

## MODELING AND SIMULATION OF COUPLED PROCESSES IN GEOLOGICAL MEDIA

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### MINISYMPOSIUM

Thermal-hydro-mechanical-chemical (THMC) processes in the subsurface are vital to the understanding natural evolutionary processes and engineered systems including carbon sequestration, energy storage, nuclear waste disposal, geothermal systems, oil and gas development, and mining. Fractures and fracture networks are important in many cases. Numerical modeling of such settings results in nonstationary, nonlinear, coupled problems, possibly subject to inequality constraints, and is crucial for advancing scientific discoveries and engineering. This mini-symposium invites contributions, to the modelling of two or more coupled processes, including but not limited to novel abstractions & mathematical models, discretization methods, coupling methods, machine learning, neural networks and artificial intelligence, and advancements to support large-scale simulations. Examples of relevant contributions may include but are not limited to:

- Numerical models such as finite element, discrete element, and machine-learning based models
- Nonlinear constitutive models of geomaterials including phase-field and non-local plasticity
- Developments to address ill-conditioning and scalability of solutions
- Integration of multiple numerical and/or analytical methods to achieve more efficient and accurate multiphysics models