

# RESEARCH TOPICS

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- Mathematical and numerical modelling of non-linear multiphase porous materials in non-isothermal conditions
- Constitutive modelling of variably saturated (visco-)elasto-plastic geomaterials in non-isothermal conditions
- Computational geo-environmental mechanics, with emphasis to strain localisation and water cavitation in multiphase geomaterials
- Numerical treatment of the post-bifurcation behaviour of geomaterials.
- Dynamics of non-isothermal multiphase geomaterials
- Phase-field modeling of fracture in variably saturated porous media
- Numerical methods in engineering
- Finite element modelling of coupled problems
- Finite strain elasto-plasticity
  
- Application to: seismic analysis of earth dams, simulation of soil collapse and onset of landslides, flowslides and catastrophic landslides, thermo-hydro-mechanical behaviour of lagoon marshes and of deep nuclear waste disposals, thermo-hydro-mechanical consolidation processes in soils, fracture in porous media, etc.