Special Issue

Multiscale Modeling and Experimental Characterization of Soil Behavior: Seepage, Deformation, and Constitutive Mechanisms for Engineering Applications

Message from the Guest Editor

This Special Issue welcomes contributions that connect theoretical, numerical, and experimental advances to real-world geotechnical engineering applications. Topics of interest include, but are not limited to:

- Constitutive models for saturated/unsaturated soils with coupled hydraulic and mechanical behavior, and their application in engineering design;
- Particle-scale and mesoscale studies of seepage–deformation interactions and their implications for macroscopic engineering properties;
- Numerical modeling of seepage-induced instability, erosion, or failure in slopes, embankments, retaining structures, and other geosystems;
- Experimental methods (e.g., imaging, DEM, μCT) for model calibration and validation in practical geotechnical contexts;
- Data-driven and machine learning approaches for predicting soil response in engineering applications;
- Integration of field monitoring and geophysical data with numerical models for site characterization and performance assessment;
- Sustainable design, risk mitigation, and decision-support frameworks based on advanced soil modeling.

Guest Editor

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Message from the Editor-in-Chief

As the world of science becomes ever more specialized, researchers may lose themselves in the deep forest of the ever increasing number of subfields being created. This open access journal *Applied Sciences* has been started to link these subfields, so researchers can cut through the forest and see the surrounding, or quite distant fields and subfields to help develop his/her own research even further with the aid of this multi-dimensional network.

Editor-in-Chief

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