



ESMC 2022

11TH EUROPEAN SOLID MECHANICS CONFERENCE

11th European Solid Mechanics Conference

4 – 8 July 2022 | NUI Galway, Ireland



NUI Galway
OÉ Gaillimh



Fáilte Ireland
National Tourism Development Authority

MEET IN
IRELAND

Dear Colleagues,

It gives me great pleasure to announce the 11th European Solid Mechanics Conference to be held in Galway, Ireland, 4th – 8th July, 2022 (ESMC 2022). The conference is being held under the auspices of the European Mechanics Society (EUROMECH <https://euomech.org/>).

The European Solid Mechanics Conference is the major event for the solid mechanics community in Europe, and provides a unique forum for scientists and engineers from Europe and across the world to exchange ideas on the current state-of-the-art in the mechanics of solids, on new concepts and ideas and to identify new research directions.

Solid mechanics is the bedrock of engineering design in areas such as mechanical engineering, civil and structural engineering, and biomedical engineering. It is a critically important element in the design and development of almost all technologies and products in these areas, such as aircraft, automobiles, buildings, bridges, and medical implants and devices. Further, solid mechanics is a key enabler in the development of new technologies that address the major global challenges of our time in sustainability, renewable energy and health.

The first European Solid Mechanics Conference was held in Munich in 1991. This very successful conference initiated a tri-annual series with subsequent conferences held in Genova, Stockholm, Metz, Thessaloniki, Budapest, Lisbon, Graz, Madrid and Bologna. The 11th European Solid Mechanics Conference will take place at the National University of Ireland Galway, in the city of Galway, Ireland.

We have assembled an outstanding group of invited lecturers for the conference, covering the General Lecture and five Plenary Lectures.

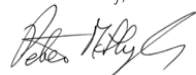
The conference is organised in terms of the following eight themes:

- Mechanics of Materials
- Biomechanics and Medical Implants
- Continuum Mechanics
- Experimental Mechanics
- Computational Mechanics
- Dynamics, Waves and Metamaterials
- Structural Mechanics
- Multiphysics and Multiscale Problems

There is a General Session for each theme and over fifty Mini-Symposia that cover a range of specialised topics, grouped under each theme.

We warmly welcome you to the wonderful city of Galway for what promises to be a very exciting and stimulating event.

Yours sincerely,



Peter E. McHugh

Chair of ESMC 2022



Peter E. McHugh, PhD, DSc, MRIA, FIEI, FIAE, CEng
Professor of Biomedical Engineering | Ollamh le hInnealtóireacht Bhiathleighis
School of Engineering | Scoil na hInnealtóireachta
College of Science and Engineering | Coláiste na hEolaíochta & na hInnealtóireachta
NUI Galway | OÉ Gaillimh

GENERAL LECTURER



Thomas J.R. Hughes

*Peter O'Donnell Jr. Chair in Computational and Applied Mathematics
Professor of Aerospace Engineering and Engineering Mechanics
University of Texas at Austin*

PLENARY LECTURERS



Gerard A. Ateshian

*Andrew Walz Professor of Mechanical Engineering
Professor of Biomedical Engineering
Columbia University*



Vikram Deshpande

*Professor in Materials Engineering
University of Cambridge*



Ellen Kuhl

*Robert Bosch Department Chair and Professor of Mechanical Engineering
Stanford University*



Javier Llorca

*Scientific Director, IMDEA Materials Institute
Professor of Materials Science, Polytechnic University of Madrid*



Alan Needleman

*University Distinguished Professor and Royce E. Wisenbaker '39 Chair II
Texas A&M University*

GENERAL SESSIONS

- Mechanics of Materials
- Biomechanics and Medical Implants
- Continuum Mechanics
- Experimental Mechanics
- Computational Mechanics
- Dynamics, Waves and Metamaterials
- Structural Mechanics
- Multiphysics and Multiscale Problems

MINI-SYMPOSIA

Mechanics of Materials

Mechanics of Composite Materials

Organisers: Pedro Camanho (University of Porto), Paul Weaver (University of Limerick)

Micromechanics-based Nonlocal Continuum Models

Organisers: Lorenzo Bardella (University of Brescia), Samuel Forest (Mines ParisTech CNRS)

Architected Materials

Organisers: Katia Bertoldi (Harvard University), Damiano Pasini (McGill University)

Mechanics of Textile Composite Reinforcements and Fibrous Materials

Organisers: Philippe Boisse (Université de Lyon), Stepan Lomov (KU Leuven), Dmytro Vasiukov (IMT Lille Douai)

Micro and Nano Systems and Applications

Organisers: Horacio Espinosa (Northwestern University), Vittorio Ferrari (University of Brescia), Attilio Frangi (Politecnico di Milano), Maria F. Pantano (University of Trento)

Multiscale Modelling of Polycrystalline Materials

Organisers: Javier Segurado (Universidad Politécnica de Madrid), Ricardo A. Lebensohn (Los Alamos National Laboratory)

Modelling of Multi-Functional Materials and Related Material Systems

Organisers: Stefanie Reese (Aachen University), Stanisław Stupkiewicz (Institute of Fundamental Technological Research)

Topology Optimization for Additive Manufacturing

Organisers: Fred van Keulen (TU Delft), Pierre Duysinx (Liège University), Can Ayas (TU Delft)

Modelling of Plasticity at Multiple Length Scales

Organisers: Fionn Dunne (Imperial College London), Noel O'Dowd (University of Limerick)

Mechanics of Additive Manufactured Materials

Organisers: Catrin Davies (Imperial College London), Noel Harrison (NUI Galway)

Computational and Data Driven Homogenization for Nonlinear Composites

Organisers: Elio Sacco (University of Naples Federico II), Djimédo Kondo (Université Pierre et Marie Curie), Felix Fritzen (University of Stuttgart), Sonia Marfia (University Roma Tre)

Polymer Mechanics

Organisers: Gary Menary (Queen's University Belfast), Alex Lennon (Queen's University Belfast)

Biomechanics and Medical Implants

Mechanics of Biological Cells and Active Tissues

Organisers: José Manuel García Aznar (Universidad de Zaragoza), Patrick McGarry (NUI Galway), Eoin McEvoy (NUI Galway)

Mechanics of Soft Biological Tissues

Organisers: Gerhard A. Holzapfel (Graz University of Technology), Ray W. Ogden (University of Glasgow)

Cardiovascular Biomechanics and Mechanobiology: from Basics to Clinical Applications

Organisers: Christian Cyron (Hamburg University of Technology), Alessandro Veneziani (Emory University and IUSS Pavia), Cairiona Lally (Trinity College Dublin)

Mechanics of Mineralised Tissues

Organisers: Glen Niebur (University of Notre Dame), Enrico Dall'ara (University of Sheffield), Ted Vaughan (NUI Galway)

Biomechanics of Blood Clots and Thrombectomy Devices

Organisers: Jose Rodriguez Matas (Politecnico di Milano), Ed Van Bavel (Amsterdam UMC), Behrooz Fereidoonzhad (NUI Galway)

Mechanics of Biodegradable Materials

Organisers: Lorenza Petrini (Politecnico di Milano), Joao Silva Soares (Virginia Commonwealth University), William Ronan (NUI Galway)

Mechanics of Impact and Trauma

Organisers: Michael Gilchrist (University College Dublin), Svein Kleiven (KTH Stockholm), Andrew Post (University of Ottawa)

Mechanics of Soft Robotic Devices

Organisers: Ellen Roche (Massachusetts Institute of Technology), Xuanhe Zhao (Massachusetts Institute of Technology), Eimear Dolan (NUI Galway)

Mechanics of Cardiovascular Implants and Devices: Modelling, Imaging and Testing

Organisers: Francesco Migliavacca (Politecnico di Milano), Michael Walsh (University of Limerick), Claire Conway (RCSI, Dublin)

Biotribology and Interface Mechanics of Tissue and Devices

Organisers: Rosaire Mongrain (McGill University), Mark Driscoll (McGill University)

Continuum Mechanics

Contact Mechanics

Organisers: Michel Raoult (Laboratory of Mechanics and Acoustics - CNRS), Peter Wriggers (Leibniz Universität Hannover), Giorgio Zavarise (Politecnico di Torino)

Homogenisation and Continuum Strategies for Multiphase and Active Materials

Organisers: Issam Doghri (Université catholique de Louvain), Nicolas Triantafyllidis (Ecole Polytechnique), Pedro Ponte Castañeda (University of Pennsylvania); Kostas Danas (Ecole Polytechnique)

Material Instabilities

Organisers: Ahmed Benallal (LMT, Ens Paris Saclay/CNRS), Henryk Petryk (Institute of Fundamental Technological Research, IPPT)

Mechanics and Physics of Dense Granular Media: Experiments, Theory and Modelling

Organisers: Lou Kondic (New Jersey Institute of Technology), Corey O'Hern (Yale University), Alessandro Gajo (University of Trento), Ken Kamrin (Massachusetts Institute of Technology), Stefan Luding (University of Twente)

Mechanics and Physics of Structures

Organisers: Sebastien Neukirch (CNRS/UPMC), Benoit Roman (CNRS/UPMC), Keith Seffen (University of Cambridge), Francesco Dal Corso (University of Trento)

Advanced Modelling of Hydromechanically Driven Discontinuities

Organisers: Gennady Mishuris (Aberystwyth University), Alexandre Lavrov (Norwegian University of Science and Technology), Brice Lecampion (EPFL, Lausanne), Panos Papanastasiou (University of Cyprus)

Nonlinear Elasticity

Organisers: Luis Dorfmann (Tufts University), Yibin Fu (Keele University), Patrizio Neff (Universitaet Duisburg-Essen)

Recent Advances in Damage Mechanics

Organisers: Claudia Comi (Politecnico di Milano), Jean-Francois Molinari (EPFL, Lausanne), Nicolas Moës (Ecole Centrale de Nantes)

Generalized Continua – New Developments and Applications

Organisers: Holm Altenbach (Otto-von-Guericke-Universität Magdeburg), Panagiotis Gourgouts (Durham University), Victor Eremeyev (Rzeszow University of Technology)

Stability of Soft Matter

Organisers: Michel Destradre (NUI Galway), Valentina Balbi (NUI Galway), Alain Goriely (University of Oxford)

Mechanics of Fatigue and Fretting

Organisers: Seán Leen (NUI Galway), David Nowell (Imperial College London), Siegfried Fouvry (École Centrale de Lyon)

Experimental Mechanics

Experimental Micromechanics and Nanomechanics

Organisers: Gerhard Dehm (Max-Planck-Institut für Eisenforschung), Jon Molina-Aldareguía (IMDEA Materials Institute), Miguel Monclus (IMDEA Materials Institute)

In-situ Mechanics of Materials

Organisers: Eric Maire (INSA Lyon), Thomas Pardoen (Université Catholique de Louvain)

Non-invasive and Inverse Methods for Constitutive Parameter Identification

Organisers: Sam Evans (Cardiff University, UK), Stéphane Avril (MINES Saint-Etienne), Kevin Moerman (NUI Galway), Dana Solov (Technion – Israel Institute of Technology)

Computational Mechanics

Cohesive-zone Modelling – Advances and Challenges

Organisers: Albert Turón (Universitat de Girona), Giulio Alfano (Brunel University), Bent F. Sørensen (Technical University of Denmark)

Geometry and Discretisation

Organisers: Alessandro Reali (University of Pavia), Pablo Antolin (EPFL, Lausanne)

Models and Simulation Methods in (Metal) Additive Manufacturing

Organisers: Ignacio Romero (IMDEA Materials Institute), Adrian Lew (Stanford University)

Non-local Models for Damage and Fracture

Organisers: Ugo Galvanetto (University of Padua), Erkan Oterkus (University of Strathclyde)

Mechanics in Energy Harvesting and Storage

Organisers: Robert McMeeking (UC Santa Barbara), Alberto Salvadori (University of Brescia), Alejandro Franco (Université de Picardie Jules Verne), Marc Kamlah (Karlsruhe Institute of Technology), Vikram Deshpande (University of Cambridge)

Advances in Analytical and Discretisation Methods for Discontinuities and Singularities

Organisers: Elena Benvenuti (University of Ferrara), Andrea Chiozzi (University of Ferrara), N. Sukumar (UC Davies), Gianmarco Manzini (Los Alamos National Laboratory)

Dynamics, Waves and Metamaterials

Nonlinear Dynamics in Mechanical and Structural Systems

Organisers: Sergey Sorokin (Aalborg University), Jon Juel Thomsen (Technical University of Denmark), Giuseppe Rega (Sapienza University of Rome)

Elastic Metamaterials

Organisers: Alexander Movchan (University of Liverpool), Sebastian Guenneau (Aix-Marseille University), Diego Misseroni (University of Trento)

Dynamic Phenomena and Transition Processes in Structured Media

Organisers: Michael Nieves (Keele University), Andrea Piccolroaz (University of Trento), Anastasia Kisil (University of Manchester), Gennady Mishuris (Aberystwyth University)

Nonlinear Waves in Solids

Organisers: Aleksei Porubov (St. Petersburg State University), Giuseppe Saccomandi (University of Perugia)

Structural Mechanics

Steel Structures: Mechanics, Simulation and Testing

Organisers: Jurgen Becque (University of Cambridge), Ahmer Wadee (Imperial College London)

Instabilities in Structural Mechanics and Fluid-Structure Interactions

Organisers: Oleg Kirillov (Northumbria University), Olivier Doare (ENSTA Paristech)

Novel Microstructured and Microarchitected Materials

Organisers: Michele Brun (University of Cagliari), Vincent Pagneux (Lab. Acoustique Univ. Maine – CNRS)

Design and Development of Sustainable and Resilient Structures

Organisers: Jamie Goggins (NUI Galway), Feargal Brennan (University of Strathclyde), Gerard O'Reilly (IUSS Pavia)

Mechanics of Flexible Structures

Organisers: Vikram Pakrashi (University College Dublin), Gordan Jelenić (University of Rijeka)

Multiphysics and Multiscale Problems

Multi-scale Solids and Homogenisation

Organisers: Natasha Movchan (University of Liverpool), Daniel Colquitt (University of Liverpool), Ross McPhedran (University of Sydney)

Nonlinear Electro- and Magneto-Elasticity and its Applications

Organisers: Weiqi Chen (Zhejiang University), Giuseppe Zurlò (NUI Galway), Stephan Rudykh (University of Wisconsin–Madison)

Variational Methods in Modelling for Multi-Physics Problems

Organisers: Anna Pandolfi (Politecnico di Milano), Laurent Stainier (Ecole Centrale de Nantes), Kerstin Weinberg (Universität Siegen)

Multiscale Materials Modelling from Atoms to Macroscale

Organisers: Siegfried Schmauder (University of Stuttgart), Somnath Ghosh (Johns Hopkins University), Bill Curtin (EPFL, Lausanne), Vera Petrova (University of Stuttgart)

Composites Manufacturing and Joining: New Developments for More Efficient Structures

Organisers: Ronan O'Higgins (University of Limerick), Irene Fernandez Villegas (TU Delft), Ben Woods (University of Bristol)

CONFERENCE SCIENTIFIC COMMITTEE

Chair

Prof. Gerhard A. Holzapfel Graz University of Technology,
and Norwegian University of Science and Technology

Members

Prof. Pedro Camanho University of Porto
Prof. Samuel Forest Mines ParisTech CNRS
Prof. Ugo Galvanetto University of Padua
Prof. Odd Sture Hopperstad Norwegian University of Science and Technology
Prof. Jean-François Molinari École Polytechnique Fédérale de Lausanne
Prof. Christian F. Niordson (Co-Chair) Technical University of Denmark
Prof. Patrick Onck University of Groningen
Prof. Alexey Porubov Russian Academy of Sciences
Prof. Kerstin Weinberg Universität Siegen

LOCAL ORGANISING COMMITTEE

Chair

Prof. Peter McHugh National University of Ireland Galway

Members

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Dr Richard Barrett National University of Ireland Galway
Dr Claire Conway Royal College of Surgeons in Ireland
Prof. Michel Destrade National University of Ireland Galway
Dr Eimear Dolan National University of Ireland Galway
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Dr William Ronan National University of Ireland Galway
Prof. David Taylor Trinity College Dublin
Dr Mingming Tong National University of Ireland Galway
Dr Ted Vaughan National University of Ireland Galway
Dr Giuseppe Zurlo National University of Ireland Galway

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 will be submitted online via the Abstract Submission Portal. A template will be provided. The conference programme will include only the accepted abstracts. Each participant is allowed to present one paper. Abstract submission will open on 12th July 2021 and the deadline for abstract submission is 19th November 2021.

CONFERENCE FORMAT

The Conference will take place from Monday 4th – Friday 8th July, 2022. In addition to the invited lectures, there will be the “EUROMECH Solid Mechanics Prize” lecture. An award ceremony for EUROMECH Fellows will be held. “Young Researcher” and “Best poster” awards will be presented. Further details will be available on the conference web page: www.esmc2022.org

LOCATION

The Conference will take place at the National University of Ireland Galway (NUI Galway). Galway is a city located on the West Coast of Ireland, which sits on the River Corrib between Lough Corrib and Galway Bay. Galway is a vibrant, cosmopolitan city steeped in culture, rich in folklore and famous for its cobble-stoned streets, quaint shops and charming restaurants. Galway is known as Ireland’s cultural heart and is renowned for its vibrant lifestyle and numerous festivals, celebrations and events.

Galway and its hinterland boasts some of the most beautiful scenery in the world. The landscape leaves one breathless, from the prehistoric fort of Dun Aengus, the most westerly point in Europe, to Connemara and the Burren.

Galway city has experienced very rapid growth in recent years and has a strong local economy with complementary business sectors, including manufacturing industry, tourism, retail and distribution, education, healthcare and services that include financial, construction, cultural, and professional. In particular, Galway is at the heart of Ireland’s rapidly developing global medical technology industry hub.

ACCOMMODATION

On campus accommodation at NUI Galway will be available and we will also offer some hotel options in the City Centre, which is within walking distance of the venue. Further details will be available on the conference web page: www.esmc2022.org and accommodation will be available to book via the Conference Registration Form.

ABOUT EUROMECH

EUROMECH — the European Mechanics Society is an international non-governmental non-profit scientific organisation, 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

REGISTRATION

The registration fee includes attendance at the conference sessions, lunch and coffee breaks, and the reception.

Early Registration (up to 31 March 2022)	
Standard	€625
Student	€375
Low & Middle Income (LMI) Countries	€375
Late Registration (from 1 April 2022)	
Standard	€675
Student	€425
Low & Middle Income (LMI) Countries	€425
Conference Dinner	
Standard/Student/Low & Middle Income (LMI) Countries	€60

Registration fees are VAT exempt. The Conference dinner fee includes VAT @ 23%.

Please note: The registration fee includes the annual EUROMECH membership fee (€30). Non-EUROMECH members who wish to attend the conference become members automatically for one year when they register for the conference. They will be invited to renew their membership subsequently. The membership of EUROMECH members will automatically be extended by one year.

SOCIAL PROGRAMME

The Social Programme will include a reception on Monday evening. The Conference Dinner will be held on Thursday evening. An additional fee will apply for the Conference Dinner and for any accompanying persons who wish to attend the dinner.

CONFERENCE SECRETARIAT

Abbey Conference & Events
City Gate
22 Bridge Street Lower
Dublin 8
Ireland
esm2022@abbey.ie

