Special Issue

Symmetry-Informed Approaches in Geotechnical Engineering: Modeling, Sensing and Soil–Structure Interaction

Message from the Guest Editors

This Special Issue aims to explore how symmetry and asymmetry principles manifest in geotechnical systems, ranging from soil behavior and foundation response to monitoring techniques and AI-based predictions. Geotechnical engineering presents a robust basis for symmetry analysis, whether in terms of material properties, stress–strain responses, the geometry of soil layers, numerical models, or sensor layouts. Manuscripts in this issue will focus on both natural and induced symmetries, as well as the implications of asymmetry—for instance, how anisotropic soils, heterogeneous subsurface conditions, and non-uniform loading affect stability and performance. Suggested topics include the following:

- Symmetry/asymmetry in soil fabric and its influence on mechanical behavior.
- Modeling of symmetric vs. asymmetric stress distributions in foundations and tunnels.
- Geometrical symmetry in pile groups, raft foundations, and retaining walls.
- Asymmetry in seismic wave propagation through layered or fractured ground.
- Symmetry in finite element meshes, boundary conditions, and constitutive models.
- Use of symmetry-aware machine learning for predicting geotechnical performance.
- etc.

Guest Editors

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About the Journal

Message from the Editor-in-Chief

Symmetry is ultimately the most important concept in natural sciences. It is not surprising then that very basic and fundamental research achievements are related to symmetry. For instance, the Nobel Prize in Physics 1979 (Glashow, Salam, Weinberg) was received for a unified symmetry description of electromagnetic and weak interactions, while the Nobel Prize in Physics 2008 (Nambu, Kobayashi, Maskawa) was received for the discovery of the mechanism of spontaneous breaking of symmetry, including CP symmetry. Our journal is named *Symmetry* and it manifests its fundamental role in nature.

Editor-in-Chief

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