

## Timetable

Wednesday, October 10, 2018

12.00 – 12.30 **CONFERENCE OPENING**

12.30 – 13.30 **PLENARY I: Engineering Science Medal, Prof. N. Sottos (AUDITORIUM)**

### SESSION I

13.45 – 15.45 **Engineering Science Medal Symposium to honor Prof. Nancy Sottos**  
Room Salón de Grados

13.45 – 15.45 **Plasticity, fracture and fatigue: Theory, simulations and experiments**  
Room 2.3.A02

13.45 – 15.45 **Mechanics and instabilities and failure in solids and structures**  
Room 2.3.A03

13.45 – 15.45 **Structures in turbulent flows**  
Room 4.0.E03

13.45 – 15.45 **Advances in micromechanics of materials**  
Room 4.1.D01

13.45 – 15.45 **Biomechanics and mechanobiology of cells and tissues**  
Room 4.2.E05

13.45 – 15.45 **Mechanics of biological and bioinspired materials**  
Room 7.0.J06

13.45 – 15.45 **Mechanics and Electrochemistry of Energy Materials**  
Room 7.2.J07

13.45 – 15.45 **Mechanics of architected metamaterials**  
Room 3.S1.08

16:00 – 18.00 **WELCOME RECEPTION (at the Cafeteria 1st Floor)**

### SESSION II

18.00 – 20.00 **Engineering Science Medal Symposium to honor Prof. Nancy Sottos**  
Room AUDITORIUM

18.00 – 20.00 **Plasticity, fracture and fatigue: Theory, simulations and experiments**  
Room 2.3.A04

18.00 – 20.00 **Mechanics and instabilities and failure in solids and structures**  
Room 2.3.B03

18.00 – 20.00 **Structures in turbulent flows**  
Room 2.3.B05

18.00 – 20.00 **Phase-Field Modeling in Materials Science and Engineering**  
Room 4.1.E02

18.00 – 20.00 **Advances in micromechanics of materials**  
Room 4.0.D03

- 18.00 – 20.00 **Biomechanics and mechanobiology of cells and tissues**  
Room 7.2.J02
- 18.00 – 20.00 **Mechanics of biological and bioinspired materials**  
Room 4.1.E02
- 18.00 – 20.00 **Mechanics and Electrochemistry of Energy Materials**  
Room 3.S1.08
- 18.00 – 20.00 **Mechanics of architected metamaterials**  
Room 3.3B.01

Thursday, October 11, 2018

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- 08.45 – 09.45 **PLENARY II: Prager Medal, Prof. L. Anand (AUDITORIUM)**
- 09.45 – 10.15 **Coffee**

### SESSION III

- 10.15 – 12.15 **Prager Medal Symposium to honor Prof. Lallit Anand**  
Room Salón de Grados
- 10.15 – 12.15 **Plasticity, fracture and fatigue: Theory, simulations and experiments**  
Room 4.0.D01
- 10.15 – 12.15 **Mechanics and instabilities and failure in solids and structures**  
Room 4.0.D03
- 10.15 – 12.15 **Structures in turbulent flows**  
Room 4.0.E01
- 10.15 – 12.15 **Phase-Field Modeling in Materials Science and Engineering**  
Room 4.0.E03
- 10.15 – 12.15 **Mechanics of composite materials and structures**  
Room 4.0.E04
- 10.15 – 12.15 **Experimental mechanics across multiple length scales**  
Room 4.0.E05
- 10.15 – 12.15 **Scale-bridging techniques in Engineering Science**  
Room 4.0.E06
- 10.15 – 12.15 **Fluids-structure Interaction**  
Room 4.1.D01
- 10.15 – 12.15 **Biomechanics and mechanobiology of cells and tissues**  
Room 4.1.D03
- 10.15 – 12.15 **Mechanics and Electrochemistry of Energy Materials**  
Room 4.1.E01
- 10.15 – 12.15 **Mechanics of architected metamaterials**  
Room 4.1.E03
- 10.15 – 12.15 **Additive manufacturing**  
Room 4.1.E04
- 10.15 – 12.15 **Mechanics and physics of soft materials**  
Room 4.1.E05

- 10.15 – 12.15 **Engineering art**  
Room 4.1.E06
- 10.15 – 12.15 **Data Science and Mechanics**  
Room 4.2.E02
- 10.15 – 12.15 **Atomistics (DFT, Ab-initio, MD, etc)**  
Room 4.2.E04
- 10.15 – 12.15 **Dislocation behaviour and dislocation-defect Interactions in crystalline materials**  
Room 4.2.E05

12.15 – 13.45 **LUNCH** – At the ground floor cafeteria

## SESSION IV

- 13.45 – 15.45 **Prager Medal Symposium to honor Prof. Lallit Anand**  
Room Salón de Grados
- 13.45 – 15.45 **Plasticity, fracture and fatigue: Theory, simulations and experiments**  
Room 4.0.D01
- 13.45 – 15.45 **Mechanics and instabilities and failure in solids and structures**  
Room 4.0.D03
- 13.45 – 15.45 **Structures in turbulent flows**  
Room 4.0.E01
- 13.45 – 15.45 **Phase-Field Modeling in Materials Science and Engineering**  
Room 4.0.E03
- 13.45 – 15.45 **Advances in micromechanics of materials**  
Room 4.0.E04
- 13.45 – 15.45 **Mechanics of composite materials and structures**  
Room 4.0.E05
- 13.45 – 15.45 **Experimental mechanics across multiple length scales**  
Room 4.0.E06
- 13.45 – 15.45 **Scale-bridging techniques in Engineering Science**  
Room 4.1.D01
- 13.45 – 15.45 **Fluids-structure Interaction**  
Room 4.1.D03
- 13.45 – 15.45 **Biomechanics and mechanobiology of cells and tissues**  
Room 4.1.E01
- 13.45 – 15.45 **Mechanics of the brain**  
Room 4.1.E02
- 13.45 – 15.45 **Mechanics and Electrochemistry of Energy Materials**  
Room 4.1.E03
- 13.45 – 15.45 **Mechanics of architected metamaterials**  
Room 4.1.E04
- 13.45 – 15.45 **Additive manufacturing**  
Room 4.1.E05

- 13.45 – 15.45 **Mechanics and physics of soft materials**  
Room 4.1.E06
- 13.45 – 15.45 **Engineering art**  
Room 4.2.E02
- 13.45 – 15.45 **Data Science and Mechanics**  
Room 4.2.E03
- 13.45 – 15.45 **Atomistics (DFT, Ab-initio, MD, etc)**  
Room 4.2.E04
- 13.45 – 15.45 **Dislocation behaviour and dislocation-defect Interactions in crystalline materials**  
Room 4.2.E05
- 15.45 – 16.15 **Coffee**

### SESSION V

- 16.15 – 18.15 **Prager Medal Symposium to honor Prof. Lallit Anand**  
Room Salón de Grados
- 16.15 – 18.15 **Plasticity, fracture and fatigue: Theory, simulations and experiments**  
Room 4.0.D01
- 16.15 – 18.15 **Mechanics and instabilities and failure in solids and structures**  
Room 4.0.D03
- 16.15 – 18.15 **Cardiac biomechanics: when heart meets the blood**  
Room 4.0.E01
- 16.15 – 18.15 **Phase-Field Modeling in Materials Science and Engineering**  
Room 4.0.E03
- 16.15 – 18.15 **Advances in micromechanics of materials**  
Room 4.0.E04
- 16.15 – 18.15 **Mechanics of composite materials and structures**  
Room 4.0.E05
- 16.15 – 18.15 **Experimental mechanics across multiple length scales**  
Room 4.0.E06
- 16.15 – 18.15 **Scale-bridging techniques in Engineering Science**  
Room 4.1.D01
- 16.15 – 18.15 **Fluids-structure Interaction**  
Room 4.1.D03
- 16.15 – 18.15 **Biomechanics and mechanobiology of cells and tissues**  
Room 4.1.E01
- 16.15 – 18.15 **Mechanics of the brain**  
Room 4.1.E02
- 16.15 – 18.15 **Engineering art**  
Room 4.1.E03
- 16.15 – 18.15 **Additive manufacturing**  
Room 4.1.E04

- 16.15 – 18.15 **Mechanics and physics of soft materials**  
Room 4.1.E05
- 16.15 – 18.15 **Flexible and stretchable electronics: mechanics, materials, and manufacture**  
Room 4.1.E06
- 16.15 – 18.15 **Atomistics (DFT, Ab-initio, MD, etc)**  
Room 4.2.E04
- 16.15 – 18.15 **Dislocation behaviour and dislocation-defect Interactions in crystalline materials**  
Room 4.2.E05
- 18.15 – 19.00 **SES MEMBERS MEETING (Salón de Grados)**
- 20.30 **Gala Dinner (at La Masía de José Luis Restaurant)**

Friday, October 12, 2018

08.45 – 09.45 **PLENARY III: G. I. Taylor Medal, Prof. H. Stone (AUDITORIUM)**

09.45 – 10.15 **Coffee**

**SESSION VI**

- 10.15 – 12.15 **Advances in micromechanics of materials**  
Room Salón de Grados
- 10.15 – 12.15 **Plasticity, fracture and fatigue: Theory, simulations and experiments**  
Room 4.0.D01
- 10.15 – 12.15 **Mechanics and instabilities and failure in solids and structures**  
Room 4.0.D03
- 10.15 – 12.15 **Structures in turbulent flows**  
Room 4.0.E01
- 10.15 – 12.15 **Phase-Field Modeling in Materials Science and Engineering**  
Room 4.0.E03
- 10.15 – 12.15 **Advances in micromechanics of materials**  
Room 4.0.E04
- 10.15 – 12.15 **Mechanics of composite materials and structures**  
Room 4.0.E05
- 10.15 – 12.15 **Experimental mechanics across multiple length scales**  
Room 4.0.E06
- 10.15 – 12.15 **Scale-bridging techniques in Engineering Science**  
Room 4.1.D01
- 10.15 – 12.15 **Engineering art**  
Room 4.1.D03
- 10.15 – 12.15 **Biomechanics and mechanobiology of cells and tissues**  
Room 4.1.E01
- 10.15 – 12.15 **Mechanics of the brain**  
Room 4.1.E02

- 10.15 – 12.15 **Structural materials for energy storage and harvesting**  
Room 4.1.E03
- 10.15 – 12.15 **Controlling mechanical waves with metamaterials**  
Room 4.1.E04
- 10.15 – 12.15 **Additive manufacturing**  
Room 4.1.E05
- 10.15 – 12.15 **Mechanics and physics of soft materials**  
Room 4.1.E06
- 10.15 – 12.15 **Flexible and stretchable electronics: mechanics, materials, and manufacture**  
Room 4.2.E02
- 10.15 – 12.15 **Mechanics of granular media: experiments, theory and modeling**  
Room 4.2.E03
- 10.15 – 12.15 **Coupled problems**  
Room 4.2.E04
- 10.15 – 12.15 **Surface and interfacial mechanics of material**  
Room 4.2.E05
- 12.15 – 13-45 **LUNCH**
- 13.45 – 14.45 **PLENARY IV: Eringen Medal, Prof. X. Zhang (AUDITORIUM)**

### SESSION VII

- 14.45 – 16.45 **Advances in micromechanics of materials**  
Room Salón de Grados
- 14.45 – 16.45 **Dislocation behaviour and dislocation-defect Interactions in crystalline materials**  
Room 4.0.D01
- 14.45 – 16.45 **Mechanics and instabilities and failure in solids and structures**  
Room 4.0.D03
- 14.45 – 16.45 **Structures in turbulent flows**  
Room 4.0.E01
- 14.45 – 16.45 **Phase-Field Modeling in Materials Science and Engineering**  
Room 4.0.E03
- 14.45 – 16.45 **Advances in micromechanics of materials**  
Room 4.0.E04
- 14.45 – 16.45 **Mechanics of composite materials and structures**  
Room 4.0.E05
- 14.45 – 16.45 **Advances in Peridynamics and other nonlocal models**  
Room 4.0.E06
- 14.45 – 16.45 **Mechanics of disordered, random, heterogeneous materials**  
Room 4.1.D01
- 14.45 – 16.45 **Multiscale Fluid dynamics**  
Room 4.1.D03
- 14.45 – 16.45 **Growth and remodeling of living matter**  
Room 4.1.E01

- 14.45 – 16.45 **Cardiac biomechanics: when heart meets the blood**  
Room 4.1.E02
- 14.45 – 16.45 **Mechano-chemistry active materials**  
Room 4.1.E03
- 14.45 – 16.45 **Controlling mechanical waves with metamaterials**  
Room 4.1.E04
- 14.45 – 16.45 **Microfluidics and Complex Fluids**  
Room 4.1.E05
- 14.45 – 16.45 **Addressing Soft Robotics Challenges**  
Room 4.1.E06
- 14.45 – 16.45 **Flexible and stretchable electronics: mechanics, materials, and manufacture**  
Room 4.2.E02
- 14.45 – 16.45 **Mechanics of granular media: experiments, theory and modeling**  
Room 4.2.E03
- 14.45 – 16.45 **Coupled problems**  
Room 4.2.E04
- 14.45 – 16.45 **Non-linear response of highly deformable structures**  
Room 4.2.E05

16.45 – 17.15 **Coffee**

## SESSION VIII

- 17.15 - 18.40 **Phase-Field Modeling in Materials Science and Engineering**  
Room 4.1.E01
- 17.15 - 18.40 **Growth and remodeling of living matter**  
Room 4.1.E03
- 17.15 - 18.40 **Mechano-chemistry active materials**  
Room 4.1.E04
- 17.15 - 18.40 **Microfluidics and Complex Fluids**  
Room 4.1.E05
- 17.15 - 18.40 **Addressing Soft Robotics Challenges**  
Room 4.1.E06
- 17.15 - 18.40 **Others**  
Room 4.2.E04

19.00 **CONFERENCE CLOSURE (AUDITORIUM)**

## Session I - 2.3

### Mechanics and instabilities and failure in solids and structures

Wednesday, October 10, 2018

13:45 – 15:45 | Room 2.3.A03

Chair: J. A. Rodríguez-Martínez and K. Ravi-Chandar

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#### KEYNOTE

**1 A multiscale model of brittle damage extended to porous materials (#22)**

**Anna Pandolfi**

*Politecnico di Milano, Civil and Environmental Engineering, Italy*

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**2 Computational modelling of failure in heterogeneous media using a combined phase field-cohesive zone model approach (#767)**

Teresa Guillén-Hernández<sup>1</sup>, Valerio Carollo<sup>2</sup>, **José Reinoso**<sup>3,1</sup>, Marco Paggi<sup>1</sup>

<sup>1</sup>*IMT Lucca, Italy*

<sup>2</sup>*IMT Lucca, Italy*

<sup>3</sup>*Universidad de Sevilla, Seville, Spain*

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**3 Space and time regularizations for dynamic fracture (#596)**

**Nicolas Moes**

*Ecole Centrale de Nantes, France*

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**4 Prediction of crack onset by the coupled criterion of Finite Fracture Mechanics considered as an instability problem (#476)**

**Vladislav Mantic**, Israel G. Garcia

*University of Seville, Continuum Mechanics and Structural Analysis, Seville, Spain*

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**5 Study of fracture using GRAFEA with gradually varying nonlocal damage criterion in brittle materials (#439)**

**D Sai Trinath**<sup>1,1</sup>, S. M. Srinivasan<sup>1,1</sup>, A. R. Srinivasa<sup>2</sup>

<sup>1</sup>*Indian Institute of Technology Madras, Dept. of Applied Mechanics, Chennai, India*

<sup>2</sup>*Texas A&M University, Dept. of Mechanical Engineering, College Station, United States*

## Session II - 2.3

### Mechanics and instabilities and failure in solids and structures

Wednesday, October 10, 2018

18:00 – 20:00 | Room 2.3.B03

Chair: J. A. Rodríguez-Martínez and K. Ravi-Chandar

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#### 1 Finite element simulation of nucleation and propagation of dynamic shear ruptures on frictional interfaces

(#633)

**Roozbeh Rezakhani**, Jean-Francois Molinari

*EPFL, Civil Engineering, Lausanne, Switzerland*

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#### 2 Instability of dynamic crack propagation as the principal feature of structural-time nature of the fracture process

(#667)

**Yuri Petrov**<sup>1</sup>, Nikita Kazarinov<sup>2</sup>

<sup>1</sup>*St.-Petersburg State University & RAS Inst Probl Mech Engng, Russia*

<sup>2</sup>*St.-Petersburg State University, Russia*

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#### 3 Towards practical phase field modeling of general ductile fracture problems (#815)

**Brandon Talamini**<sup>1</sup>, Andrew Stershic<sup>2</sup>, Michael Tupek<sup>3</sup>, Jakob Ostien<sup>1</sup>, James Foulk<sup>1</sup>, Julia Plews<sup>3</sup>

<sup>1</sup>*Sandia National Laboratories, Mechanics of Materials, Livermore, United States*

<sup>2</sup>*Sandia National Laboratories, Multi-Physics Modeling and Simulation, Livermore, United States*

<sup>3</sup>*Sandia National Laboratories, Computational Solid Mechanics and Structural Dynamics, Albuquerque, United States*

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#### 4 Tensile plastic deformation behaviour of bulk metallic glass composites (#28)

**Tanmay Dutta**<sup>1</sup>, **R Narasimhan**<sup>2</sup>

<sup>1</sup>*Graduate Research Student, Indian Institute of Science, Mechanical Engineering, Bangalore, India*

<sup>2</sup>*Professor, Indian Institute of Science, Mechanical Engineering, Bangalore, India*

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#### 5 Deformation-diffusion coupled computational model for hydrogen diffusion (#166)

**Pilar Ariza**<sup>1</sup>, Xingsheng Sun<sup>2</sup>, Kevin Wang<sup>2</sup>, Michael Ortiz<sup>3</sup>

<sup>1</sup>*ETSI, Universidad de Sevilla, Spain*

<sup>2</sup>*Virginia Polytechnic Institute and State University, Department of Aerospace and Ocean Engineering, Blacksburg, United States*

<sup>3</sup>*California Institute of Technology, Pasadena, United States*

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#### 6 Phase transition in a compressed CNT forest (#303)

**Prashant Purohit**

*University of Pennsylvania, Department of Mechanical Engineering and Applied Mechanics, Philadelphia, United States*

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## Session III - 2.3

### Mechanics and instabilities and failure in solids and structures

Thursday, October 11, 2018

10:15 – 12:15 | Room 4.0.D03

Chair: J. A. Rodríguez-Martínez and K. Ravi-Chandar

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#### KEYNOTE

1 **Intergranular Mechanics of Metallic Ductile Damage Under Dynamic Loading Conditions** (#197)

**Curt Bronkhorst**

*Los Alamos National Laboratory, Fluid Dynamics and Solid Mechanics, United States*

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2 **The Art (and Science) of Experimentation of Explosively Loaded Plate Structures.** (#546)

**Gerald Nurick**

*University of Cape Town, Mechanical Engineering, Cape Town, South Africa*

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3 **Shell-buckling revisited: “Everybody loves a buckling problem!”** (#89)

**Pedro Reis**

*École Polytechnique Fédérale de Lausanne (EPFL), Institute of Mechanical Engineering, Switzerland*

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4 **Instability leading to localization in high strain-rate deformations of metals** (#62)

**Athanasios Tzavaras, Min-Gi Lee**

*King Abdullah University of Science and Technology (KAUST), Computer, Electrical and Mathematical Sciences and Engineering Division, Thuwal, Saudi Arabia*

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5 **Large Data Analytics for Deformation and Failure Analysis** (#365)

**Zhe Chen<sup>1</sup>, Samantha Daly<sup>2</sup>**

<sup>1</sup>UCSB, Materials Department, Santa Barbara, United States

<sup>2</sup>UCSB, Mechanical Engineering, Santa Barbara, United States

## Session IV - 2.3

### Mechanics and instabilities and failure in solids and structures

Thursday, October 11, 2018

13:45 – 15:45 | Room 4.0.D03

Chair: J. A. Rodríguez-Martínez and K. Ravi-Chandar

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1 **On Linear Non-local Thermo-viscoelastic Waves in Fluids (#287)**

**Joe Goddard**

*University of California, San Diego, Mechanical and Aerospace Engineering, La Jolla, United States*

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2 **Quasi-static and dynamic fracture behavior of particulate epoxide polymers (#758)**

**Leslie Lamberson**, Steven Pagano, Amanda Bellafatto

*Drexel University, Mechanical Engineering and Mechanics, Philadelphia, United States*

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3 **The combined effect of plastic orthotropy and tension-compression asymmetry on the development of necking instabilities in flat tensile specimens subjected to dynamic loading (#208)**

Guadalupe Vadillo, **José A. Rodríguez-Martínez**

*University Carlos III of Madrid, Continuum Mechanics and Structural Analysis, Leganés, Spain*

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4 **Instabilities in stretched and twisted elastic sheets and filaments (#645)**

**Arshad Kudrolli**, Andreea Panaitescu

*Clark University, Physics, Worcester, United States*

## Session V - 2.3

### Mechanics and instabilities and failure in solids and structures

Thursday, October 11, 2018

16:15 – 18:15 | Room 4.0.D03

Chair: J. A. Rodríguez-Martínez and K. Ravi-Chandar

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#### KEYNOTE

##### 1 Three-Dimensional Simulations of Ductile Fracture in Anisotropic Solids (#780)

Joshua Herrington, Nithin Thomas, **Amine Benzerga**

*Texas A&M University, Aerospace Engineering, College Station, United States*

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##### 2 Shear band dilation in metallic glasses (#215)

**Lan-Hong Dai**

*Chinese Academy of Sciences, Institute of Mechanics, Beijing, China*

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##### 3 Pop-in instabilities in a 6061 aluminum alloy (#793)

Tom Petit<sup>1,2</sup>, Thilo Morgeneyer<sup>1</sup>, Claire Ritter<sup>2</sup>, **Jacques Besson**<sup>1</sup>

<sup>1</sup>*MINES ParisTech, PSL Research University, Centre des matériaux, CNRS UMR 7633, Evry, France*

<sup>2</sup>*DEN-Service d'Etudes des Matériaux Irradiés, CEA, Université Paris-Saclay, Gif-sur-Yvette, France*

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##### 4 Modelling the torsional response of fully-dense and porous metallic materials (#563)

**Oana Cazacu**, Nitin Chandola

*University of Florida, Shalimar, United States*

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##### 5 Theoretical investigation of shear shock propagation (#638)

**Chockalingam Senthilnathan**, **Ta Cohen**

*Massachusetts Institute of Technology, Cambridge, United States*

## Session VI - 2.3

### Mechanics and instabilities and failure in solids and structures

Friday, October 12, 2018

10:15 – 12:15 | Room 4.0.D03

Chair: J. A. Rodríguez-Martínez and K. Ravi-Chandar

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#### 1 On deformation and damage micromechanisms in strong work hardening 2198 T3 aluminium alloy (#483)

**Ante Buljac**<sup>1,2</sup>, **François Hild**<sup>1</sup>, Lukas Helfen<sup>3,4</sup>, Thilo F. Morgeneyer<sup>2</sup>

<sup>1</sup>LMT, Cachan, France

<sup>2</sup>CDM, Evry, France

<sup>3</sup>KIT, Karlsruhe, Germany

<sup>4</sup>ESRF, Grenoble, France

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#### 2 Fracture surface roughness and fracture toughness: do they scale? (#532)

**Yali Barak**<sup>1</sup>, Ankit Srivastava<sup>2</sup>, **Shmuel Osovski**<sup>1</sup>

<sup>1</sup>Technion, Faculty of Mechanical Engineering, Haifa, Israel

<sup>2</sup>Texas A&M, Department of Materials Science and Engineering, college station, United States

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#### 3 First principles studies of H interaction with the face-centred cubic Al Σ5 [100] twist grain boundary during a uniaxial tensile test (#652)

**Flemming J.h. Ehlers**<sup>1,2</sup>, **Sylvain Queyreau**<sup>2</sup>

<sup>1</sup>University Paris Diderot, Sorbonne Paris Cité, ITODYS, UMR 7086 CNRS, France

<sup>2</sup>Université Paris XIII, Sorbonne Paris Cité, Laboratoire des Sciences des Procédés et des Matériaux, LSPM, CNRS, UPR 3407, Villetaneuse, France

## Session VII - 2.3

### Mechanics and instabilities and failure in solids and structures

Friday, October 12, 2018

14:45 – 16:45 | Room 4.0.D03

Chair: J. A. Rodríguez-Martínez and K. Ravi-Chandar

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#### 1 Thin cylindrical shells subjected to vertical edge loads (#792)

**Ciprian Coman**<sup>1</sup>, Andrew Bassom<sup>2</sup>

<sup>1</sup>University of Nottingham, Mathematical Sciences, United Kingdom

<sup>2</sup>University of Tasmania, Physical Sciences, Hobart, Australia

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#### 2 Numerical analysis for quasi-static crack propagation in a heated glass plate (#232)

**Sayako Hirobe**, Kenji Oguni

Keio University, System Design Engineering, Yokohama, Japan