



ALERT Geomaterials

Alliance of Laboratories in Europe for Education, Research and Technology

<http://alertgeomaterials.eu>

29th ALERT Workshop and School

Aussois, 1st October to 6th October 2018

Program



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29th ALERT Workshop Program

Aussois, 1st October 2018

SESSION I: Fluid flow and strain localization: fingering and fracture processes in partially saturated materials

Coordinators: Francesca Casini (Università di Roma TorVergata), Giulio Sciarra (Ecole Centrale de Nantes), Jean Vaunat (UPC)

- 8:20 – 8:30 Opening of the 29th ALERT Workshop**
Cino Viggiani (Université Grenoble-Alpes, France), President of ALERT
- 8:30 – 8:40 Session Opening**
Francesca Casini (Università di Roma TorVergata), Giulio Sciarra (Ecole Centrale de Nantes), Jean Vaunat (UPC)
- 8:40 – 9:10 Invited Speaker**
Deformation of saturated granular media under gas injection or shaking
R. Toussaint (University of Strasbourg & PoreLab, University of Oslo)
- 9:10 – 9:35 Neutron and x-ray imaging for capturing flow phenomena in geomaterials**
A. Tengattini (Université Grenoble Alpes)
- 9:35 – 10 :00 How do cracks form and propagate in remoulded clays on drying path?**
M. Hattab (Université de Lorraine)
- 10:00 – 10:25 In-situ accelerated maturation of shale under x-ray tomography**
A.L. Fauchille (Ecole Centrale de Nantes)
- 10:25 – 10:50 COFFEE BREAK**
- 10:50 – 11:15 From frictional fingering to fracturing in saturated granular materials**
B. Sandnes (Swansea University)
- 11:15 – 11:40 Jerky compaction in chemically-degrading brittle porous materials**
F. Guillard (University of Sydney)
- 11:40 – 12:05 Shear band and dilatancy in wet granular materials**
V. Magnanimo (University of Twente)
- 12:05 – 12:30 Acid dissolution fingering in a radially symmetric borehole**
E. Papamichos (Aristotle University of Thessaloniki)



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12:30 – 14:30 LUNCH

14:30 – 15:00 Invited Speaker

Diffuse-interface modeling of multicomponent flows at the pore scale
L. Cueto-Felgueroso (Technical University of Madrid)

15:00 – 15:30 Phase-field modelling of cracks in variably saturated porous media with application to soil desiccation
L. Sanavia (University of Padova)

15:30 – 16:00 Thermo-hydro-mechanical numerical modelling of the aperture/closure of desiccation cracks in clay rocks
R. Giot (Université de Poitiers)

16:00 – 16:30 COFFEE BREAK

16:30 – 17:00 Introduction of Contact Phase-Field Modelling for Porous Media
A. Guevel (University of New South Wales)

17:00 – 17:30 A phase field approach to unsaturated poromechanics
G. Sciarra (Ecole Centrale de Nantes)

17:30 – 18:00 ALERT General Assembly

18:00 – 20:00 Poster Session (intermediate level) and aperitif

20:00 DINNER



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29th ALERT Workshop Program

Aussois, 2nd October 2018

SESSION II: Geomaterials under the nanoscope

Coordinators: Roland Pellenq (CNRS-MIT), Farhang Radjai (Université de Montpellier), Franz Josef Ulm (MIT)

- 8:20 – 8:30 Session Opening**
Roland Pellenq (CNRS-MIT), Farhang Radjai (Université de Montpellier),
Franz Josef Ulm (MIT)
- 8:30 – 9:00** Mesoscale modeling of cement: Microstructure, Mechanics and Durability
K. Ioannidou (LMGC Montpellier and <MSE>2 MIT-CNRS)
- 9:00 – 9:30** Cohesion of cementitious granular materials
J.-Y. Delenne (INRA, Montpellier)
- 9:30 – 10:00** Geomechanical irreversibility under the nanoscope: plasticity and brittle failure
L. Brochard (ENPC, Paris)
- 10:00 – 10:30** Use of the Gay-Berne potential to model clay particle interactions
C. O'Sullivan (Imperial College, London)
- 10:30 – 11:00 COFFEE BREAK**
- 11:00 – 11:30** Multi-scale Transport Properties of Water in Clay Materials
V. Marry (PHEMIX, Sorbonne U., Paris)
- 11:30 – 12:00** A Grand Canonical Monte Carlo approach to Fracture
F. Ulm (CEE, MIT)
- 12:00 – 12:30** Working at the bio-geo-interface: multiscale elastoplasticity of bone
C. Hellmich (TU Vienna)
- 12:30 – 14:30 LUNCH**



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15:00 – 17:00 ALERT Board of Directors

17:30 – 18:30 ALERT PhD Prize 2018

18:30 – 19:30 ALERT Special Lecture 2018

The potential of mean force: the tool to model dense colloidal systems

Dr. Roland Pellenq (Director of Research at CNRS, the French Government Agency for Scientific Research and a MIT Senior Research Scientist)

20:00 BANQUET



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29th ALERT Workshop Program

Aussois, 3rd October 2018

SESSION III: Offshore Geotechnics

Organizers: Ken Gavin (TU Delft), Federico Pisanò (TU Delft), Gudmund Eiksund (NTNU)

8:20 – 8:30 Opening Session - Offshore Shallow Foundations

Ken Gavin (TU Delft), Federico Pisanò (TU Delft), Gudmund Eiksund (NTNU)

8:30 – 9:00 Invited Speaker

Suction bucket foundations for offshore renewable energy installations
B. Bienen (University of Western Australia)

9:00 – 9:25 Long-term behaviour of different offshore foundations studied with a high-cycle accumulation model

P. Staubach (Bauhaus-Universität Weimar)

9:25 – 9:50 A FE procedure for calculation of displacements and capacity of offshore foundations subjected to cyclic undrained loading

H.P. Jostad (Norwegian Geotechnical Institute)

9:50 – 10:15 Hypoplastic modeling of offshore structures subject to cyclic loading

D. Masin (Charles University)

10:15 – 10:45 COFFEE BREAK

10:45 – 11:10 Coupled macroelement-based dynamic SSI for offshore wind shallow foundations

M. Arroyo (Universitat Politecnica de Catalunya)

11:10 – 11:35 Vertical breakwater seaward tilt mechanism induced by partial liquefaction

M.M. Stickle (Universidad Politecnica de Madrid)

11:35 – 12:00 The role of hydro-mechanically coupled finite elements of interface in offshore engineering: application to bucket foundations

B. Cerfontaine (University of Dundee)



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12:30 – 14:30 LUNCH

14:25 – 14:30 Opening Session - Offshore Piles and Pipelines

Ken Gavin (TU Delft), Federico Pisanò (TU Delft), Gudmund Eiksund (NTNU)

14:30 – 15:00 Interface friction between marine sediments and polypropylene coated pipelines

A. Diambra (University of Bristol)

15:00 – 15:30 Simulations of pile installation using the axisymmetric material point method

M. Martinelli (Deltares)

15:30 – 16:00 Shear behaviour of carbonate rock/grout interfaces: application on offshore piles of wind turbines

E. Stavropoulou (Université Grenoble Alpes)

16:00 – 16:30 COFFEE BREAK

16:30 – 17:00 Drainage conditions around monopiles in sand

Y. Zhang (Norwegian Geotechnical Institute)

17:00 – 17:30 Offshore foundations: from behaviour of clayey soils to response of monopiles

S. Ahayan (Université de Liège/Ecole Centrale de Nantes)

17:30 – 18:00 Combining physical and numerical modelling for the cyclic-based design of monopiles in sand

F. Pisanò (Delft University of Technology)

20:00 DINNER



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29th ALERT Doctoral School

Aussois, 4th October 2018

Energetical Methods in Geomechanics

Coordinators:

Itai Einav, University of Sydney

Eleni Gerolymatou, Chalmers University of Technology

8:30 – 8:45 Introduction to the course

Itai Einav, University of Sydney, Eleni Gerolymatou, Chalmers University of Technology

8:45 – 10:30 Basic thermodynamic definitions

Mario Liu (University of Tübingen)

10:30 – 11:00 COFFEE BREAK

11:00 – 12:30 Energetics in Discrete Element Modelling

François Guillard (University of Sydney)

12:30 – 14:00 LUNCH

14:00 – 16:00 Hierarchical guide for constructing thermodynamically admissible constitutive models

Itai Einav (University of Sydney)

16:00 – 16:30 COFFEE BREAK

16:30 – 18:30 Landau's approach for advanced thermodynamics

Mario Liu (University of Tübingen)

20:00 DINNER



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29th ALERT Doctoral School

Aussois, 5th October 2018

Energetical methods in Geomechanics

Coordinators:

Itai Einav, University of Sydney

Eleni Gerolymatou, Chalmers University of Technology

8:30 – 10:30 Definition and uses of virtual power
Ioannis Stefanou (Ecole Nationale des Ponts et Chaussées, IFSTTAR, CNRS)

10:30 – 11:00 COFFEE BREAK

11:00 – 12:30 Energetical background of common approaches in geomechanics
Eleni Gerolymatou (Chalmers University of Technology)

12:30 – 14:00 LUNCH

14:00 – 16:00 An energy based constitutive framework for multiphysics geomechanics
Manolis Veveakis (Duke University)

16:00 – 16:30 COFFEE BREAK

16:30 – 18:30 Energetics of crushable granular materials: from particle fracture to breakage mechanics
Yida Zhang (University of Colorado)

20:00 DINNER



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29th ALERT Doctoral School

Aussois, 6th October 2018

Energetical methods in Geomechanics

Coordinators:

Itai Einav, University of Sydney

Eleni Gerolymatou, Chalmers University of Technology

Exercises session

8:30 – 10:00 Introduction to Python and FEniCS

10:00 – 10:30 **COFFEE BREAK**

10:30 – 12:30 Examples of the effect of constitutive choices on the energetics

12:30 – 12:45 **Closure of the school**

Itai Einav, University of Sydney, Eleni Gerolymatou, Chalmers University of Technology

12:30 – 14:00 **LUNCH**