International Workshop:
Advances in Laboratory Testing
& Modelling of Soils and Shales

WORKSHOP PROGRAMME

18 – 20 January 2017
Villars-sur-Ollon
Switzerland
The Swiss Federal Institute of Technology in Lausanne, the Laboratory of Soil Mechanics – Chair “Gaz Naturel” - Petrosvibri, the Technical Committees 101, 106 and 308 of the International Society for Soil Mechanics and Geotechnical Engineering, and the Swiss Alps welcome you to the International Workshop “Advances in Laboratory Testing and Modelling of Soils and Shales” (ATMSS-2017).

We are delighted to announce that almost 100 participants from 25 countries will attend the event. We hope that this workshop will once again provide a forum for debate, learning and innovation on the challenging topics on experimental analysis and modelling of soils and shales.

We believe Villars-Sur-Ollon is an ideal place for this workshop, providing an isolated and calm environment for excellent presentations, fruitful discussions and exchange of ideas. Welcome to the Swiss Alps!

Thank you very much for joining us.

Lyesse Laloui & Alessio Ferrari
January, 2016
LABORATORY OF SOIL MECHANICS
Chair “Gaz Naturel” - Petrosvibri

The Laboratory of Soil Mechanics Chair “Gaz Naturel” – Petrosvibri (LMS) is a part of the School of Architecture, Civil and Environmental Engineering (ENAC) at the Swiss Federal Institute of Technology, Lausanne (EPFL). Since its establishment - as the successor of the Geotechnical Laboratory founded in 1935 - the LMS has been contributing to fundamental and applied research activities, education, as well as consulting for civil engineering construction works.

RESEARCH ACTIVITIES
The LMS gives priority to the protection from geo-hazards and industrial damage to the environment, landforms and structures. The main research areas are:

- Energy Geostructures
- Nuclear Waste Storage
- Landslide Analysis
- CO2 Storage
- Behaviour of Shales
- Bio-improved Soils

EXPERIMENTAL FACILITIES & MODELLING CAPABILITIES
Experimental and modelling resources of LMS are mobilised to understand, describe and predict the environmental impact of the technologies of future days. In addition to conventional geotechnical laboratory testing, laboratory equipment of LMS allows: Unsaturated soil testing, Non-isothermal testing of soils, Dynamic testing of soils, High pressure and high temperature testing, Hydro-mechanical testing of gas shales, Advanced triaxial cell for CO2 injection.

CONSULTING SERVICES
The consulting services offered by the LMS deal with the preparation and updating of national and international standards and codes, laboratory and in-situ geomechanical tests, monitoring of structures and construction sites, numerical modelling, and expert’s reports.

For more information, please visit lms.epfl.ch
The ATMSS Workshop is supported by:

ISSMGE Technical Committees:
- TC101 Laboratory Testing
- TC106 Unsaturated Soils
- TC308 Energy Geotechnics

The ATMSS Workshop is sponsored by:

CHAIRMEN

Prof. Lyesse Laloui
Swiss Federal Institute of Technology, EPFL, Lausanne

Prof. Alessio Ferrari
Swiss Federal Institute of Technology, EPFL, Lausanne

ADVISORING COMMITTEE

Prof. Bernardo Caicedo
Universidad de Los Andes, Colombia

Prof. Mario Manassero
Politecnico di Torino, Italy

Dr. David Dewhurst
CSIRO, Australia

Prof. Dong Soo Kim
KAIST, South Korea

Prof. Junichi Koseki
University of Tokyo, Japan
# PROGRAMME AT A GLANCE

## Tuesday, Jan 17

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<tr>
<td>08:00 - 08:30</td>
<td>Registration</td>
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<tr>
<td>08:30 - 08:50</td>
<td>Workshop opening ceremony</td>
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<tr>
<td>08:50 - 09:30</td>
<td>Workshop organizers: Lyesse Laloui and Alessio Ferrari</td>
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<td>Vice-president for Europe of the ISSM-GE: Antonio Gens</td>
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<tr>
<td>09:30 - 10:00</td>
<td>Unsaturated behaviour of soils and shales</td>
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<tr>
<td>10:00 - 10:20</td>
<td>Soil-structure interactions</td>
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<tr>
<td>10:20 - 12:00</td>
<td>Lunch</td>
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<td>12:00 - 13:30</td>
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<tr>
<td>13:30 - 16:30</td>
<td>Visit of LMS Laboratory at EPFL (optional)</td>
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<tr>
<td>20:30 - 20:35</td>
<td>Introduction to the Special Issue of GETE Journal by Alessio Ferrari</td>
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<tr>
<td>20:35 - 21:45</td>
<td>The 3rd Bishop Lecture</td>
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<td>21:45 - 23:00</td>
<td>Wine and Cheese Party</td>
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<td>Time</td>
<td>Thursday, Jan. 19</td>
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<tr>
<td>08:15 - 08:30</td>
<td>Registration</td>
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<tr>
<td>08:30 - 09:10</td>
<td>Keynote lecture: Russel Ewy</td>
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<tr>
<td></td>
<td>Shale capillarity, osmotic suction and permeability, and solutions to practical testing</td>
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<tr>
<td>09:10 - 09:40</td>
<td>Feature lecture: Feng Zhang</td>
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<td>Measurement of Supercritical CO2 Permeability in Porous Rock at Reservoir Conditions</td>
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<tr>
<td>09:40 - 10:00</td>
<td>Coffee Break</td>
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<tr>
<td>10:00 - 12:00</td>
<td>Opalinus Clay Advanced laboratory testing for site-characterization and in-situ application studies</td>
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<td>Modelling the mechanical behaviour of Callovo - Oxfordian argillite. Formulation and application</td>
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<td>16:30 - 17:10</td>
<td>Feature lecture: Mahdia Hattab</td>
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<td>Identification of local mechanisms in clays and energy-based modelling</td>
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<td>19:15 - 20:00</td>
<td>Meeting of the editorial board of the Journal Geomechanics for Energy and the Environment</td>
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</table>
Mario Manassero  
Politecnico di Torino  

Professor of Geotechnical Engineering at Politecnico di Torino. Past Chairman of Technical Committee (TC 215) “Environmental Geotechnics” of the International Society for Soil Mechanics and Geotechnical Engineering (ISSMGE). Appointed as the second Kerry Rowe Lecturer by ISSMGE TC 215. Research activities about soil improvement methods, landfill and polluted subsoil containment systems, mechanical behavior of municipal and industrial wastes, chemical-physical interaction between pore fluids and solid skeleton, multiphase coupled flows and associated transport phenomena. Geotechnical consultant of MOSE project for Venice lagoon protection and of Victoria State Environmental Protection Agency (Melbourne). Member of geotechnical design team for Messina Strait suspension bridge.

Charles Wang Wai Ng  
Hong Kong University of Science and Technology  

Associate Vice-President for Research and Graduate Studies and a Chair Professor in the Department of Civil and Environmental Engineering at the Hong Kong University of Science and Technology. He obtained PhD degree from the University of Bristol in 1993. Prof Ng was elected an Overseas Fellow from Churchill College, Cambridge University, in 2005 and also was elected Changjiang Scholar (Chair Professorship in Geotechnical Engineering) by the Ministry of Education in China in 2010. He is Fellow of the Institution of Civil Engineers (FICE), the American Society of Civil Engineers (FASCE), and the Hong Kong Academy of Engineering Sciences. Currently, he chairs the Awards Committee of the International Society for Soil Mechanics and Geotechnical Engineering (ISSMGE) and is the Editor-in-Chief of the ISSMGE Bulletin and also an Associate Editor of the Canadian Geotechnical Journal. He has also served in many other editorial boards of reputable journals.

Charles D. Shackelford  
Colorado State University  

Professor and Head of the Department of Civil and Environmental Engineering at Colorado State University, USA. Dr. Shackelford’s research is focused primarily on evaluating flow and transport of hazardous liquids and contaminants through engineered soil and geosynthetic barriers commonly used in geoenvironmental containment applications, as well as through soil-bentonite vertical cutoff walls used for in situ control and containment of polluted groundwater. In 2013, his career contributions to the area of Environmental Geotechnics were recognized with the receipt of the inaugural Kerry Rowe Lecture from the International Society of Soil Mechanics and Geotechnical Engineering.

Cristina Jommi  
Delft University of Technology  

She graduated cum laude in civil engineering from the Politecnico di Milano, and received her PhD from the Politecnico di Torino with a dissertation on the numerical modelling of coupled processes in saturated and unsaturated soils. She is Professor of Dykes and Embankments at the Faculty of Civil Engineering of Delft University of Technology since 2013, where she moved from the Politecnico di Milano where she had been assistant professor and associate professor of Soil Mechanics and Geotechnical Engineering. She is author or co-author of about 100 scientific papers, and delivered various invited lectures in different international conference. She is member of the TC106 (unsaturated soils) and of the TC214 (soft soils) of the ISSMGE. She has been serving several scientific journals as reviewer or member of the Editorial Board.
Russel Ewy
Chevron Energy Technology Co.

Russ Ewy is a Research Consultant with Chevron Energy Technology Co. He leads Chevron’s technology development and deployment efforts in laboratory rock mechanics testing, and in reservoir geomechanics. Prior to joining Chevron in 1996, Russ was with Exxon Production Research. He has over 25 years of experience testing shales and claystones in the laboratory. Russ holds BS and M Eng degrees in mineral engineering and a PhD degree in rock mechanics (with minor in Geotechnical Engineering), all from the U. of California at Berkeley. Russ has served on the Board and the Executive Committee of the American Rock Mechanics Association, and currently serves as an associate editor for the Society of Petroleum Engineers Journal. Russ is also a member of the Petroleum Geomechanics Commission of the International Society for Rock Mechanics (a sister society of ISSMGE). With other commission members he has conducted a series of workshops on petroleum geomechanics testing methods, and has contributed to the development and publication of international testing standards.

Antonio Gens
Technical University of Catalonia

Antonio Gens graduated from the Technical University of Madrid and he obtained a M.Sc. and a Ph.D. degree from Imperial College in London. He is a professor of Geotechnical Engineering at the Technical University of Catalonia in Barcelona where he has been Head of the Department of Geotechnical Engineering and Geosciences and member of the Governing Council of the University. He has been involved in geotechnical research, consulting and education for more than 30 years. He is the author or co-author of more than 250 scientific papers and he sits in the Editorial Board of several International Journals. He is a member of TC105 (unsaturated soils), TC215 (environmental geotechnics) and TC308 (energy geotechnics) of the ISSMGE. He has consulted widely and has given geotechnical advice on a series of landmark projects, both at home and abroad.

Feng Zhang
Nagoya Institute of Technology

Dr. Feng Zhang is a professor of Nagoya Institute of Technology (NIT, National University Association, Japan) since 2005. He got Ph.D. degree from Kyoto University in 1995. He served as the head of Civil Engineering Department of NIT during 2006 to 2008 and the director of Advanced Disaster Prevention Engineering Center of NIT during 2011 to 2014. His main research interests are in constitutive modeling in soil mechanics & rock mechanics, numerical analyses in geotechnical engineering and seismic evaluation of earth structures. He is recipient of the awards including the Best Paper Medal of Soils & Foundations (2002, 2011) and the Best Paper Medal of Japan Society of Civil Engineers (2007).

Mahdia Hattab
Université de Lorraine

Mahdia Hattab is full Professor of civil engineering at the Université de Lorraine, she works in the field of Soil mechanics and Geotechnics. At the Université de Lorraine she teaches an undergraduate course of geotechnical engineering, and applications of finite elements to geotechnical structures, a graduate course of soil mechanics and, at doctoral level, a course in multiscale multiphysical behavior of clayey soils. Mahdia Hattab research activities are mainly focused on experimental investigation of strain mechanisms in clayey materials. Strain mechanisms are considered from the mesoscopic scale (groups of particles) to the macroscopic scale (specimen level). Mahdia Hattab serves as codirector of Civil Engineering Master of the Université de Lorraine, and as Vice chair of EMI «Granular Material» Committee of the ASCE. She is chair of the first EMI International Conference organized in Europe (2016EMI International Conference).
KEYNOTE & FEATURE LECTURERS

FRIDAY 20TH JANUARY, 8:30 – 9:10
KEYNOTE LECTURE

Bernado Caicedo
Los Andes University


FRIDAY 20TH JANUARY, 16:30 – 17:10
KEYNOTE LECTURE

Richard Wan
University of Calgary

Richard Wan is a Professor with the Department of Civil Engineering at the University of Calgary. He holds a diplôme d’ingénieur from the Ecole Nationale des Travaux Publics de L’Etat (ENTPE), an MSc in geotechnical engineering from the University of Ottawa, and a PhD. in geomechanics from the University of Alberta. He has many years of experience in geomechanics with special emphasis on continuum mechanics, micromechanics, experimental mechanics, soil and rock mechanics, constitutive laws for engineering materials and numerical modelling of complex geotechnical structures. He sits on the Editorial Board of several International Journals and is the Vice-Chair of the TC103 (Numerical Methods) of the ISSMGE. His research expertise covers the fields of Geomechanics and Computational Mechanics with applications such as energy resource extraction and cold regions engineering. He also conducts biomechanics/biomedical research related to the freezing of tissues such as in Prostrate Cryosurgery.

FRIDAY 20TH JANUARY, 9:10 – 9:40
FEATURE LECTURE

Frank Wuttke
Kiel University

Frank Wuttke studied Civil Engineering at the Bauhaus-University Weimar. In 2005 he earned his doctorate. During his post-doctoral work, he had different research visits at the Bulgarian Academy of Science, Institute of Mechanics, at the Colorado School of Mines, Center of Wave Phenomena and at GeorgiaTech, Particulate Media Research Lab. In 2013 he earned his Habilitation and in the same year he starts at the new Professorship Marine and Land Geomechanics & Geotechnics at Kiel University. He is member of different national and international task forces in geotechnical, earthquake and energy-geotechnical fields.

FRIDAY 20TH JANUARY, 17:10 – 17:40
FEATURE LECTURE

Matthieu Vandamme
École Nationale des Ponts et Chaussées

Matthieu VANDAMME received his Ph.D. from the Civil and Environmental Engineering department at MIT (Cambridge, MA) in 2008, for a study of the creep properties of cementitious materials by nanoindentation. He is also engineer from École Polytechnique (France) and from École Nationale des Ponts et Chaussées (France), and received an M.S. in solid mechanics from École Nationale des Ponts et Chaussées in 2002. He was awarded the 2016 EMI Leonardo da Vinci Award. Since 2008, he has been working at Laboratoire Navier (ENPC, CNRS, IFSTTAR) at École Nationale des Ponts et Chaussées. He performs Materials Science applied to materials relevant for Civil and Petroleum Engineering (i.e., cementitious materials, coal, clay-based materials...). More precisely, his main interest lies in the mechanics and physics of porous solids.
THE 3rd BISHOP LECTURE

**WEDNESDAY 18TH JANUARY, 20:35 – 21:45**

**Hervé Di Benedetto University of Lyon**

Professor Hervé Di Benedetto received his Diploma of Civil Engineer from the “Ecole Nationale des TPE” (ENTPE). He is Doctor of Engineering in Soil Mechanics (1981) and “Docteur ès-Sciences” (1987), both from the University of Grenoble, France. Currently he is Professor at ENTPE, University of Lyon.

Prof. Di Benedetto’s research focuses on the study of mechanical, thermo-mechanical and structural behaviour of geomaterials, including experimental and modelling aspects. He is working in the fields of soils mechanics and road engineering, working in closing the gap between these two disciplines.

He has been the Supervisor of more than 50 PhD students and of a large volume of research works in collaboration with various private and public partners. He is author of more than 180 publications. Prof. Di Benedetto has been frequently Invited or Keynote Speaker for international conferences. He Chaired Technical Committee 101 “Laboratory testing” of the International Society of Soil Mechanics and Geotechnical Engineering (ISSMGE) from 2009 to 2013. He was President from 2013 to 2015 of the International Society of Asphalt Pavement (ISAP), and is cofounder and member of the Steering Committee the European Asphalt Technology Association (EATA). He is a Fellow and member of the Technical Advisory Committee of RILEM (International Union of Laboratories and Experts in Construction Materials, Systems and Structures) where he animated and animates different working groups. He belongs to the Board of different journals and is Editor-in-Chief of the SCI International Journal “Road Materials and Pavement Design”.

Bishop Lecture was established by the Technical Committee 101 in commemoration to the Professor Alan W. Bishop. The 3rd Bishop Lecture is entitled “Advanced testing and modelling of granular material with and without viscous glue: research and practical implication”.

**THEMED ISSUE OF ATMSS FOR THE JOURNAL OF GEOMECHANICS FOR ENERGY AND THE ENVIRONMENT**

Participants to the ATMSS Workshop will receive the opportunity to publish in the Journal of Geomechanics for Energy and the Environment.

The aim of the Geomechanics for Energy and the Environment is to publish research results of the highest quality and of lasting importance on the subject of geomechanics, with the focus on applications to geological energy production and storage, and the interaction of soils and rocks with the natural and engineered environments.

Editors-in-Chief: Prof. Lyesse Laloui
Prof. Tomasz Hueckel

Guest Editor for the special issue: Prof. Alessio Ferrari

**AGENDA:**

- **31 January 2017:** the Authors that are interested in publishing an extended version of their contribution should contact Prof. Alessio Ferrari (alessio.ferrari@epfl.ch) within this date.
- **15 February 2017:** selection of the contributions to be considered for the special issue and notification to Authors.
- **1 March 2017:** opening of the submission process through the journal platform.
- **30 June 2017:** deadline for the submission through the journal platform.
- **31 December 2017:** all the papers will be fully reviewed and final decisions will be made by this deadline.
- **Early 2018:** Publications of the accepted papers.
### Detailed Programme

#### Tuesday, Jan. 17

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<td>EPFL-LMS, Building GC, Station 18, CH-1015 Lausanne, Switzerland</td>
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<td>- TC101: Dr. Erdin Ibraim</td>
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<td>- TC106: Prof. Bernardo Caicedo</td>
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<td>Coupled membrane and diffusion testing of active clays for barrier</td>
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<td>11:20</td>
<td>SESSION B</td>
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<td>Chair: Frank Wuttke</td>
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SESSION A:

Use of psychrometers, capacitive sensors and vapour transfer technique to determine the water retention curve of compacted bentonite
Maria Victoria Villar, Rubén Javier Iglesias, Carlos Gutiérrez-Álvarez, Gemma Campos

Water content effect on the fault rupture propagation through wet soil using direct shear tests
Mohammad Ahmadi, Mojtaba Moosavi, Mohammad Kazem Jafari

Specimen preparation techniques for testing fully and partially saturated sands in dynamic simple shear (DSS) test device with confining pressure
Derya Burcu Gulen, E. Ece Eseller – Bayat

Response of clay rock to moisture change
Chun-Liang Zhang

Measurement of vertical strain of compacted bentonite at changing of potential of without lateral stress
Tomoyoshi Nishimura, Keita Iwasaki

SESSION B:

Experimental and numerical study of the thermo-mechanical behaviour of energy piles for Belgian practice
Malek Allani, Gust Van Lysebetten, Noël Huybrechts

Drained & Undrained Analysis for Foundations based on Triaxial Tests
André Arnold, Manuel Krühenbühl, Andreas Schmid

Impact of thermally induced soil deformation on the serviceability of energy pile groups
Alessandro Rotta Loria, Lyesse Laloui

Numerical analysis of seismic soil-pile-structure interaction in soft soil with strong nonlinearity and its validation by 1g shaking table test
Kheradi Hamayoon, Ye Bin, Morikawa Yukihiro, Zhang Feng

On the interface shearing behavior between granular soil and artificial rough surfaces
Xue-Ying Jing, Wan-Huan Zhou, Hua-Xiang Zhu, Zhen-Yu Yin, Yangmin Li

12:00 - 13:30 Lunch

13:30 - 16:30 Enjoy your stay in the Swiss Alps: skiing, relaxing or just working in a beautiful landscape
<table>
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<tr>
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<tr>
<td>16:30 - 17:10</td>
<td>Keynote lecture</td>
<td>Charles Wang Wai Ng</td>
<td>Cyclic thermo-mechanical behaviour of unsaturated fine-grained soils</td>
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<td>17:10 - 17:40</td>
<td>Feature lecture</td>
<td>Cristina Jommi</td>
<td>Evidences of the effects of free gas on the hydro-mechanical behaviour of peat</td>
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<td>SESSION A</td>
<td>Anne-Catherine Dieudonné, Robert Charlier</td>
<td>Evaluation of the instantaneous profile method for the determination of the relative permeability function</td>
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<td>SESSION B</td>
<td>Qing Cheng, Raejee Kaewsong, Chao Zhou, Charles Wang Wai Ng</td>
<td>A double cell triaxial apparatus for testing un-saturated soil under heating and cooling</td>
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<td>Jeanne Ewers, Fabian Karl</td>
<td>Determining fluid compressibility and soil permeability of quasi saturated sand with the alternating flow apparatus</td>
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### The 3rd Bishop Lecture
**Hervé Di Benedetto**
Advanced testing and modelling of granular materials with and without viscous glue: Research and practical implication
Chair: Lyesse Laloui

### "Wine and cheese" party

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**Thursday, Jan. 19**

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
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<tbody>
<tr>
<td>08:15 - 08:30</td>
<td>Registration</td>
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<tr>
<td><strong>Chair: Lyesse Laloui</strong></td>
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<tr>
<td>08:30 - 09:10</td>
<td>Keynote lecture</td>
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<tr>
<td><strong>Russel Ewy</strong></td>
<td>Shale capillarity, osmotic suction and permeability, and solutions to practical testing</td>
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<tr>
<td>09:10 - 09:40</td>
<td>Feature lecture</td>
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<tr>
<td><strong>Zhang Feng</strong></td>
<td>Measurement of supercritical CO₂ permeability in porous rock at reservoir conditions</td>
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<tr>
<td>09:40 - 10:00</td>
<td>Coffee Break</td>
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#### SESSION A
**Opalinus Clay**
Chair: Maria Victoria Villar

**SESSION A:**

**One-Dimensional Compression Behaviour of Opalinus Clay**
Valentina Favero, Alessio Ferrari, Lyesse Laloui

**The role of anisotropy on the volumetric behaviour of Opalinus Clay upon suction change**
Alberto Minardi, Eleonora Crisci, Alessio Ferrari, Lyesse Laloui

**Consolidated-undrained triaxial test results of Opalinus Clay and comparison with caprock shales**
Silvio Giger, Russell Ewy, Rudy Stankovic

**SESSION B**
Advanced laboratory testing for site characterization and in-situ application studies
Chair: Mahdia Hattab

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### DETAILED PROGRAMME

#### SESSION A:

**One dimensional consolidation of Opalinus Clay from shallow depth**  
Eleonora Crisci, Alessio Ferrari, Silvio Giger, Lyesse Laloui

**Lessons learned from electron microscopy of deformed Opalinus Clay**  
Ben Laurich, Janos L. Urai, Guillaume Desbois, Jop Klaver, Christian Vollmer, Christophe Nussbaum

**The rock mechanical behavior of Opalinus Clay – 20 years of experience in the Mont Terri rock laboratory**  
David Jaeggi, Paul Bassart, Christophe Nussbaum

#### SESSION B:

**Cyclic testing on low - density chalk**  
Sven Pilgaard Larsen, Nataša Katić, Niels Trads

**Long duration oedometric tests to analyse the creep behaviour of lacustrine sediments**  
Luca Bonzanigo, Fabrizio Jauch

**Deep soil mixing method for the bio-cement by means of bender element test**  
Keeratikan Priyakul, Janjit lamchaturapatr

**Studying of shale organic matter structure and pore space transformations during hydrocarbon generation**  
Dina Giliazetdinova, Dmitry Korost

**On the application of the microbially induced calcite precipitations for soils: a multiscale study**  
Dimitrios Terzis, Lyesse Laloui

**Determination of intergranular strain parameters and their dependence on properties of grain assemblies**  
Sparsha Nagula, Jürgen Grabe

#### 12:00 - 13:30

**Lunch**

#### 13:30 - 16:30

Enjoy your stay in the Swiss Alps: skiing, relaxing or just working in a beautiful landscape

**Chair: Bernardo Caicedo**

#### 16:30 - 17:10

**Keynote lecture**  
Antonio Gens  
Modelling the mechanical behaviour of Callovo - Oxfordian argillite. Formulation and application

#### 17:10 - 17:40

**Feature lecture**  
Mahdia Hattab  
Identification of local mechanisms in clays and energy - based modelling
## DETAILED PROGRAMME

### 17:40 - 18:00
Coffee Break

### 18:00 - 19:00
**SESSION A**  
Advanced laboratory testing  
Chair: Enrique Romero  

**SESSION B**  
Constitutive and numerical modelling of soils and shales  
Chair: Matthieu Vandamme

**SESSION A:**
- A suction- and temperature-controlled oedometric device  
  *Hugo Troupel, Jean-Michel Pereira, Matthieu Vandamme*
- Acoustic emission technology to investigate internal micro-structure behavior of shear banding in sands  
  *Wenli Lin, Wuwei Mao, Junichi Koseki*
- **Direct and indirect local deformations of sand in undrained cyclic triaxial tests by image analysis technique**  
  *Chuang Zhao, Junichi Koseki, Yukika Miyashita*

**SESSION B:**
- **Constitutive framework for unsaturated soils with differentiation of capillarity and adsorption**  
  *Yafei Qiao, Wenqi Ding, Lyesse Laloui*
- **Efficient Parameter Identification for THM Behaviour of claystone using optimization methods**  
  *Roger Schlegel, Johannes Will*
- **A thermodynamic model for rate-dependent geomaterials**  
  *Hao Wang, Xiaohui Cheng*

### 19:15 - 20:00
Meeting of the editorial board of the Journal Geomechanics for Energy and the Environment

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**Friday, Jan. 20**

**8:15 - 8:30**  
Registration

**Chair: Mario Manassero**

**08:30 - 09:10**  
Keynote lecture  
**Bernardo Caicedo**  
Hydro - mechanical behaviour of unsaturated argillaceous rocks

**09:10 - 09:40**  
Feature lecture  
**Frank Wuttke**  
Advanced meso - scale modelling to study the effective T-M parameter in solid geomaterial
Coffee Break

SESSION A
Hydro-Mechanical behaviour of shales and stiff clays
Chair: Silvio Giger

SESSION B
Constitutive and numerical modelling of soils and shales
Chair: Xiaohui Cheng

SESSION A:
Fractal analysis of the progressive failure of shales and stiff clays under shear
Luis E. Vallejo, Jairo M. Espitia, Bernardo Caicedo

Recent Developments in Measurement and Use of Fully Softened Shear Strength in the USA
Bernardo A. Castellanos, Thomas L. Brandon

Chemical influence of pore pressure on brine flow in clay-rich material
Etienne Cassini, Roman Makhnenko, Danila Mylnikov

Development of Classification Charts for Q index of shale from Parameters
Nandyala Darga Kumar, Ravikant R. Singh, Faijal Ali, Efray’im

Exploring fissure opening in a Cenozoic clay induced by gas injection
Laura-Gonzalez Blanco, Romero Enrique, Cristina Jommi, Xavier Sillen, Xiangling Li

Profiling the In situ Compressibility of Cretaceous Shale using Grouted-in Piezometers and Laboratory Testing
Laura Smith, S. Lee Barbour, M. Jim Hendry, David Elwood

Seismic dispersion in shales: saturation and stress effects
Andreas Bauer

SESSION B:
Thermo-viscoplastic subloading soil model for isotropic stress and strain conditions
João R. Maranha, C. Pereira, A. Vieira

Coupled analysis of CO₂ injection induced stress variation in the caprock
Chao Li, Lyesse Laloui

Numerical simulation of multi-phase flow in CO₂ geological sequestration
X.W. Wang, Bin Ye, Y.L. Xiong, F. Zhang, K.Y. Li, W.M. Ye

Mechanics and modeling of cohesive frictional granular materials
Saurabh Singh, Ramesh K. Kandasami, Tejas G. Murthy

Numerical modelling of liquefaction tests of partially saturated sands in CSSLB
Seyed Mohsen Seyedi Viand, E.Ece Eseller-Bayat

Aspects of Thermal Fracturing of Clays with Electromagnetic Excitation
Morteza Mohamadi, Richard G. Wan
Reproduction of discrete element model by 3D printing and its experimental validation on permeability issue  
Akihiko Kondo, S. Matsumura, T. Mizutani, E. Kohama

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<tr>
<td>12:20 - 14:00</td>
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<td>14:00 - 16:30</td>
<td>Enjoy your stay in the Swiss Alps: skiing, relaxing or just working in a beautiful landscape</td>
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<td>Chair: Antonio Gens</td>
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</table>
| 16:30 - 17:10 | Keynote lecture  
Richard Wan  
Multiscale approach to micro-poro-mechanical modelling of unsaturated shales |
| 17:10 - 17:40 | Feature lecture  
Matthieu Vandamme  
Measurement of mechanical properties of thin clay films and comparison with molecular simulations |
| 17:40 - 18:00 | A New Laboratory Setup for Phase Equilibria Studies of Methane Hydrate in Porous Media  
Brice Y. Kim, I. Yucel Akkutlu |
| 18:00 - 18:20 | Coffee                                      |
| 19:30 - 23:30 | Workshop Gala dinner                       |

**GALA DINNER on Friday, January 20th**

The Gala Dinner will take place at the center of the ski area of Villars-sur-Ollon, at the restaurant “Col de Betraye” at an altitude of 1808 m. Participants will arrive at the restaurant by train. The train ride and the restaurant offer a beautiful view of the landscape! Please note that transport is included. The meeting point is the Eurotel Victoria main Hall at 19.30. For this special occasion, we suggest participants to leave aside the typical “gala dinner” dress code and attend the dinner in **warm and casual clothes** since a surprise party will follow the Gala dinner and the **expected outside temperature is -10°C**!

Don’t forget to bring your badge!
GENERAL INFORMATION

EMERGENCY CONTACT NUMBERS
If for any reason you are in need of emergency assistance, please dial:

- General Emergency 112
- Fire service 118
- Police 117
- Ambulance 144

For any emergency concerning your attendance to the ATMSS Workshop please dial:

- +41216932810 for French and Chinese
- +41216935387 for English and Turkish
- +41216934213 for Italian

PUBLIC TRANSPORTATION
Villars-sur-Ollon has one train station situated in the center of the village. It will take you a ten minutes’ walk to reach the station from the Workshop Venue. There is one bus and one train per hour leaving the village in the direction of AIGLE or BEX. From these two locations, you can take a train to Lausanne, Geneva or Milano. A bus leaves the village each hour at XY:55. Beware the public transportation ends at 10 pm. For more information on public transportation time schedule: [http://fahrplan.sbb.ch/bin/query.exe/en](http://fahrplan.sbb.ch/bin/query.exe/en)

Please note that a shuttle is available in front of the Workshop Venue until Villars train station.

ATMSS TWITTER HASHTAG
Please use #ATMSS in your tweets, so all tweets can be quickly found and read.

WHATSAPP GROUP
A WhatsApp group has been created for the participants that wish to receive information before and during the event. If you did not give us your phone number during the registration and you wish to participate, please let us know.

PRACTICAL INFORMATION
The electric current used in Switzerland is 230 Volts AC. Wall outlets are unique to Switzerland. You can find adaptors at the airport. Some adaptors are also available at the venue reception, a deposit of 5.- CHF is requested.

Swiss wall outlet and hexagonal three pin plug
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Selection of our product range

- All kinds of shear apparatus
- Triaxial cells and triaxial testing devices with static, cyclic and dynamic loading, for saturated and unsaturated conditions
- Special local transducers, submersible load cells, local axial and radial strain transducers, local pore water pressure and local pore air pressure transducer
- Static dynamic, electromechanical and servo-hydraulic material testing systems with temperature control
- Specialized in low and high pressure systems
- Servo-hydraulic load systems for advanced triaxial and uniaxial rock testing

Field of application

- Specialized in development and manufacturing of measuring and material test equipment with simulation of individual application conditions (environmental and stress conditions)
- Technically specialized in different drive systems and their performance limits (electro mechanical, servo-hydraulic and servomechanical drives/actuators)
- Static and dynamic material testing machines for soils, aggregates and bituminous materials
- Testing equipment for Geosynthetics

Wille Geotechnik® is an exclusive brand of the APS GmbH Germany
International Workshop:  
Advances in Laboratory Testing  
& Modelling of Soils and Shales  

18 - 20 January 2017  
Villars-sur-Ollon, Switzerland