

Chairs

Prof. Patrizia Trovalusci. Department of Structural and Geotechnical Engineering, Sapienza University of Rome, Rome, Italy

Prof. Tomasz Sadowski. Lublin University of Technology, Lublin, Poland

Prof. Adnan Ibrahimbegovic. Universite de Technologie Compiegne, Centre de Recherches Royallieu, Laboratoire Roberval Mecanique, Compiegne, France

Proceedings

Accepted Abstracts and Full papers will be published on the Springer *Series Advanced Structured Materials*

<https://www.springer.com/series/8611>

Selected talks will be published on dedicated Special Issues of International Journals (after standard peer-reviewing process):

- *Composite Structures*
<https://www.sciencedirect.com/journal/composite-structures>
- To define

Deadline for submitting a one-page Abstract: **December 28, 2023**

Deadline for submitting (optional) Full Papers (6-10 pages, **May 31, 2024**)

Venue

The conference will take place at the Faculty of Civil and Industrial Engineering, Sapienza University of Rome
Via Eudossiana 18, 00184, Rome, Italy

<https://www.ing.uniroma1.it/>

Registration

A webpage containing the online registration form and payment instructions will be available soon

Early registration by March 31, 2024:

Regular 500.00 € (Euomech members) + 30,00 € (Euomech association fee)

Poster 250.00 € (Euomech members) + 30,00 € (Euomech association fee)

Late registration after March 31, 2024:

Regular 570.00 € (Euomech members) + 30,00 € (Euomech association fee)

Poster 300.00 € (Euomech members) + 30,00 € (Euomech association fee)

Fees include the conference material, coffee breaks, lunches, welcome reception

Details at <https://642.euomech.org/>

Contacts

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EUROMECH Colloquium 642



International Colloquium on Multiscale and Multiphysics Modelling for Advanced and Sustainable Materials

September 23 – 27, 2024
Rome, Italy



SAPIENZA
UNIVERSITÀ DI ROMA

<https://642.euomech.org/>

Scope

The Colloquium will provide a forum to present and debate several advanced computational, experimental, and analytical methods for studying the behavior of complex materials and structures. The goal is to gather researchers specialized in multiscale material modelling for simulating the mechanics of solids and the physics of matter with the final aim of bridging the gap between Solids and Structural Mechanics and Material Science in the modelling of complex materials, so defined for the presence of internal structure at different scales and non-linear constitutive behavior. Various types of complex materials are used nowadays in engineering practice: particle or fibrous composites; laminates; green composites with natural fillers and industrial or urban recyclable materials; nanomaterials; architecture materials; complex multiphase materials with a complex internal structure including: porosity, reinforcement in the form of short fibres and particles of various properties, shapes and sizes, filled in different media. A thorough understanding of how multiphysics processes occurring at one to several scales below the level of observation influence the reduction of stiffness and strength, is a key to the analysis of existing, and the design of improved, complex materials. Particular interest will concern the modelling of non-classical/non-local continuous models, which keep memory of the internal structure and whose field equations contain lengths of internal scale which allow to avoid convergence and mesh-dependency problems. In this framework, the suitability of multiscale strategies bridging different material scales will be highlighted, as well as engineering applications.

Topics

Topics focus on the following aspects (but not restricted to them):

- Mathematical and computational foundations of multiscale methods
- Multiscale and multiphysics aspects of materials modelling
- Material classes: structural, multi-functional, interfaces, high-entropy alloys, shape-memory alloys, granular media, nano/microstructured materials, biological bio-inspired and soft materials
- Material properties: elasticity, fracture, friction, plasticity, dislocation dynamics, creep, poro-mechanics, fluid flow, thermo-mechanics, viscosity
- Additive manufacturing, architected materials, metamaterials
- Atomistic (classical/quantum) modelling
- Statistical and mesoscale materials modelling
- Non-standard/non-local continuous formulations, computational methods for media with microstructure
- Materials informatics (machine learning, data mining and artificial intelligence) and materials design
- Synergistic coupling of experiments with MMM modelling
- Industrial applications

Keynote Speakers

Altenbach Holm,
Otto von Guericke University Magdeburg,
Germany

Ghosh Somnath,
Johns Hopkins University, Baltimore, MD, USA

Hellmich Christian,
Vienna University of Technology (TU Wien),
Austria

Hu Heng,
Department of Engineering Mechanics, Wuhan
University, China

Kaminski Marcin,
Lodz University of Technology, Poland

Pierre Ladevèze,
Université Paris-Saclay, France

Ponte Castañeda Pedro,
University of Pennsylvania, Philadelphia, PA, USA

Podio Guidugli Paolo,
Università di Roma Tre, Italy

Sladek Vladimir,
Slovak Academy of Sciences, Slovakia

Sulem Jean,
École des Ponts Paris Tech, France

Wriggers Peter,
Leibniz Universitaet Hannover, Germany