

Symposium in honour of Professor Davide Bigoni's 60th birthday
RECENT ADVANCES IN MECHANICS OF SOLIDS AND STRUCTURES

Thursday June 6, 2019

8:00 – 8:30 Registration

8:30 – 9:00 Opening Ceremony (Chair: Luca Deseri)

Welcome by

- Paolo Collini (Rector of the University of Trento)
- Paolo Baggio (Deputy Director DICAM, University of Trento)
- John Willis (University of Cambridge)
- Giulio Maier (Accademia dei Lincei)

9:00 - 10:30 SESSION 1 (Chair: Davide Bigoni)

9:00 – 9:30 J.R. Rice, A. Yehya, Z. Yang

L1 **How Relic Fault Zone Structure Guides Transmission of Elevated Pore Pressures from Nearby Fluid Injection Sites**

9:30 – 10:00 B. Audoly, J.W. Hutchinson

L2 **Buckling Localization in Spherical Shells**

10:00 – 10:30 J.R. Willis

L3 **Transmission and reflection of waves at a metamaterial/ordinary material interface**

10:30 – 11:00 Coffee break and Poster Exhibition

R. Baggio, O.U. Salman, L. Truskinovsky

P1 **Nonlinear Elasticity Perspective on Crystal Plasticity**

G. Bordiga, L. Cabras, A. Piccolroaz, D. Bigoni

P2 **In-plane Floquet-Bloch waves in elastic grids and prestress tuning of structured interfaces**

R. Cavuoto, K. Dayal, M. Fraldi, L. Deseri

P3 **A peridynamic model for the delamination of thin plates**

A. Cazzolli, F. Dal Corso, D. Misseroni

P4 **A catastrophe machine based on elastic strips**

M. Nardin, D. Veber, F. Dal Corso, A. Piccolroaz, D. Bigoni

P5 **Sub Parametric 2D Finite Element for Strain Gradient Theory**

G. Rizzi, F. Dal Corso, D. Veber, D. Bigoni

P6 **Non-local behavior of hexagonal lattice structures**

M. Rossi, D. Veber, M. Gei

P7 **Computational model for the cloaking of flexural waves in Kirchhoff-Love elastic plates**

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11:00 - 12:30 **SESSION 2** (Chair: John Willis)

- 11:00 – 11:30 M. Vasoya, A.A. Benzerga, B. Kondori, A. Needleman
L4 **Transformation Strain Kinetics for Non-negative Dissipation**
- 11:30 – 12:00 N.A. Fleck, M. Mirzajanzadeh, V.S. Deshpande
L5 **Actuation of a cellulose foam due to liquid infiltration**
- 12:00 – 12:30 S. Pellegrino, Y. Li
L6 **Design of Multi-Stable Morphing Structures**

12:30 – 13:30 Lunch (and Poster Exhibition)

13:30 - 15:30 **SESSION 3** (Chair: Alan Needleman)

- 13:30 – 14:00 H. Petryk
L7 **A Quasi-Extremal Principle in Rate-Independent Theory of Non-Associative Elastoplasticity**
- 14:00 – 14:30 W.J. Drugan
L8 **Novel Effects Possible in Wave Propagation in Discrete Structures and Composite Materials Due to Stabilized Negative-Stiffness Components**
- 14:30 – 14:50 P. Podio-Guidugli
L9 **Order, Symmetry, Invariance, Equilibrium, and All that Jazz**
- 14:50 – 15:10 N.M. Pugno
L10 **Could a spider lift Davide Bigoni?**
- 15:10 – 15:30 A. DeSimone, G. Cicconofri, A. Lucantonio, G. Noselli, M. Arroyo
L11 **Morphing and shape control in mechano-biology**

15:30 – 16:00 Coffee break (and Poster Exhibition)

16:00 - 18:00 **SESSION 4** (Chair: Alexander Movchan)

- 16:00 – 16:20 A. Corigliano
L12 **Nonlinear mechanics in Microsystems**
- 16:20 – 16:40 A. Reali
L13 **Advanced modeling and applications of Isogeometric Analysis with a focus on shells and laminates**
- 16:40 – 17:00 F. Auricchio
L14 **Additive Manufacturing: modeling and computational challenges!!**
- 17:00 – 17:20 E. Radi, A. Nobili, G. Mishuris
L15 **Time harmonic analysis of antiplane crack in couple stress elastic materials**

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17:20 – 17:40 M. Gei, L. Morini, Z. Chen, F. Bosi
L16 **Periodic frequency spectra of canonical quasicrystalline axial waveguides**

17:40 – 18:00 M. Brun, M. Morvaridi, G. Carta
L17 **Platonic crystal with low-frequency resonators**

19:00 – 19:30 *Guided tour of Sala Depero*

19:30 *Social dinner*

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Friday June 7, 2019

8:00 – 8:30 Registration

8:30 - 10:30 SESSION 5 (Chair: Henryk Petryk)

8:30 – 9:00 R.M. McMeeking

L18 **Storage particle cracking, redox kinetics, interface roughening, and solid electrolyte cracking in lithium-ion batteries**

9:00 – 9:30 A.B. Movchan, G. Carta, N.V. Movchan, I.S. Jones, M.J. Nieves

L19 **Wave Localization and Dispersion in Discretized Chiral Systems**

9:30 – 10:00 G. Mishuris, D. Peck, A. Piccolroaz, M. Wrobel

L20 **On the role of the hydraulically induced tangential traction on the fracture walls in the HF problem**

10:00 – 10:30 P. Ponte Castañeda, J. Furer

L21 **Macroscopic Instabilities and Domain Formation in Elastomeric Composites**

10:30 – 11:00 Coffee break (and Poster Exhibition)

11:00 - 12:30 SESSION 6 (Chair: Alberto Corigliano)

11:00 – 11:30 K. Bertoldi, B. Deng, L. Chen, D. Wei

L22 **Motion via non-linear waves**

11:30 – 12:00 C. Lestringant, B. Audoly

L23 **Asymptotically exact strain-gradient models for slender elastic structures**

12:00 – 12:30 S. Neukirch, P. Grandgeorge, D.E. Moulton

L24 **Open trefoil knots with no self-contact**

12:30 – 13:30 Lunch (and Poster Exhibition)

13:30 - 16:00 SESSION 7 (Chair: Katia Bertoldi)

13:30 – 13:45 M. Conti, D. Maturi

T1 **Mechanics of Solids and Applied Civil Engineering: two meaningful case studies**

13:45 – 14:00 Secret Guest Speaker (on the behalf of T. Hueckel)

Presentation Title to be unveiled

14:00 – 14:20 A. Pandolfi, A. Gizzi, M. Vasta

L25 **A microstructural model of crosslink interaction between collagen fibrils in the human cornea**

14:20 – 14:40 A. Piccolroaz, N. Gorbushin, G. Mishuris, M. Nieves

L26 **Failure propagation in dissimilar elastic lattices**

14:40 – 15:00 G. Noselli, M. Arroyo, A. DeSimone

L27 **Smart helical structures inspired by the pellicle of euglenids**

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- 15:00 – 15:20 S. Roccabianca, M. Sinha, A. Izadi, R. Anthony
L28 **Bifurcation in finite bending: a novel approach to estimate the mechanical properties of thin layers in situ**
- 15:20 – 15:40 M. Bacca
L29 **Contraction of active soft gels by transient microstructural evolution**
- 15:40 – 16:00 F. Bosi, S. Pellegrino
L30 **Viscoelastoplastic characterisation of highly deformable membranes for stratospheric balloons**
- 16:00 – 16:15 Symposium closure**