

12-14  
FEBRUARY  
2019  
ARTEM  
NANCY, FRANCE

# COGGUS<sup>2</sup>

**COMPUTATIONAL &  
GEOENVIRONMENTAL GEOMECHANICS  
FOR UNDERGROUND AND SUBSURFACE  
STRUCTURES**

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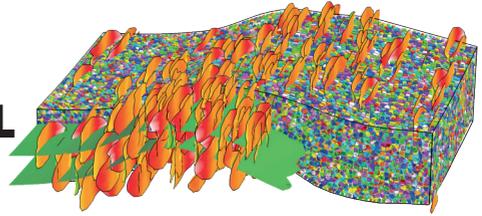
controlling risks |  
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## COMPUTATIONAL & GEOENVIRONMENTAL GEOMECHANICS FOR UNDERGROUND AND SUBSURFACE STRUCTURES

Numerical modelling is getting more and more prominent in most geoengineering fields. It offers a unique way to study and better understand complex physical phenomena that must be forecasted facing new industrial projects and uses of the solid earth medium. For underground structures, the macroscopic response of geomaterials, especially rocks, are strongly governed by coupled hydro-mechanical and chemical processes occurring at multiple scales. The behaviour of geomaterials involves several physics with different time and length scales. The behaviour at the macroscopic scale is governed by that of the micro scale level (pore scale). Underground structures are subjected to different time-dependent or independent physical loading and initial state: mineralogy, water-gas saturation degree, fluid pressure, temperature,



mechanical loading (static, cyclic, dynamic), geochemical reactions, cracking, strains localisation and many other parameters. One of the goal of *Computational Geomechanics* is to predict as accurately as possible the behaviour of underground structures in such frameworks. In order to meet the challenge posed by the complexity of such boundary value problems, increasingly sophisticated numerical models are being developed.

The purpose of this Symposium is multifold: it aims first to offer a comprehensive stock of the most recent advances in *Computational Geomechanics*, including both new attributes and current limits; second: to compare modelling methods and approaches; and last to show the relevance of computation on both real cases and new projects.

The Symposium wants to address a wide range of topical issues, from the fundamental and theoretical points, to real case studies in many fields of underground operations.

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## 4 THEMES

Four themes are devoted to cover a wide range in computational analysis for underground structures. Topics within the scope of interests include:

- Theme 1: Recent Advances in Computational Geomechanics
- Theme 2: Thermo-Hydro-Mechanic-Chemico Couplings
- Theme 3: Case Studies
- Theme 4: Storage & Monitoring

Note that presentations are not strictly limited to this list.

Presentations dealing with transversal subjects are welcome.

## KEYNOTE LECTURES

will be presented by leading international experts in *Computational Mechanic and Geomechanics*

- Pr APS Selvadurai, Mc-Gill, Canada
- Pr R.I. Borja, Stanford, USA
- Pr L. Laloui, EPFL, Switzerland
- Pr J. Sulem, ENPC, France

## A VISIT OF ANDRA URL

(Underground Research Laboratory)

is planned during the third day.

Andra is the French national radioactive waste management agency.



## MAIN TOPICS

- Continuum modelling
- Discrete element modelling
- Hybrid modelling models
- Fractures, strain localisation and damage modelling
- Multiscale: micro-macro constitutive models
- Enhanced constitutive models
- Multiscale and Multiphysics (THMC) modelling
- Geophysical analysis and computation
- Experimental vs numerical modelling
- Case studies
- Numerical modelling and back analysis
- Study of underground structures
- Underground storages and monitoring

**SPECIAL  
ISSUE**

**EJECE**  
European  
Journal of  
Environmental  
and Civil  
Engineering

**BEST POSTER  
AWARD**  
3 prizes will  
be awarded

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