



UNIVERSITY OF TRENTO - Italy



ALMA MATER STUDIORUM  
UNIVERSITÀ DI BOLOGNA

**EUROPEAN  
MECHANICS  
SOCIETY**

# ESMC 2018

## 10th European Solid Mechanics Conference



July 2-6, 2018  
Bologna, Italy

[www.esmc2018.org](http://www.esmc2018.org)



# GENERAL LECTURER

Prof. Bernhard Schrefler, University of Padova

## PLENARY LECTURERS

Prof. Lorna Gibson

Prof. Odd Sture Hopperstad

Prof. Ray W. Ogden

Prof. Thomas Pardoën

Prof. Zhigang Suo

## MINI SYMPOSIA

### Mechanics of Materials

#### Mechanics of Composite Materials

*Pedro Camanho, Josep Costa*

#### The Virtual Concrete Lab: Modelling the Behaviour of Concrete from Fresh State to Long Term Durability

*Günter Hofstetter, Liberato Ferrara*

#### Architected Materials

*Katia Bertoldi, Damiano Pasini, Patrick Onck*

#### Mechanics of Textile Composite Reinforcements and Fibrous Materials

*Philippe Boisse, Stepan Lomov*

#### Micro and Nano Mechanics Systems

*Horacio Espinosa, Vittorio Ferrari, Attilio Frangi, Fiorella Pantano*

#### Multiscale Modelling of Polycrystalline Materials

*Javier Segurado, Ricardo A. Lebensohn*

#### Shape Memory Alloys – Modelling, Numerical Algorithms and Applications

*Stefanie Reese, Stanisław Stupkiewicz*

#### Topology Optimization for Additive Manufacturing

*Fred van Keulen, Pierre Duysinx*

#### Modelling of Fracture in Hard and Soft Materials

*Roberta Massabò, Chad Landis*

#### Graphene and Related Materials and Systems

*Costas Galiotis, Nicola Pugno*

## GENERAL SESSIONS

### Biomechanics

Composite Materials and Homogenization Theory

Computational Mechanics

Continuum Mechanics

Dynamics, Waves, and Metamaterials

Experimental Mechanics

Mechanics of Materials

Multifield and Multiscale Problems

Structural Mechanics

### Biomechanics

#### Brain Mechanics

*Antoine Jerusalem, Alain Goriely*

#### Cell Mechanics

*José Manuel Garcia Aznar, Patrick McGarry, Paolo Bisegna*

#### Mechanics and Shape Control of Biological Membranes and Thin Structures

*Marino Arroyo, Antonio DeSimone, Giovanni Noselli*

#### Mechanics of Silk: from Molecules to Orb-webs

*Frauke Graeter, Nicola Pugno*

#### Mechanics of Soft Biological Tissues

*Gerhard A. Holzapfel, Ray W. Ogden*

#### Cardiovascular Biomechanics and Mechanobiology: from Basics to Clinical Applications

*Christian Cyron, Alessandro Veneziani*

#### Mechanics of Mineralised Tissues and Biomaterials

*Anna Tampieri, Marco Viceconti*

## Continuum Mechanics

### Contact Mechanics

*Michel Raous, Peter Wriggers, Giorgio Zavarise*

### Constitutive Models for Smart and Active Materials

*Nick Triantafyllidis, Pedro Ponte Castañeda*

### Homogenization Strategies for Multiphase and Active Materials

*Issam Doghri, Kostas Danas*

### Material Instabilities

*Ahmed Benallal, Henryk Petryk*

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

*Alessandro Gajo, Ken Kamrin, Stefan Luding*

### Mechanics and Physics of Solids and Structures

*Sebastien Neukirch, Benoit Roman, Keith Seffen, Francesco Dal Corso*

### Multi-Physics of Solids at Fracture

*Bernhard Schrefler, Gennady Mishuris, Alexander Linkov*

### Nonlinear Elasticity

*Roger Bustamante, Luis Dorfmann, Yibin Fu, Patrizio Neff*

### Recent Advances in Damage Mechanics

*Claudia Comi, Jean-Jacques Marigo*

### The Physics of Dense Granular Media

*Robert Behringer, Lou Kondic, Corey O'Hern*

### Mechanics of Generalized Continua with Cohesion-adhesion Interactions and their Applications to Size-dependent Thin Structures

*Holm Altenbach, Nikita Morozov, Francesco dell'Isola, Sergey Lurie*

### Generalized Continua

*Panagiotis Gougiotis, Patrizio Neff, Victor Eremeyev*

### Rivlin's Legacy in Solid Mechanics

*Michel Destrade, Tommaso Ruggeri, Giuseppe Saccomandi*

## Experimental Mechanics

### Experimental Micromechanics and Nanomechanics

*Gerhard Dehm, Jon Molina-Aldareguía, Miguel Monclus*

### In-situ Mechanical Characterization of Materials

*Eric Maire, Thomas Pardoën*

## Computational Mechanics

### Advanced Strategies for Computational Modelling of Material Failure

*Guenther Meschke, Angelo Simone*

### Cohesive-zone Modelling – Advances and Challenges

*Albert Turón, Giulio Alfano, Bent F. Sørensen*

### Geometry and Discretization

*Alessandro Reali, Annalisa Buffa*

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

*Ignacio Romero, Adrian Lew*

### Non-local Models for Damage and Fracture

*Ugo Galvanetto, Erkan Oterkus*

### Mechanics in Energy Harvesting and Storage

*Alberto Salvadori, Angelo Simone, Robert McMeeking*

### Advances in Analytical and Discretization Methods for Discontinuities and Singularities

*Antonio Tralli, Elena Benvenuti, N. Sukumar*

## Dynamics, Waves, and Metamaterials

### Nonlinear Dynamics in Mechanical and Structural Systems

*Sergey Sorokin, Jon Juel Thomsen, Giuseppe Rega*

### Elastic Metamaterials

*Alexander Movchan, Sebastian Guenneau, Diego Misseroni*

### Dynamic Failure and Phase Transition in Structured Media

*Gennady Mishuris, Michael Nieves, Andrea Piccolroaz, Bernd Markert*

## Structural Mechanics

**Beam, Plate and Shell Finite Elements based on non-Classical Theories of Structures**

*Erasmus Carrera, Francisco Chinesta*

**Steel Structures: Mechanics, Simulation and Testing**

*Nuno Silvestre, Leroy Gardner*

**Mechanics of Tensegrity Structures and Multifunctional Lattice Materials**

*Fernando Fraternali, Robert E. Skelton*

**Instabilities in Structural Mechanics and Fluid-Structure Interactions**

*Oleg Kirillov, Olivier Doare*

**Smart Materials and Structures**

*Michele Brun, Vincent Pagneaux*

**Structural Analysis of Real Historic Buildings**

*Maurizio Angelillo, Santiago Huerta*

## Composite Materials and Homogenization Theory

**Micromechanics-based Nonlocal Continuum Models**

*Lorenzo Bardella, Samuel Forest*

**Computational Homogenization of Nonlinear Composites**

*Elio Sacco, Djimédo Kondo, Felix Fritzen, Jean-Claude Michel*

**Inelastic Processes in Heterogeneous Materials: Formulations, Uncertainty Quantification, Computations**

*Adnan Ibrahimbegovic, Hermann Matthies*

## Multifield and Multiscale Problems

**Multi-scale Solids and Homogenisation**

*Natasha Movchan, Daniel Colquitt, Ross McPhedran*

**Reaction Diffusion Problems in Mechanics**

*Marco Paggi, Ricardo Ruiz Baier*

**Variational Methods in Constitutive Modelling for Multi-physics Problems**

*Anna Pandolfi, Laurent Stainier, Kerstin Weinberg*

**Modeling of Additive Manufacturing Processes**

*Ferdinando Auricchio, Simone Morganti, Ernst Rank, Stefan Kollmannsberger*



# CONFERENCE SCIENTIFIC COMMITTEE

## Chairman

**Prof. A. Corigliano** Politecnico di Milano

## Members

**Prof. D. Bigoni** University of Trento  
**Prof. S. Bordas** Université du Luxembourg and Cardiff University  
**Prof. P. Camanho** University of Porto  
**Prof. L. Dormieux** Université Paris-Tech  
**Prof. A. Freidin** Russian Academy of Sciences, St. Petersburg  
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**Prof. G.A. Holzapfel** Graz University of Technology; Norwegian University of Science and Technology  
**Prof. J. Huyghe** Technical University Eindhoven  
**Prof. P.E. McHugh** National University of Ireland Galway  
**Prof. J.F. Molinari** École Polytechnique Fédérale de Lausanne  
**Prof. C.F. Niordson** Technical University of Denmark  
**Prof. F. Ubertini** University of Bologna

# LOCAL ORGANIZING COMMITTEE

## Chairmen

**Prof. D. Bigoni** University of Trento  
**Prof. F. Ubertini** University of Bologna

## Members

**Prof. C. Carloni** University of Bologna  
**Dr. G. Castellazzi** University of Bologna  
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**Prof. T. Ruggeri** University of Bologna  
**Prof. M. Savoia** University of Bologna  
**Dr. R. Springhetti** University of Trento



## 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 web site. The conference programme will include only the accepted abstracts. Abstract submission will open on July 15th, 2017. **The deadline for abstract submission is November 15th, 2017.**

## 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 two "Young Researcher" and one "Best Poster" awards will be assigned. Further details will be available on the conference web site [www.esmc2018.org](http://www.esmc2018.org).

## VENUE

The conference will be held in the Palazzo della Cultura e dei Congressi of Bologna.

Bologna is the capital of the Emilia-Romagna Region and is located in the Northern part of Italy. It is a city full of art and culture and home of the oldest University in the Western world – Alma Mater Studiorum – founded in 1088. The very special urban fabric, the cultural heritage, and the remarkable architecture make Bologna a warm and welcoming city. The centre of the city, with its well preserved

Medieval layout, is famous for its porticoes, that extend for more than 40 kilometers, and for the ancient towers. Bologna, with its international airport "Guglielmo Marconi", is well connected with almost all the main European cities. Finally, its strategic location makes Bologna a major road and railway hub, which is extremely well connected with all Italian cities.

## ACCOMODATION

Bologna has an age-old tradition of hospitality with high-quality hotel accommodations that include a wide range of solutions. The choice spans from charming old-style hotels to world famous modern, international hotels. A number of hotels are located within walking distance from the conference venue. Additional hotels, in centre of the city, can be conveniently reached by bus. Further details will be available on the conference web site [www.esmc2018.org](http://www.esmc2018.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, 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 March 31st, 2018)		
	EUROMECH members	Non-EUROMECH members
Regular	600€	625€
Students	350€	350€
Late Registration (after March 31st, 2018)		
	EUROMECH members	Non-EUROMECH members
Regular	650€	675€
Students	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 web site.

## SECRETARIAT

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