



# **ALERT GEOMATERIALS**

The Alliance of Laboratories in Europe for Education, Research and Technology  
<http://alertgeomaterials.eu/>

## **28<sup>th</sup> ALERT Workshop and School** **Aussois, 2<sup>nd</sup> October to 7<sup>th</sup> October 2017**

### **Preliminary Programme** (September 20, 2017)



## 28<sup>th</sup> ALERT Workshop Program

Aussois, 2<sup>nd</sup> October 2017

### Session I: Porous Media Mechanics from geomaterials to non-geological media

Coordinators: William G. Gray (University of North Carolina, Chapel Hill and University of Vermont, Burlington, USA), Bernhard Schrefler (Università degli Studi di Padova, Italy), Claudio Tamagnini (University of Perugia, Italy)

**8:20 - 8:30 Opening of the 28<sup>th</sup> ALERT Workshop**

Manuel Pastor (Universidad Politécnica de Madrid, Spain), President of ALERT

**8:30 - 8:45 Session opening**

William G. Gray, Bernhard Schrefler, Claudio Tamagnini

**8:45 - 9:30 Keynote Lecture**

A multiphase porous media model for vascular tumor growth and drug delivery

Bernhard Schrefler (Università degli Studi di Padova, Italy)

**9:30 - 10:00 A hierarchical multi-compartment porous medium system for evolution of tumor microenvironment during avascular and vascular growth**

G. Sciumé (University of Bordeaux, France)

**10:00 - 10:20 COFFEE BREAK**

**10:20 - 11:05 Keynote Lecture**

Toward the Closure of a New Generation of Multiphase Flow Models  
Cass T. Miller, J.E. McLure, W.G. Gray (University of North Carolina, USA)

**11:05 - 11:35 Micromechanical  $\mu$ -UNSAT expression of a stress-(quasi-elastic)strain-strength effective stress in dry and wet porous media**

J. Duriez, R. Wan (University of Calgary, Canada)

- 11:35 - 12:05** Swelling processes in grouting mortar induced by local phase transition  
M. Sauerwein, H. Steeb (University of Stuttgart, Germany)
- 12:05 - 12:35** Conceptual model of the microstructure of hydrophobized sand in unsaturated state conditions  
P. Baryla, M. Lefik (Lodz University of Technology)
- 12:35 - 14:00** **LUNCH**
- 14:00 - 14:45** **Keynote Lecture**  
Mechanics and multi-physics of drying of particulate and polymer materials  
Tomasz Hueckel (Duke University, USA)
- 14:45 - 15:15** Impact of drying – wetting cycles on the microstructure and hydraulic behaviour of a compacted clayey silt  
A. Azizi<sup>1</sup>, G. Musso<sup>1</sup>, C. Jommi<sup>2</sup> (<sup>1</sup>Politecnico di Torino, Italy ; <sup>2</sup>Delft University of Technology, The Netherlands)
- 15:15 - 15:45** Experimental observations and constitutive description of the effect of compaction banding on the hydraulic properties of porous rock  
J. Leuthold, E. Gerolymatou, M. Vergara (Karlsruhe Institute of Technology, Germany)
- 15:45 - 16:05** **COFFEE BREAK**
- 16:05 - 16:35** The role of gas on the hydro-mechanical behaviour of peat  
S. Muraro, C. Jommi (Delft University of Technology, The Netherlands)
- 16:35 - 17:05** A new practical analytical solution for the one-dimensional consolidation under a general time-dependent loading  
M. Stickle, M. Pastor, D. Manzanal, A. Yague, P. Mira (Universidad Politécnica de Madrid, CEDEX, Spain)
- 17:05 - 17:35** Application of IGA-FEM to second-gradient poroelastoplasticity  
C. Plua<sup>1,2</sup>, C. Tamagnini<sup>2</sup>, P. Besuelle<sup>1</sup> (<sup>1</sup>Université Grenoble Alpes, France ; <sup>2</sup>University of Perugia, Italy )
- 17:35 - 18:05** Numerical and Experimental Approaches Using Unconventional Geomechanics for Porous Media  
Mustafa Sari, Manolis Veveakis, Thomas Poulet, Klaus Regenauer-Lieb (University of New South Wales, CSIRO Energy and Resources Group, Australia)
- 18:05 - 18:30** **ALERT General Assembly**  
Election of the Board of Directors
- 18:30 - 20:00** **Poster Session (intermediate level) and aperitif**
- 20:00** **DINNER**



## 28<sup>th</sup> ALERT Workshop Program

Aussois, 3<sup>rd</sup> October 2017

### Session II: Must Critical State Theory for Granular Mechanics be Revisited?

Coordinators: Yannis F. Dafalias (UC Davis, USA; National Technical University of Athens, Greece), Gioacchino Viggiani (Université Grenoble Alpes, France)

- 8:30 - 8:40** Why the workshop?  
Yannis F. Dafalias<sup>1</sup>, Gioacchino Viggiani<sup>2</sup> (<sup>1</sup>UC Davis, USA; National Technical University of Athens, Greece ; <sup>2</sup>Université Grenoble Alpes, France)
- 8:40 - 9:10** Critical State: misleading elegance?  
J. Carlos Santamarina (KAUST, Saudi Arabia)
- 9:10 - 9:20** Questions, comments and audience participation
- 9:20 - 9:50** Fabric: a missing link between Critical State and Critical State Theory  
Yannis F. Dafalias<sup>1,2</sup>, Achilleas G. Papadimitriou<sup>2</sup>, Alexandros I. Theocharis<sup>2</sup>, Emmanouil Vairaktaris<sup>2</sup> (<sup>1</sup>UC Davis, USA ; <sup>2</sup>National Technical University of Athens, Greece)
- 9:50 - 10:00** Questions, comments and audience participation
- 10:00 - 10:30** Critical State of finely grained soils under “environmental loads“  
Cristina Jommi<sup>1</sup>, Guido Musso<sup>2</sup>, Claudio Tamagnini<sup>3</sup> (<sup>1</sup>Delft University of Technology, The Netherlands ; <sup>2</sup>Politecnico di Torino, Italy ; <sup>3</sup>Università degli Studi di Perugia, Italy)
- 10:30 - 10:40** Questions, comments and audience participation
- 10:40 - 11:10** **COFFEE BREAK**
- 11:10 - 11:40** Is Critical State a utopia? A Barodesy answer  
Dimitrios Kolymbas (University of Innsbruck, Austria)
- 11:40 - 11:50** Questions, comments and audience participation

- 11:50 - 12:20** On critical state, rate and state, and thermodynamic state of soils  
Itai Einav (The University of Sydney, Australia)
- 12:20 - 12:30** Questions, comments and audience participation
- 12:30 - 12:40** Closing comments  
Giacchino Viggiani<sup>1</sup>, Yannis F. Dafalias<sup>2</sup> (<sup>1</sup>Université Grenoble Alpes, France ; <sup>2</sup>UC Davis, USA; National Technical University of Athens, Greece)
- 12:40 - 14:30** **LUNCH**
- 15:00 - 17:00** **ALERT Board of Directors**
- 17:30 - 18:30** **ALERT PhD Prize 2017**
- 18:30 - 19:30** **ALERT Special Lecture 2017**  
Systematic Description of Multiphase Flow in Porous Media  
Prof. William G. Gray (University of North Carolina, Chapel Hill and University of Vermont, Burlington, USA)
- 20:00** **DINNER**



## 28<sup>th</sup> ALERT Workshop Program

Aussois, 4<sup>th</sup> October 2017

### Session III: Advanced numerical modelling of geomaterials with emphasis on large deformation and flow problems

Coordinators: Michael A. Hicks (TU Delft, The Netherlands), Pablo Mira (CEDEX and Universidad Politécnica de Madrid, Spain), Lorenzo Sanavia (Università degli Studi di Padova, Italy)

- 8:30 - 8:40** Opening  
Michael A. Hicks<sup>1</sup>, Pablo Mira<sup>2</sup>, Lorenzo Sanavia<sup>3</sup> (<sup>1</sup>TU Delft, The Netherlands ; <sup>2</sup>CEDEX and Universidad Politécnica de Madrid, Spain ; <sup>3</sup>Università degli Studi di Padova, Italy )
- 8:40 - 9:05** Coupling solid and fluid phases in fast landslide propagation  
Manuel Pastor<sup>1</sup>, Angel Yagüe<sup>1</sup>, Miguel Martin Stickle<sup>1</sup>, Diego Manzanal<sup>1</sup>, Saeid Moussavi<sup>1</sup>, Chuan Lin<sup>1</sup>, Andrea Furlanetto<sup>2</sup>, Pablo Mira<sup>1,3</sup>, Jose A. Fernandez Merodo<sup>4</sup> (<sup>1</sup>Universidad Politécnica de Madrid, Spain ; <sup>2</sup>University of Padova, Italy ; <sup>3</sup>CEDEX, Spain ; <sup>4</sup>Instituto Geológico y Minero de España, Spain)
- 9:05 - 9:30** Cylinder Drag through Saturated Granular Bed in Zero Effective Gravity: Experiment and SPH Simulation  
Siliang Guo, Takashi Matsushima (University of Tsukuba, Japan)
- 9:30 - 9:55** Mechanisms and consequence of bed entrainment for landslides of the flow type  
Sabatino Cuomo (University of Salerno, Italy)
- 9:55 - 10:20** Local Max-Ent meshfree method applied to large deformation problems in saturated soils  
Pedro Navas<sup>1</sup>, Lorenzo Sanavia<sup>2</sup>, Susana López-Querol<sup>3</sup>, Rena C. Yu<sup>1</sup> (<sup>1</sup>University of Castilla-La Mancha, Spain; <sup>2</sup>University of Padova, Italy ; <sup>3</sup>University College London, United Kingdom)
- 10:20 - 10:50** **COFFEE BREAK**
- 10:50 - 11:15** Eulerian-Lagrangian scheme for hydro-mechanical simulations on CT-scans

Martin Lesueur<sup>1</sup>, Manolis Veveakis<sup>1</sup>, Thomas Poulet<sup>2</sup> (<sup>1</sup>University of New South Wales, Australia ; <sup>2</sup>CSIRO, Australia)

**11:15 - 11:40** Multiscale modeling of large deformation in geosynthetic-reinforced granular soils

Hongyang Cheng<sup>1</sup>, Ning Guo<sup>2</sup>, Hariyuki Yamamoto<sup>3</sup> (<sup>1</sup>University of Twente, The Netherlands ; <sup>2</sup>Carleton University, Canada ; <sup>3</sup>Hiroshima University, Japan)

**11:40 - 12:05** G-PFEM: a Particle Finite Element Method platform for geotechnical applications

Lluís Monforte<sup>1</sup>, Marcos Arroyo<sup>1</sup>, Antonio Gens<sup>1</sup>, Josep Maria Carbonell<sup>2</sup> (<sup>1</sup>Universitat Politècnica de Catalunya, Spain ; <sup>2</sup>International Center for Numerical Methods in Engineering – CIMNE, Spain)

**12:05 - 12:30** Numerical simulation of cone penetration tests using G-PFEM

Laurin Hauser<sup>1</sup>, Lluís Monforte<sup>2</sup>, Helmut F. Schweiger<sup>1</sup>, Marcos Arroyo<sup>2</sup> (<sup>1</sup>Graz University of Technology, Austria ; <sup>2</sup>Universitat Politècnica de Catalunya, Spain )

**12:30 - 14:30 LUNCH**

**14:30 - 14:55** Modelling of the progressive failure of the sensitive landslide in Saint Monique, Quebec

Quoc Anh Tran, Wojciech T. Sołowski (Aalto University, Finland)

**14:55 - 15:20** The role of constitutive models in large deformation MPM simulations

Elliot James Fern, Kenichi Soga (University of California Berkeley, USA)

**15:20 - 15:45** Application of the random material point method to slope reliability, risk and the evolution of slope failure mechanisms

Michael Hicks<sup>1</sup>, Philip Vardon<sup>1</sup>, Bin Wang<sup>2</sup>, Leon Gonzalez-Acosta<sup>1</sup> (<sup>1</sup>Delft University of Technology, The Netherlands ; <sup>2</sup>Chinese Academy of Sciences, Wuhan, China)

**15:45 - 16:15 COFFEE BREAK**

**16:15 - 16:40** Real scale test design of a sand flowslide by MPM slope (in)stability analysis

Marco Bolognin<sup>1</sup>, Michael Hicks<sup>1</sup>, Philip Vardon<sup>1</sup>, Alexander Rohe<sup>2</sup> (<sup>1</sup>Delft University of Technology, The Netherlands ; <sup>2</sup>Deltares, The Netherlands )

**16:40 - 17:05** Modelling of compaction grouting using the implicit MPM

Peter Geißler<sup>1</sup>, Ilaria Iaconeta<sup>2</sup>, Matthias Baeßler<sup>1</sup>, Pablo Cuéllar<sup>1</sup> (<sup>1</sup>Bundesanstalt für Materialforschung und –prüfung, Germany ; <sup>2</sup>International Center for Numerical Methods in Engineering – CIMNE, Spain)

**20:00 DINNER**



**27<sup>th</sup> ALERT Doctoral School**

**Aussois, 5<sup>th</sup> October 2017**

## **Discrete Element Modeling**

*Coordinators:*

*Gaël Combe (3SR, Université Grenoble Alpes, France)*

*Stefan Luding (University Twente, The Netherlands)*

**8:30 - 8:45 Introduction**

Stefan Luding<sup>1</sup>, Gaël Combe<sup>2</sup> (<sup>1</sup>University Twente, The Netherlands ;  
<sup>2</sup>3SR, Université Grenoble Alpes, France)

**8:45 - 10:30 Simulations PART I (Molecular Dynamics, Event Driven, DEM basics)**

Stefan Luding (University Twente, The Netherlands)

**10:30 - 11:00 COFFEE BREAK**

**11:00 - 12:30 Simulations PART II (Molecular Dynamics, Event Driven, DEM basics)**

Stefan Luding (University Twente, The Netherlands)

**12:30 - 14:00 LUNCH**

**14:00 - 16:00 Advanced contact laws for DEM applications**

Christophe Martin (SIMAP, Université Grenoble Alpes, France)

**16:00 - 16:30 COFFEE BREAK**

**16:30 - 18:30 Contact Dynamics**

Farhang Radjai (LMGC, Université de Montpellier, France)

**20:00 DINNER**





**27<sup>th</sup> ALERT Doctoral School**  
**Aussois, 6<sup>th</sup> October 2017**

## **Discrete Element Modeling**

*Coordinators:*

*Gaël Combe (3SR, Université Grenoble Alpes, France)*

*Stefan Luding (University Twente, The Netherlands)*

**8:30 - 10:15 Good practice and sample preparation**  
Gaël Combe (3SR, Université Grenoble Alpes, France)

**10:15 - 10:45 COFFEE BREAK**

**10:45 - 12:30 DEM applied to soil mechanics**  
Vanessa Magnanimo, Kianoosh Taghizadeh (University Twente, The Netherlands)

**12:30 - 14:00 LUNCH**

**14:00 - 15:30 DEM applied to rock mechanics**  
Frédéric Victor Donzé (3SR, Université Grenoble Alpes, France)

**15:30 - 16:15 Granular rheology, granular matter, Dense flows and micro-macro transition PART I**  
Stefan Luding (University Twente, The Netherlands)

**16:15 - 16:45 COFFEE BREAK**

**16:45 - 17:30 Granular rheology, granular matter, Dense flows and micro-macro transition PART II**  
Vanessa Magnanimo (University Twente, The Netherlands)

**17:30 - 19:00 LBM method for Fluid/Grain coupling**  
Jean-Yves Delenne (INRIA, Université de Montpellier, France)

**20:00 DINNER**



**27<sup>th</sup> ALERT Doctoral School**

**Aussois, 7<sup>th</sup> October 2017**

## **Discrete Element Modeling**

*Coordinators:*

*Gaël Combe (3SR, Université Grenoble Alpes, France)*

*Stefan Luding (University Twente, The Netherlands)*

### **Two parallel sessions**

**8:30 - 12:30 DEM for beginners (practicing 2D modelling and analysing tools)**

*Gaël Combe, Vincent Richefeu (3SR, Université Grenoble Alpes, France)  
no skill required*

*For this practical session, the organizers will provide bootable US-Bkey with OS (linux) and DEM programs pre-installed. 10 laptops will be provided by the organizers.*

**8:30 - 12:30 DEM for experts (practicing 3D modeling - MercuryDPM.org )**

*Stefan Luding, Anthony Thornton (University Twente, The Netherlands)  
Basics in programming language are required*

*For this practical session, students have to bring their own laptops. This session may be continued after the lunch for those who want to.*

**12:30 - 14:00 LUNCH**