

# Lyesse Laloui

**CHAIR FULL PROFESSOR**, Swiss Federal Institute of Technology, EPFL


**DIRECTOR** of the Laboratory of Soil Mechanics,  
CO<sub>2</sub> Sequestration and Geo-Engineering, EPFL

**FULL MEMBER**, Swiss Academy of Engineering Sciences


**HONORARY EDITOR IN CHIEF**, *Geomechanics for Energy and the Environment*

**VICE PRESIDENT EUROPE**, International Society of Soil  
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## PROFESSIONAL PROFILE

Prof. Laloui has dedicated much of his career to understanding the natural world for the benefit of society. His research and exploration of the mechanics of geomaterials and other geology has made significant contributions to our understanding of the physical mechanisms of these materials. From this, he has developed innovative and sustainable technologies for today and the generations to come. His efforts in areas such as sustainability, climate change, renewable energy and the optimisation of natural resources have been recognized and awarded by the European Research Council with an Advanced ERC Grant for his project BIOGEOS (BIO-mediated GEO-material Strengthening), followed by an ERC Proof of Concept Grant (PoC) in 2020. In 2022 Prof. Laloui has been recognized for his commitment to global sustainability with two honoris causae from Heriot-Watt University and from the Technical University of Cluj-Napoca.

## MAIN PROFESSIONAL POSITIONS

### Professor

Swiss Federal Institute of Technology, EPFL | 2006 – current

### Director

Laboratory for Soil Mechanics, Geoengineering and CO<sub>2</sub> Storage | 2008 – current  
Swiss Federal Institute of Technology, EPFL  
Establishing it as a world-class teaching and research unit.

### Founder and Editor-In-Chief

*Geomechanics for Energy and the Environment* – Elsevier | 2014 – current  
Impact Factor: **4.6**, CiteScore: **6.8** (2021)

### Honorary Director

International Joint Research Center for Energy Geotechnics, Nanjing, China | 2018 – current

### Full Member

Swiss Academy of Engineering Sciences | 2021 – current

### Vice President Europe

International Society of Soil Mechanics and Geotechnical Engineering (ISSMGE) | 2022 – 2026  
27000 members in the world, 9000 members in Europe.

### Director

Civil Engineering Section, Swiss Federal Institute of Technology, EPFL | 2012 – 2022

**Member of the Board of directors**

School of Architecture, Civil and Environmental Engineering (ENAC), Swiss Federal Institute of Technology, EPFL | 2013 – 2022

**Director**

Doctoral Program in Mechanics, Swiss Federal Institute of Technology, EPFL | 2008 – 2012

**President**

EPFL Assembly | 1991 – 2001

**Board Member**

ETH-Rat Board | 1991 – 2001

**Research Fellow**

Swiss Federal Institute of Technology, EPFL | 1994 – 2006

**EDUCATION****Administrator of companies** | 2021

Swiss Board School (Uni. of St. Gallen, Lausanne, Geneva, and Swiss Board Institute)

**Ph.D.** with honours: "Summa cum laude" | 1993

Ecole Centrale Paris, France

**Advanced Master** in Soil and Structural Mechanics, | 1989

Ecole Centrale Paris, France

**Master in Civil Engineering**

Ecole Nationale des Travaux Publics, Algiers | 1987

**ADJUNCT POSITIONS****Adjunct professor**

School of Civil and Environmental Engineering, Duke University, USA | 2007 – 2022.

**Advisory professor**

Hohai University, Nanjing, China | 2016 – 2019

**Distinguished Adjunct professor**

King Abdulaziz University (KAU), Jeddah, Saudi Arabia | 2013 – 2014

**ACADEMIC HONOURS****Scott Sloan Best Paper Award**

Award received for the paper "Numerical study of the response of a group of energy piles under different combinations of thermo-mechanical loads" written by Prof. L. Laloui, Dr. Alice Di Donna and Dr. Alessandro F. Rotta Loria, 2023.

**Doctorate Honoris Causa**

In recognition of the contribution to geotechnical engineering solutions for a sustainable world. Technical University of Cluj-Napoca (UTCN), Romania, 2022.

**2022 Eshbach Lecture**

"Tailor-made soil properties by bio-geochemical means", USA October 2022.

**Doctorate Honoris Causa**

For outstanding achievements in geotechnical engineering and developing innovative technologies supporting the sustainable future, Heriott-Watt University (UK), 2022.

**"Vienna Terzaghi Lecture"**

"Tailor-made soil properties by bio-geochemical means", Austrian Geotechnical Conference, 2022.

**Distinguished lecturer**

"Sustainable (geo-)energies: Global progress and existing challenges", Sustainability summit on "Earth-Human Interactions: Sustainability and Development", Northwestern University, USA, 2022.

**Proof of Concept Grant (PoC)**

European Research Council (ERC) for the project CEBREWA (Construction & Environmental Biocementation in Real World Applications), 2020.

### **“2020 Kersten Lecture”**

“Energy Geotechnology: A New Era for Geotechnical Engineering Practice”, Geo-congress 2020 Minneapolis, Minnesota (USA).

### **“Advanced ERC Grant”**

European Research Council (grant 2.5 Million Euros) for the project BIOGEOS (Biomediated Geomaterial Strengthening), 2018.

### **“30<sup>th</sup> Roberval Award”**

For the book “Mécanique des sols et Roches” (ISBN 978-2-88074-961-3), co-authored with L. Vulliet and J. Zhao. Award received at the French Academy of Science, 2018. Among the former receivers of this award some Nobel prize winners such as G. Charpak et P-G. de Gennes.

### **“2016 RM Quigley Award”**

For the best paper published in the Canadian Geotechnical Journal in 2015.

### **“12<sup>th</sup> G.A. Leonards Lecture”**

“Advances in the Analysis of Thermo-Active Foundations”, University of Purdue, 2014.

### **Honorary Editor and Chairman**

Géotechnique Symposium in Print 2013 – Institute of Civil Engineering, UK.

### **“2012 Vardoulakis Lecture Award”**

For significant contributions to the field of geomechanics, University of Minnesota (USA).

### **“Excellent Contributions Award”**

International Association for Computer Methods and Advances in Geomechanics for significant contributions in research, academic activities and professional service in the interdisciplinary area of Geomechanics, 2008.

## **Industrial activities**

### COMPANIES :

- **Laloui Consulting:** founder and owner
- **MeduSoil:** founder, co-owner and board member
- **GEOEG:** founder and co-owner
- **Enerdrape:** founder and co-owner
- **Nesol:** founder and co-owner
- **Stunex SA:** board president
- **Realstone SA:** board member
- **Local Energy SA:** board member

### Company activities:

**LALOU CONSULTING** company provides expertise and advice for local and international projects in civil, geotechnical and geothermal engineering, including legal and arbitration cases.

**MEDUSOIL** is an EPFL spin-off that applies world’s first ground bioreinforcement technology to mainstream construction problems. By coupling traditional construction practice with lab-developed, nature-based biochemical carriers we reduce application costs, minimize equipment requirements and increase long-term ground resistance against failures and environmental threats. The startup develops and commercializes a ground stabilization agent which produces mineral calcite in the subsurface when mixed with the ground. Currently, MeduSoil is involved in custom infrastructure repair works and new construction projects.

[medusoil.com](http://medusoil.com)

**GEOEG** is an EPFL spin-off that provides integrated solutions to apply a revolutionary technology for urban environments: energy geostructures. At GEOEG we strive to sustain human activity with a limited impact on the environment. Geog offers six services devoted to the application of energy geostructures: consulting, analysis, design, testing, monitoring and training. These services have been currently proposed for several architectural and engineering projects around the world.

**ENERDRAPE** offers an innovative technology allowing for the harnessing of heat from unexploited environments. This technology, based on the use of modular geothermal panels, can be installed easily within existing building and enables the heat harvesting from the built underground (e.g. parking lots, train stations, tunnels).

<https://enerdrape.com/>

**NESOL** – Nesol's mission is to provide support to the design and analysis of complex systems employing state of the art numerical tools and dedicated experimental procedures developed in decades of applied research in the field of geomechanics and material science.

<https://www.nesol.net/>

## INNOVATION, TECHNOLOGY TRANSFER - PATENTS AND COMMERCIAL SOFTWARE

- **Invention 1: PCT/IB2019/054532 - System and method for ground consolidation.**

The present invention belongs to the fields of construction technology and geotechnical engineering. More precisely, the present invention relates to a method and system for ground stabilisation by using a system of electrodes in the ground.

- **Invention 2: PCT/IB2019/052950 Patent: heat exchanger module and methods of using thereof**

Heat exchanger module and methods of using thereof. The present invention relates to a thermal energy transfer unit and its applications in e.g. heat exchange processes in a built environment.

- **Invention 3: PCT/IB2020/05473 - Method and system for producing a carbonate-containing species rich, nitrogen-containing species-free solution.**

The present invention generally belongs to the field of inorganic chemistry. More particularly, the invention pertains to a method and system for producing a carbonate-containing speciesrich, nitrogen-containing species-free solution from a urea-rich solution, as well as applications for ground bio-consolidation processes.

- **Invention 4: PCT/EP2017/062995 - Patent: a geosynthetic element for soil bio-improvement**

The present invention relates to a geosynthetic element for geotechnical engineering applications. More specifically, the geosynthetic element according to the present invention comprises bacteria carriers for calcifying bacteria and a flow network. The present invention also relates to a method of inducing microbial calcium carbonate precipitation in a geomaterial by using the geosynthetic element.

The related activities are developed in the context of a start-up (MeduSoil) that was awarded the Swiss National ClimateKIC 2017.

- **Software for the design of energy geostructures**

In 2011 I developed the commercial software "Thermo-Pile" for the geotechnical design of energy piles. This is the only software of its kind available on the market for the feasibility analysis of energy pile projects. The software is based on the scientific achievements of my research activities in this area. It is currently in use in several countries including France, Spain, Belgium and Korea.

Further details can be found on <http://lms.epfl.ch/thermopile>

More about patents: <https://patents.justia.com/search?q=Laloui>

## Other Professional Activities

### AMBASSADOR

#### **Lausanne Montreux Congress (LMC)**

LMC brings together the experts from different sectors in the economic region of Lausanne and Montreux.

### GUEST EDITOR (SPECIAL ISSUES)

- Energy Procedia - Volume 114, Pages 1-7666 (July 2017)  
Proc. 13th International Conference on Greenhouse Gas Control Technologies, GHGT-13, 14-18 November 2016, Lausanne, Switzerland. Edited by Tim Dixon, Lyesse Laloui and Sian Twinning
- Acta Geotechnica: Thermoactive Geotechnical Systems, 2014.
- Engineering Geology: Mechanics and velocity of large landslides, vol. 109, 2009.
- European Journal of Environmental and Civil Engineering:  
1. Coupled Multi-Physics Processes in Geomechanics, vol. 9, N°5-6, 2005.  
2. Failure in multiphase geomaterials, vol. 13, N°7-8, 2009.
- International Journal of Road Materials and Pavement Design: Water in Pavements, vol. 8, N°4, 2007.
- Géotechnique: Symposium in Print – Bio- and Chemo-Mechanical processes in geotechnical engineering (Vol. LXIII N° 2, 2013; Vol. LXIII N° 3, 2013)
- Soils and Foundations: Geomechanics of Structured Materials, Vol. 49, N°3, 2009.
- Water Resources Research: Hydrology and Mechanical Coupling in Earth Sciences and Engineering: Interdisciplinary Perspectives, Vol. 44, Issue 5, 2008.

### SCIENTIFIC AND EXPERT COMMITTEES

#### **Chair:**

Chairman of the Advisory Committee during XVIII European Conference on Soil Mechanics and Geotechnical Engineering, Portugal, 2024.

Chair of the Evaluation Panel of Civil and Geological Engineering R&D Units of Portugal (2018).  
*Portuguese Science and Technology Foundation (FCT).*

#### **Executive Committee representative:**

Government of Switzerland in the International Energy Agency Greenhouse R&D Technology Collaboration Program (2016-2021)

#### **Vice-Chair:**

TC101 "Laboratory Stress Strain Strength - Testing of Geomaterials" of the International Society for Soil Mechanics and Geotechnical Engineering (2013-2017).

#### **Vice-director:**

ALERT-Geomaterials network (Alliance of Laboratories in Europe for Research and Technology - Leading European network in Geomechanics formed by 27 universities) (2005-2011).

#### **Expert:**

European Commission in the context of the Euratom project (CLUSTER EDZ working group), Luxembourg (2003).

#### **Member:**

Executive Committee of the Swiss Competence Center for Energy Research – Supply of Electricity (SCCER-SoE) – Leader of Work Package Geo-Energies (2017- 2021).

Scientific Council of CISM, the International Centre for Mechanical Sciences, Udine (Italy) (2017- 2018).

EU-ERC Consolidator Grants panel dealing with Products and Processes Engineering - The Consolidator Grant is intended to provide significant support to the most promising researchers of the next generation who are consolidating their research career, usually 7 – 12 years beyond the doctorate (2014-2015).

Scientific Committee of the INERIS (French National Institute of Industrial Environment and Risks). Evaluation of research groups and research projects (2002-2008).

Evaluation Committee of the research activities of the French Environment and Energy Management Agency (ADEME) (2008).

International Experts Group in charge of building a Thermo-Hydro-Mechanical Capability at NAGRA (Swiss national co-operative for the disposal of radioactive waste) (2002, 2006, 2019).

**Search committees for professor positions** at various Universities including EPFL, ETH Zurich, University of Grenoble, University of Montpellier, etc.

## SUPERVISED PHD RESEARCHERS

Prof. Laloui has supervised more than 40 Ph.D. theses and frequently supports the work of post-doctoral researchers, and master's students. Many have resulted in distinguished awards including:

- **Zeno Karl Schindler** 2019 Award (A. Rotta Loria).
- US Deep Foundation Institute (DFI) **Educational Trust 2018 Young Professor Paper Competition** for the paper "Performance - Based Design of Energy Pile Foundations" (A. Rotta Loria) .
- **"First runner-up position"** at the US Deep Foundation Institute (DFI) Educational Trust 2011 Young Professor Paper Competition for the paper "Design of Piles with Dual Role of Structural stability and as a Sustainable Source of Energy for the Heating and Cooling of Buildings" (A. Di Donna).
- **"Best European PhD thesis in Geomechanics in 2010"** from the European Association ALERT Geomaterials (M. Nuth).
- **"Best European PhD thesis in Geomechanics in 2009"** from the European Association ALERT Geomaterials (B. François).
- **"EPFL Chorafas prize 2009"** (M. Nuth)
- **"2009 best PhD thesis"** from the "Association universitaire de génie civil" in France (M. Nuth)
- **"EPFL Zanelli prize for a Master work"** (T. Meynet)
- **"Best European PhD thesis in Geomechanics in 2008"** from the European Association ALERT Geomaterials (A. Koliji)
- **"Second position for the best European PhD thesis in Geomechanics in 2008"** from the European Association ALERT Geomaterials (H. Péron)
- **"Second prize for 2003 best PhD thesis"** from the "Association universitaire de génie civil" in France (C. Cekerevac).

## Keynote Lectures

Prof. Laloui has given more than 40 keynote and invitational lectures in over 30 countries. Recent highlights include:

### 2023

- **Keynote lecture**, "Energy geotechnology: a new era for geotechnical engineering practice", **17th Asian Regional Conference on Soil Mechanics and Geotechnical Engineering 2023**, Astana, Kazakhstan, August, 2023
- **Distinguished lecture**: "Smart exploitation of the renewable energy situated under our cities", Hong Kong University, July 2023.
- "Carbon Dioxide Injection into Deep Aquifers: A Geomechanical Perspective", **9th International Congress on Environmental Geotechnic (9ICEG)**, Greece, June 2023
- **European Conference on Geotechnical Engineering (17DECG)**, "Exploiting the renewable energy resources of our cities' underground" Bucharest, Romania, June 2023
- **International Conference on Advances in Structural and Geotechnical Engineering (ICASGE'23)**, "Smart exploitation of the renewable energy situated under our cities" Hurghada, March 2023.

### 2022

- **The Big 5, International Building and Construction Show**, "Innovation for a Sustainable Geotechnical Engineering Industry", Dubai, December 2022.

- **Northwestern Sustainability Lecture Series**, “Sustainable (geo-)energies: Global progress and existing challenges” Chicago, October 2022.
- **16<sup>th</sup> International Conference of the International Association for Computer Methods and Advances in Geomechanics** “Tailor-made soil properties by bio-geochemical means”, Turin, August 2022.
- **XXVII Italian National Congress on Geotechnical Engineering for a Sustainable Development**, “Energy from Geotechnical Constructions: Analysis and Design”, Reggio Calabria, July 2022.
- Vienna – **Terzaghi Lecture, Austrian Geotechnical Conference**, “Tailor-made soil properties by bio-geochemical means,” Vienna, April 2022.
- **2nd International Conference on Energy Geotechnics: “Field Monitoring and Simulations of Nuclear Waste Barrier Systems “**, San Diego, USA, April 2022.

#### 2021

- **GE@2M** (Grand Est, Mécanique et Matériaux), “Fundamentals of Soils Desiccation” December, 2021.

#### 2020

- **Kersten Lecture** at the **Geo-congress 2020** “Energy Geotechnology: A New Era for Geotechnical Engineering Society”, at Minneapolis, Minnesota, USA, June 2020.
- Keynote lecture, **4th European Conference on Unsaturated Soils, “Bentonite clay barriers in nuclear waste repositories”**, Lisbon, Portugal, 2020.

#### 2019:

- State-of-the-art lecture, **7th International Symposium on Deformation Characteristics of Geomaterials**, “Geothermal structures: from laboratory testing to engineering design”, Glasgow, 2019.
- Keynote lecture, **XVII European Conference on Soil Mechanics and Geotechnical Engineering**, “Energy Geotechnology: A New Era for Geotechnical Engineering Society”, Reykjavik, 2019
- Keynote lecture, **1st Mediterranean Young Geotechnical Engineers Conference (MYGEC)**, “Tailor-made soil properties with novel bio-geo-chemical means”, Bodrum, 2019.
- Keynote lecture, **DECOVALEX 2019 Symposium on Coupled Processes in Radioactive Waste Disposal and Subsurface Engineering Applications**, “Subsurface Energy Applications and the Importance of Coupled Processes in Shales”, Brugg, 2019
- Keynote lecture, **XVI Pan-American Conference on Soil Mechanics and Geotechnical Engineering (XVI PCSMGE)**, “Analysis, Design and Application of Energy Geostructures from the Building to the City Scale”, Cancun, 2019
- Keynote lecture, **University of Minnesota 68th Annual Geotechnical Engineering Conference**, “Energy Geotechnology: A New Era for Geotechnical Engineering Society”, Minneapolis, 2020.
- Keynote lecture, **XXVII Italian National Congress on “Geotechnical Engineering for a Sustainable Development**, “Energy from Geotechnical Constructions: Analysis and Design”, Reggio Calabria, 2020.
- Keynote lecture, **2nd International Conference on Energy Geotechnics**, “Energy from Geotechnical Constructions: Analysis and Design”, San diego, 2020.
- Keynote lecture, **International Symposium on Energy Geostructures**. “THM behaviour of bentonite-based materials”. Nancy, 2019.

#### 2018

- Keynote lecture, **International Symposium on Energy Geostructures**. “Analysis and design of energy tunnels and walls”. Lausanne, 2018.
- Invited lecture, **Deep Foundations Institute**. “Analysis and design of energy tunnels and walls”. Chicago, 2018.
- Keynote lecture, **7th International Conference on Unsaturated Soils**. “Gas shales: geomechanical challenges and analysis”. Hong Kong, 2018.
- Keynote lecture, **ComGEo IV**. “Gas shales: geomechanical challenges and analysis”. Assisi, 2018.

#### 2017

- Keynote lecture, **7th Geotechnical Symposium with International Participation”, organized by the Turkish Chamber of Civil Engineers in Istanbul**. “Design of energy geostructures”. Istanbul, 2017.
- Keynote lecture, **2<sup>nd</sup> International conference on Geo-Energy and Geo-Environment, GeGe2017** “Advances in energy piles design”. Hangzhou, China, 2017.



- Keynote lecture, Workshop **“Shallow geothermal energy systems. Applications and perspectives”**. “Design of thermos-active piles”. University of Aveiro – Portugal, 2017.
- Keynote lecture, **"Bochum Underground Space Day 2017"** “Geomechanical solutions for Geo-Energy issues”. Bochum, Germany, 2017.

## 2016

- Keynote lecture, **XVII French-Polish Colloquium of Soil and Rock Mechanics**, “Geomechanical solutions for Geo-Energy issues”. Lodz, Poland, November 2016.
- Keynote lecture, **1<sup>st</sup> International conference on energy geotechnics, ICEGT 2016 on Energy Geotechnics**, “Analysis of the vertical deformation of energy pile groups” Kiel, Germany, August 2016.
- Keynote lecture, **International mini symposium Chubu - New concepts and new developments in soil mechanics and geotechnical engineering**, “Analysis of canister movements in an engineered barrier system”. Nagoya, Aichi, Japan May, 2016.
- Keynote lecture, **8<sup>th</sup> Conference on Geoengineering**. Vysoké Tarty, Slovakia, June 2016.

## 2015

- Keynote lecture, **1<sup>st</sup> International Conference on Geo\_Energy and Geo\_Environment (GeGe2015)**, Hong-Kong, December, 2015.
- Keynote lecture, **Sixth International Symposium on Deformation Characteristics of Soils**, Buenos Aires (Argentina), November, 2015.
- Keynote lecture, **EAGE Geomechanics and Energy workshop** “Geomechanical solutions for Geo-Energy issues”, Celle (Germany), October 2015.
- Keynote lecture, **6th Asia-Pacific Conference on Unsaturated Soils (AP-UNSAT 2015)** “Testing of the Hydro-Mechanical behaviour of Shales”, Guilin, China, October 2015.
- Keynote lecture, **Prague Geotechnical Days 2015** “Analysis of a volcanic ash slope subjected to wetting and drying cycles”, Prague (Czech Republic), May 2015.

## 2014

- Theme lecture, **Environmental Geotechnics Congress** "Geomechanical solutions for CO2 sequestration". Melbourne (Australia), November 2014.
- Plenary lecture, **14th International Conference of Int. Association for computer methods and advances in geomechanics** (IACMAG), Kyoto (Japan), September 2014.
- Plenary lecture, **GeoShanghai 2014 International Conference**, Shanghai (China), May 2014.
- Plenary lecture, **6th International Conference on Porous Media**, Milwaukee, Wisconsin (USA), May 2014.
- Keynote lecture, **Annual meeting of the Mont Terri Consortium**. “THM simulation of canister movements in an engineered barrier system”. Saint-Ursanne (Switzerland), February 2014.

## 2013

- “Multiphysical couplings in (geo)materials”. Keynote lecture, **1<sup>st</sup> International Workshop on the Finite Element Code LAGAMINE**, Liège (Belgium), September 2013.
- “Hydromechanical analysis of a volcanic ash slope subjected to wetting and drying cycles”. Feature lecture, **3rd International Symposium on Computational Geomechanics**, Krakow (Poland), August 2013.
- “Hydro-mechanically Coupled Processes in Rainfall-induced Landslide Modelling”. Keynote lecture, **XVI French-Polish Colloquium of Soil and Rock Mechanics**, Montpellier (France), July 2013.
- “Geotechnical Analysis of Energy Geo-Structures”. Keynote lecture, **European Geothermal Congress 2013**, Pisa (Italy), June 2013.
- “Geotechnical Analysis of Energy Geo-Structures”. General report, International Symposium **CPEG 2013 Coupled Phenomena in Environmental Geotechnics**, Torino (Italy), July 2013.
- “Coupled analytical and numerical solutions of CO2 injection induced surface uplift and caprock deflection”. Keynote lecture, **3<sup>rd</sup> Sino-German Conference on Underground storage of CO2 and Energy**, Goslar (Germany), May 2013.



- “Advances in the analysis of thermo-active foundations and underground structures”. Keynote lecture, **International Workshop on Thermo-active Geotechnical Systems for Near-Surface Geothermal Energy**, Lausanne (Switzerland), March 2013.

## 2011

- “Multiphysical Coupled Processes in Underground Nuclear Waste Disposal Problems”. Plenary lecture, **Computational Methods for Coupled Problems in Science and Engineering IV**, Kos (Greece), June 2011.
- “Evidences on the deformation mechanisms of a Shale”. Theme lecture, **5th International Symposium on Deformation Characteristics of Geomaterials (IS-Seoul 2011) IV**, Seoul (Korea), September 2011.
- “Geotechnical design of energy piles”. Feature lecture, **2nd International Symposium on Computational Geomechanics**, Cavtat-Dubrovnik (Croatia), April 2011.

## 2010

- “Mechanics of unsaturated soils: concepts and applications” Plenary lecture, **3<sup>rd</sup> International Euro-Mediterranean Symposium on Advances in Geomaterials and Structures**, AGS’10, Djerba (Tunisia), May 2010.

## 2008

- “Numerical Simulation of an In-Situ underground Experiment for Nuclear Waste Storage”. Invited lecture at the **12th IACMAG Conference**, Goa (India), October 2008.
- “Enhanced viscoplastic modeling of soft soils” Keynote lecture at the **2nd International Workshop on Geotechnics of Soft Soils - Focus On Ground Improvement**, University of Strathclyde, Glasgow (UK), September 2008.
- “Geomechanical modeling of a natural slope affected by multiple slip surface failure mechanisms” Invited lecture at the **Intensive Course on Quantitative Risk Assessment and Risk management**, Barcelona (Spain), September 2008.
- “Environmental Geomechanics, Concepts and Applications” Keynote lecture at the **33<sup>rd</sup> IGC International Geological World Congress**, Oslo (Norway), August 2008.
- “A THM framework for modeling clay barriers performance in underground nuclear waste storage”. Keynote lecture at the **European Conference on Unsaturated Soils**, Durham (UK), July 2008.

## 2007

- “New insight into the unified hydro-mechanical constitutive modeling of unsaturated soils”. Invited lecture, **3<sup>rd</sup> Asian Conference on Unsaturated Soils**, Nanjing (China), 2007.

## 2006

- “Numerical modelling of the geomechanical behaviour of a large slope movement: The Triesenberg landslide (Liechtenstein)”. Invited lecture, JTC-1 (the joint ISSMGE, ISRM and IAEG Committee on Landslides and Engineered Slopes), **Workshop on the Mechanics and Velocity of Large Landslides**, Courmayeur (Italy), September 25<sup>th</sup> to 28<sup>th</sup>, 2006.
- “A THM stress-strain framework for modelling the performance of argillaceous materials in deep repositories for radioactive wastes”. Invited lecture, **Mont Terri Project, 10 Years Anniversary Workshop**, St-Ursanne (Switzerland), May 16, 2006.

## INSTITUTIONAL RESEARCH GRANT REVIEWS

Regular reviewer of research proposals for a range of international research institutions including the Swiss National Science Foundation, the European Research Council (ERC), the National Research Council of Canada, the Austrian Science Fund and the French National Agency for Research.

## ORGANISATION OF INTERNATIONAL EVENTS

Over 40 events organized. Most recently:

## 2023

- Ongoing director of the annual intensive course, **Energy geostructures analysis and design** in Lausanne, Switzerland, since 2018.

## 2020

- Biogeotechnics Webinar - 5 Little Known Keys for Successful Biogeotechnical Practice, Online, September 2020.
- Chair of the international **Winter School on Geomechanics for Energy and the Environment** in Villars, Switzerland, (2018-2020).

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## 2018

- Chair of the international **Symposium on Energy Geotechnics** in Lausanne, Switzerland. More than 260 participants from 35 countries, 26-28 September 2018.

## 2017

- Convener of the **15th Swiss Geoscience Meeting**, session “Shale-Gas, CO2 Storage and Deep Geothermal Energy”. Davos, Switzerland, November 2017.
- 2<sup>nd</sup> International Workshop on **Advances in laboratory testing and modelling of soils and shales**, Villars-sur-Ollon, Switzerland, 18 - 20 January 2017.

## 2015

- Vice-Chair, **1<sup>st</sup> International Conference on Geo\_Energy and Geo\_Environment (GeGe2015)**, Hong-Kong, December, 2015.
- Chair 2<sup>nd</sup> International Workshop on **Geomechanics and Energy - the Ground as Energy Source and Storage**, Celle, 13 - 15 October 2015 (116 participants).
- One day session on **Shale-Gas, CO2 Storage and Deep Geothermal Energy**, 11<sup>th</sup>, 12<sup>th</sup> and 13<sup>th</sup> Swiss Geoscience Meetings, Lausanne, Fribourg and Basel, November 2013 (70 participants), November 2014 (200 participants), November 2015 (120 participants).

## 2014

- Chair Short course on **Introduction to multiphysical geomechanics**, Minneapolis, June 2014 (20 participants).
- Chair One day session on **Geothermal Energy, CO2 Sequestration and Shale Gas**, 12<sup>th</sup> Swiss Geoscience Meeting, Fribourg, November 2014 (60 participants).

## 2013

- Chair International Workshop on **Geomechanics and Energy - the Ground as Energy Source and Storage**, Lausanne, 26 - 28 November 2013 (100 participants).
- Short course on **Introduction to multiphysical geomechanics**, Lausanne, 25 November 2013 (17 participants).
- **Geotechnique Symposium in Print 2013** on Bio- and Chemo-Mechanical Processes in Geotechnical Engineering, London, May 2013.
- International Workshop on **Thermo-active Geotechnical Systems for Near-surface Geothermal Energy**, sponsored by US-NSF, Lausanne, March 2013 (70 participants).

## 2012

- **5th Low Carbon Energy University Alliance Workshop**, Lausanne, November 2012 (30 participants).
- **International Workshop on Multiphysical Testing of soils and Shales**, Lausanne, September 2012 (80 participants).
- One day session on **Geomechanics for Energy Production**, ALERT-Geomechanics Workshop, Aussois, France, October 2012 (220 participants).

## 2011

- Two sessions on **“Energy foundations”** at GeoFrontiers 2011 Conference, Dallas, Texas, March 2011.

## 2010

- ALERT Olek Zienkiewicz Course on **“Mechanics of Unsaturated Geomaterials”**, EPFL, Lausanne, 5-9 July 2010 (60 participants).

- Six sessions on: “**Computational Models and Methods for Multiphysics Processes in Geomaterials, Biomaterials and other Multiphase Porous Media**”. IV European Conference on Computational Mechanics, ECCM 2010, Paris (France), May 16-21, 2010.

## 2009

- **European Doctoral School of the ALERT-Geomaterials** on Failure in Multiphase Materials. Aussois (France), 15-17 October 2009 (102 participants).
- Two sessions: “**Multiphysics Modelling of Geo-environmental Engineering Problems**” and “**Multiscale Problems**”. ECCOMAS Computational Methods for Coupled Problems in Science and Engineering, Coupled 09, Ischia (Italy), Jun. 8-10, 2009.

## 2008

- Training course on **THM Behaviour of Clays in Deep Excavation with Application to Underground Radioactive Waste Disposal**, EPFL, July 7-9, 2008 (50 participants).
- Special session on **Environmental Geomechanics** in the ASCE GeoCongress 2008, New Orleans, March 9-12, 2008.

## 2007

- **European Workshop on Hazard Analysis** (slides, rockfall, debris flow, snow avalanche) (50 participants), Lausanne, November 26-30, 2007.
- Special session on “Water in Pavements” – **International Conference on Advanced Characterisation of Pavement and Soil Engineering Materials**, Athens (Greece), 2007.
- Special session on **Thermo-Hydro-Mechanical Coupling in Geomaterials** in the Second International Conference on Porous Media and its Applications in Science, Engineering and Industry, Kauai, Hawaii, June 17-22, 2007.
- One day session in the ALERT Geomaterials annual meetings: “**Geomechanics of Structured Materials**”, October 2007.
- Two special sessions on **Modeling of Multiphysics Processes in Soils** in the ASCE GeoDenver 2007 Conference, Denver, February 18-21, 2007.

## 2005

- **International Workshop “Water in Pavements WIP’05”**. Centro de Estudios y Experimentación de Obras Públicas (CEDEX), Madrid, 27 October 2005 (70 participants).
- **European Doctoral School of the ALERT-Geomaterials and DIGA Networks**. Aussois (France), 13-16 October 2005 (130 participants).

## 2003

- Special session on “Environmental Geomechanics” in the **International Conference on Environmental Geotechnics**, Singapore, 2003.

## 2002

- **International Workshop on Environmental Geomechanics**. Monte Verità, June 31- July 5, 2002 (80 participants).

## 2001

- **European Workshop on Geothermal Response Tests**. EPFL, October 25 & 26, 2001 (40 participants).

## 2000

- One day session in the ALERT Geomaterials annual meetings: “**Multiphysical processes in geomaterials**”, October 2000, Aussois (France).

## 1996

- **International Workshop on Constitutive Modelling and Finite Elements Method applications in Geomechanics**. EPFL, June 25 & 26, 1996 (40 participants).

## 1995

- **International Workshop « Mechanics of granular flows in an environment of natural disasters »**. EPFL, December 19 & 20, 1995 (50 participants).

## CONTRIBUTION TO INTERNATIONAL CONFERENCES

### 2019

- Member of the International Technical Committee of **AP-UNSAT2019 - 7th Asia-Pacific Conference on Unsaturated Soils**, August 23-25, 2019, Nagoya, Japan

### 2017

- Member of the Scientific Committee of the **6th GeoProc conference**, Paris 2017.
- Member of the Technical Advisory Committee of the **2nd International Symposium on Coupled Phenomena in Environmental Geotechnics (CPEG2)** – Leeds (UK), 2017.
- Member of the Scientific Committee of the International Conference on Computational Methods for Coupled Problems in Science and Engineering (**COUPLED PROBLEMS 2017**, Island of Rhodes (Greece), 2017.
- Member of the international technical committee of the **PanAm-UNSAT 2017: The 2<sup>nd</sup> Pan American Conference on Unsaturated Soils**, Dallas/Fort Worth, Texas, USA, 2017.
- Member of the scientific committee of the **7<sup>th</sup> Clay Conference** (Clays in Natural and Engineered Barriers for Radioactive Waste Confinement) Davos, 2017.

### 2016

- Member of the International Advisory Committee of the **Third European Conference on Unsaturated Soils (E-UNSAT2016)** in Paris, France.

### 2015

- Member of the International Advisory Committee of the **Sixth International Symposium on Deformation Characteristics of Geomaterials** Buenos-Aires, Argentina 2015.
- Member of the Scientific Committee of the **VI International Conference on Computational Methods for Coupled Problems in Science and Engineering (COUPLED PROBLEMS 2015)**, 18 - 20 May 2015, Island of San Servolo, Venice, Italy.

### 2014

- Member of the Scientific Advisory Committee of the **48th U.S. Rock Mechanics/Geomechanics Symposium ARMA 2014**, University of Minnesota, June 1-4, 2014.
- Member of the international scientific committee of the **1<sup>st</sup> International Workshop on the Finite Element Code LAGAMINE**, Liège (Belgium), 9-12 September 2013.
- Member of the international scientific committee of **UNSAT2014**, Sydney, Australia, July 2-4, 2014
- Member of the international scientific committee of **IACMAG2014**, Kyoto, Japan, September 22-25, 2014

### 2013

- Member of the international scientific committee of the **4th Canadian Conference on Nonlinear Solid Mechanics (CanCNSM2013)**, Montreal, Canada, July 23-26, 2013
- Member of the International Advisory Committee of the **2nd International Symposium on Constitutive Modelling**, Beijing (China), October 2012.
- Member of the International Advisory Committee of the **1st international Pan-American Conference on Unsaturated Soils**, Cartagena (Colombia), February 2013.

### 2011

- Member of the Technical Advisory Panel of the 4<sup>th</sup> conference on Computational Methods for **Coupled Problems in Science and Engineering (Coupled Problems 2011)**, Kos (Greece), June 2011.

### 2010

- Member of the scientific committee of the International Conference **Mountain Risks: Bringing Science to Society**, Firenze (Italy), 24 - 26 November 2010.
- Member of the scientific committee of the **Eurock Conference**, EPFL (Switzerland), June 2010.

- Member of the International Advisory Committee of the **UNSAT2010 - International Conference on Unsaturated Soils**, Barcelona (Spain), 2010.
- Member of the scientific committee of the **2nd International Conference Marine Environment Damage to Coastal and Historical Structures**, La Rochelle (France), April 2010.

## 2009

- Member of the Technical Advisory Committee of the **International Symposium on Unsaturated Soil Mechanics and Deep Geological Nuclear Waste Disposal**, Shanghai (China), 2009.
- Member of the Technical Advisory Panel of the **1st International Symposium on Computational Geomechanics** (ComGeo I – previously NUMOG), Cote d'Azur (France), 2009.
- Member of the International Advisory Committee of the **4th Asia-Pacific Conference on Unsaturated Soils**, Newcastle (Australia), 2009.

## 2008

- President of the scientific committee of the **26th Annual Meeting of French Universities in Civil Engineering**, Nancy (France), June 2008.
- Chairman of a session at the **International Workshop on Unsaturated Soils**. Trento (Italy), 2008.
- Member of the International Advisory Committee of the **12th IACMAG Conference**, Gao (India), 2008.
- Member of the scientific Committee of the **International Symposium Drought and Constructions**, Paris (France), 2008.

## 2007

- Chairman of the session “Microstructure and fabric” at the **2nd International Conference on Mechanics of Unsaturated Soils**. Weimar (Germany), 2007.
- Chairman of the session “Modelling and numerical analysis” at the **3rd Asian Conference on Unsaturated Soils**. Nanjing (China), 2007.
- Chairman of the session “Landfill covers and confinement barriers” at the **7th Japanese-Korean-French Seminar on Geo-Environmental Engineering**, Grenoble (France), 2007.

## 2005

- Chairman of the session “Performance related properties of the pavement and subgrade material” at the **International Workshop “Water in Pavements WIP’05”**. Centro de Estudios y Experimentación de Obras Públicas (CEDEX), Madrid (Spain), 2005.
- Member of the scientific committee of the **International conference Geotechnics in Cities**, Lille (France), 2005.
- Co-reporter on the state-of-the-art on « Mechanical Testing in Unsaturated Soils » in the International Conference « EXPERUS 2005 - Advanced Experimental Unsaturated Soil Mechanics », Trento (Italy), 2005
- Member of the scientific committee of the **5th International Conference on Micromechanics of Granular Media**, Stuttgart (Germany), 2005.
- Member of the Conference Advisory Committee of the **6th International Conference on Ground Improvement Techniques**, Coimbra (Portugal), 2005.

## 2003

- Member of the Conference Advisory Committee of the **International Conference on Environmental Geotechnics**, Singapore, 2003.
- Member of the scientific committee of the **International Symposium of Shallow Foundations, FONDSUP**, Paris (France), 2003.
- Discussion leader in the **3rd International Conference on Unsaturated Soils**, Recife (Brazil), 2002.
- Member of the scientific committee of the **4th International Conference on Micromechanics of Granular Media**, Sendai (Japan), 2001.

# Publications

## SCIENTIFIC OUTPUT – BASED ON SCOPUS DATABASE

- **13** books

Over **370** articles, over **10 000** citations, **H-index=52** (Scopus), 2 highly cited papers (papers received enough citations to be placed it in the **top 1%** of the academic field of Engineering based on a highly cited threshold for the field and publication year).

**The complete list of publications is available here:**

<https://infoscience.epfl.ch/search?Ln=fr&p=lyesse+laloui&f=>

## BOOKS

1. *Analysis and Design of Energy Geostructures*. **L. Laloui**, A. Rotta Loria. Elsevier publishing house, 1096 pages, ISBN : 9780128206232, 2019.
2. *Energy Geotechnics*. A. Ferrari, **L. Laloui** (Editors). Springer International Publishing, 511 pages, <https://doi.org/10.1007/978-3-319-99670-7>, ISBN: 978-3-319-99669-1, 2018.
3. *Energy Procedia - Volume 114, Pages 1-7666 (July 2017)* - Proc. 13th International Conference on Greenhouse Gas Control Technologies, GHGT-13, 14-18 November 2016, Lausanne, Switzerland. Edited by Tim Dixon, **L. Laloui** and Sian Twinning.
4. *Advances in Laboratory Testing and Modelling of Soils and Shales (ATMSS)*. A. Ferrari, **L. Laloui** (Editors). Springer International Publishing, 235 pages, Doi : 10.1007/978-3-319-52773-4, ISBN : 978-3-319-52772-7, 2017. Since its online publication on January 18, 2017, there has been a total of 36,637-chapter downloads on SpringerLink. This means our book was one of the top 25% most downloaded eBooks in the relevant eBook Collection in 2017.
5. *Energy Geostructures*. **L. Laloui**, A. Di Donna, G. Kong (Editors). China Architecture and Building Press, 255 pages, ISBN: 978-7-112-19661-6., 2016.
6. *Géostructures énergétiques*. **L. Laloui**, A. Di Donna (Editors). Hermes science Publications, 250 pages, ISBN : 978-2-7462-4577-8, 2015.
7. *Energy Geostructures: Innovation in Underground Engineering*. **L. Laloui**, A. Di Donna (Editors). Wiley-ISTE, 250 pages, ISTE Ltd. and John Wiley and Sons, Hoboken, NJ, ISBN: 9781848215726. 2014.
8. *Mécanique des sols et des roches*. Vulliet L., **Laloui L.**, J. Zhao. Presses Polytechniques Universitaires Romandes, 624 pages, ISBN 978-2-88074-961-3, 2016.
9. *Multiphysical Testing of Soils and Shales*. Editors: **L. Laloui** and A. Ferrari. Springer, 978-3-642-32491-8, Springer Series in Geomechanics and Geoengineering, 2012. Since its online publication there has been a total of **104,098**-chapter downloads for the eBook on SpringerLink. This means the book was one of the **top 25%** most downloaded eBooks in the relevant eBook Collection in 2017.
10. *Mechanics of Unsaturated Geomaterials*. **L. Laloui** (Editor). Wiley-ISTE, 380 pages, 2010. ISTE Ltd. and John Wiley and Sons, Hoboken, NJ, ISBN 9781848212664.
11. *Computer applications in geotechnical engineering*. Siegel TC, R. Luna, T. Hueckel, **L. Laloui** (Editors). ASCE Geotechnical special publication N°157, 2007.
12. *Environmental Geomechanics*. L. Vulliet, **L. Laloui** & B. Schrefler (Editors). Publisher EPFL-Press. 423 pages; ISBN 2-88074-515-2. 2002.
13. *Tests de réponse géothermique/Geothermische response tests*. W.J. Eugster & **L. Laloui** (Editors). Proceedings of the European Workshop on Geothermal Test Responses. Lausanne, 130 pages. Publisher GTV; ISBN 3-932570-43-X. 2002.

## Media

Regular contributor to local and international media outlets.

Recent TV interview:

**Site pour déchets nucléaires – Forum RTS, 12.09.2022**

<https://www.rts.ch/play/tv/forum/video/forum-video-presente-par-esther-coquoz-et-renaud-malik22?urn=urn:rts:video:13379051>



More about media appearances: <https://www.epfl.ch/labs/lms/page-131128-en-html/>

## OTHER INFORMATION

Information on advised post-docs, master students, teaching activities, etc. is available in the following annual reports that cover the period 2008-2022: <https://www.epfl.ch/labs/lms/annualreports/>

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Google Scholar ID: <https://scholar.google.ch/citations?user=XgJfPH4AAAAJ&hl=fr>



Prof. Dr. Dr. Hc mult. Lyesse LALOUÏ

## Annex: Publication list

### ARTICLES IN PEER REVIEWED JOURNALS

#### 2021

1. Houhou, R., Sutman, M., Sadek, S., Laloui, L., "Microstructure observations in compacted clays subjected to thermal loading", *Engineering Geology*, 287, 2021
2. Bourhis, P., Cousin, B., Rotta Loria, A. F., Laloui, L., "Machine learning enhancement of thermal response tests for geothermal potential evaluations at site and regional scales", *Geothermics*, 25, 2021
3. Minardi, A., Giger, S. B., Ewy, R. T., Stankovic, R., Stenebraten, J., Soldal, M., Rosone, M., Ferrari, A., Laloui, L., "Benchmark study of undrained triaxial testing of Opalinus Clay shale: Results and implications for robust testing", *Geomechanics For Energy and The Environment*, 25, 2021
4. Garbellini, C., Laloui, L., "Soil-structure interaction of surface footings", *Computers and Geotechnics*, 143, 2021
5. Crisci, E., Ferrari, A., ; Giger, S. B., Laloui, L. "Effect of the mineralogical composition on the elastoplastic hydromechanical response of Opalinus Clay shale", *International Journal of Rock Mechanics and Mining Sciences*, 143, 2021
6. Minardi, A., Stavropoulou, E., Kim, T., Ferrari, A., Laloui, L., "Experimental assessment of the hydro-mechanical behaviour of a shale caprock during CO<sub>2</sub> injection" , *International Journal of Greenhouse Gas Control*, 106, 103225, 2021.
7. Tuttolomondo, A., Ferrari, A., Laloui, L., « Generalized effective stress concept for saturated active clays », *Canadian Geotechnical Journal*, 58, 1, 2021.
8. Qiao, Y., Tuttolomondo, A., Lu, X., Laloui, L., Ding, W., "A generalised water retention model with soil fabric evolution », *Geomechanics for Energy and the Environment*, 25, 100205, 2021.
9. Adinolfi, M., Rotta Loria, A. F., Laloui, L., Aversa, S., "Experimental and numerical investigation of the thermo-mechanical behavior of an energy sheet pile wall », *Geomechanics for Energy and the Environment*, 25, 100208, 2021.
10. Garbellini, C., Laloui, L., « Thermal stress analysis of energy piles », *Géotechnique*, 71, 3, 260-271, 2021.

#### 2020

1. Ravera, E., Sutman, M., Laloui, L., "Cyclic thermomechanical response of fine-grained soil-concrete interface for energy piles applications », Ravera, E., Sutman, M., Laloui, L., *Canadian Geotechnical Journal*, 2020.
2. Houhou, R., Sutman, M., Sadek, S., Laloui, L., "Microstructure observations in compacted clays subjected to thermal loading", *Engineering Geology*, 105928, 2020.
3. Zannin, J., Rotta Loria, A.F., Llabjani, Q., Laloui, L., "Extension of Winkler's solution to non-isothermal conditions for capturing the behaviour of plane geostructures subjected to thermal and mechanical actions ». *Computers and Geotechnics*, 128, 103618, 2020.
4. Terzis, D., Hicher, P., Laloui, L., « Direct currents stimulate carbonate mineralization for soil improvement under various chemical conditions », *Scientific Reports*, 10, 17014, 2020.
5. Ravera, E., Sutman, M., Laloui, L., "Load Transfer Method for Energy Piles in a Group with Pile–Soil–Slab–Pile Interaction », *Journal of Geotechnical and Geoenvironmental Engineering*, 146, 6, 1-17, 2020.
6. Shahnazari, H., Laloui, L., Kouzegaran, S., Jafarian, Y., "Prediction and experimental evaluation of soil-water retention behavior of skeletal calcareous soils », *Bulletin of Engineering Geology and the Environment*, 79, 5, 2020.
7. Rotta Loria, A. F., Laloui, L., Catala Oltra, V., "Equivalent pier analysis of full-scale pile groups subjected to mechanical and thermal loads », *Computers and Geotechnics*, 120, 103410, 2020.
8. Rotta Loria, A.F., Bocco, M., Garbellini, C., Muttoni, A., Laloui, L., "The role of thermal loads in the performance-based design of energy piles », *Geomechanics for Energy and the Environment*, 21, 100153, 2020.
9. Ravera, E., Sutman, M., Laloui, L., "Analysis of the interaction factor method for energy pile groups with slab", *Computers and Geotechnics*, 119, 103294, 2020.

#### 2019

1. Schäfers, A., Gens, A., Rodriguez-Dono, A., Baxter, S., Tsitsopoulos, V., Holton, D., Malmberg, D., Sawada, M., Qiao, Y., Ferrari, A., Laloui, L., Sjöland, A. « Increasing understanding and confidence in THM simulations of Engineered Barrier Systems », *Environmental Geotechnics*, 7, 1, 59-71, 2019.

11. Qiao, Y., Yingming, X., Laloui, L., Ding, W., He, M., "A double-structure hydromechanical constitutive model for compacted bentonite », *Computers and Geotechnics*, 115, 10-21, 103173, 2019.
2. Peltier, M., Loria, Rotta Loria, A. F., Lepage, L., Garin, E., Laloui, L., "Numerical investigation of the convection heat transfer driven by airflows in underground tunnels », *Applied Thermal Engineering*, 159, 113844, 2019.
3. Sütman, M., Speranza, G., Ferrari, A., Larrey-Lassalle, P., Laloui, L., "Long-term performance and life cycle assessment of energy piles in three different climatic conditions », *Renewable Energy*, 146, 1177-1191, 2019.
4. Cousin, B. C. H., Rotta Loria, A. F., Bourget, A., Rognon, F., Laloui, L., "Energy performance and economic feasibility of energy segmental linings for subway tunnels », *Tunnelling and Underground Space Technology*, 91, 102997, 2019.
5. Vilarrasa R. V., Carrera, J., Olivella, S., Rutqvist, J., Laloui, L., «Induced seismicity in geologic carbon storage », *Solid Earth*, 10, 871-892, 2019.
6. Garbellini, C., Laloui, L., « Three-dimensional finite element analysis of piled rafts with energy piles », *Computers and Geotechnics*, 114, 103-115, 2019.
7. Fryer, B. P., Siddiqi, G., Laloui, L., "Compaction-induced permeability loss's effect on induced seismicity during reservoir depletion », *Pure and Applied Geophysics*, 176, 4277-4296, 2019.
8. Crisci E., Ferrari A., Giger S., **Laloui L.** « The hydro-mechanical behaviour of shallow Opalinus Clay shale". *Engineering Geology*, Volume 251, Pages 214-227, 2019.
9. Sutman M., Guney O., Laloui L. "Cyclic Load - Transfer Approach for the Analysis of Energy Piles" *Journal of Geotechnical and Geoenvironmental Engineering*, 145(1), 2019. Terzis D., **Laloui L.** "Cell-free soil biocementation with strength, dilatancy and fabric characterization" *Acta Geotechnica*, 10.1007/978-3-319-00764-3, 2019

## 2018

1. Kong G., Wu D., Liu H., Laloui, L., Cheng X., Zhu X. "Performance of a geothermal energy deicing system for bridge deck using a pile heat exchanger". *International Journal of Energy Research*, Vol. 43, 596-603, 2018.
2. Terzis D., Laloui L. "3-D micro-architecture and mechanical response of soil cemented via microbial-induced calcite precipitation" *Nature Scientific Reports*, 10.1038/s41598-018-19895-w, vo. 8, n° 1416, 2018.
3. Favero V., **Laloui L.** "Impact of CO2 injection on the hydro-mechanical behaviour of a clay-rich caprock". *International Journal of Greenhouse Gas Control*, vol. 71, pp. 133-141, 2018.
4. Rotta Loria A. F., **Laloui L.** "Group action effects caused by various operating energy piles" *Geotechnique*, 10.1680/jgeot.17. P.213, 68(9):834-841, 2018.
5. Favero V., Ferrari A., **Laloui L.** " Anisotropic behaviour of Opalinus Clay through consolidated and drained triaxial testing in saturated conditions". *Rock Mechanics and Rock Engineering*, 10.1007/s00603-017-1398-5, 2018.
6. Zhou H., Kong, G, Liu H, **Laloui L.** « Similarity Solution for Cavity Expansion in Thermoplastic Soil". ". *International Journal for Numerical and Analytical Methods in Geomechanics*, DOI:10.1002/nag.2724, Vol. 42 Issue 2, p 274-294, 2018.
7. Fryer BP, Siddiqi G., **Laloui L.** "Reservoir stimulation's effect on depletion-induced seismicity". *Journal of Geophysical Research - Solid Earth* (2018).
8. Rotta Loria A. F., Vadrot A., **Laloui L.** "Analysis of the vertical displacement of energy pile groups". *Geomechanics for Energy and the Environment*, Vol. 16, pp. 1-14, 10.1016/j.gete.2018.04.001, 2018.
9. Parisio F., Vilarrasa V., **Laloui L.** "Hydro-mechanical modeling of tunnel excavation in anisotropic shale with coupled damage-plasticity and micro-dilatant regularization". *Rock Mechanics and Rock Engineering*, 2018.
10. Ferrari A., Minardi A., Ewy R., **Laloui L.** "Gas Shales Testing in Controlled Partially Saturated Conditions". *International Journal of Rock Mechanics and Mining Sciences*, in press, 2018.
11. Minardi A., Ferrari A., Ewy R., **Laloui L.** " Non-linear elastic response of partially saturated gas shales in uniaxial compression" *Rock Mechanics and Rock Engineering*, 2018.

## 2017

1. Rotta Loria A. F., **Laloui L.** "The equivalent pier method for energy pile groups" *Geotechnique*, 10.1680/geot.16-P-139, 67 (5), pp. 374 – 393, 2017.
2. Parisio F., **Laloui L.** "Plastic-damage modeling of saturated quasi-brittle shales". *International Journal of Rock Mechanics and Mining Sciences*, Vol. 93, pp. 295–306, 2017.
3. Rotta Loria AF, A. Vadrot, **Laloui L.** "Effect of non-linear soil deformation on the interaction among energy piles". *Computers and Geotechnics*, Vol. 86, pp. 9-20, 2017.
4. Vilarrasa V., F. Parisio, **Laloui L.** "Strength evolution of geomaterials in the octahedral plane under non-isothermal and unsaturated conditions". *International Journal of Geomechanics*, [http://dx.doi.org/10.1061/\(ASCE\)GM.1943-5622.0000851](http://dx.doi.org/10.1061/(ASCE)GM.1943-5622.0000851), Volume 17, Issue 7, 2017.

5. Parisio F., **Laloui L.** "Plastic-damage modeling of saturated quasi-brittle shales". *International Journal of Rock Mechanics and Mining Sciences*, Vol. 93, pp. 295–306, 2017.
6. Vilarrasa V., Bustarreta G., **Laloui L.**, Zeidouni M. « A methodology to detect and locate low-permeability faults to reduce the risk of inducing seismicity of fluid injection operations in deep saline formations ». *International Journal of Greenhouse Gas Control*, Vol. 59, pp. 110-122, 2017
7. Parisio F., **Laloui L.** "On the formulation of anisotropic-polyaxial failure criteria: a comparative study." *Rock Mechanics and Rock Engineering*, 2017.
8. Rotta Loria AF, **Laloui L.** "Displacement interaction among energy piles bearing on stiff soil strata" *Computers and Geotechnics*, 2017
9. Chao L., **Laloui L.** "Impact of material properties on caprock stability in CO2 geological storage". *Geomechanics for Energy and the Environment*, Vol. 11, pp. 28- 41, 2017.
10. Zou Y., Li J., **Laloui L.**, Zhao J. Analytical Time-Domain Solution of Plane Wave Propagation Across a Viscoelastic Rock Joint. *Rock Mech Rock Eng.* DOI:10.1007/s00603-017-1246-7, 2017.
11. Minardi A., Ferrari A., Ewy R., **Laloui L.** "The impact of the volumetric swelling behavior on the water uptake of gas shale". *Journal of Natural Gas Science & Engineering*, vol. 49, p. 132-144, 2017

## 2016

1. **Laloui L.**, A. Ferrari, C. Li and J. Eichenberger. Hydro-mechanical analysis of volcanic ash slopes during rainfall". *Geotechnique*, Vol. 66, N°3, pp. 220-231, 2016.
2. Rotta Loria A. F., **Laloui L.** "Thermally induced group effects among energy piles". *Géotechnique*, 10.1680/jgot.16. P.039, 2016.
3. Li C., **Laloui L.** « Coupled multiphase thermo-hydro-mechanical analysis of supercritical CO2 injection: benchmark for the In Salah surface uplift problem". *International Journal of Greenhouse Gas Control*, vol. 51 pp. 394 – 408, 2016.
4. Rotta Loria AF, **Laloui L.** "The interaction factor method for energy pile groups". *Computers and Geotechnics*, vol. 10.1016/j.compgeo.2016.07.002, Volume 80, pp. 121–137 2016.
5. Dupray F., **L. Laloui** " Numerical analysis of canister movements in an engineered barrier system". *Acta Geotechnica*, DOI : 10.1007/s11440-014-0347-7, pp. 145-160, Volume 11, N°1, 2016.
6. Vilarrasa V., **L. Laloui** " Impact of thermally induced stresses on fracture stability during geological storage of CO2". *Energy Procedia* (86), DOI : 10.1016/j.egypro.2016.01.042, pp. 411-419, 2016.
7. Venuleo S., **Laloui L.**, Terzis D., Hueckel T., Hassan M. "Effect of Microbially Induced Calcite Precipitation on soil thermal conductivity". *Géotechnique Letters*, 10.1680/jgele.15.00125, vol. 6, Issue 1, 2016.
8. Di Donna A., Rotta Loria AF, **Laloui L.** "Numerical study of the response of a group of energy piles under different combinations of thermo-mechanical loads". *Computers and Geotechnics*, 72, pp. 126–142, 2016.
9. Terzis D., R. Bernier-Latmani, **L. Laloui** "Fabric characteristics and mechanical response of bio-improved sand to various treatment conditions", *Géotechnique Letters*, 10.1680/jgele.15.00134, Vol. 6, Issue 1, 2016.
10. Manca D., Ferrari A., **Laloui L.** "Fabric evolution and the related swelling behaviour of a sand/bentonite mixture upon hydro-chemo-mechanical loadings". *Géotechnique*; 10.1680/geot./15-P-073, Volume 66 Issue 1, pp. 41-57, 2016.
11. Comodromosa EM, Papadopoulou, MC, **Laloui L.** "Contribution to the design methodologies of piled raft foundations under combined loadings". *Canadian Geotechnical Journal*, 53:(4), 559 – 577, 10.1139/cgj-2015-0251, 2016.

## 2015

1. Di Donna A., Ferrari A., **Laloui L.** "Experimental investigations of the soil-concrete interface: physical mechanisms, cyclic mobilisation and behaviour at different temperatures". *Canadian Geotechnical Journal*, 53:(4), 659 – 672, 10.1139/cgj-2015-0294, 2016.
2. Favero V., Ferrari A., **Laloui L.** "On the Hydro-Mechanical Behaviour of Remoulded and Natural Opalinus Clay Shale". *Engineering Geology*, Volume 208, pp. 128-135, 2016.
3. Bandara S., Ferrari A., **L. Laloui** "Modelling landslides in unsaturated slopes subjected to rainfall infiltration using material point method". *International Journal for Numerical and Analytical Methods in Geomechanics*, 10.1002/nag.2499, Vol. 40, pp. 1358-1380, 2016.
4. Seiphoori A., **L. Laloui**, Ferrari A., Hassan M., Khushefati W.H. « Water retention and swelling behaviour of granular bentonites for application in Geosynthetic Clay Liner (GCL) systems". *Soils and Foundations*, DOI:10.1016/j.sandf.2016.04.011, 56, pp. 449-459, 2016.
5. Ferrari, A., Favero V., **Laloui L.** "One-dimensional Compression and Consolidation of Shales". *Int. Journal of Rock Mechanics and Mining Sciences*, Vol. 88, pp. 286–300, 2016.
6. Favero V., Ferrari, A., **Laloui L.** "Thermo-mechanical volume change behaviour of Opalinus Clay" *International Journal of Rock Mechanics and Mining Sciences*, Volume 90, Pages 15–25, 2016.

7. Qiao Y., Ferrari A., **Laloui L.**, Wenqi D. « Nonstationary flow surface theory for modeling the viscoplastic behaviors of soils ». *Computers and Geotechnics*, N° 76 pp. 105 - 119, 2016.
8. Minardi, A., Crisci E., Ferrari A., **Laloui L.** "Anisotropic volumetric behaviour of Opalinus Clay shale upon suction variation". *Geotechnique Letters*, 6(2), pp. 144–148, 2016.

## 2015

1. Di Donna A., **Laloui L.** "Response of soil subjected to thermal cyclic loading: experimental and constitutive study". *Engineering Geology*, 190, 65-76, 2015.
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