energy, and Process Engineering), Prof. Lin Fu (The Hong Kong University of Science and Technology)

Deep learning accelerated solutions of viscous incompressible flow

***X. Bian**

A wall-modeled LES framework for compressible wall-bounded turbulent flows based on the cut-cell method

D. Song, B. Huang, ***L. Fu**

"CFD 4-One" Rule for Next-Generation Solvers: Getting There With Octrees, AMR, and GPUs

***C. COREIXAS**, J. Latt

A total-shear-stress-conserved wall model for large eddy simulation

***H. Liu**, C. Xu, W. Huang

Tensor Network Fluid Simulations in Structured Domains Using the Lattice Boltzmann Method

L. Gross, E. Mounzer, ***D. Wawrzyniak**, J. Winter, N. Adams

Temporal coherency in high-resolution 3D neural PDE surrogates

***L. Guastoni**, N. Thuerey

Fri, 24/07/2026 15:00 - 16:30

ICM - 12a

MS189C - Multiphysical modeling and characterization of ferroelectric materials – state of the art and new challenges III

Main Organizer: Dr. Felix Sutter (Physik Instrumente (PI) SE & Co. KG)

Chaired by: Prof. Astrid Pechstein (Johannes Kepler University Linz), Mr. Marc Kamlah (Karlsruhe Institute of Technology)

High Throughput Synthesis and Characterization for Development of High Entropy Oxides

***K. Webber**, U. Eckstein

Energy harvesting using ferroelectric/ferroelastic switching

***W. Kang**

Finite Element Analysis of Piezoelectric and Pyro-Piezoelectric Energy Harvesting

A. Hegendörfer, M. Schwarz, R. Yamamoto, K. Kakimoto, ***J. Mergheim**

Multiscale simulation in FEniCS of the temperature-dependent material behavior of piezoceramics

***C. Spieker**, J. Förstner

On the modeling of loss mechanisms in piezoceramics

***F. Sutter**

Quantitative Modelling of Dynamic Nonlinearity in Piezoelectric Components

***O. Friesen**, J. Hölscher, C. Spieker, J. Förstner, L. Claes

Fri, 24/07/2026 15:00 - 16:30

ICM - 12b

MS218C - Structure preserving numerical methods for nonlinear hyperbolic systems III

Main Organizer: Dr. Vincent Perrier (INRIA)

Chaired by: Dr. Francesco Fambri (Max Planck Institute for Plasma Physics)

Residual Viscosity with Summation-by-parts Finite Differences for the Euler and Navier-Stokes Equations

***D. Niemelä**

SBP-FDEC: Summation-by-Parts Finite Difference Exterior Calculus

G. Gassner, ***D. Bach**, A. Rueda-Ramírez, E. Sonnendrücker, D. Del Rey Fernandez

OEDG: Oscillation-eliminating discontinuous Galerkin method for hyperbolic conservation laws

***M. Peng**, K. Wu, Z. Sun

A Riemann-Invariant-Bound-Preserving COS(DG) Method for Shallow Water Equations with Bottom Topography

***J. Xu**, S. Cui, K. Wu

Fri, 24/07/2026 15:00 - 16:30

ICM - 13a

MS088F - Advanced Multi-physics CFD Simulations in Science and Engineering VI

Main Organizer: Prof. Takahiro Tsukahara (Tokyo University of Science)

Chaired by: Prof. Takahiro Tsukahara (Tokyo University of Science), Prof. Ryo ONISHI (Institute of Science Tokyo)

DNS study on the regularity of turbulent spot formation in plane channel flow

R. Ono, Y. Matsukawa, K. Kohyama, ***T. Tsukahara**

Assessing the Impact of Bulk Viscosity in Compressible Turbulence

***J. Ruano**, A. Alsalti-Baldellou, F. Trias

Implementation and Validation of Liquid Metal Turbulence Models for ESFR Reactor Design Using a Coupled CFD-SYS-TH Approach

S. Baldini, G. Borna, A. Cervone, ***F. Giangolini**, S. Manservigi, M. Polidori, D. Rimondini

Computational Analysis of Particulate Matter Dispersion in High-Density Urban Slopes of the Aburrá Valley

***G. Suárez Guerrero**, D. Nisperuza Toledo

Fri, 24/07/2026 15:00 - 16:30

ICM - 13b

MS095E - Advances and Challenges in Phase-Field Modeling and Computations V

Main Organizer: Prof. Fadi Aldakheel (Leibniz Universität Hannover)

Chaired by: Dr. Alberto Antonini (Leibniz University Hannover), Prof. Yousef Heider (Universität Kassel)

Modelling of fatigue crack propagation in ductile materials under non-proportional loading conditions

***A. Tsakmakis**, A. Gibb

Bayesian Data Assimilation for Phase-field Simulation of Fatigue Crack Propagation

***A. Yamanaka**, S. Yoshizaki

Using a Degradation Tensor Based Phase Field Model for Nucleation and Propagation of Fractures in Brittle Materials

***M. Bittencourt**, C. Esteves, A. Modetso, J. Boldrini

Spatio-Temporal Extrapolation of Phase-Field Simulations with Convolution-Only Neural Networks

***C. Saffa**

Fri, 24/07/2026 15:00 - 16:30

ICM - 14a

MS316B - Fundamental Concepts in Scientific ML II

Main Organizer: Prof. Arif Masud (University of Illinois Urbana-Champaign)

Chaired by: Prof. George Karniadakis (Brown University), Prof. Assad Oberai (University of Southern California)

Kernel Functions and Loss-embedded Closure Models for Discrepancy Modeling in Finite Strain Elastodynamics

***A. Masud**, I. Wijaya, J. Hickman

Topological Deep Learning for PDE Simulations on Meshes

***L. Tesán**, D. González, P. Martins, E. Cueto

Uncertainty Quantification of Foundation Models for Scientific Machine Learning

***M. ZAKI**, P. Thiagarajan, S. Chakraborty, M. Shields

Deep Operator Gaussian Process for Uncertainty Quantification of Operator Learning

***J. Lee**, Y. Shin

Learning to Choose Optimizers

***M. van der Schelling**, D. Toshniwal, M. Bessa

Development of a low-order model of Li-Ion cell using machine learning techniques

***Z. Buliński**, W. Adamczyk, T. Krysiński, A. Schydló

Fri, 24/07/2026 15:00 - 16:30

ICM - 14b

MS154D - The Next AI Frontier: Physics-Informed Models, LLMs, and HPC IV

Main Organizer: Dr. M. Giselle Fernández-Godino (Lawrence Livermore National Laboratory)

Chaired by: Dr. M. Giselle Fernández-Godino (Lawrence Livermore National Laboratory), Dr. Jonathan Belof (Lawrence Livermore National Laboratory)

Differentiable fluid dynamics for inverse design and the study of dissipative structure Keynote

***J. Belof**

Development of an LLM-based AI agent for Site Selection of Floating Offshore Wind Turbines

***S. Cho,** S. Oh, Y. Ha, B. Kim, J. Kim

Generative surrogate modeling of hydrodynamic instabilities using stochastic interpolants

***S. Thévenin,** D. Sterbentz, K. Korner, A. Briard, B. Gréa, B. Nadiga, G. Fernández-Godino, C. Jekel, W. Schill, J. Belof

Physics-Informed Training Strategies for Scalable Surrogate Modeling of Complex Fluid Flows.

***H. Ramachandran,** M. Samset, L. Ortner, S. Schmidt, N. Adams

A Discretization-Free Physics-Informed Graph Neural Network for Thermal Flow Estimation

***K. Shimoyama,** K. Okuhara

A Unified Pressure-Saturation PINN for the Buckley-Leverett Model

***Y. Kenzhebek,** T. Imankulov, S. Bekele, D. Akhmed-Zaki

Fri, 24/07/2026 15:00 - 16:30

ICM - 14c

MS133E - Data-Driven Design of Materials – from Performance to Sustainability V

Main Organizer: Prof. Markus Kästner (TU Dresden)

Chaired by: Prof. Markus Kästner (TU Dresden)

Polymer Inverse Design in Extreme Low-Data Regimes via Graph-Grammar Machine Learning

***Y. Guo,** P. Thakolkaran, Y. Zhen, C. Bezik, V. Varshney, G. Filonenko, A. Vashisth, S. Kumar

First-principles study on aluminum alloy surfaces and interfacial bonding mechanism with polymer

***Z. Wei,** I. Plyushchay, N. Bulut, F. Lehmann, P. Grimm, M. Gude, J. Hufenbach, S. Gemming

Computational Design of Grain Boundary Topology for Fracture Mitigation in Additively Manufactured Tungsten

***R. Liu,** M. Li, A. Godfrey, Y. Niu, S. Zhong, M. Ma, Y. Lan, J. Chen, K. Li, W. Zhang, W. Liu, X. Huang, H. Gao

Fri, 24/07/2026 15:00 - 16:30

ICM - B11

MS094E - Integrating Experimental Data and Computational Models in Biomechanics V

Main Organizer: Dr. Silvia Hervas-Raluy (Technical University of Munich)

Chaired by: Dr. Silvia Hervas-Raluy (Technical University of Munich), Dr. Sebastian Brandstaeter (University of the Bundeswehr Munich)

Enhancing numerical robustness in geodesic muscle path computation via a local parameterisation

***X. Chen,** S. Heinrich, S. Martelli, P. Pivonka, S. Leyendecker, M. Lavaill

A numerical study of the effects of destructive preprocessing on bone conduction transfer path measurements

***L. Taenzer,** M. Arseven, J. Niermann, I. Dobrev, P. Tiso, B. Van Damme

Numerical Modelling of Head Impact Biomechanics in Female Youth Soccer: Finite Element Head Model Validation and Application

***C. Cardoso,** A. Silva, N. Costa, R. Sousa

Assessing Spine Biomechanics in Cervical Spondylotic Myelopathy Using Finite Element Analysis

***A. Silva,** C. Cardoso, F. Fernandes, A. Calheiros, R. Alves de Sousa

From Dogbones to Organs: Applying Digital Image Correlation in the Context of Minimally Invasive Surgery

***I. Nowakowska,** C. Durcan, M. Saleh, R. Henrywood, B. MacPherson, D. Hand, R. Reuben, Y. Chen

Bioheat Transfer Analysis of Electromagnetic Wireless Charging of Implantable Devices in Torso Tissue Models

***A. Honaryar,** M. Amirpour, P. Kelly, E. Kwon

Fri, 24/07/2026 15:00 - 16:30

ICM - B12

MS137B - Recent Advances in Numerical Methods for Mixed-Dimensional PDEs II

Main Organizer: Phd. Oriol Colomés (Delft University of Technology)

Chaired by: Phd. Oriol Colomés (Delft University of Technology)

Cut Finite Element Methods for Curvature-Driven Interface Evolution

***N. Berre,** A. Massing, E. Neiva

Mixed-dimensional coupling with the Arlequin method

***I. Romero,** D. Portillo

Scalable Solvers for Linearized Simulations of Very Large Floating Structures

***S. Prashanth,** O. Colomés, A. Heinlein

Fri, 24/07/2026 15:00 - 16:30

ICM - B13

MS235C - Advances in high-order discretization methods and reduced-order models for complex engineering systems III

Main Organizer: Dr. Michele Giuliano Carlino (ONERA/INRIA)

Chaired by: Phd. Alessia Del Grosso (Inria Bordeaux), Dr. Michele Giuliano Carlino (ONERA/INRIA)

Optimal Domain Decomposition in Multifidelity Modeling for Uncertain Geometries in Fluid Structure Interaction

***M. POTIN**, M. Carlino, A. Iollo

An agglomeration-based multigrid solver for the Discontinuous Galerkin discretization of cardiac electrophysiology

***P. Africa**, M. Feder

A High-Order Fast Direct Solver for Surface PDEs on Triangulated Geometries

***G. Zavalani**

Generic Low-Rank Parametric Model Order Reduction for Vibro-Acoustics Using Modal Projection

***M. Hinz**, G. Müller, E. Deckers, D. Panagiotopoulos

Model Order Reduction applied to Slowly Decaying Kolmogorov n-width Problems based on Non Linear Interpolations

***M. Truel**, M. Bergmann, A. Iollo, G. Vogt

Entropy Stable Model Reduction Using a Structure-Preserving Nodal Basis Approach

***R. Klein**, B. Sanderse, P. Costa, R. Pecnik, R. Henkes

Fri, 24/07/2026 15:00 - 16:30

ICM - B21

MS123D - Chemo-Mechanical Coupling Phenomena in Solids IV

Main Organizer: Prof. Thomas Antretter (Montanuniversität Leoben)

Chaired by: Prof. Ozgur Aslan (University of Bristol)

Thermal-Mechanical Coupling Analysis of Twist Drills Based on the Stable Node-based Smoothed Radial Point Interpolation Method (SNS-RPIM)

***F. Qiuxia**

Thermo-Chemo-Mechanical Modelling of Thermally Loaded Metallization Layers

N. Prabhu, J. Velo, ***M. Diehl**

Microstructure-Based Modelling of Hydrogen Distribution in Fasteners from Processing to Service

***S. Leitner**, P. Hammer, M. Pötz, C. Posch-Pepperkorn, M. Galler, V. Razumovskiy

A Multiphysics Numerical Framework for Hydrogen Assisted Fracture in Polycrystalline Materials

***O. Aslan**, C. Camalan

Numerical comparative analysis of heat flux in two assemblies : steel/steel with Resistance Spot Welding and with Resistance Element Welding

***V. Barras**, T. Fkyerat, F. Le Poulain, R. Creac'hcadec

Fri, 24/07/2026 15:00 - 16:30

ICM - B22

MS197B - Advances in Modeling Damage, Fracture, and Multiphysics II

Main Organizer: Dr. Mostafa Mobasher (New York University Abu Dhabi)

Chaired by: Dr. Mostafa Mobasher (New York University Abu Dhabi), Prof. Lampros Svolos (University of Vermont)

An Algebraic Multigrid Block-Preconditioning Method for Modelling Material Failure Using Indirect Displacement Control

***P. Gamnitzer**, N. Alkmim, A. Dummer, M. Neuner, G. Hofstetter

Explicit Phase-Field Simulation of Dynamic Failure Under Thermal Loading: Application to a Solar Receiver

L. Mersel, ***X. LIU**, A. de la Vauvre, J. Réthoré

Fracture of Silicon-Based Metamaterials: Size Effects and Other Structurally Induced Anomalies

***K. Kraschewski**, D. Kochmann

Fri, 24/07/2026 15:00 - 16:30

ICM - 21a

MS164B - Computational geomechanics, geophysics and geohazards II

Main Organizer: Dr. Yunteng Wang (Universitat für Bodenkultur Wien)

Chaired by: Prof. Zhennan Zhang (Shanghai Jiao Tong University), Dr. Yunteng Wang (Universitat für Bodenkultur Wien)

Modelling Multiscale fracturing behaviours of shale by virtual internal bonds

***W. Xiao**, Z. Zhang

A lightweight physics-data-driven method for real-time prediction of subgrade settlements induced by shield tunneling

***Y. Shan**, G. Wang, Z. Tian, B. Detmann

A Tensor Decomposition Approach to the Computation of Elastodynamic Green's Functions in Layered Soil

***Z. Farooq**, S. François, G. Degrande

3D Discrete Element Modelling of Soil-Pipeline Interaction Subjected to Large Fault Displacements: A Micro-Mechanical Perspective

***Y. Yang**, J. Shang, H. Lan, X. Xu

Threshold Stress for Grain Boundary Sliding During Coble Creep

***S. Mortadi**, L. Delannay, H. Rattez

Fri, 24/07/2026 15:00 - 16:30

ICM - 21b

MS124B - Advanced Methods for High-Fidelity Digital Twins II

Main Organizer: Prof. Roland Wüchner (Technical University of Munich (TUM))

Chaired by: Dr. Suneth Warnakulasuriya (Chair of Structural Analysis), Prof. Rainald Löhner (George Mason University)

Statistical Finite Elements: A Bayesian Perspective on Digital Twinning **Keynote**

*F. Cirak, Y. Jetti

Damage Progression Detection in Structures Using Time-Indexed Deformation Measurements

*T. Ansari, S. Warnakulasuriya, I. Antonau, H. Antil, R. Löhner, R. Wüchner

Signal-Based Multi-Scale Parameter Identification Using Graph-Space Optimal Transport on Power Spectra

*J. Hillenbrand, S. Warnakulasuriya, G. Müller, R. Wüchner

Towards System Identification of Degraded Prestressed Concrete Bridges

*J. Wessels, C. Flack, I. Antonau, U. Kowalsky

Streamlining CAD to Simulation Workflows Using Graph Neural Networks

*B. Oralalp, F. Dietrich, J. Lorenzi

Fri, 24/07/2026 15:00 - 16:30

ICM - 22a

MS394A - Reduce order modeling and its applications I

Main Organizer: Dr. Lei Zhang (Tongji University, China)

Chaired by: Prof. Dunhui Xiao (Tongji University), Dr. Lei Zhang (Tongji University, China)

Reduced-order modeling for uncertainty quantification of parameterized fluid-structure interaction problems

T. Xu, *X. Sun, J. Choi

Accelerating the Design of Components Within an Assembly Using Reduced Order Modeling of the Assembly Context

*A. Humphry, M. Ebrahimi, N. Morris, A. Butscher

Optimization of nonlinear vibration of internally resonant mechanical systems using reduction on spectral submanifolds

H. Liang, *M. Li

Parametric Probabilistic Manifold Decomposition for Nonlinear Model Reduction of Parametric Dynamical Systems

J. Guo, *D. Xiao

An adaptive, hybrid FOM/PROM approach for fast and robust out-of-sample predictions

*S. Riffaud

Data-free tools for Rigorous Nonlinear Model Reduction Dependent on Parameters

*S. Jain

Fri, 24/07/2026 15:00 - 16:30

ICM - 22b

MS336A - Computational models of soft tissue growth and remodeling I

Main Organizer: Dr. Joakim Sundnes (Simula Research Laboratory)

Chaired by: Dr. Joakim Sundnes (Simula Research Laboratory)

Numerical Stability of Homogenized Constrained Mixture Models: Analysis and Application to Cardiac Growth and Remodeling

*P. Tuch, A. Gebauer, W. Wall

Towards Predictive Multiscale-Multiphysics Modeling of Liver Regrowth

A. Ebrahem, J. Hohl, E. Jessen, *D. Schillinger

Simulating the Interaction of Growth, Remodeling and Smooth Muscle Activity in Atherosclerotic Arteries

*S. Nurani Ramesh, D. Balzani

Computational Modeling of Growth and Remodeling in Tissue-Engineered Cardiovascular Implants

*M. Sesa, F. Vogt, M. Behr, S. Reese, K. Linka

Fri, 24/07/2026 15:00 - 16:30

ICM - 41 (Ostersee A)

MS036B - Integration of Computational Tools for Materials Innovation, Characterisation, Modelling, and Manufacturing II

Main Organizer: Prof. Eric Li (Teesside University)

Chaired by: Prof. Eric Li (Teesside University), Dr. Yi WU (University of Science and Technology Beijing)

Topology optimization of multi-material structures with interfacial debonding resistance

*Y. Wu

CALPHAD-Informed Phase-Field Modeling of Microstructure Evolution in Chemically Complex Mg Alloys and CoCrNi-Based Medium-Entropy Alloys

*T. Su, H. Huang, B. Kuo, L. Wu, Y. Chan, M. Wu, I. Chen, K. Liang

Computational Investigation of Crashworthiness in Hierarchical Multi-Cavity Tubes with Axial and Radial Thickness Gradation

*D. Yang

Multiscale Computational Design of Helical Carbon Fiber Composites and Robust Topology Optimisation for Additive Manufacturing

Keynote

*E. Li, Z. He

Fri, 24/07/2026 15:00 - 16:30

ICM - 42 (Ostersee B+C)

MS395C - Advanced Structure-preserving Moment Methods and Numerics of Kinetic Equations III

Main Organizer: Dr. Qian Huang (Universidad Carlos III de Madrid)

Chaired by: Mr. Teddy Pichard (École polytechnique), Dr. Qian Huang (Universidad Carlos III de Madrid)

A kinetic model of angiogenesis

***F. Terragni**, M. Carretero, L. Bonilla

Electron-Ion Plasmas in Strong Electromagnetic Fields: A Gyrokinetic/Gyromoment Approach

***Z. Tazakkati**, T. Pichard, J. Massot, M. Massot

Moment methods for Vicsek-type kinetic equations of active particles

Y. Chen, Q. Huang, ***H. Yu**

Review of a moment-preserving property and convergence of a weighted finite volume scheme for the fragmentation equation

***J. Granet**, C. Etchegaray, C. Poignard

Fri, 24/07/2026 15:00 - 16:30

ICM - 43 (Eibsee)

MS182A - Modelling and Simulation of Welding and Wire Arc Additive Manufacturing Processes I

Main Organizer: Dr. Josselin DELMAS (Électricité de France R&D)

Chaired by: Dr. Serge PASCAL (CEA)

Analysis and Prediction of Welding Distortion in 316L Stainless Steel Using Finite Element Analysis

J. KIM, ***Y. KIM**, E. HA, S. KANG, K. SHIN, K. LEE, M. KO

Computational Modelling of Friction Spinning for Hot Forming of Metals

***J. Friedlein**, P. Steinmann, J. Mergheim

Evaluating Thermal Behavior and Sigma Phase Risks in Large Austenitic Stainless Steel Parts Produced by Wire Arc Additive Manufacturing

***R. Ufarté**, S. Hilal

Latent-Space Surrogate Modelling of RSW Process Signals for Bayesian Calibration

***B. Verkens**, M. Faes, P. Van Rymenant, D. Moens

A Rapid Predictive Model for Unsupported Printability of Inclined Metal Rods in Additive Manufacturing

***Z. Ji**, C. Liu, Y. Cui

Fri, 24/07/2026 15:00 - 16:30

ICM - 44 (Schliersee)

MS329B - Mechanics of Entangled Networks: Woven, Knitted, Knotted, Polycatenated, and Fibrous Materials II

Main Organizer: Mr. Elias Pescialli (ETH Zurich)

Chaired by: Dr. Xiaoxiao (Catherine) Ding (Harvard University), Mr. Bharadwaj Tallapragada (TU Delft)

Pantographic Interwoven Composable Lattices

***R. Lennon**, J. Hart

Topology-Mediated Mechanics in 3D Intertwined Helix-Based Architected Materials

***E. Pescialli**, K. Karapiperis, D. Kochmann

Multiscale Tuneable Mechanics of Cytoskeletal Intermediate Filament Networks: Entanglement, Crosslinking, and Neighbour Cooperation

***M. Pensalfini**, M. Arroyo

From Personalized Implants to Braided Architected Materials (BAMs): Programming Resilience in 4D Printed Nitinol Networks

***C. Aguilar Vega**, J. Molina-Aldareguia, A. Díaz Lantada

Fri, 24/07/2026 15:00 - 16:30

ICM - 31 (Zugspitze)

MS025B - Numerical Analysis of Lightweight Composite Structures: Classical Computational Approaches and Novel AI-based Strategies II

Main Organizer: Dr. Giovanni Zucco (University of Limerick)

Chaired by: Dr. Giovanni Zucco (University of Limerick), Prof. Antonio Madeo (University of Calabria)

Stability Analysis of Functionally Graded Sandwich Plates with Auxetic Core

***R. Kumar**, N. Tomar, S. Pradyumna

Surrogate-Assisted Optimization of Buckling and Stress Concentrations in Tow-Steered Cylinders with Cutouts

***G. Zucco**, R. Groh, M. Rouhi, K. Wu

Nonlinear dynamic response of viscoelastic composite shells

***H. Kumar**, B. Patel

Nonlinear Transient Analysis of Variable Stiffness Composite Plates and Shell Panels with Embedded Delamination under Hygrothermal Conditions

***A. Chandel**, S. Pradyumna, M. Singha

Fri, 24/07/2026 15:00 - 16:30

ICM - 32 (Watzmann)

MS384B - Novel Insights and Practical Advances in Boundary Element Methods II

Main Organizer: Dr. Toru Takahashi (Nagoya university)

Chaired by: Prof. Takahiro SAITOH (Tokyo City University)

Parallel computing in TDBEM in Elastodynamics with mCCSR Sparse Storage

***W. Zhou**, H. Zhang, Y. Chen

Boundary integral quadrature method for the SH-wave scattering problems by an orthotropic basin

***J. Lee**, Y. Wang, S. Kao, J. Chen

The Method of Fundamental Solutions for Wave Scattering in Eringen's Nonlocal Elastic Solids

***A. Furukawa**, T. Saitoh, S. Hirose

Time-domain topology optimisations based on the boundary element methods

***T. Takahashi**

Fri, 24/07/2026 15:00 - 16:30

BrainLab - Auditorium

MS378B - Isogeometric Methods II

Main Organizer: Prof. Trond Kvamsdal (Norwegian University of Science and Technology (NTNU))

Chaired by: Prof. Giancarlo Sangalli (University of Pavia, Italy), Prof. Trond Kvamsdal (Norwegian University of Science and Technology (NTNU))

A fast Poisson solver for isogeometric analysis

M. Montardini, S. Takacs, ***M. Tani**

Fast multi-patch solver for Maxwell equations based on discontinuous Galerkin techniques

Á. Pita da Veiga, J. Rodríguez, ***R. Vázquez**

Isogeometric Analysis for Explicit Wave Propagation in Poroelastic Media

***M. Hodzelmans**, R. Hiemstra, J. Remmers, C. Verhoosel

Robust NURBS-Based Time Integration: A Study of Stress Concentration in Phase Transformation with Nonlinear Equations

***E. Bakhtiari**, M. Mohammadi Aghdam, A. Fattahi, D. Schillingier

Applying IGANets to computational Mechanics: Fast numerical Predictions over varying Geometries

***G. Obermair**, S. Elgeti, M. Möller

Solving Inverse Problems on Spline Discretizations by Optimization of a Discrete Loss

***M. Chasapi**, V. Chheda, L. Amoudruz, P. Koumoutsakos

Fri, 24/07/2026 15:00 - 16:30

NM - 1 (Multimedia Saal)

MS063E - Neural Network Solvers for PDEs: Bridging Theory and Practice in Scientific Computing V

Main Organizer: Dr. Jooyoung Hahn (Czech Technical University in Prague / Faculty of Nuclear Sciences and Physical Engineering)

Chaired by: Dr. Jooyoung Hahn (Czech Technical University in Prague / Faculty of Nuclear Sciences and Physical Engineering), Dr. Alexander Heinlein (TU Delft)

A Lower-envelope Eikonal Neural Operator

***H. Son**, S. Cho, J. Hahn

Hybrid AI: Homotopic Physics Relaxation for Sparse Parameter Discovery in Misspecified Models

***D. WU**, A. Ammar, F. Chinesta

Neural PDE Surrogates for American Options: Real-Time Prices, Greeks, and Implied Volatilities

***S. Stoykov**

Data Driven vs. Physics-Informed Neural Solvers for Aerodynamic Analysis and Design

***S. Choi**

Physics-Guided Hybrid FEM–ML Framework for Structural Dynamics Response Estimation with Sparse Sensors

***J. Park**, J. Lim

Fri, 24/07/2026 15:00 - 16:30

NM - 2 (Salzburg)

MS392A - Robust Design of Structures I

Main Organizer: Dr. Malte von Scheven (University of Stuttgart)

Chaired by: Dr. Jan Gade (University of Kassel), Dr. Malte von Scheven (University of Stuttgart)

Detectability vs. Criticality: A Probabilistic Framework for the Design of Additive Manufactured Jet Engine Components

***E. Stavropoulou**, L. Bruder, J. von Lautz

Robust Structural Design Considering Polymorphic Uncertainties

***S. Freitag**

Matrix-based Assessment and Optimization of Structural Robustness

***S. Briem**, M. von Scheven, D. Chiquin, A. Thrall, M. Bischoff

An additive split of internal forces for the design of load-carrying behavior of frame structures

***J. Gade**, J. Wackerfuß

IOPER: Inverse-Optimized Pushover with Energy Redistribution -- A Framework for Enhanced Control and Degraded Stiffness-Aware Seismic Analysis

***J. Mendoza**, A. Canelas

Fri, 24/07/2026 15:00 - 16:30

NM - 4 (Hamburg)

MS299A - Novel Design and Fabrication Methods for Variable-stiffness Composites I

Main Organizer: Prof. Gokhan Serhat (KU Leuven)

Chaired by: Prof. Gokhan Serhat (KU Leuven), Dr. Buse Aktas (Max Planck Institute for Intelligent Systems)

Active Shell Formulation for the Inverse Design of Adaptive Thin-walled Structures

***R. Sachse**, S. Warnakulasuriya, R. Aristio, R. Wüchner

Prebuckling and Buckling Analysis of Variable-Stiffness Composite Laminates with Cutouts Using Energy Methods

***A. Alhaj Ahmad**, C. Mittelstedt

Meshless Electrodynamics Analysis of Plates with Embedded Macroscopic Piezoelectric Fibers

***J. Rahimi**, M. Simsek, A. Ghasempoor, A. Aghakhani, I. Basdogan, G. Serhat

Analytical Solutions of Quadratically-Closed Folgar–Tucker Equations for Benchmark Flows: A Computational App

***M. Ranjbar**, C. Papenfuss

Fri, 24/07/2026 15:00 - 16:30

NM - 5 (KK)

MS022B - Advanced Physics-based and Data-driven Modeling for Biomedical Digital Twin II

Main Organizer: Dr. Dongwei Ye (Xi'an Jiaotong-Liverpool University)

Chaired by: Dr. Yidan Xue (The University of Manchester), Dr. Elena Zappon (Medical University of Graz)

Neural Operator-Based Differentiable Framework for Automatic Whole-Brain Fractional Flow Reserve Estimation

***S. Li**, M. Hu, Z. Zhang

Learning Vascular Hemodynamics: Physics-Informed GNN Inference From Capillary Networks to Pulsatile Flow

***P. Botta**, P. Vitullo, F. Behrens, T. Ventimiglia, A. Linninger, L. Müller, P. Zunino

HyperFlow: LoRA-Modulated Implicit Neural Operator for Patient-Specific 3D Aneurysm Hemodynamics Estimation

***M. Hu**, S. Li, Z. Zhang

What are the most influential factors in modeling aneurysmal thrombosis? A sensitivity analysis and validation study

***Q. Liu**, T. Lassila, F. Lin, T. Patankar, A. Sarrami-Foroushani, A. Frangi

Applications of the physics-informed neural network in computational mechanics

***J. Bai**, X. Feng, Y. Gu

A Physics-Based Digital Shadow Framework for Fast and Predictive Defect Modeling in LPBF

***Y. Li**, J. Guo, W. Liu

Fri, 24/07/2026 15:00 - 16:30

NM - 3 (BB)

MS149B - Uncertainty, Monitoring & Physics-Enhanced Machine Learning in Computational Mechanics II

Main Organizer: Dr. Alessandra Vizzaccaro (Politecnico di Milano)

Chaired by: Prof. Luca Rosafalco (Politecnico di Milano), Prof. Andrea Manzoni (Politecnico di Milano)

Scientific Machine Learning for Nonlinear Aeroelastic Applications

***Y. Li**, U. Fasel

Data-driven governing equation inference of weakly nonlinear oscillators

***T. Ma**, L. Rosafalco, W. Cui, L. Zhao, A. Frangi

Learning Nonlinear Forces for the Harmonic Balance Method Using Neural Networks

***M. Goldack**, J. Groß, M. Krack, M. Stender

Reduced-Order Discovery and Joint State-Model Tracking of High-Dimensional Dynamical Systems

***C. Santillán Moreno**, L. Rosafalco, P. Conti, A. Manzoni, A. Frangi

Neural Markov chain Monte Carlo: Likelihood density estimation via normalizing flows and variational autoencoders

***G. Bottacini**, M. Torzoni, A. Manzoni

Machine Learning-Enhanced Variable-Node Substructure Element for Efficient Analysis and Optimal Design

***C. Ni**, Y. Liang, X. Guo

Fri, 24/07/2026 15:00 - 16:30

H4 - 1 (Ludwig)

MS139C - Optimization under Uncertainty III

Main Organizer: Dr. Oindrila Kanjilal (Georg Nemetschek Institute - AI for the Built World, TU Munich)

Chaired by: Prof. Daniel Straub (Technische Universität München), Dr. Pablo G. Morato (Technical University of Munich)

Problem-Independent Machine Learning (PIML)-Accelerated Fail-Safe Topology Optimization of 3D Continuum Structures

***C. he**

Resilience for Optimal Systems Under Uncertainty: Efficient Surrogates to Unveil Vulnerabilities

***E. Ampellio**, F. De Marco, G. Sansavini

Predictive Maintenance Planning with Influence-Based Abstraction and Reinforcement Learning

***P. Bhustali**, C. Andriotis, F. Oliehoek

Plastic Redistribution of Load Effects to Optimize Form and Usage of Material Capacity in Load-bearing Structures Considering Uncertainties in Load and Material Properties

***J. Neszvecskó**, J. Köhler, M. Luczkowski, B. Skallerud

Efficient Robust Design Optimisation under Mixed Uncertainty

***U. Agbogwu**

Fri, 24/07/2026 15:00 - 16:30

H4 - 2 (Leopold)

MS060A - Uncertainty Quantification and Scientific Machine Learning for Predictive Modeling of Complex Systems I

Main Organizer: Dr. Danial Faghihi (University at Buffalo)

Chaired by: Dr. Georgios Georgalis (GE Aerospace)

Quantification and Propagation of Model Form Uncertainties in Simulation-based Digital Twins of Structures

***D. Andrés Arcones**, M. Weiser, P. Koutsourelakis, J. Unger

Equation Learning for Agent-Based Infectious Disease Models

J. Catlin, O. Özaltin, M. Mayorga, J. Swann, P. Sheeran, ***K. Flores**

Scientific Machine Learning Methods for Spatial Correlation-Preserving Surrogate Models of HIV and EBV Infection

***M. Sadecki**, K. Flores

Probabilistic Surrogate Modelling for Spatially Resolved Data

***A. Seidel**, K. Cremanns

Calibrated Uncertainty for Fine-tuned Scientific Foundation Models via Stochastic Attention

***A. Yadav**, T. Adebisi, R. Zhang

Adaptive Development and Validation of Large-Scale Multiphysics Simulations via Bayesian Networks

***G. Georgalis**, A. Al Noman, K. Budzinski, A. Patra, D. Faghihi

Fri, 24/07/2026 15:00 - 16:30

H4 - 3 (Franz)

MS210B - Advances In The Design Of Architected Metamaterials II

Main Organizer: Prof. Maria Laura De Bellis (University of Chieti-Pescara)

Chaired by: Dr. Claudio Boni (University of Genoa), Prof. Maria Laura De Bellis (University of Chieti-Pescara)

Analytical Modelling of Instability- and Disarrangements-based Architected Continua

***S. Palumbo**, A. Cutolo, A. Carotenuto, L. Deseri, M. Fraldi

Stochastic Characterization of Wave Propagation in Metaconcrete

***M. De Bellis**, A. Bacigalupo, A. Pandolfi

Control Strategies for Smart Chiral Metafilters via Spectrally High-Fidelity Continuum Models

***P. Badino**, A. Bacigalupo

Symmetry-Breaking in Twisted Kelvin Cell Lattices for Elastic Wave Control

***L. Kleine-Wächter**

Designing Geometrically Polarized Auxetic Piezoelectric Metamaterials with Multiple Electro-mechanical Modes

***B. Yu**, J. Hong, Z. Hou

Fri, 24/07/2026 15:00 - 16:30

H4 - 4 (Alois)

MS393A - Development and Performance Portability of Computational Mechanics Codes Targeting Advanced and Emerging Architectures I

Main Organizer: Dr. Julia Plews (Sandia National Laboratories)

Chaired by: Dr. Julia Plews (Sandia National Laboratories), Dr. Matthew Mosby (Sandia National Laboratories)

Maximizing Available Hardware Parallelism on MI300A for Finite Element Applications

***M. Mosby**, K. Parmar, T. Shelton, D. Glaze

Performance-Portable Implementation of the Conforming Reproducing Kernel Method for Explicit Dynamics

***J. Koester**, K. Ford

Accelerated Explicit Dynamics Simulations of Impact Problems Using GPU-Enabled Material Models in MOOSE

***D. Schwen**, T. Hu, B. Huddleston

Leveraging AI to Modernize Computational Mechanics Codes: Transitioning Pocket Tensor to Kokkos for GPU Acceleration

***T. Shelton**, E. Parish, P. Lindsay, J. Mersch

Advances in Performance-Portable Solver Strategies for Large-Scale Structural Dynamics on Emerging Heterogeneous Supercomputers

***J. Plews**, D. Beale, G. Bunting, N. Crane, D. Day, C. Dohrmann, P. Lindsay, J. Pepe, B. Treweek, I. Yamazaki

Fri, 24/07/2026 15:00 - 16:30

H4 - 5 (Xaver)

MS005B - Vehicle-Bridge Interaction and Its Applications II

Main Organizer: Prof. Judy Yang (National Yang Ming Chiao Tung University)

Chaired by: Prof. Jong-Dar YAU (Tamkang University), Prof. Judy Yang (National Yang Ming Chiao Tung University)

Enhanced bridge vibration suppression using a tuned vehicle suspension with an inerter damper

***X. Cheng**, C. Tan, D. McFarland, H. Lu, X. Hua

Experimental Determination of Dynamic Parameters of Short-Span Bridges via Vehicle-Induced Responses

***S. Urushadze**, J. Bayer, J. Yau

A Combined Coupling Model for Analyzing the Interactions between Soil, Structure, Track, and Vehicle in Bridges Exposed to High-Speed Trains

***P. König**, C. Adam

Fri, 24/07/2026 15:00 - 16:30

H4 - 6 (Sissi)

MS385A - Multiscale and Data-Driven Computational Approaches for Advanced Materials and Structures I

Main Organizer: Prof. Seunghwa Yang (Chung-Ang University)

Chaired by: Prof. Seunghwa Yang (Chung-Ang University), Prof. Hyunseong Shin (INHA UNIVERSITY)

An efficient direct FE² method using equivalent quadratic-RVEs for nonlinear problems

***L. Nguyen**, H. Kim

Deep learning framework to accelerate the data-driven multiscale finite element analysis

***H. Shin**

Mechanical Metamaterials with Strain-Driven Multi-Phase Elasticity

***R. Yousefi Nooraie**, S. Bagherifard

Integrated Multiscale Modelling of Polymer Nanocomposites: Linking Surface Chemistry-driven Filler Distribution to Macroscopic Properties

***S. Yang**, S. Park, M. Cho, S. Choi

Fri, 24/07/2026 15:00 - 16:30

H4 - 7 (Maximilian)

MS325A - High-Performance Computing Meets Biomechanics: Exascale Models from Cells to Human Organs I

Main Organizer: Prof. Martin Kronbichler (Ruhr University Bochum)

Chaired by: Prof. Martin Kronbichler (Ruhr University Bochum), Dr. Ivan Prusak (Ruhr-Universität Bochum)

Matrix-Free Large-Scale Poromechanical Simulation of Cardiac Perfusion on High-Performance Computing Architectures

***J. Wang**, L. Dede'

Modeling and Simulation of Surfactant Effects on Finely Resolved Alveolar Structures

***B. Temür**, R. Schussnig, W. Wall

A space-time discontinuous Galerkin method for parabolic problems on moving domains with agglomerated polytopic meshes

***X. Gui**, A. Cangiani, A. Pleto

Matrix-free algorithms for cardiac electromechanical simulations

***A. Tonini**, L. Dede'

High-performance simulation of coupled flow problems with the deal.II finite element library

***M. Kronbichler**, L. Heltai, A. Salvadori

Fri, 24/07/2026 15:00 - 16:30

H4 - 8 (Eventcenter)

MS199A - Learning from Data: Bayesian Methods for Safer and Smarter Computational Modeling in Science and Engineering I

Main Organizer: Dr. Christina Schenk (IMDEA Materials Institute)

Chaired by: Dr. Christina Schenk (IMDEA Materials Institute), Prof. Ignacio Romero Olleros (Universidad Politecnica de Madrid)

Injecting Domain Knowledge into Bayesian Optimization: A Comparative Study

***B. Schuscha**, F. Rohrhofer, D. Scheiber, B. Geiger

Bayesian Optimisation in Mixed Design Spaces for CFD Problems Involving Topological Changes

***J. Katavi?**, A. Revell, A. Skillen, T. Mari?

Towards Learning from Multiple Low-Fidelity Models in Bayesian Inverse Analysis

***L. Haeusel**, J. Nitzler, W. Wall

Bayesian Calibration and Uncertainty Quantification with Advanced Surrogates

***C. Schenk**, I. Romero

Fri, 24/07/2026 15:00 - 16:30

BrainLab - Training

MS084C - Integrating HPC and AI for Real-World Applications III

Main Organizer: Prof. Makoto Tsubokura (RIKEN R-CCS/Kobe University)

Chaired by: Dr. Luis Cifuentes (Jülich Supercomputing Centre / Forschungszentrum Jülich)

Advancing Large-Scale CFD Simulations via online Training & Inference using SOD2D solver and TorchFort

***F. Spiga**, L. Gasparino, O. Lehmkuhl

Transfer Learning for Efficient Prediction of Automotive Surface Pressure and Stress Using Graph Neural Networks

***T. Tanaka**, J. Onishi

Towards an Online Training Strategy for Machine Learning-based Wall Models for Large-eddy Simulations Using TorchFort

***V. Kumar**, B. Eiximeno, F. Spiga, O. Lehmkuhl

Topology Optimization of Automotive Roof Structures Considering Mastic Adhesives

***A. Hashioka**, Y. Wada, T. Kashiya, K. Hosaka

A high-performance parallel algorithm based on problem independent machine learning (PIML) for large-scale topology optimization

***X. Ma**, H. Gao, X. Guo

Inverse Identification of Automotive Aeroacoustic Sources Using Physics-Informed Neural Networks

***Y. Inoue**, A. Tajima, J. Onishi

Fri, 24/07/2026 15:00 - 16:30

NM - 7 (Venice)

MS007C - Synthesizing Experimental and Computational Perspectives in Mechanics/Mechanobiology of Soft Tissues: Dialogue Towards Mechanistic Insight III

Main Organizer: Prof. David Pierce (University of Connecticut)

Chaired by: Prof. Corey Neu (University of Colorado Boulder), Prof. Stéphane Avril (Mines Saint-Etienne)

Multiscale Modeling of Cell-Matrix Mechanical Interaction in the Arterial Wall Using Embedded Elements

J. Laubrie, ***S. Avril**

Machine learning-based software can reproduce knee joint cartilage stresses analyzed using finite element modeling during gait

***M. Nematollahi**, J. Kosonen, J. Kuronen, A. Esrafilian, J. Arokoski, M. Turunen, M. Mononen, R. K Korhonen

Modelling how cells sense and respond to stiffness in microporous scaffolds

***O. Santis-Lopes**, D. Tzeranis, V. Vavourakis

Design of a hydrogel lattice structure to achieve a homogeneous stiffness distribution

***L. Zerhusen**, E. Schätzlein, O. Weeger

Full-Field Elastography of the Cell Nucleus Reveals Strain-Dependent and Structure-Associated Stiffness Heterogeneity

K. Winkler, E. Miller, S. Schneider, B. Seelbinder, ***C. Neu**

SPH Simulation of Needle-Free Injection in SEBS Soft Tissue Surrogates

***H. Li**, T. Hirschler, S. Roth

Fri, 24/07/2026 16:30 - 17:00

Farewell Coffee Break

Fri, 24/07/2026 17:30 - 19:00

H4 - 4 (Alois)

ECCOMAS IGA School - Advanced School on Isogeometric Analysis: Fundamentals and Applications

Other organizers: Thomas Hughes and Trond Kvamsdal

Main Organizer: Prof. Harald van Brummelen (Eindhoven University of Technology)

Saturday, 25/07/2026

Sat, 25/07/2026 09:00 - 17:00

H4 - 4 (Alois)

ECCOMAS IGA School - Advanced School on Isogeometric Analysis: Fundamentals and Applications

Other organizers: Thomas Hughes and Trond Kvamsdal

Main Organizer: Prof. Harald van Brummelen (Eindhoven University of Technology)

Sunday, 26/07/2026

Sun, 26/07/2026 09:00 - 17:00

H4 - 4 (Alois)

ECCOMAS IGA School - Advanced School on Isogeometric Analysis: Fundamentals and Applications

Other organizers: Thomas Hughes and Trond Kvamsdal

Main Organizer: Prof. Harald van Brummelen (Eindhoven University of Technology)