

institute  
**imdea**  
materials

**EUROPEAN  
MECHANICS  
SOCIETY**

# ESMC 2015

## 9<sup>th</sup> European Solid Mechanics Conference



July 6<sup>th</sup>-10<sup>th</sup>, 2015.  
Leganés, Madrid, Spain

[www.esmc2015.org](http://www.esmc2015.org)

# GENERAL LECTURER

Prof. J. W. Hutchinson, Harvard University

# PLENARY LECTURERS

Prof. W. A. Curtin (multiscale mechanics)  
Prof. M. G. D. Geers (micromechanics)  
Prof. J. D. Humphrey (mechanobiology)  
Prof. E. Oñate (computational solid mechanics)  
Prof. P. Suquet (homogenization)

# GENERAL SESSIONS

Continuum Mechanics  
Material Mechanics  
Computational Mechanics  
Biomechanics  
Multifield Problems  
Structural Mechanics  
Experimental Mechanics  
Dynamics

# MINI SYMPOSIA

## Mechanics of Materials

### Computational Modeling of Metal Forming Processes

Carlos Agelet de Saracibar (*Polytechnic University of Catalonia*) and Jean-Philippe Ponthot (*Université de Liège*)

### Mechanics of Composite Materials

Pedro Camanho (*University of Porto*) and Josep Costa (*University of Girona*)

### Mechanics of Concrete

Gonzalo Ruiz (*University of Castilla La Mancha*) and Günter Hofstetter (*Universität Innsbruck*)

### Mechanics of Micro-Electro-Mechanical Systems

Attilio Frangi (*Politecnico di Milano*) and Jan Korvink (*IMTEK Freiburg*)

### Multiscale Modeling of Polycrystalline Materials

Javier Segurado (*IMDEA Materials Institute*) and Ricardo A. Lebensohn (*Los Alamos National Laboratory*)

### Mechanics of (Nano)porous, Fibrous and Cellular Materials

Katia Bertoldi (*Harvard University*) and Patrick Onck (*University of Groningen*)

### Mechanics of Textile Composite Reinforcements and Fibrous Materials

Philippe Boisse (*INSA Lyon*) and Stepan Lomov (*K.U.Leuven*)

### Phase-Field Modeling

Ingo Steinbach (*Ruhr-Universität Bochum*) and Ralf Müller (*University of Kaiserslautern*)

### Shape Memory Alloys - Modeling, Numerical Algorithms and Applications

Stefanie Reese and Ferdinando Auricchio (*Università di Pavia*) and Claire Davis (*University of Birmingham*)

### Topology Optimization for Additive Manufacturing

Fred van Keulen (*TU Delft*) and Pierre Duysinx (*University of Liege*)

## Biomechanics and Mechanics of Biological Systems

### Cardiac Mechanics

Alexander V. Panfilov (*Gent University*) and Frans N. van de Vosse (*Eindhoven University*)

### Cell Mechanics

José Manuel Garcia Aznar (*University of Zaragoza*) and Patrick McGarry (*National University of Ireland Galway*)

### Mechanics of Biological Membranes

Marino Arroyo (*Technical University of Catalonia*) and Antonio DeSimone (*SISSA*)

## **The Mechanics of Cartilage**

David M. Pierce (*University of Connecticut*) and Tim Ricken (*University of Duisburg-Essen*)

## **Mechanics of Silk**

Gustavo Guinea (*Polytechnic University of Madrid*)

## **Mechanics of Soft Biological Tissues**

Gerhard A. Holzapfel (*Graz University of Technology*) and Ray W. Ogden (*University of Glasgow*)

## **Modelling and Simulation of Aneurysm Mechanics**

Anne Robertson (*University of Pittsburgh*) and Paul Watton (*University of Oxford*)

## **Multiscale Mechanobiology**

Seungik Baek (*Michigan State University*) and Igor Karsaj (*University of Zagreb*)

## **Multiscale Modelling of Bones**

Christian Hellmich (*TU-Wien*) and Bert van Rietbergen (*TU-Eindhoven*)

## **Multiscale Muscle Mechanics**

Sae-Il Murtada (*Karolinska Institutet, Stockholm*) and Oliver Röhrle (*University of Stuttgart*)

## **Theoretical and Numerical Modelling of the Function of the Eye**

Anna Pandolfi (*Politecnico di Milano*) and Peter Pinsky (*Stanford University*)

## **Continuum Mechanics**

### **Contact Mechanics**

Michel Raous (*Laboratoire de Mécanique et d'Acoustique, Marseille*) and Peter Wriggers (*University of Hannover*)

### **Constitutive Models for Smart and Active Materials**

Nick Triantafyllidis (*Ecole Polytechnique*) and Pedro Ponte Castañeda (*University of Pennsylvania*)

### **Homogenization Strategies for Multiphase Materials**

Issam Doghri (*Université Catholique de Lovain*)

### **Instabilities in Materials Mechanics**

Davide Bigoni (*Università di Trento*) and Henryk Petryk (*Polish Academy of Sciences*)

## **Mechanics of Granular Media: Experiments, Theory and Modelling**

Erich Bauer (*Graz University of Technology*), Felix Darve (*University of Grenoble*) and Joe D. Goddard (*University of California, San Diego*)

## **Mechanics of Interfaces**

Siegfried Schmauder (*Stuttgart University*) and Jörg Weißmüller (*Hamburg University of Technology*)

## **Mechanics and Physics of Solids and Structures**

Sebastien Neukirch (*Paris*), Benoit Roman (*École Supérieure de Physique et de Chimie Industrielles*), Keith Seffen (*Cambridge University*) and Davide Bigoni (*Università di Trento*)

## **Micro and Nano Mechanics**

Nicola Pugno (*Università di Trento*) and Ettore Barbieri (*Queen Mary College*)

## **Model Order Reduction Techniques**

Francisco Chinesta (*École Centrale Nantes*) and Tamara Bechtold (*IMTEK Freiburg*)

## **Multi-Physics Problems**

Bernhard Schrefler (*Università di Padova*) and Christian Miehe (*University of Stuttgart*)

## **Nonlinear Elasticity**

Roger Bustamante (*Universidad de Santiago de Chile*) and Luis Dorfmann (*Tufts University*)

## **Recent Advances in Damage Mechanics**

Claudia Comi (*Politecnico di Milano*) and Jean Jacques Marigo (*École Polytechnique*)

## **Statics and Dynamics of Dense Granular Matter**

Robert Behringer (*Duke University*), Lou Kondic (*New Jersey Institute of Technology*) and Corey O'Hern (*Yale University*)

## **Surface-Related Phenomena in Mechanics: from Nano- to Macroscale**

Holm Altenbach (*Otto von Guericke University Magdeburg*), Nikita Morozov (*Saint-Petersburg State University*) and Victor Eremeyev (*Russian Academy of Sciences*)

## Experimental Mechanics

### Experimental Micromechanics and Nanomechanics

Gerhard Dehm (*Max-Planck-Institut für Eisenforschung*) and Jon Molina-Aldareguía (*IMDEA Materials Institute*)

### In situ Mechanical Characterization of Materials

Eric Maire (*INSA Lyon*) and Thomas Pardoen (*Université Catholique de Louvain*)

## Computational Mechanics

### Advanced Strategies for Computational Modeling of Material Failure

Xavier Oliver (*Polytechnic University of Catalonia*) and L. J. Sluys (*Delft University of Technology*)

### Cohesive Zone Models

Albert Turón (*University of Girona*)

### Computational Fracture Mechanics

Olivier Allix (*ENS Cachan*) and Pedro Camanho (*University of Porto*)

### Geometry and Discretization

Alessandro Reali (*University of Pavia*) and Annalisa Buffa (*IMAT*)

### Models and Numerical Methods for Coupled Problems in Mechanics

Ignacio Romero (*Polytechnic University of Madrid*) and Adrian Lew (*Stanford University*)

### Recent Advances in Numerical Simulation of Hydraulic Fracture

Gennady Mishuris (*Wales Institute of Mathematical, Computational Sciences*) and Alexander Linkov (*Rzeszow University of Technology*) and Anton Krivtsov (*Russian Academy of Sciences*)

## Dynamics

### Impact and Penetration Mechanics

Nik Petrinic (*Oxford University*) and Sidney Chocron (*Southwest Research Institute, San Antonio*)

### Nonlinear Vibrations and Acoustics

Sergey Sorokin (*Aalborg University*) and Jon Juel Thomsen (*Denmark Technical University*)

### Virtual Testing of Composites under Impact

Claudio Saul López and Carlos González (*IMDEA Materials Institute*)

## Structural Mechanics

### Computational Models for Shell Structures

Erasmus Carrera (*Politecnico di Torino*) and Umberto Perego (*Politecnico di Milano*)

### Fire Safety of Structures

Carmelo Majorana (*Università di Padova*) and Jean-Marc Franssen (*University of Liege*)

### Mechanics of Masonry Structures

Elio Sacco (*Università di Cassino*)

### Nondestructive Evaluation and Structural Health Monitoring

Alfredo Güemes (*Polytechnic University of Madrid*) and Wieslaw Ostachowicz (*Polish Academy of Sciences*)

### Steel Structures: Mechanics, Simulation and Testing

Nuno Silvestre (*Technical University of Lisbon*) and Leroy Gardner (*Imperial College London*)





## CONFERENCE SCIENTIFIC COMMITTEE

### Chairman

Prof. A. Corigliano Politecnico di Milano

### Members

Prof. S. Bordas Cardiff University  
Prof. P. Camanho University of Porto  
Prof. L. Dormieux Universite Paris-Tech  
Prof. A. Freidin Russian Academy of Sciences, St. Petersburg  
Prof. G. A. Holzapfel Graz University of Technology, Austria  
Prof. J. Huyghe Technical University Eindhoven  
Prof. J. LLorca IMDEA Materials Institute & Polytechnic University of Madrid  
Prof. P. McHugh National University of Ireland, Galway  
Prof. S. Reese RWTH Aachen, Germany  
Prof. O. Sigmund Denmark Technical University, Lyngby

## LOCAL ORGANIZING COMMITTEE

### Chairman

Prof. J. LLorca IMDEA Materials Institute & Polytechnic University of Madrid

### Members

Prof. J. M. Atienza Polytechnic University of Madrid  
Prof. E. Barbero Carlos III University  
Prof. D. Cendón Polytechnic University of Madrid  
Prof. M. Elices Polytechnic University of Madrid  
Prof. F. Gálvez Polytechnic University of Madrid  
Prof. J. M. Goicolea Polytechnic University of Madrid  
Prof. G. V. Guinea Polytechnic University of Madrid  
Prof. C. González IMDEA Materials Institute & Polytechnic University of Madrid  
Prof. C. S. López IMDEA Materials Institute  
Prof. J. M. Molina-Aldareguía IMDEA Materials Institute  
Prof. F. Montans Polytechnic University of Madrid  
Prof. M. Perlado Polytechnic University of Madrid  
Prof. J. Planas Polytechnic University of Madrid  
Prof. P. Poza Rey Juan Carlos University  
Prof. J. Rodríguez Rey Juan Carlos University  
Prof. I. Romero Polytechnic University of Madrid  
Prof. V. Sánchez-Gálvez Polytechnic University of Madrid  
Prof. J. Segurado IMDEA Materials Institute & Polytechnic University of Madrid  
Prof. R. Zaera Carlos III University of Madrid

## ABSTRACT SUBMISSION

Authors wishing to contribute to the conference through the General Sessions or a Mini-Symposium are invited to submit a two-page abstract. Abstracts have to be submitted online using a template which will be downloaded from the conference webpage. The conference programme will include only the accepted abstracts. Each participant is allowed to present one paper.

**The deadline for abstract submission is November 15th, 2014.**

## CONFERENCE FORMAT

The Conference will last five days (Monday to Friday). One afternoon will be reserved for optional organized trips. In addition to the invited lectures, there will be the "EUROMECH Solid Mechanics Prize" lecture. An award ceremony for EUROMECH Fellows will be held and the best oral and poster presentations by Young Researchers, aged under 35, will be recognized with prizes.

## VENUE

The conference will be held in the Higher Polytechnic School of the Carlos III University of Madrid, located in Leganés, Madrid.

Madrid, capital of Spain, looks monumental, with its buildings, squares and avenues, all the more imposing in their austerity. The city is a throne of

beauty, with different styles that have left their imprint in the city over the centuries.

Madrid is more than just a city to visit: it's a city to be lived. And, no matter how short your stay will be, you will live Madrid with intensity, enjoying the capital or using it as a base for countless trips to historic towns from the very heart of Spain.

## ACCOMMODATION

A number of hotels and a student residence are located within walking distance of the conference venue. Hotels in downtown Madrid can be conveniently reached by commuter train and/or subway. Further details will be available on the conference webpage: [www.esmc2015.org](http://www.esmc2015.org)

## About EUROMECH

EUROMECH – the European Mechanics Society is an international non-governmental non-profit scientific organization, whose objective is to engage in all activities intended to promote in Europe the development of mechanics as a branch of science and engineering. Activities within the field of mechanics range from fundamental research on the behaviour of fluids and solids to applied research in engineering.

The approaches used comprise theoretical, analytical, computational and experimental methods. Further details are available on [www.euomech.org](http://www.euomech.org)



## REGISTRATION

The registration fees include the conference program (hardcopy and electronic), the book of abstracts (electronic), participation in all sessions, lunch and coffee breaks, a reception and the conference banquet. Each registered participant will be allowed to present one oral talk or poster.

Early Registration (up to April 1st, 2015)		
	EUROMECH members	Non-EUROMECH members
<b>Regular</b>	600€	625€
<b>Students</b>	350€	350€

  

Late Registration (after April 1st, 2015)		
	EUROMECH members	Non-EUROMECH members
<b>Regular</b>	650€	675€
<b>Students</b>	400€	400€

## SOCIAL PROGRAMME

The Social Programme will include a reception on Monday evening. The Conference banquet will be held on Thursday evening. An additional fee will apply for those accompanying persons who wish to attend the banquet. Optional tourist programme will be organized on the free afternoon, and details will be published on the conference webpage.

## SECRETARIAT

### Mariana Huerta

IMDEA Materials Institute  
Address: C/ Eric Kandel, 2 Tecnogetafe E-28906,  
Getafe, Madrid (Spain)  
Phone: (+34) 91 549 34 22  
[info@esmc2015.org](mailto:info@esmc2015.org)

### Sergio Santiago

ADCOMM CENTURY (Tour Operator)  
Address: C/ Telegrafía, 1 – Bajo E-28044,  
Madrid (Spain)  
Phone: (+34) 671916660  
[info@esmc2015.org](mailto:info@esmc2015.org)