Thirteenth International Conference on Isogeometric Analysis

YIC 2025

17-19 September, 2025
Pescara, Italy

PROGRAMME

ECCOMAS YIC 2025 CONFERENCE
The 8th Young Investigators Conference

PROGRAMME

Pescara, Italy
17 – 19 September, 2025

GREETINGS AND PRESENTATION

It is our pleasure to present the official programme of the **8th ECCOMAS Young Investigators Conference (YIC 2025)**, to be held in **Pescara, Italy, on 17–19 September 2025**, at the **Aurum** venue, in collaboration with the University "G. d'Annunzio" of Chieti–Pescara and within the ECCOMAS framework. The conference will also host the **ECCOMAS PhD Olympiads** with dedicated sessions.

The YIC series is a recognized forum for students and early-career researchers in **computational science and engineering**. It offers a focused environment where new ideas can be presented and discussed, and where young investigators can connect across institutions and disciplines.
The 2025 edition continues the YIC format of **invited plenary lectures** alongside **thematic minisymposia**, offering a coherent view of current advances and emerging directions. The plenary talks—delivered by leading scholars—will highlight frontier developments in modelling, numerical methods, and simulation, and outline perspectives at the interface with data-enabled approaches.

The scientific programme is articulated across broad **macro-areas** that reflect the diversity of contemporary research: **structures, fluids, and fluid–structure interaction**; **multiscale and multiphysics modelling** and **advanced discretization techniques** (including nonlocal approaches); **materials, manufacturing, architected materials and metamaterials**; **fracture, damage, and failure**; **optimization, inverse problems, and uncertainty quantification**; **waves, acoustics, and propagation phenomena**; **biomechanics and bio-inspired systems**. Cross-cutting all these areas are **data-driven modelling and machine learning** for simulation and design.

In addition, the programme includes an **Early-Career Mentoring Session** aimed at providing young participants with practical insights into **career opportunities in Europe**—covering mobility schemes, funding programmes, and pathways in both academia and industry. The conference will also feature the participation of **industrial partners and local companies**, fostering a constructive, synergistic dialogue between research and the world of work.

The programme has benefited from the dedication of the Organizing, Scientific, and Advisory Committees. We also thank the **supporting organizations**: **ECCOMAS**, the **Italian Association of Theoretical and Applied Mechanics (AIMETA)**, and its groups **GMA** (Italian Mechanics of Materials Group), **GIMC** (Italian Computational Mechanics Group), and **GBMA** (AIMETA Biomechanics Group), as well as the **Città di Pescara**. Their support has been essential to the realization of YIC 2025.

Participants are invited to consult the conference website for the **Programme Overview** and **Day-by-day** information—plenary sessions, minisymposia, technical contributions, and social activities. We look forward to welcoming the community in Pescara for a dynamic and forward-looking edition of YIC.

The conference chairwomen:

Maria Laura de Bellis

Rosaria del Toro

ACKNOWLEDGEMENTS

The conference organizers acknowledge the support towards the organization of YIC 2025 to the following sponsors and organizations:

SPONSORS:

Gold sponsor:

Bronze sponsor:

SUPPORTING ORGANIZATIONS:

AIMETA BioMechanics Group (GBMA)

European Community on Computational Methods in Applied Sciences (ECCOMAS)

Italian Association of Theoretical and Applied Mechanics (AIMETA)

Italian Computational Mechanics Group (GIMC)

Italian Mechanics of Materials Group (GMA)

Città di Pescara

ORGANIZERS AND COMMITTEES

Conference Chairwomen

The ECCOMAS Young Investigators Conference 2025 will be organized by the Department of Engineering and Geology (InGeo) belonging to the University “G. D’Annunzio” of Chieti-Pescara, Italy.

Rosaria Del Toro
University of Brescia, Italy

Maria Laura De Bellis
University of Chieti-Pescara, InGeo, Italy

Organizing committee:

Rosaria Del Toro - University of Brescia, Italy (Chair)
Maria Laura De Bellis -University of Chieti-Pescara, Italy (Co-Chair)
Cristina Falcinelli - University of Chieti-Pescara, Italy
Luca Parente - University of Chieti-Pescara, Italy
Francesco Potenza - University of Chieti-Pescara, Italy
Filippo Recrosi - University of Chieti-Pescara, Italy
Valentino Sangiorgio - University of Chieti-Pescara, Italy

Scientific Committee:

- **Fadi Aldakheel** - Leibniz University Hannover, Germany
- **Gioacchino Alotta** - Mediterranean University of Reggio Calabria, Italy
- **Paola Francesca Antonietti** - Politecnico di Milano, Italy (ECCOMAS Lions Award)
- **Andrea Bacigalupo** - University of Genoa, Italy
- **Joan Baiges** - Technical University of Catalonia, Spain (ECCOMAS Zienkiewicz Award)
- **Lourenco Beirao Da Veiga** - University of Milano-Bicocca, Italy (ECCOMAS Lions Award)
- **Giulia Bertaglia** - University of Ferrara, Italy (ECCOMAS Olympiad winner)
- **Alessandra Bonfanti** - Politecnico di Milano, Italy
- **Walter Boscheri** - Université Savoie Mont Blanc, France (ECCOMAS Lions Award)
- **Emanuela Bosco** - Eindhoven University of Technology, The Netherlands
- **Federico Bosi -** University College London, UK
- **Silvia Budday, Friedrich-Alexander**-Universität Erlangen-Nürnberg, Germany
- **Harald van Brummelen** - Eindhoven University of Technology, The Netherlands (ECCOMAS Lions Award)
- **Michele Bucelli** - Politecnico di Milano, Italy (ECCOMAS Olympiad winner)
- **Riccardo Cavuoto** - University of Naples Federico II, Italy
- **Marco Colatosti** - Sapienza University of Rome, Italy
- **Massimiliano Cremonesi** - Politecnico di Milano, Italy
- **Elias Cueto** - University of Zaragoza, Spain (ECCOMAS Zienkiewicz Award)
- **Antonio Maria D'Altri** - University of Bologna, Italy (EYIC member)
- **Gabriele Della Vecchia** - Politecnico di Milano, Italy
- **Alberto Di Matteo** - University of Palermo, Italy
- **Paolo Di Re** - Sapienza University of Rome, Italy
- **Stefanie Elgeti** - Vienna University of Technology, Austria (ECCOMAS Zienkiewicz Award)
- **Francesca Fantoni** - University of Brescia, Italy
- **Moritz Flaschel** - FAU Erlangen, Germany (ECCOMAS PHD Award)
- **Ivan Fumagalli** - Politecnico di Milano, Italy (EYIC member)
- **Carolina Furtado** - University of Porto, Portugal (ECCOMAS PHD Award)
- **Beatriz Moya Garcia** - CNRS-CREATE, Spain (EYIC member)
- **Cristina Gatta** - Sapienza University of Rome, Italy
- **Alessio Gizzi** - University Campus Biomedico Roma, Italy
- **Antonio Gil** - Swansea University, UK (ECCOMAS Zienkiewicz Award)
- **Tim Hageman** - University of Oxford, UK (ECCOMAS PHD Award)
- **Vilho Halonen** - University of Jyväskylä, Finland (EYIC member)
- **Jonas Heinzmann** - ETH Zurich, Switzerland
- **Sonja Hellebrand** - University of Duisburg-Essen, Germany (EYIC member)
- **Erik Hiltunen** - University of Oslo, Norway (ECCOMAS PHD Award)
- **Christophe Hoareau** - Cnam, France (EYIC member)
- **Ioannis Kalogeris** - National Technical University of Athens, Greece (EYIC member)
- **David Kammer** - ETH Zurich, Switzerland (EYIC member)
- Øystein Andersson Klemetsdal - SINTEF, Norway (EYIC member)
- **Dennis Kochmann** - ETH Zurich, Switzerland
- **Antonia Larese** - University of Padova, Italy
- **Lorenzo Leonetti** - University of Calabria, Italy

- **Markus Lukacevic** - TU Wien, Austria (EYIC member)
- **Roland Maier** - Karlsruhe Institute of Technology, Germany (ECCOMAS Olympiad winner)
- **Andrea Manzoni** - Politecnico di Milano, Italy (ECCOMAS Lions Award)
- **Michele Marino** - University of Rome "Tor Vergata", Italy
- **Siddhartha Mishra** - ETH Zurich, Switzerland (ECCOMAS Lions Award)
- **Diego Misseroni** - University of Trento, Italy
- **Simone Morganti** - University of Pavia, Italy
- **Lorenzo Morini** - University of Cagliari, Italy
- **Greta Ongaro** - Sapienza University of Roma, Italy
- **Antonio Palermo** - University of Bologna, Italy
- **Marco Pingaro** - Sapienza University of Roma, Italy
- **Francesco Paolo Pinnola** - University of Naples Federico II, Italy
- **Alexander Popp** - University of the Bundeswehr Munich, Germany (ECCOMAS Zienkiewicz Award)
- **Barbara Re** - Politecnico di Milano, Italy (EYIC member)
- **Alessandro Reali** - University of Pavia, Italy (ECCOMAS Zienkiewicz Award)
- **Emanuele Reccia** - University of Cagliari, Italy
- **Francesco Regazzoni** - Politecnico di Milano, Italy (ECCOMAS PHD Award)
- **Maximilian Ries** - Friedrich-Alexander-Universität Erlangen-Nürnberg, Germany (ECCOMAS PHD Award)
- **Gianluigi Rozza** - International School for Advanced Studies, Italy (ECCOMAS Lions Award)
- **Renate Sachse** - Technical University of Munich, Germany(EYIC member)
- **Laura Scarabosio** - Radboud University, The Netherlands (EYIC member)
- **Ivo Steinbrecher** - University of the Bundeswehr Munich, Germany (ECCOMAS Olympiad winner)
- **Paulina Stempin** - Poznan University of Technology, Poland (EYIC member)
- **Wei Tan** - QMUL, UK (EYIC member)
- **Marco Tezzele** - Emory University, Atlanta, Georgia, USA (ECCOMAS PHD Award)
- **Marie Touboul** - Imperial College London, UK (ECCOMAS Olympiad winner)
- **Aleksandra Vulović** - University of Kragujevac, Serbia (EYIC member)
- **Julien Yvonnet** - Gustave Eiffel University, France (ECCOMAS Zienkiewicz Award)

Advisory committee:

- **Ferdinando Auricchio** - University of Pavia, Italy (President of ECCOMAS)
- **Guido Camata** - University of Chieti-Pescara, Italy
- **Sonia Marfia** - Roma Tre University, Italy (Italian Computational Mechanics Group-GIMC)
- **Marco Paggi** - IMT School for Advanced Studies Lucca, Italy (Italian Mechanics of Materials Group-GMA)
- **Anna Pandolfi** - Politecnico di Milano, Italy (Editor in Chief of the Journal "Meccanica")
- **Elio Sacco** - University of Naples Federico II, Italy (Italian Association of Theoretical and Applied Mechanics- AIMETA)
- **Enrico Spacone** - University of Chieti-Pescara, Italy
- **Giuseppe Vairo** - University of Rome "Tor Vergata", Italy (AIMETA BioMechanics Group-GBMA)
- **Marcello Vasta** - University of Chieti-Pescara, Italy

CONFERENCE SECRETARIAT

CIMNE CONGRESS BUREAU
Campus Nord UPC
Building C1 - Office C4
Gran Capità, S/N 08034 Barcelona, Spain
Tel. +34 93 405 4696

Conference Secretariat: YIC2025_sec@cimne.upc.edu
Payments & invoices: financialsupport@cimne.upc.edu

CIMNE

PLENARY SPEAKERS

		
Annalisa Quaini University of Houston, United States Nonlinear Spatial Filtering for Large Eddy Simulation	**Maria Strazzullo** Politecnico di Torino, Italy Regularized Reduced Order Models for Convection-Dominated Flows: Stabilization, Sensitivity, and Control	**Emilio Martínez-Pañeda** University of Oxford, United Kingdom Coupled phase-field based computational models to accelerate the energy transition: hydrogen and Li-Ion batteries

MINISYMPOSIA

MS001 Advanced Metamaterial-Inspired Strategies for Ground-Borne and Seismic Vibration Mitigation
F. Zeighami (University of Bologna, Italy), G. Alotta (Mediterranean University of Reggio Calabria, Italy) and A. Russillo (Mediterranean University of Reggio Calabria, Italy)

MS002 Advanced Methods for System Identification and Optimal Sensor Placement in Complex Engineering Applications
S. Warnakulasuriya (Technical University of Munich, Germany), I. Antonau (Technische Universität Braunschweig, Germany), T. Ansari (Technical University of Munich, Germany), F. Airaudo (George Mason University, United States), H. Antil (George Mason University, United States), R. Löhner (George Mason University, United States) and R. Wüchner (Technical University of Munich, Germany)

MS003 Advanced Numerical Methods for Fluid Flows
C. De Michele (CIRA Italian Aerospace Research Centre, Italy), A. Aiello (University Federico II of Naples, Italy), L. Alberti (Marche Polytechnic University, Italy) and E. Carnevali (Marche Polytechnic University, Italy)

MS004 Advanced Numerical Techniques for Multi-Scale Problems with Applications
S. Di Giovacchino (University of L'Aquila, Italy), N. Ferro (MOX Politecnico di Milano, Italy), S. Mirabella (MOX Politecnico di Milano, Italy), G. Pagano (University of Salerno, Italy) and F. Pichi (SISSA, Italy)

MS006 Advances in Control and Model Order Reduction for Simulation Science
M. Manucci (University of Stuttgart, Germany), L. Saluzzi (Sapienza Università di Roma, Italy) and M. Strazzullo (Politecnico di Torino, Italy)

MS007 Advances in Data-driven Approaches for Multiscale Agent-based Systems
G. Bertaglia (University of Ferrara, Italy), E. Iacomini (University of Ferrara, Italy) and C. Segala (Università della Svizzera Italiana, Switzerland)

MS009 Advances in Modeling and Applications of Viscoelastic Soft Materials
F. Califano (Sapienza University of Rome, Italy) and M. Ruggieri (Roma Tre University, Italy)

MS010 Advances in Numerical Methods for Multi-physics Problems With Application to Sustainable Development
P. Antonietti (Politecnico di Milano, Italy), S. Bonetti (Politecnico di Milano, Italy), N. Kumar (Politecnico di Milano, Italy) and S. Pagani (Politecnico di Milano, Italy)

MS011 Atomistic, Nano, and Micro Mechanics of Materials
M. Ries (FAU Erlangen-Nürnberg, Germany) and L. Laubert (FAU Erlangen-Nürnberg, Germany)

MS012 Biomechanics of growth and morphogenesis for advanced applications
A. Carotenuto (University of Napoli "Federico II", Italy) and S. Palumbo (University of Napoli "Federico II", Italy)

MS013 Cardiovascular tissues: from the characterisation to the modelling
A. Caimi (Università di Pavia, Italy), G. Formenton (Università di Pavia, Italy) and M. Schembri (Università di Pavia, Italy)

MS015 Emerging Trends In Vibration Control And Energy Harvesting: Modeling And Analysis Of Advanced Materials And Structures At Micro And Macro Scales
G. Alotta ("Mediterranean" University of Reggio Calabria, Italy), A. Di Matteo (University of Palermo, Italy) and F. Pinnola (University of Naples "Federico II", Italy)

MS017 High-order and advanced discetization methods for complex problems
L. Greco (University of Pavia, Italy) and M. Torre (Univesity of Pavia, Italy)

MS018 Innovative Approaches and Open Challenges in the Simulation and Modelling of Composite Structures
M. Schilling (University of Stuttgart - IBB, Germany) and M. Vinot (German Aerospace Center - DLR, Germany)

MS020 Interacting Particle Models: Applications in Complex Systems and Approaches for Reducing the Computational Cost
S. Bonandin (RWTH Aachen University, Germany) and S. Veneruso (University of Ferrara, Italy)

MS021 Microstructurally Graded Materials: Design and Computing
F. Recrosi (University of Chieti-Pescara, Italy), M. Schiantella (University of Perugia, Italy) and F. Luppino (University of Chieti-Pescara, Italy)

MS022 Modeling of Complex Biological Systems: From Cell to Tissue
F. Recrosi (University of Chieti-Pescara, Italy), G. Lucci (La Sapienza University of Rome, Italy) and M. Serpelloni (University of Brescia, Italy)

MS024 Modelling and design of advanced materials
M. Doškář (Czech Technical University in Prague, Czechia) and M. Horák (Czech Technical University in Prague, Czechia)

MS025 Multiscale Methods and Coupled Problems
D. Güzel (TU Dortmund University, Germany), P. Hartwig (University of Duisburg-Essen, Germany), S. Hellebrand (University of Duisburg-Essen, Germany) and T. Kaiser (TU Dortmund University, Germany)

MS026 Non-conventional models for nano- and micro-mechanics
G. Failla (University of Reggio Calabria, Italy), G. Alotta (University of Reggio Calabria, Italy) and A. Burlon (University of Reggio Calabria, Italy)

MS027 Numerical Modeling of High-Speed Aero-thermodynamics
A. Ceci (Sapienza University of Rome, Italy), D. Passiatore (Università del Salento, Italy), M. Di Renzo (Università del Salento, Italy) and D. Modesti (Gran Sasso Science Institute, Italy)

MS028 Numerical Modelling of Damage Characteristics of Classical and Non-classical Materials
G. Ongaro (Sapienza University of Rome, Italy), M. Tuna (Alma Mater Studiorium - University of Bologna, Turkey), M. Colatosti (Sapienza University of Rome, Italy) and M. Pingaro (Sapienza University of Rome, Italy)

MS029 Phase-field and gradient damage models for fracture: theory, algorithms and applications
J. Heinzmann (ETH Zurich, Switzerland) and A. Fajardo Lacave (Robert Bosch GmbH, ETH Zurich, Germany)

MS030 Phase-Field Modeling of Microstructure Evolution
A. Gomero Soria (Empa, ETH Zürich, Switzerland) and H. Oudich (ETH Zürich, Switzerland)
MS031 Recent Advances in Computational Modeling of Masonry Material and Structures
P. Di Re (Sapienza University of Rome, Italy), C. Gatta (Sapienza University of Rome, Italy), N. Nodargi (University of Rome Tor Vergata, Italy) and A. Paoloni (Sapienza University of Rome, Italy)

MS032 Recent Advances in Computational Modelling of Fracture and Damage Mechanics
R. Cavuoto (University of Naples "Federico II", Italy), M. Marulli (IMT School for Advanced Studies Lucca, Italy), E. Monaldo (Roma Tre University, Italy) and A. Rodella ("Sapienza" University of Rome, Italy)

MS033 Recent Advances in Polytopal Finite Element Methods
I. Fumagalli (Politecnico di Milano, Italy) and S. Gómez (Università degli Studi di Milano-Bicocca, Italy)

MS034 Recent Advances on Scientific Machine Learning and Data-Driven Approaches in Sustainability
A. D'Inverno (SISSA, Italy), C. Scalone (University of L'Aquila, Italy), G. Speroni (Politecnico di Milano, Italy), E. Temellini (Politecnico di Milano, Italy) and C. Valentino (University of Salerno, Italy)

MS035 Reduced Order Models, Surrogates and Fast Solvers
M. Chasapi (RWTH Aachen University, Germany), D. Goutaudier (Arts et Métiers ParisTech, France), T. Hirschler (Université Bourgogne Franche-Comté, France) and F. Rocha (Université Paris-Est Créteil, France)

MS039 Various Apects of Machine Learning Enhanced Numerical Methods to Solve Differential Problems
D. Oberto (Sissa, Italy), M. Pintore (Sorbonne Université, France) and G. Teora (Politecnico di Torino, Italy)

15th ECCOMAS PhD OLYMPIAD

Friday, September 19, 2025

OLYA ECCOMAS PhD Olympiad I

Fri, 19/09/2025
10:15 - 12:15
Sala D'Annunzio

Scheduled presentations:

- Matrix-free weighted quadrature isogeometric analysis applied to thermal and mechanical simulations
  ***J. Cornejo Fuentes**
- Multi-Scale Modeling and Design of PC/ABS Polymer Blends: Integrating Constitutive Modeling with Bayesian Optimization for Inverse Problems
  ***A. Carvalho Alves**, B. Ferreira, F. Andrade Pires
- Virtualization of Parametric Dynamical Systems through Uncertainty-Aware Reduced Order Modeling
  ***K. Vlachas**
- Multiscale Numerical Model for the Analysis of Laminated Glass Structures Exposed to Static Load
  ***G. Grozdanic**, M. Galic, A. Ibrahimbegovic
- Deep Learning-Enhanced Multi-Scale Simulation Approaches for Complex Molecular Systems
  ***E. Christofi**
- Thermomechanical Modelling and Simulation of Laser Powder Bed Fusion Processes
  ***I. Noll**
- Multi-scale Finite Element Method (MsFEM) for Incompressible Flows in Heterogeneous Media: Implementation and Convergence Analysis
  ***L. Balazi**, G. Allaire, P. Omnes

OLYB ECCOMAS PhD Olympiad II

Fri, 19/09/2025
13:00 - 15:00
Sala D'Annunzio

Scheduled presentations:

- Space–time virtual elements for the heat equation
  ***S. Gomez**, L. Mascotto, A. Moiola, I. Perugia
- Finite-Element Modelling of Moving Weak Discontinuities Using Laminated Microstructures
  ***J. Dobrzański**
- Isogeometric Analysis of Wrinkling
  ***H. Verhelst**
- Advanced Finite Element and Isogeometric modeling for homogeneous and composite shells involving plasticity, large deformations, and warping
  ***A. Corrado**
- Phase-Field-Based Chemo-Mechanical Modelling of Corrosion-Induced Cracking in Reinforced Concrete
  ***E. Korec**, M. Jirásek, H. Wong, E. Martínez-Pañeda
- The Role and Potential of Explainability in Interactive Multiobjective Optimization

  ***G. Misitano**

PRACTICAL INFORMATION

CONFERENCE VENUE & HOST CITY

The ECCOMAS Young Investigators Conference will take place from September 17th to 19th 2025, and the venue for this event will be the “Aurum”, a historical building nestled within the D’Annunzio pine forest, near the seaside.

The location is at 15 minutes’ walk from the Pescara university campus. At one time, the building housed the distillery that produced the “Aurum” liqueur, currently it is a central location for expressing the identity and culture of Pescara.

The Sala d’Annunzio is the largest room and it will be the venue for the plenary lectures. The location is also equipped with additional spaces, arranged on two floors, which can accommodate parallel sessions and the PhD Olympiad. Aurum is situated at Largo Gardone Riviera, 65127 Pescara (PE), easily accessible from the Central train station and the city center via urban bus lines.

Pescara

Pescara is located in the region of Abruzzo and lies along italian Adriatic cost with a population of about 118.316 inhabitants. The city combines natural beauty, rich culture, accessibility and modern structures. Pescara boasts extensive sandy beaches along the Adriatic Sea and a rich cultural heritage with historical sites, museums and galleries. Visitors have the opportunity to explore the Modern Art Museum “Vittoria Colonna” that houses a collection including works by artists such as Picasso, Guttuso and Mirò, among the others. Pescara is the birthplace of famed italian poet Gabriele D’Annunzio who is celebrated with the national monument “Museo D’Annunzio” devoted to his life and poetics. Pescara is a tourist place that offers a wide range of modern facilities and several cicle routes that connect the city center with various neighbourhoods and municipalities for a total of over 20km.

The Pescara seafront is a long tree-lined avenue that stretches for approximately 10km along the Adriatic Sea. The promenade is adorned with a variety of charming Liberty-style villas. The D’Annunzio pine forest is the largest green place in the city with more that 50 hectares of protected area that contains a rich diversity of flora and fauna species characteristic of Mediterranean ecosystem. The city offers a variety of hotels to suit different preferences and budgets, making it a versatile destination for travellers.

Moreover, Pescara is renowned for being a costeffective place to stay. Finally, Pescara is a gastronomic delight, offering authentic Italian cuisine with a focus on fresh seafoods and regional specialities.

REGISTRATION

Registration will begin on **Tuesday, September 16th, 2025**, from **18:00 to 20:00**, at the **JUMBO BEACH resort** together with a welcome drink.

Registration will continue on **Wednesday, September 17th**, starting at **08:00** while on **Thursday**, the registration will start at **8.30.**

To register, please present your **Registration Code** at the registration desk. You will then receive your **conference badge**.

Please remember to **wear your badge at all times** during the conference, as it is required for access to all sessions and events.

Secretariat Desk Timetable:

- Tuesday, September 16th: 18:00 -20:00
- Wednesday, September 17th: 08:00 -12:30 / 13:45- 17:00
- Thursday, September 18th: 08:30 -12:30 / 13:45- 16:30
- Friday, September 19th 8: 45- 12.00/ 13:00-15:00

PRESENTATIONS

Technical Programme:

The technical programme of YIC 2025 includes 3 plenary lectures, 29 invited Minisymposia, two sessions of the PhD Olympiad, and a total of 240 oral presentations.

Time:

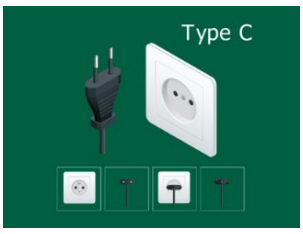
Each contributed talk will last 20 minutes, while plenary lectures will be 45 minutes long. These durations include time for Q&A.

Equipment:

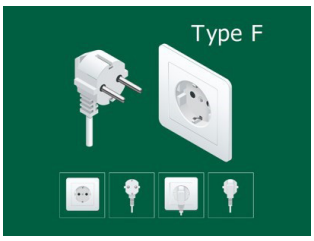
Each session room will be equipped with a PC, an LCD projector and an HDMI connection. Please make sure to bring your own adapter if needed. We strongly recommend bringing a backup copy of your presentation on a USB drive.

Power sockets and plug converters:

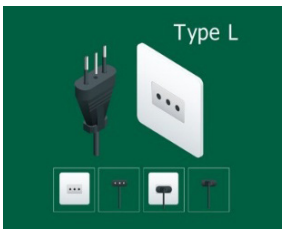
The power supply in Italy operates at 230V and 50Hz. The common electric sockets are types C, F, and L (see below). Types C and F have two round pins, while type L has three round pins. You may need a travel adapter to use your electronic devices.



Type C



Type F



Type L

COFFEE & LUNCH BREAKS

Coffees and lunches will be served at the conference venue.

SOCIAL PROGRAMME

Welcome drink and registration

Grab your badge and kick off the conference with a welcome drink!

This is the perfect way to meet delegates, friends and colleagues in a relaxed atmosphere.

When: Tuesday - September 16, 2025 (18:30-20:30)
Where: Jambo, Viale della Riviera, 38, 65123 Pescara

Pub Crawl

Be part of the pub crawl across four different venues. You'll be guided by local hosts that you can meet at Piazza della Rinascita.

When: Wednesday - September 17, 2025 (22:00)
Meeting point: Piazza della Rinascita, Pescara

Participation is limited to **150** people and registration is required.

Distilleria Clandestina, via Goito, 14, Pescara (link here)
Wild Pescara, via C. Battisti, 74, 65122, Pescara
Amber Wine Corner, via C. Battisti, 80, 65122, Pescara Italy (link here)
Birreria Hai Bin "Al Centro", via C. Battisti, 77/79, 65122, Pescara (link here)

Jazz Concert & Congress Banquet

When: Thursday - September 18, 2025 (20:30)
Where: Granchio Royal, Piazza Le Laudi, 2 – Pescara (5 minutes walk from "Aurum")

The banquet dinner will be preceded by a short jazz concert performed at Aurum by Stefano Taglietti, a renowned Italian composer.

EMERGENCY CALLS

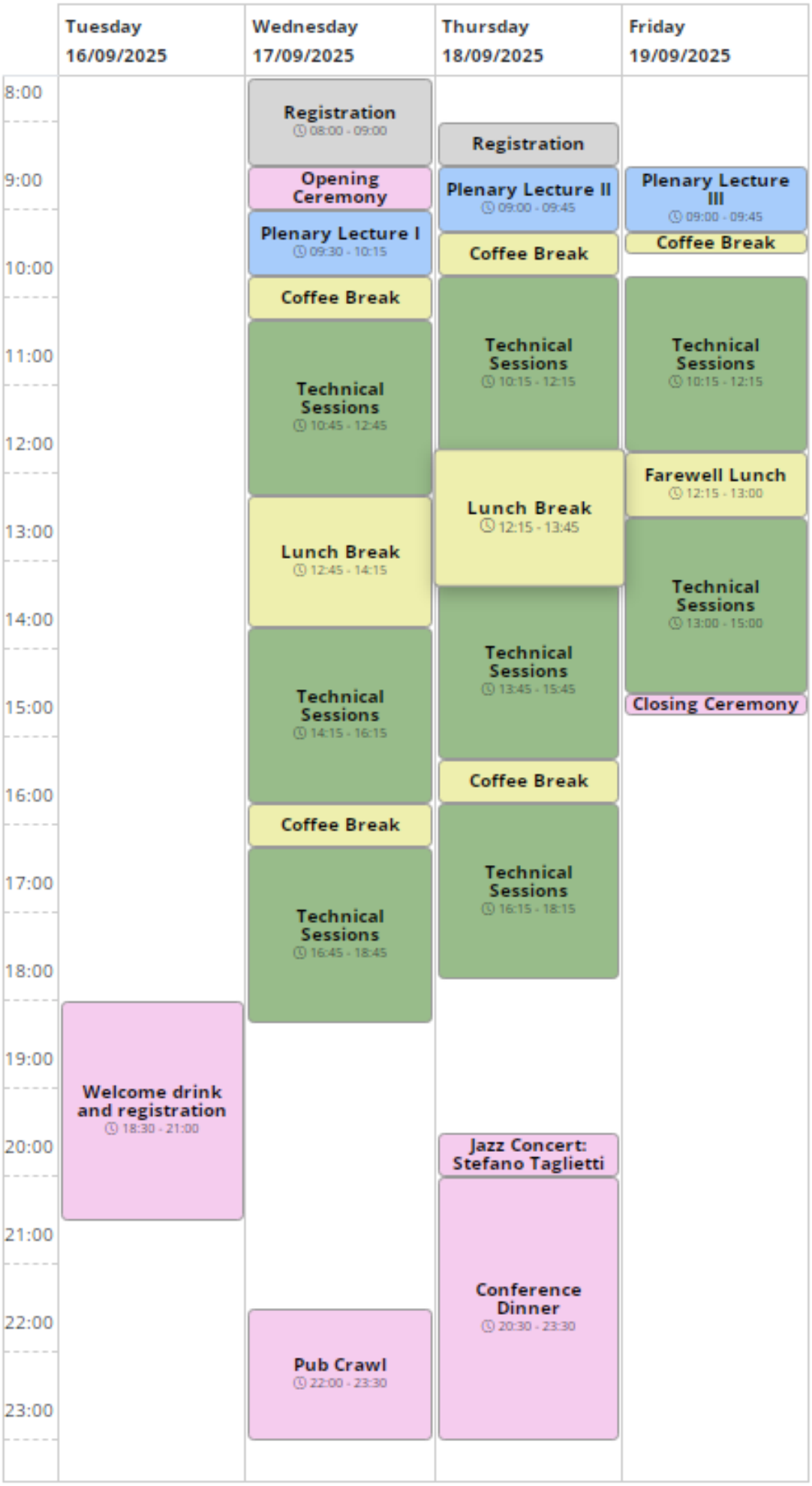
There are a range of **emergency numbers** at your disposal that you can call for free based on your needs:

- **Emergency (Police, Fire, Ambulance): 112**
- **Medical Emergency: 118**
- **Fire Department: 115**
- **Police: 113**

Taxi – Pescara

- **Radio Taxi Pescara:** +39 085 35155
- **Taxi Pescara Centrale:** +39 085 430 320

TECHNICAL PROGRAMME OVERVIEW



YIC2025
Technical Programme

Last updated: 2025-09-10 17:00

Tuesday, 16/09/2025

Tue, 16/09/2025 18:30 - 21:00
Welcome drink and registration

Wednesday, 17/09/2025

Wed, 17/09/2025 08:00 - 09:00
Registration

Wed, 17/09/2025 09:00 - 09:30
Opening Ceremony

Wed, 17/09/2025 09:30 - 10:15 Sala D'Annunzio
Plenary Lecture I
Chaired by: Dr. Annalisa Quaini (University of Houston)

Coupled phase-field based computational models to accelerate the energy transition: hydrogen and Li-Ion batteries
***E. Martínez-Pañeda**

Wed, 17/09/2025 10:15 - 10:45
Coffee Break

Wed, 17/09/2025 10:45 - 12:45 Sala D'Annunzio
MS015A - Emerging Trends In Vibration Control And Energy Harvesting: Modeling And Analysis Of Advanced Materials And Structures At Micro And Macro Scales
Co-Organizers: G. Alotta (“Mediterranean” University of Reggio Calabria, Italy) and F. Pinnola (University of Naples “Federico II”, Italy)
Main Organizer: Dr. Alberto Di Matteo (University of Palermo)
Chaired by: Dr. Alberto Di Matteo (University of Palermo), Dr. Francesco Paolo Pinnola (University of Naples "Federico II")

Modelling and Optimisation of Triboelectric Nanogenerators Considering Surface Roughness
***M. Sanglap,** R. Mukherjee, J. Perris, C. Kumar, D. Mulvihill, ?. Kaczmarczyk, A. Shvarts

Efficient GA-Based Analytical FRF Analysis for MDOF 3D-Printed Viscoelastic specimens
***S. Russotto,** S. Orlando, A. Pirrotta

Tuned Liquid Column Damper based energy harvester with dielectric elastomer generator
***A. Di Matteo,** G. Nuzzo

A floating resonant absorber for motion mitigation in floating offshore wind turbines
***G. Alotta,** C. Ruzzo, G. Malara, G. Failla, F. Arena

Modeling and Testing of a Rack-and-Pinion Inerter with Geometric Inertance Amplification
C. Masnata, ***L. Di Nardo,** A. Pirrotta

Stationary and Non-Stationary Analysis of Nonlocal Viscoelastic Plates
***F. Pinnola,** F. Scudieri, F. Marotti de Sciarra

Wed, 17/09/2025 10:45 - 12:45 Sala Tosti
MS009A - Advances in Modeling and Applications of Viscoelastic Soft Materials
Co-organized by M. Ruggieri (Roma Tre University, Italy)
Main Organizer: Mr. Federico Califano (Sapienza University of Rome)
Chaired by: Mr. Federico Califano (Sapienza University of Rome), Mr. Matteo Ruggieri (Università degli Studi Roma Tre)

On the Role of Viscoelasticity in Cell Mechanosensing: From Reorientation to Adhesion
***G. Lucci,** J. Ciambella, C. Giverso, P. Nardinocchi, L. Preziosi

Experimental and numerical characterization of porcine brain tissue in the time and frequency domain
***L. Ruhland,** K. Willner

A Constrained Approach to Modeling Uniaxial Nematic Elastomers: Internal Constraints, Gauge Conditions and “Effective” Reaction Forces
***A. Pastore,** A. Grillo, E. Fried

Modeling the Payne Effect in Elastomers through Deep Rheological Elements
***F. Califano,** S. Domesi, J. Ciambella

Modelling Magneto-Viscoelastic Laminates for Tuneable Vibration Absorber
***M. Ruggieri,** J. Ciambella, G. Tomassetti, S. Rudykh

Modeling Early Fracture Precursors in Viscoelastic Solids: A Phase-Field Approach
***S. Domesi,** J. Ciambella, G. Lancioni

Wed, 17/09/2025 10:45 - 12:45 Sala Fisso L'Idea

MS018A - Innovative Approaches and Open Challenges in the Simulation and Modelling of Composite Structures

Co-Organized by M. Vinot (German Aerospace Center - DLR, Germany)
Main Organizer: Mr. Maximilian Schilling (University of Stuttgart)
Chaired by: Mr. Maximilian Schilling (University of Stuttgart), Mr. Mathieu Vinot (German Aerospace Center)

Towards Digital Continuity in Virtual Product Development of Composite Aerospace Structures by means of a Domain-Specific Language for Computational Structural Mechanics and its Software Ecosystem
***M. Rädel,** A. Schuster, F. Schoenitz, J. Lefèvre

Analyzing the effect of spatial variability of material properties on lvi damage in composites - A stochastic finite element analysis
***C. Gorsky**

Investigation of simulation methodologies for thick-walled composite hydrogen tanks under internal pressure and impact load with LS-DYNA
***J. Dittmann,** M. Vinot, N. Toso, H. Voggenreiter

Static and dynamic analysis of curved laminated beams through the position-based finite element formulation
***L. Lottici,** P. Fisicaro, S. Scheid, P. Valvo

Enhanced Stress Prediction in Fiber-Reinforced Laminates Using Higher-Order 3D-Shell Finite Elements
***M. Schilling,** M. von Scheven, M. Bischoff

Integrating Laminate-Level Bolted Joint Failure Envelope Data into Connector-Based Finite Element Models for Composite Joint Stiffness and Failure Prediction
A. Volpi, F. Danzi, F. Otero, ***C. Furtado,** G. Catalanotti

Wed, 17/09/2025 10:45 - 12:45 Sala Ufficio della Riserva

MS028A - Numerical Modelling of Damage Characteristics of Classical and Non-classical Materials

Co-organized by: G. Ongaro (Sapienza University of Rome, Italy), M. Tuna (Alma Mater Studiorium - University of Bologna, Turkey) and M. Colatosti (Sapienza University of Rome, Italy)
Main Organizer: Dr. Marco Pingaro (Sapienza University of Rome)

The structural behaviour of Crinkle Cranke walls
***M. Lai,** V. Paris, E. Reccia

Volumetric Locking Alleviation in Peridynamic Correspondence Models of Soft Tissues
***F. Scabbia,** V. Diana, F. Fantoni, M. Zaccariotto, U. Galvanetto

Coupling of FEM and Peridynamics for a 3D Brain Model
***M. Jeddi,** F. Scabbia, M. Zaccariotto, P. Pavan, U. Galvanetto

The role of soft tissue damage in the performance of subcutaneous insulin port devices
***L. Zoboli,** F. Luppino, D. Bianchi, A. Gizzi

A novel chemo-mechanical computational model for bio-absorbable Mg-based orthopedic implants
***P. Gaziano,** L. Zoboli, L. Chimenti, M. Marino, A. Gizzi, G. Vairo

Wed, 17/09/2025 10:45 - 12:45 Sala Europa 1

MS033A - Recent Advances in Polytopal Finite Element Methods

Co-organized by: S. Gómez (Università degli Studi di Milano-Bicocca, Italy)
Main Organizer: Dr. Ivan Fumagalli (Politecnico di Milano)
Chaired by: Dr. Sergio Gomez (University of Milano-Bicocca), Dr. Ivan Fumagalli (Politecnico di Milano)

Rapid prototyping for polytopal methods: the first 10 years of DiSk++
***M. Cicuttin**

A posteriori error analysis and adaptivity for VEM
S. Berrone, A. Borio, C. Canuto, ***D. Fassino,** F. Marcon, F. Vicini

A p-adaptive polytopal method for modeling neuronal electrophysiology
***C. Leimer Saglio,** S. Pagani, P. Antonietti

Mesh Quality and Optimization in the Virtual Element Method
***T. Sorgente**

A Unified Framework for Trefftz-like Discretization Methods
P. Lederer, C. Lehrenfeld, ***P. Stocker,** I. Voulis

Wed, 17/09/2025 10:45 - 12:45 Sala Europa 2

MS006A - Advances in Control and Model Order Reduction for Simulation Science

Co-Organized by: L. Saluzzi (Sapienza Università di Roma, Italy) and M. Strazzullo (Politecnico di Torino, Italy)
Main Organizer: Dr. Mattia Manucci (University of Stuttgart)
Chaired by: Dr. Maria Strazzullo (Politecnico di Torino)

Two-stage Model Reduction for Parametrized Optimal Control Problems

***H. Kleikamp,** L. Renelt

Multi-level Nonlinear Optimal Control with Neural Surrogate Models

D. Kalise, E. Loayza-Romero, K. Morris, ***Z. Zhong**

Risk-adjusted feedback control under uncertainty

***P. Guth,** P. Kritzer, K. Kunisch

Nonlinear Feedback Control via Dynamical Low-Rank Approximation

***L. Saluzzi,** M. Strazzullo

Model predictive control for switched evolution equations using model order reduction

M. Kartmann, ***M. Manucci,** B. Unger, S. Volkwein

Wed, 17/09/2025 12:45 - 14:15

Lunch Break

Wed, 17/09/2025 14:15 - 16:15 Sala D'Annunzio

MS039A - Various Apects of Machine Learning Enhanced Numerical Methods to Solve Differential Problems

Co-organized by: D. Oberto (Sissa, Italy) and G. Teora (Politecnico di Torino, Italy)
Main Organizer: Mr. Moreno Pintore (Sorbonne University, Inria)
Chaired by: Mr. Davide Oberto (SISSA), Dr. Gioana Teora (DISMA - Politecnico di Torino)

Graph-Based Machine Learning Approaches for Model Order Reduction Keynote

***F. Pichi,** B. Moya, O. Morrison, J. Hesthaven

rbVEM: the Reduced Basis Virtual Element Method

***F. Credali**

Machine Learning-based quadratic closures for non-intrusive Reduced Order Models

***G. Codega,** A. Ivagnes, N. Demo, G. Rozza

A New Set of Test Functions for Variational Physics-Informed Neural Networks in Solid Mechanics

***N. Radin,** S. Klinkel, O. Altay

The Three-Dimensional Volume Of Fluid - Machine Learning Method

***M. Pintore,** B. Després

Wed, 17/09/2025 14:15 - 16:15 Sala Tosti

MS025A - Multiscale Methods and Coupled Problems I

Co-organized by: D. Güzel (TU Dortmund University, Germany), P. Hartwig (University of Duisburg-Essen, Germany) and T. Kaiser (TU Dortmund University, Germany)
Main Organizer: Dr. Sonja Hellebrand (University of Duisburg-Essen)
Chaired by: Mr. Philipp Hartwig (University Duisburg-Essen), Ms. Dilek Güzel (TU Dortmund University, Institute of Mechanics)

Shakedown Analysis of Particle-Reinforced Metal Matrix Composites (PRMMCs): A Multiscale and Lower-Bound Approach

***L. Veludandi,** R. Vafadari, L. Ochoa Octavious, J. Simon

Shakedown Analysis of Paper and Paperboard Materials: A Computational Framework for Predicting Structural Reliability

***R. Vafadari,** L. Veludandi, L. Aurora Ochoa, J. Simon

Homogenization of Heterogeneous Electro-active Polymers using Polygonal Elements

***J. Kumar,** M. Jabareen

Homogenisation of Thermo-Electrically Coupled Systems with Dissipative Terms

***D. Güzel,** D. Wiedemann, T. Kaiser, A. Menzel

Structure-Structure Homogenization of Corrugated Core Sandwich Panels Using a Reissner-Mindlin Shell Formulation

***M. Herrmann,** S. Klarmann, S. Klinkel

Wed, 17/09/2025 14:15 - 16:15 Sala Fisso L'Idea

MS022A - Modeling of Complex Biological Systems: From Cell to Tissue

Co-organized by: G. Lucci (La Sapienza University of Rome, Italy) and M. Serpelloni (University of Brescia, Italy)
Main Organizer: Phd. Filippo Recrosi (University of Chieti-Pescara)
Chaired by: Phd. Filippo Recrosi (University of Chieti-Pescara), Dr. Giulio Lucci (Istituto Nazionale di Alta Matematica "F. Severi")

A Model Of Growth Mechanics **Keynote**

***A. Grillo,** A. Pastore, S. Di Stefano

Agradient flow approach to leaves morphogenesis

***D. Andrini,** A. Lucantonio, G. Noselli

Incompatibility-driven growth

***A. Erlich,** G. Zurlo

Integrating Data-Driven and Microstructure-Inspired Modelling of Spider Silk's Mechanical Behavior under Varying Environmental Conditions
***V. Fazio,** A. Malay, K. Numata, N. Pugno, G. Puglisi

A Stochastic Finite Element Analysis of Crosslinked F-actin Networks

***L. Pacheco,** J. Ferreira, M. Parente

Wed, 17/09/2025 14:15 - 16:15 Sala Ufficio della Riserva

MS003A - Advanced Numerical Methods for Fluid Flows I

Co-Organized by A. Aiello (University Federico II of Naples, Italy), L. Alberti (Marche Polytechnic University, Italy) and E. Carnevali (Marche Polytechnic University, Italy)
Main Organizer: Dr. Carlo De Michele (Gran Sasso Science Institute)
Chaired by: Dr. Carlo De Michele (Gran Sasso Science Institute), Dr. Alessandro Aiello (Università degli Studi di Napoli "Federico II")

Structure-Preserving Methods for Compressible Flows Simulation **Keynote**

***C. De Michele,** G. Coppola

On the Application of an Entropy-Aware Modal Discontinuous Galerkin Solver for the Implicit Large Eddy Simulations of Under-Resolved Channel Flows
***E. Carnevali,** L. Alberti, A. Crivellini, A. Colombo

Unsteady Mesh Adaptation within the Arbitrary Lagrangian–Eulerian framework

***B. Re**

A Conservative and Pressure-Equilibrium Preserving Discretization for Compressible Flows with an Arbitrary Equation of State

***A. Aiello,** C. De Michele, G. Coppola

Entropy-Stable High-Order Methods for the Compressible Euler Equations in Potential Temperature Formulation for Atmospheric Flows

***M. Artiano,** H. Ranocha, P. Spichtinger

Wed, 17/09/2025 14:15 - 16:15 Sala Europa 1

MS033B - Recent Advances in Polytopal Finite Element Methods

Co-organized by: S. Gómez (Università degli Studi di Milano-Bicocca, Italy)
Main Organizer: Dr. Ivan Fumagalli (Politecnico di Milano)
Chaired by: Dr. Ivan Fumagalli (Politecnico di Milano), Dr. Sergio Gomez (University of Milano-Bicocca)

H^2 Conforming Virtual Element Discretization of Nondivergence Form Elliptic Equations

***G. Bonnet,** A. Cangiani, A. Dedner, R. Nochetto

Towards stabilization-free Hybrid High-Order methods for elliptic problems

A. Borio, ***K. Cascavita,** M. Cicuttin, F. Marcon

A pressure and convection robust Finite Element Method for non-newtonian Navier-Stokes system

L. Beirão da Veiga, D. Di Pietro, ***K. Haile**

Virtual Element Method for Contact Problem

***L. Molinari,** C. Lovadina

Uniform Poincaré inequalities for the discrete de Rham complex of differential forms

D. Di Pietro, J. Droniou, M. Hanot, ***S. Pitassi**

Virtual Elements on polyhedra with a curved face

***D. Prada**

Wed, 17/09/2025 14:15 - 16:15 Sala Europa 2

MS006B - Advances in Control and Model Order Reduction for Simulation Science II

Co-Organized by: L. Saluzzi (Sapienza Università di Roma, Italy) and M. Strazzullo (Politecnico di Torino, Italy)
Main Organizer: Dr. Mattia Manucci (University of Stuttgart)
Chaired by: Dr. Luca Saluzzi (University of Roma, La Sapienza)

Parallel Rank-Adaptive Integrators for Dynamical Low-Rank Approximation

***G. Ceruti**

Nonlinear ROM for Gradient Flow Dynamics

***I. Gonnella,** F. Pichi, R. Bailo, O. Mula, G. Rozza

KLAP: KYP Lemma Based Low-Rank Approximation for Passivation

***J. Nicodemus,** B. Unger, M. Voigt, S. Gugercin

Variationally Correct Neural Residual Regression for Parametric PDEs: On the Viability of Controlled Accuracy

M. Bachmayr, W. Dahmen, ***M. Oster**

A three-operator proximal splitting approach for sparse consensus control

G. Albi, D. Kalise, ***C. Segala**

Multi-Fidelity approaches to reduce computational cost in UQ

***E. Iacomini,** L. Pareschi

Wed, 17/09/2025 16:15 - 16:45

Coffee Break

Wed, 17/09/2025 16:45 - 18:45 Sala D'Annunzio

MS039B - Various Apects of Machine Learning Enhanced Numerical Methods to Solve Differential Problems

Co-organized by: D. Oberto (Sissa, Italy) and G. Teora (Politecnico di Torino, Italy)
Main Organizer: Mr. Moreno Pintore (Sorbonne University, Inria)
Chaired by: Mr. Moreno Pintore (Sorbonne University, Inria), Dr. Gioana Teora (DISMA - Politecnico di Torino)

Exploring AI-based feature selection techniques for geoeffective solar events prediction

***F. Camattari,** S. Guastavino, F. Marchetti, E. Perracchione, M. Piana, A. Massone

Intertwining Deep Autoencoders and Singular Value Decomposition: Beyond Efficiency, Towards Explainability

***S. Brivio,** N. Franco, S. Fresca, A. Manzoni

Reducing Generalization and Training Errors of DeepONets for Approximating Parametric PDEs

***J. Gonzalez-Sieiro,** D. Pardo, V. Calo

Adaptive Kernel Approximation: Bridging Classical Methods and Neural Networks

***G. Audone,** F. Della Santa, E. Perracchione, S. Pieraccini

Beyond Heuristics: Data-Based Estimation of Critical Time Steps in Dynamics

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

Real-Time UAV Sensor Failure Prediction Under Icing Using CFD-Derived Data-Driven Surrogates

***S. Zaher,** Y. Lin, J. Wang

Wed, 17/09/2025 16:45 - 18:45 Sala Tosti

MS025B - Multiscale Methods and Coupled Problems II

Co-organized by: D. Güzel (TU Dortmund University, Germany), P. Hartwig (University of Duisburg-Essen, Germany) and T. Kaiser (TU Dortmund University, Germany)
Main Organizer: Dr. Sonja Hellebrand (University of Duisburg-Essen)
Chaired by: Ms. Dilek Güzel (TU Dortmund University, Institute of Mechanics), Mr. Philipp Hartwig (University Duisburg-Essen)

Multiscale Modeling of Porous Materials: Comparison of analytical and micromechanics-based approaches

***J. Dahler,** S. Staub, L. Scheunemann

Multiscale Insights into Solidification Cracking in Laser Welding

***P. Hartwig,** L. Scheunemann, J. Schröder

On the analysis of phase transition effects on microscopic residual stresses in hot bulk forming

***S. Hellebrand,** L. Scheunemann, D. Brands, J. Schröder

Thermodynamically consistent phase transformation modelling for Ti-Al alloys in Laser Powder Bed Fusion

***I. Noll,** T. Bartel, A. Menzel

Wed, 17/09/2025 16:45 - 18:45 Sala Fisso L'Idea

MS022B - Modeling of Complex Biological Systems: From Cell to Tissue

Co-organized by G. Lucci (La Sapienza University of Rome, Italy) and M. Serpelloni (University of Brescia, Italy)
Main Organizer: Phd. Filippo Recrosi (University of Chieti-Pescara)
Chaired by: Dr. Mattia Serpelloni (Università degli Studi di Brescia), Dr. Giulio Lucci (Istituto Nazionale di Alta Matematica "F. Severi")

Growth and remodeling phenomena in arterial wall through homogenized constrained mixture models

***F. Recrosi,** M. Vasta, A. Gizzi, C. Falcinelli, M. De Bellis, F. Luppino

Invasive Behaviour of an Active Biological Tissue Into an Elastic Matrix: Competition Between Degradation and Indentation

***G. Reho,** P. Blanco Dorca, M. Arroyo Balaguer

The Mechanobiology of Cells Migration

***M. Serpelloni,** V. Maini, E. Jacchetti, A. Salvadori

Mathematical and Computational Model for Self-organized Collective Invasion of Breast Cancer Organoids

***P. Blanco,** G. Cicconofri, G. Vilanova, P. Saez, M. Arroyo

Tensorial Bases for Anisotropic Nonlinear Elasticity and the Modelling of Skeletal Muscles

S. Galasso, ***G. Giusteri**

Space–time Isogeometric Analysis of Cardiac Electrophysiology

P. Antonietti, L. Dedè, G. Loli, M. Montardini, G. Sangalli, ***P. Tesini**

Wed, 17/09/2025 16:45 - 18:45 Sala Ufficio della Riserva

MS003B - Advanced Numerical Methods for Fluid Flows II

Co-Organized by A. Aiello (University Federico II of Naples, Italy), L. Alberti (Marche Polytechnic University, Italy) and E. Carnevali (Marche Polytechnic University, Italy)
Main Organizer: Dr. Carlo De Michele (Gran Sasso Science Institute)
Chaired by: Dr. Emanuele Carnevali (Università Politecnica delle Marche), Phd. Luca Alberti (Marche Polytechnic University - Department of Industrial Engineering and Mathematical Sciences)

Hybrid RANS/LES Models for a High-Order Discontinuous Galerkin Scheme: A Comparative Assessment

***L. Alberti,** E. Carnevali, A. Crivellini

Investigating Machine Learning-Based Shock Sensors for Scale-Resolving Discontinuous Galerkin Simulations

***F. Mangini,** A. Crivellini, A. Colombo

An adaptive finite element solver for the shallow water equations with irregular bathymetry

***L. Arpaia,** G. Orlando, L. Bonaventura

Towards Adjoint CFD Optimization using Engineering Design CAD Parameters

***S. Elsweijer,** J. Holke, J. Kleinert

Numerical Strategy for High-order Simulation of Turbulent Impinging Jets

***A. Palumbo,** A. Aiello, G. Coppola

Wed, 17/09/2025 16:45 - 18:45 Sala Europa 1

MS033C - Recent Advances in Polytopal Finite Element Methods III

Co-organized by: S. Gómez (Università degli Studi di Milano-Bicocca, Italy)
Main Organizer: Dr. Ivan Fumagalli (Politecnico di Milano)
Chaired by: Dr. Sergio Gomez (University of Milano-Bicocca), Dr. Ivan Fumagalli (Politecnico di Milano)

Polytopal discontinuous Galerkin approximation of a thermo/poro-viscoelasticity model Keynote

***S. Bonetti,** M. Corti

A Virtual Element Approach for Non-Linear Problems on Arbitrary Distorted 8-Node Bricks

***F. Bossi,** C. Massimiliano, F. Dassi, C. Lovadina, P. Umberto, A. Russo

Hybrid virtual element method for the elastic and elasto-plastic analysis of plates and membranes

***F. Liguori,** A. Madeo, S. Marfia, G. Garcea, E. Sacco

Wed, 17/09/2025 16:45 - 18:45 Sala Europa 2

MS006C - Advances in Control and Model Order Reduction for Simulation Science III

Co-Organized by: L. Saluzzi (Sapienza Università di Roma, Italy) and M. Strazzullo (Politecnico di Torino, Italy)
Main Organizer: Dr. Mattia Manucci (University of Stuttgart)
Chaired by: Dr. Mattia Manucci (University of Stuttgart)

Accelerating Numerical Simulations in CFD by Model Reduction with Scientific and Physics-Informed Machine Learning
***G. Rozza**

Adaptive Filtering Strategies for Convection-Dominated flows through Reinforcement Learning
***A. Ivagnes,** M. Strazzullo, G. Rozza

An Order-Preserving Multi-Stage Tensor Reduction Strategy with Efficient Interpolation/Regression for Reduced-Order Modeling
***H. Kapadia,** L. Feng, P. Benner

Advances in Optimal Transport: Efficient Semi-Discrete Solvers and Application to Data-Driven Reduced Order Modeling
***M. Khamlich,** G. Rozza, F. Pichi

Reduced Order Modeling for Advection-dominated and Turbulent Flows
***D. Oberto,** M. Strazzullo, F. Pichi, S. Berrone, G. Rozza

Data-Driven Model Reduction via Non-Intrusive Optimization of Projection Operators and Reduced-Order Dynamics
***A. Padovan,** D. Bodony

Wed, 17/09/2025 22:00 - 23:30

Pub Crawl

Thursday, 18/09/2025

Thu, 18/09/2025 08:30 - 09:00

Registration

Thu, 18/09/2025 09:00 - 09:45 Sala D'Annunzio

Plenary Lecture II

Chaired by: Prof. Maria Laura De Bellis (University of Chieti-Pescara)

Nonlinear Spatial Filtering for Large Eddy Simulation

***A. Quaini**

Thu, 18/09/2025 09:45 - 10:15

Coffee Break

Thu, 18/09/2025 10:15 - 12:15 Sala D'Annunzio

MS013A - Cardiovascular tissues: from the characterisation to the modelling

Co-Organized by: A. Caimi (Università di Pavia, Italy) and M. Schembri (Università di Pavia, Italy)
Main Organizer: Ms. Giulia Formenton (Università di Pavia)
Chaired by: Ms. Giulia Formenton (Università di Pavia), Mr. Luigi Greco (University of Pavia)

An integrated 1D-0D model of the cardiorespiratory system with local autoregulation

***C. Dalmaso,** P. Blanco, L. Müller

Mechanical characterization of tissues from aortic dissection

***G. Formenton,** F. Auricchio, A. Caimi, M. Schembri, M. Conti, P. Totaro

A Framework for Meshing and Simulating Coronary Artery Haemodynamics

***F. Marcinno',** J. HInz, A. Buffa, S. Deparis

Effects of Homeostatic-Driven Growth and Remodeling on Biomechanical Predictions in Atherosclerotic Carotid Vessels

***A. Mastrofini,** M. Marino, E. Karlof, U. Hedin, C. Gasser

Patient-Specific Zero-Stress Configuration of Anomalous Aortic Origin of Coronary Arteries: A 3D CAD-FEM Approach

***S. Saporito,** A. Rosato, M. Lo Rito, M. Conti, C. Menna

An Idealized Model of Arterial Wall Remodeling: A Finite Element Approach

***D. Tarantino,** B. Fantaci, S. Pasta

Thu, 18/09/2025 10:15 - 12:15 Sala Tosti

MS026A - Non-conventional models for nano- and micro-mechanics

Co-organized by: G. Alotta (University of Reggio Calabria, Italy) and A. Burlon (University of Reggio Calabria, Italy)
Main Organizer: Prof. Giuseppe Failla (University of Reggio Calabria, Italy)
Chaired by: Prof. Giuseppe Failla (University of Reggio Calabria, Italy), Dr. Gioacchino Alotta (University of Reggio Calabria)

Finite Element Method for Space-Fractional Truss and Frame

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

Integral solution of Stress-Driven Nonlocal Model with Morozov regularization on different nonlocal kernels

***G. Lovisi,** R. Penna, L. feo

Wave Dispersion Analysis of Periodic Stress-Driven Nonlocal Timoshenko Beams

***G. Alotta,** A. Russillo, G. Failla

Wave Dispersion Analysis of Periodic Nonlocal Solids

A. Russillo, ***G. Failla**

Thu, 18/09/2025 10:15 - 12:15 Sala Fisso L'Idea

MS021A - Microstructurally Graded Materials: Design and Computing

Co-Organized by M. Schiantella (University of Perugia, Italy) and F. Luppino (University of Chieti-Pescara, Italy)
Main Organizer: Phd. Filippo Recrosi (University of Chieti-Pescara)
Chaired by: Phd. Filippo Recrosi (University of Chieti-Pescara), Dr. Mattia Schiantella (University of Perugia)

Metamaterials behavior and their effective micromorphic counterparts

***G. Rizzi,** A. Madeo

Free Vibrations of Functionally Graded Circular Arches

***L. Ledda,** D. D'Urso, I. Caliò, A. Greco

Additive manufacturing of beams with triply periodic minimal surfaces (TPMS) geometry

***M. Schiantella,** F. Cluni, V. Gusella

Microstructural-Based Design and Optimization for Bone Implants

***F. Luppino,** F. Recrosi, C. Falcinelli, M. De Bellis, M. vasta, V. Gusella

A New Kernel-Based Method for the Computational Analytical Solution of Linear Laminated Plates

***G. Picciani,** F. Potenza, M. Vasta

Thu, 18/09/2025 10:15 - 12:15 Sala Ufficio della Riserva

MS001A - Advanced Metamaterial-Inspired Strategies for Ground-Borne and Seismic Vibration Mitigation

Co-Organized by: F. Zeighami (University of Bologna, Italy) and G. Alotta (Mediterranean University of Reggio Calabria, Italy)
Main Organizer: Dr. Andrea Francesco Russillo (University of Reggio Calabria)
Chaired by: Dr. Farhad Zeighami (University of Bologna), Dr. Andrea Francesco Russillo (University of Reggio Calabria)

Modeling Metabarriers and Metafoundations for Ground-Borne Vibration Mitigation Using a Coupled ITM-FEM Approach

***T. Hicks,** G. Müller

A Novel Concept of Seismic Metamaterial for Ground Vibrations Mitigation: Water-tank Metabarriers

***A. Russillo,** G. Failla

Mitigation of elastic Love waves using embedded locally resonant metamaterials

***F. Zeighami**

The Group-Theoretical Structure behind Wave Propagation in Layered Media

***J. garcia-suarez**

Effect of Stable Gas-Bubble Layers in Viscoelastic Media on Ultrasonic Waves: Numerical Simulations Towards the Definition of Acoustic Metamaterials
***E. Carreras-Casanova,** M. Tejedor Sastre, C. Vanhille

3D printed metamaterials for vibration control: the role of geometric defects

D. Addessi, C. Gatta, A. Paoloni, L. Parente, ***R. Zuppi**

Thu, 18/09/2025 10:15 - 12:15 Sala Europa 1

MS029A - Phase-field and gradient damage models for fracture: theory, algorithms and applications

Co-organized by: A. Fajardo Lacave (Robert Bosch GmbH, ETH Zurich, Germany)
Main Organizer: Mr. Jonas Heinzmann (ETH Zurich)
Chaired by: Mr. Jonas Heinzmann (ETH Zurich)

Efficient Phase-Field Fracture Simulations for Fracture Analysis in Heterogenous Materials

***M. Rohracker,** J. Mergheim

Variational Phase-Field Modeling of Fatigue and Fracture in Shape Memory Alloys

***A. Brambilla,** L. De Lorenzis, L. Petrini

Gamma-Convergence of A Variational Cohesive Phase-Field Model

***E. Maggiorelli,** M. Negri, F. Vicentini, L. De Lorenzis

Simulation of Cohesive Fracture in Solids with PUMA

***M. Schneider,** S. Conti, M. Schweitzer

Improving Convergence of Phase-Field Fracture Computations Through Line-Search-Enhanced Alternate Minimization

***J. Heinzmann,** F. Vicentini, P. Carrara, L. De Lorenzis

Thu, 18/09/2025 10:15 - 12:15 Sala Europa 2

MS011A - Atomistic, Nano, and Micro Mechanics of Materials

Co-Organized by: L. Laubert (FAU Erlangen-Nürnberg, Germany)
Main Organizer: Dr. Maximilian Ries (FAU Erlangen-Nürnberg)
Chaired by: Dr. Maximilian Ries (FAU Erlangen-Nürnberg), Mr. Lukas Laubert (Friedrich-Alexander-Universität Erlangen-Nürnberg)

Evaluating the coupling quality of domain decomposition methods

***L. Laubert,** S. Pfaller

The Role of Grain Packing and Pore Distribution in Fracture Evolution of Rocks

***J. Karimi,** B. Mathur, D. Koehn

Contact-Anisotropy-Driven Microscale Splitting: A Polyhedral DEM Grain Fracture Model

***B. Mathur,** E. Salomon, J. Karimi Aghsaghali, D. Koehn

Tuning Fracture Behaviour in Architected Composite Materials

***L. Pyka,** C. Greff, P. Moretti, M. Zaiser

A Unified Framework for Strain Analysis in Pentatwinned Nanoparticles

***K. Zhao,** Z. Cheng, C. Shi, Y. Han, M. Jones, M. Engel

Interphase formation in epoxy-based structural adhesive joints: a molecular dynamics study

***M. Ries,** V. Dötschel, E. Richter, G. Possart, P. Steinmann

Thu, 18/09/2025 12:15 - 13:45

Lunch Break

Thu, 18/09/2025 13:00 - 13:45 Sala D'Annunzio

Round table-Mentoring YI

Thu, 18/09/2025 13:45 - 15:45 Sala D'Annunzio

MS010A - Advances in Numerical Methods for Multi-physics Problems With Application to Sustainable Development

Co-Organized by P. Antonietti (Politecnico di Milano, Italy), N. Kumar (Politecnico di Milano, Italy) and S. Pagani (Politecnico di Milano, Italy)
Main Organizer: Mr. Stefano Bonetti (Politecnico di Milano)

Simulating Root Water Uptake in Complex Soil Geometries via Virtual Element Method

S. Berrone, S. Ferraris, D. Grappein, ***G. Teora,** F. Vicini

Numerical modeling of coupled fluid and tissue mechanics in the brain by polytopal methods

P. Antonietti, M. Corti, ***I. Fumagalli,** N. Parolini, M. Verani

Towards a Sustainable Approach to the Space Debris Problem

***P. Fisicaro,** V. Lottici, P. Valvo

Development and numerical validation of a dual-stream thermoelectric subcooler for vapour compression system applications

***T. Ozyildiz,** M. Haida, R. Fingas, J. Smolka, D. Sanchez Garcia-Vacas, P. Aranguren

Thu, 18/09/2025 13:45 - 15:45 Sala Tosti

MS027A - Numerical Modeling of High-Speed Aero-thermodynamics

Co-organized by: D. Passiatore (Università del Salento, Italy), M. Di Renzo (Università del Salento, Italy) and D. Modesti (Gran Sasso Science Institute, Italy)
Main Organizer: Dr. Alessandro Ceci (Sapienza University of Rome)
Chaired by: Dr. Alessandro Ceci (Sapienza University of Rome), Dr. Donatella Passiatore (University of Salento)

Supersonic turbulent boundary layers over curved walls

***D. Modesti,** F. Salvadore, M. Bernardini

State-to-State investigation of thermochemical non-equilibrium in the boundary layer of an ablative thermal protection system

***D. Ninni,** F. Bonelli, G. Colonna, A. Laricchiuta, G. Pascazio

Evaluation of recycle-rescaling methods for simulation of turbulent chemically reacting boundary layers

***C. Meo,** D. Passiatore, M. Di Renzo

Conjugate heat transfer effects in shock wave/boundary layer interactions

***G. Della Posta,** M. Fratini, M. Bernardini

High-fidelity simulation of turbulence-chemistry interaction in a strongly reacting high-Mach boundary layer

C. Williams, ***M. Di Renzo,** P. Moin

Time and length scales of low-frequency pressure fluctuations in supersonic swept ramps

***G. Soldati,** A. Ceci, A. Palumbo, S. Pirozzoli

DNS of high–speed turbulent boundary layers subject to pressure gradients

***A. Ceci,** S. Pirozzoli

Thu, 18/09/2025 13:45 - 15:45 Sala Fisso L'Idea

MS032A - Recent Advances in Computational Modelling of Fracture and Damage Mechanics I

Co-organized by: R. Cavuoto (University of Naples "Federico II", Italy), E. Monaldo (Roma Tre University, Italy) and A. Rodella ("Sapienza" University of Rome, Italy)
Main Organizer: Dr. Maria Rosaria Marulli (IMT School for Advanced Studies Lucca)
Chaired by: Phd. Andrea Rodella (Sapienza University of Rome), Dr. Maria Rosaria Marulli (IMT School for Advanced Studies Lucca)

Phase-field approach for craquelure in paintings Keynote

***L. Mingazzi,** F. Freddi

Diffusion-assisted fracture mechanism and linseed oil-effect in compacted waste sludge from paper industry

***A. Bertolini,** M. Paggi, M. Marulli, J. Reinoso Cuevas

Fatigue Behaviour of Bonded Joints and Modelling Using an Imperfect Interface Model with Variable Damage Kinetics

***C. Telloli,** F. Lebon, R. Rizzoni, A. Maurel Pantel

Modeling Fatigue Crack Growth: a Cohesive Interface Approach

***E. Monaldo,** S. Marfia, E. Sacco

Exploring Nonlocal Fracture Features in Peridynamic Materials

***S. Damian,** R. Cavuoto, N. Pugno, M. Fraldi, L. Deseri

Thu, 18/09/2025 13:45 - 15:45 Sala Ufficio della Riserva

MS024A - Modelling and design of advanced materials I

Co-organized by: M. Horák (Czech Technical University in Prague, Czechia)
Main Organizer: Dr. Martin Doškář (Czech Technical University in Prague)

On the Modelling of Fluid and Ion Transport through Cracks in Quasi-Brittle Materials in Multiphysics Phase-Field-Based Models

***E. Korec,** M. Jirásek

Hyperelastic Material Models for Geometrically Nonlinear Beam with Lateral Strain Effects

***M. Horák,** C. Bonvissuto, E. La Malfa Ribolla, M. Jirásek

Surface-Polyconvex Models for Soft Elastic Solids

M. Horák, ***M. Šmejkal,** M. Kružík

Hard-magnetic soft materials: theory and implementation

***M. Amato,** M. Horak, O. Faltus, M. Jirasek

Thu, 18/09/2025 13:45 - 15:45 Sala Europa 1

MS035A - Reduced Order Models, Surrogates and Fast Solvers I

Co-organized by: D. Goutaudier (Arts et Métiers ParisTech, France), T. Hirschler (Université Bourgogne Franche-Comté, France) and F. Rocha (Université Paris-Est Créteil, France)
Main Organizer: Dr. Margarita Chasapi (RWTH Aachen University)
Chaired by: Dr. Thibaut Hirschler (Université de Technologie de Belfort Montbéliard), Mr. Felipe ROCHA (Université Paris-Est Créteil)

Rank Reduction Autoencoders for Generative Thermal Design

***A. Tierz,** J. Mounayer, B. Moya, P. Chinesta

Deep learning enhanced model order reduction for parametric problems with discontinuities

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

Mind the Scale Gap: a Fast Finite Strain FE2 Solver via (Model-free) Data-Driven Computational Mechanics

***F. Rocha,** A. Platzer, A. Leygue, L. Stainier

ROM for localization of multiple defects with ultrasonic guided waves

***P. Sieber,** R. Soman, W. Ostachowicz, E. Chatzi, K. Agathos

Non-intrusive model reduction of damage simulations in a digital twin

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

Structural Health Monitoring with signature-informed models: towards ultra-sparse sensing solutions

***D. Goutaudier**

Thu, 18/09/2025 13:45 - 15:45 Sala Europa 2

MS020A - Interacting Particle Models: Applications in Complex Systems and Approaches for Reducing the Computational Cost I

Co-Organized by S. Veneruso (University of Ferrara, Italy)
Main Organizer: Ms. Sabrina Bonandin (RWTH Aachen University)
Chaired by: Ms. Sara Veneruso (University of Ferrara & RWTH Aachen University), Ms. Sabrina Bonandin (RWTH Aachen University)

Condensation Effects in a Novel Consensus-Based Optimization Algorithm
***J. Franceschi,** L. Pareschi, M. Zanella

Consensus-based optimization in the spirit of mirror descent
L. Bungert, F. Hoffmann, D. Kim, ***T. Roith**

A Mean-field Limit for Two-layer Neural Networks Trained with Consensus-based Optimization
***W. De Deyn,** M. Herty, G. Samaey

Kinetic Methods for Consensus-Based Segmentation
***H. Tettamanti,** M. Zanella

Consensus-based Optimization for Boundary Value Problems
***M. Khatab,** C. Totzeck

Asymptotic preserving verification tests for particle transport codes
***W. Bennett,** J. Ferguson

Thu, 18/09/2025 15:45 - 16:15

Coffee Break

Thu, 18/09/2025 16:15 - 18:15 Sala D'Annunzio

MS030A - Phase-Field Modeling of Microstructure Evolution

Main Organizer: Ms. Andrea Gomero Soria (Empa, ETH Zürich)
Chaired by: Ms. Andrea Gomero Soria (Empa, ETH Zürich), Mr. Hamza Oudich (Eidgenössische Technische Hochschule (ETH) Zürich)

Phase-field modeling of elastic microphase separation
***H. OUDICH,** P. Carrara, L. De Lorenzis

Phase-Field Simulations of Capillary Interactions Between Rough Surfaces
***Y. Wang,** M. Ladecky, L. Pastewka

New insights into grain boundary kinetics by phase-field crystal modeling
***M. Punke,** M. Salvalaglio

Large Strain Effects in Phase Separating Polymeric Media
***A. Gomero Soria,** A. Stracuzzi, A. Ehret

Thu, 18/09/2025 16:15 - 18:15 Sala Tosti

MS012A - Biomechanics of growth and morphogenesis for advanced applications

Co-Organized by S. Palumbo (University of Napoli
Main Organizer: Dr. Angelo Rosario Carotenuto (University of Napoli "Federico II")

Volumetric Growth Material Model for Naturally Shaped Timber Structures Using GSBIGA
***F. Spahn,** F. Kolisch, S. Klinkel

Toward Modeling Contact in Growing Solids with an Eulerian Finite-Element Approach
***D. Kammer,** F. Lorez, M. Pundir

Topological Defects as Morphogenetic Factors
***S. Paparini,** G. Giusteri, A. Mihai

Primal and Dual Scaling Laws for Fiber-reinforced Bilayers
***A. Mirandola,** A. Carotenuto, A. Cutolo, S. Palumbo, M. Fraldi, L. Deseri

Thu, 18/09/2025 16:15 - 18:15 Sala Fisso L'Idea

MS032B - Recent Advances in Computational Modelling of Fracture and Damage Mechanics II

Co-organized by: R. Cavuoto (University of Naples "Federico II", Italy), E. Monaldo (Roma Tre University, Italy) and A. Rodella ("Sapienza" University of Rome, Italy)
Main Organizer: Dr. Maria Rosaria Marulli (IMT School for Advanced Studies Lucca)
Chaired by: Phd. Elisabetta Monaldo (Roma Tre University), Dr. Riccardo Cavuoto (Università degli Studi di Napoli)

A Variational Model for Gradient Plasticity describing Shear Band Localization

***M. Comella,** S. Vidoli, A. Favata, A. Rodella

Beyond LEFM: Unveiling a Geometric Nonlinear Length Scale

***R. Lazo-Molina,** M. Adda-Bedia, M. Pundir, D. Kammer

Principle of Local Symmetry in Mixed-Mode Fracture in Hydrogels

***L. Ortellado,** A. Abate, A. Santarossa, L. Gómez, T. Pöschel

Investigating Rubberlike Polymeric Materials by means of a Gradient-extended Thermomechanical Model for Rate-dependent Damage and Failure at Finite Strains
***S. Bögershausen,** J. Kehls, S. Reese, T. Brepols

A scalable framework for 3D crack propagation based on a mixed ?nite element formulation

***A. Bijaya,** C. Runcie, A. Shvarts, L. Kaczmarczyk, C. Pearce

Sensor Placement Optimization and BIM-Driven Management for the Digital Twin of LNGS

***D. Karluklu,** M. Crognale, C. Rinaldi, B. Mancini, F. Potenza, V. Gattulli

Thu, 18/09/2025 16:15 - 18:15 Sala Ufficio della Riserva

MS024B - Modelling and design of advanced materials II

Co-organized by: M. Horák (Czech Technical University in Prague, Czechia)
Main Organizer: Dr. Martin Doška? (Czech Technical University in Prague)

Coupled Discrete Element Model for Thermal-Electrical-Mechanical Phenomena in Spark Plasma Sintering

***F. Nisar,** J. Rojek, S. Nosewicz, K. Kaszyca, M. Chmielewski

Sintering Model of Ceramics for Deformation and Stress Considering Internal Temperature Distribution

***C. Natsumeda,** K. Matsui, J. Tatami, T. Yamada

Non-uniform pneumatic actuation of elastomeric honeycombs for switchable macroscopic properties

***O. Faltus,** J. Havelka, P. Rychnovský, M. Doška?, O. Rokoš

Dynamic Continualization of Layered Metamaterials with Alternating Chirality

***P. Badino,** A. Bacigalupo

Relationships between microstructure and macroscopic mechanical properties of binary/ternary OPC/limestone/calcined clay cement pastes
***S. Schmid,** L. Zelaya-Lainez, O. Lahayne, M. Peyerl, B. Pichler

Thu, 18/09/2025 16:15 - 18:15 Sala Europa 1

MS035B - Reduced Order Models, Surrogates and Fast Solvers II

Co-organized by: D. Goutaudier (Arts et Métiers ParisTech, France), T. Hirschler (Université Bourgogne Franche-Comté, France) and F. Rocha (Université Paris-Est Créteil, France)
Main Organizer: Dr. Margarita Chasapi (RWTH Aachen University)
Chaired by: Dr. Dimitri Goutaudier (CNRS, ENSAM)

Drastic speed-up of the master-slave elimination for multi-point constraints by parallelization

***J. Boungard,** J. Wackerfuß

Isogeometric shape optimization of lattice structures

***T. Hirschler,** M. Chasapi, P. Antolin, A. Buffa

RB-GEVP: Accelerating Adaptive Coarse Space Construction in FETI-DP via Reduced-Basis Generalized Eigenvalue Problems

T. Med?ický, A. Heinlein, ***M. Doška?**

Thu, 18/09/2025 16:15 - 18:15 Sala Europa 2

MS020B - Interacting Particle Models: Applications in Complex Systems and Approaches for Reducing the Computational Cost II

Co-Organized by S. Veneruso (University of Ferrara, Italy)
Main Organizer: Ms. Sabrina Bonandin (RWTH Aachen University)
Chaired by: Ms. Sabrina Bonandin (RWTH Aachen University), Ms. Sara Veneruso (University of Ferrara & RWTH Aachen University)

Follower-leader dynamics in optimization: a Genetic KBO approach.

G. Albi, ***F. Ferrarese,** C. Totzeck

On the mean-field limit of the Cucker-Smale model with Random Batch Method

***Y. Wang,** Y. Lin

Learning cooling strategies in simulated annealing through binary interactions

***F. Blondeel,** L. Pareschi, G. Samaey

Swarm-based optimization with jumps: a kinetic BGK framework and convergence analysis

***H. Im,** G. Borghi, L. Pareschi

Adaptive Cucker-Smale Model and its Asymptotic Behavior in the Singular Limit

C. Kuehn, ***J. Yoon**

Efficient Parallel Implementation of the Finite Volume Particle Method

***F. Breiden,** M. Schweitzer

Uncertainty Quantification in Hydrocodes using Hypercomplex Automatic Differentiation

***M. Balcer**

Thu, 18/09/2025 20:00 - 20:30 Foyer Aurum

Jazz Concert: Stefano Taglietti

Thu, 18/09/2025 20:30 - 23:30

Conference Dinner

Friday, 19/09/2025

Fri, 19/09/2025 09:00 - 09:45 Sala D'Annunzio

Plenary Lecture III

Chaired by: Dr. Barbara Re (Politecnico di Milano)

Regularized Reduced Order Models for Convection-Dominated Flows: Stabilization, Sensitivity, and Control

***M. Strazzullo**

Fri, 19/09/2025 09:45 - 10:00

Coffee Break

Fri, 19/09/2025 10:15 - 12:15 Sala D'Annunzio

OLYA - ECCOMAS PhD Olympiad I I

Matrix-free weighted quadrature isogeometric analysis applied to thermal and mechanical simulations

***J. Cornejo Fuentes**

Multi-Scale Modeling and Design of PC/ABS Polymer Blends: Integrating Constitutive Modeling with Bayesian Optimization for Inverse Problems

***A. Carvalho Alves,** B. Ferreira, F. Andrade Pires

Virtualization of Parametric Dynamical Systems through Uncertainty-Aware Reduced Order Modeling

***K. Vlachas**

Multiscale Numerical Model for the Analysis of Laminated Glass Structures Exposed to Static Load

***G. Grozdanic,** M. Galic, A. Ibrahimbegovic

Deep Learning-Enhanced Multi-Scale Simulation Approaches for Complex Molecular Systems

***E. Christofi**

Thermomechanical Modelling and Simulation of Laser Powder Bed Fusion Processes

***I. Noll**

Multi-scale Finite Element Method (MsFEM) for Incompressible Flows in Heterogeneous Media: Implementation and Convergence Analysis

***L. Balazi,** G. Allaire, P. Omnes

Fri, 19/09/2025 10:15 - 12:15 Sala Tosti

MS031A - Recent Advances in Computational Modeling of Masonry Material and Structures I

Co-organized by: P. Di Re (Sapienza University of Rome, Italy), N. Nodargi (University of Rome Tor Vergata, Italy) and A. Paoloni (Sapienza University of Rome, Italy)

Main Organizer: Dr. Cristina Gatta (Sapienza University of Rome)

Chaired by: Prof. Nicola A. Nodargi (University of Rome Tor Vergata), Dr. Paolo Di Re (Sapienza University of Rome)

Continuum damage modelling of masonry structures through an in-plane mechanism-based strength domain

***G. Bertani,** A. D'Altri, G. Barbat, L. Patruno, M. Cervera, S. de Miranda

3D Kinematic Limit Analysis for Irregular Masonry with Lumped Joints

***Y. Hermans,** K. Ehab Moustafa Kamel, G. Milani, T. Massart

A Nonlinear Beam Macroelement for the In-plane and Out-of-plane Behaviour of Masonry Walls

***A. Paoloni,** D. Addessi, D. Liberatore

Assessing the vulnerability of historical masonry structures under excavation settlements: the case study of Castel Sant'Angelo in Rome

***S. Tosti,** P. Di Re, C. Gatta, D. Addessi, A. Paolone

Fri, 19/09/2025 10:15 - 12:15 Sala Fisso L'Idea

MS034A - Recent Advances on Scientific Machine Learning and Data-Driven Approaches in Sustainability I

Co-organized by: A. D'Inverno (SISSA, Italy), C. Scalone (University of L'Aquila, Italy), G. Speroni (Politecnico di Milano, Italy) and E. Temellini (Politecnico di Milano, Italy)

Main Organizer: Dr. Carmine Valentino (University of Salerno)

Chaired by: Dr. Carmine Valentino (University of Salerno), Dr. Ida Santaniello (University of Salerno)

Generative and Bayesian Modelling for Prediction and Uncertainty Quantification in Scientific Machine Learning

***D. Coscia,** N. Demo, M. Welling, G. Rozza

Reduced Order Modeling and Control with Shallow Recurrent Decoder Networks

***M. Tomasetto,** J. Williams, F. Braghin, A. Manzoni, N. Kutz

Simulation Based Inference: Likelihood-free MCMC via Normalizing Flows and Variational Autoencoders

***G. Bottacini,** M. Torzoni, A. Manzoni

Discovering Stochastic Differential Equations from data

D. Conte, ***I. Santaniello,** D. Breda, M. Tanveer, R. D'Ambrosio

Fri, 19/09/2025 10:15 - 12:15 Sala Ufficio della Riserva

MS017A - High-order and advanced discetization methods for complex problems I

Co-Organized by M. Torre (Univesity of Pavia, Italy)
Main Organizer: Mr. Luigi Greco (University of Pavia)
Chaired by: Mr. Luigi Greco (University of Pavia), Dr. Hugo Verhelst (University of Pavia)

High-order Phase-Field Models for accurate and efficient fracture simulations via Isogeometric discretizations

***L. Greco,** J. Kiendl, E. Maggiorelli, M. Negri, A. Patton, A. Reali

The Shifted Boundary Method in IGA for Structural and Contact Mechanics Problems

***A. Gorgi,** K. Li, N. Antonelli, A. Cornejo, R. Rossi, G. Scovazzi

ALE-FEM Simulation of Free-Surface Viscoelastic Dynamics in Additive Manufacturing: Insights into Coaxial Extrusion

***F. Chirianni,** G. Vairo, M. Marino

Adaptive Isogeometric Analysis of Phase-Field Brittle Fracture

***H. Verhelst,** L. Greco, A. Reali

Fri, 19/09/2025 10:15 - 12:15 Sala Europa 1

MS004A - Advanced Numerical Techniques for Multi-Scale Problems with Applications I

Co-Organized by S. Di Giovacchino (University of L'Aquila, Italy), N. Ferro (MOX Politecnico di Milano, Italy), S. Mirabella (MOX Politecnico di Milano, Italy) and F. Pichi (SISSA, Italy)
Main Organizer: Dr. Giovanni Pagano (University of Naples Federico II (Italy))
Chaired by: Dr. Federico Pichi (SISSA), Dr. Stefano Di Giovacchino (University of L'Aquila)

Split exponential integrators for Kronecker-structured systems generating Turing patterns

***F. Cassini,** M. Caliari

Domain Decomposition with Nonlinear Model Order Reduction for Multiscale Mixed-Dimensional Problems

***P. Vitullo,** N. Dimola, P. Zunino

Collocation Model Order Reduction: Application to Nonlinear Approximation Manifold

***M. Carlino,** D. Sipp, A. Del Grosso, A. Iollo

Free-Surface Numerical Modeling and Simulation of Polymer Mixing Processes

***E. Capuano**

Integrating FEM and Continuous Monitoring Data with PINNs: A Scalable Framework for Structural Analysis

***L. Pinnetti,** C. Rinaldi, M. Crognale, V. Gattulli

A Comprehensive Framework for Cultural Heritage Conservation exploiting PINNs and ROMs

F. Colace, D. Conte, F. Pichi, G. Rozza, ***C. Valentino**

Fri, 19/09/2025 10:15 - 12:15 Sala Europa 2

MS007A - Advances in Data-driven Approaches for Multiscale Agent-based Systems I

Co-Organized by E. Iacomini (University of Ferrara, Italy) and C. Segala (Università della Svizzera Italiana, Switzerland)
Main Organizer: Prof. Giulia Bertaglia (University of Ferrara)
Chaired by: Dr. Elisa Iacomini (University of Ferrara), Dr. Chiara Segala (USI)

Hybrid physics-based and data-driven approaches for multiscale modelling of collective dynamics

***M. Menci**

A mesoscopic compartmental approach for the modeling of vaccine hesitancy

***A. Bondesan**

A Microscopic Traffic Flow Model on Network with Destination-Aware V2V Communications and Rational Decision-Making

E. Cristiani, ***F. Ignoto**

Consensus and Kinetic Based Algorithms for Stochastic Optimization

***S. Bonandin,** M. Herty

Extensions of Consensus-Based Methods

M. Herty, L. Pareschi, ***S. Veneruso**

Fri, 19/09/2025 12:15 - 13:00

Farewell Lunch

Fri, 19/09/2025 13:00 - 15:00 Sala D'Annunzio

OLYB - ECCOMAS PhD Olympiad II

Space–time virtual elements for the heat equation

***S. Gomez,** L. Mascotto, A. Moiola, I. Perugia

Finite-Element Modelling of Moving Weak Discontinuities Using Laminated Microstructures

***J. Dobrza?ski**

Isogeometric Analysis of Wrinkling

***H. Verhelst**

Advanced Finite Element and Isogeometric modeling for homogeneous and composite shells involving plasticity, large deformations, and warping

***A. Corrado**

Phase-Field-Based Chemo-Mechanical Modelling of Corrosion-Induced Cracking in Reinforced Concrete

***E. Korec,** M. Jirásek, H. Wong, E. Martínez-Pañeda

The Role and Potential of Explainability in Interactive Multiobjective Optimization

***G. Misitano**

Fri, 19/09/2025 13:00 - 15:00 Sala Tosti

MS031B - Recent Advances in Computational Modeling of Masonry Material and Structures II

Co-organized by: P. Di Re (Sapienza University of Rome, Italy), N. Nodargi (University of Rome Tor Vergata, Italy) and A. Paoloni (Sapienza University of Rome, Italy)
Main Organizer: Dr. Cristina Gatta (Sapienza University of Rome)
Chaired by: Ms. Alessandra Paoloni (Sapienza University of Rome), Dr. Cristina Gatta (Sapienza University of Rome)

On the Use of Simulation-Driven Machine Learning for Real-Time Damage Prognosis of Masonry Walls

***A. D'Altri,** M. Pereira, B. Glisic, S. de Miranda

Seismic fragility of rigid rocking structures: optimal intensity measures by a deep learning approach

***N. Nodargi,** P. Bisegna

Effects of Durability of FRCM Systems for the Seismic Retrofitting of Historical Masonry Walls

***R. Labernarda,** F. Mazza

Concrete confined with FRCM composites: Exposition to elevated temperatures

***K. TOSKA,** A. Beaucour, F. Faleschini, A. NOUMOWE, C. Pellegrino

Fri, 19/09/2025 13:00 - 15:00 Sala Fisso L'Idea

MS034B - Recent Advances on Scientific Machine Learning and Data-Driven Approaches in Sustainability II

Co-organized by: A. D'Inverno (SISSA, Italy), C. Scalone (University of L'Aquila, Italy), G. Speroni (Politecnico di Milano, Italy) and E. Temellini (Politecnico di Milano, Italy)
Main Organizer: Dr. Carmine Valentino (University of Salerno)
Chaired by: Dr. Carmine Valentino (University of Salerno), Dr. Ida Santaniello (University of Salerno)

Derivation of Step-by-Step Time-Discrete Physics-Informed Neural Networks for PDEs

F. Colace, D. Conte, ***G. Pagano,** B. Paternoster, C. Valentino

An analysis of the under-reaching phenomenon in graph neural networks

***L. Tesán,** M. M.Iparraguirre, D. González, P. Martins, E. Cueto

Adapted Numerical Modeling for Information Diffusion

D. Conte, ***S. Iscaro,** G. Pagano, B. Paternoster

Fri, 19/09/2025 13:00 - 15:00 Sala Ufficio della Riserva

MS017B - High-order and advanced discetization methods for complex problems II

Co-Organized by M. Torre (Univesity of Pavia, Italy)
Main Organizer: Mr. Luigi Greco (University of Pavia)
Chaired by: Mr. Luigi Greco (University of Pavia), Dr. Hugo Verhelst (University of Pavia)

Impact of spurious low-frequency modes in immersogeometric explicit dynamics and potential remedies

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

Adaptive Isogeometric Analysis of the Cahn–Hilliard Equation

***L. Venta Viñuela,** H. Verhelst, A. Mantzaflaris, C. Giannelli, A. Reali

Immersed IGA and mass lumping for explicit dynamics of structural elements

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

Fri, 19/09/2025 13:00 - 15:00 Sala Europa 1

MS004B - Advanced Numerical Techniques for Multi-Scale Problems with Applications II

Co-Organized by S. Di Giovacchino (University of L'Aquila, Italy), N. Ferro (MOX Politecnico di Milano, Italy), S. Mirabella (MOX Politecnico di Milano, Italy) and F. Pichi (SISSA, Italy)
Main Organizer: Dr. Giovanni Pagano (University of Naples Federico II (Italy))
Chaired by: Dr. Giovanni Pagano (University of Naples Federico II (Italy)), Dr. Stefano Di Giovacchino (University of L'Aquila)

Time integration of dissipative stochastic PDEs

***H. Biscevic,** R. D'Ambrosio

TASE methods for stochastic differential equations

D. Conte, R. D'Ambrosio, ***A. Montano,** B. Paternoster

Advanced Computational Methods for Quantum Devices

C. Barone, A. Cardone, S. Pagano, ***R. Sanfelice**

Fri, 19/09/2025 13:00 - 15:00 Sala Europa 2

MS007B - Advances in Data-driven Approaches for Multiscale Agent-based Systems II

Co-Organized by E. Iacomini (University of Ferrara, Italy) and C. Segala (Università della Svizzera Italiana, Switzerland)
Main Organizer: Prof. Giulia Bertaglia (University of Ferrara)
Chaired by: Dr. Chiara Segala (USI), Dr. Elisa Iacomini (University of Ferrara)

Averaged and uniform ensemble optimal control for uncertain systems

***A. Scagliotti**

Connecting kernel methods, kinetic theory, and large-scale multiagent systems

***C. Fiedler**

The nonlocal particle approximation of the quadratic porous medium equation

***V. Iorio**

Improving the robustness of neural ODEs with minimal weight perturbation

***A. De Marinis,** N. Guglielmi, A. Savostianov, S. Sicilia, F. Tudisco

Fri, 19/09/2025 15:00 - 15:15

Closing Ceremony

CIMNE