

## Special Issue

# Advances in Thermo-Hydro-Mechanical and Biochemical (THMBC) Characterization and Modelling of Unsaturated Soils

### Message from the Guest Editors

Over the past few decades, research on coupled hydro-mechanical processes in unsaturated soil mechanics has expanded to include thermal gradients. This has led to significant advancements in experimental techniques and the development of more robust constitutive and computational models. The present Special Issue aims to further expand the scope of unsaturated soil mechanics by incorporating thermo-hydro-mechanical (THM) and biochemical (BC) couplings. It highlights key scientific advances essential for characterizing and modeling interactions between unsaturated soils and their environments. Integrating concepts from physics, chemistry, and biology is crucial for progress in clean energy, soil bioremediation, and bio-inspired technologies in geotechnical engineering. This Special Issue follows a previous one on Advances in Thermo-Hydro-Mechanical Characterization and Modelling of Unsaturated Soils. Contributions will undergo rigorous review, focusing on recent experimental and computational advances in THMBC characterization and modeling. Submissions focusing solely on hydro-mechanical, THM, or biomechanical processes are also welcome.

### Guest Editors

Prof. Dr. Laureano R. Hoyos

Prof. Dr. Dunja Perić

Dr. Aritra Banerjee

### Deadline for manuscript submissions

31 October 2025



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### Message from the Editor-in-Chief

Understanding the Earth's origin and its bio-geological evolution, the multiple implications of the geosciences (as a coherent set of interconnected disciplines), and the sociocultural and ethical interdisciplinary approaches, will be crucial for a better understanding of Nature, and also for undertaking scientifically based political decisions.

We are committed to drive *Geosciences* to a position in which it is recognized for its high-quality, cutting-edge research and scientific influence, and strongly encourage and invite your participation and manuscripts.

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### Editor-in-Chief

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