Special Issue

Advances in Evaluation, Development, Simulation and Utilization of Geo-Energy Resources and Underground Space

Message from the Guest Editor

This Special Issue focuses on the sustainable development of geo-energy resources in the context of the global energy transition and carbon neutrality goals, emphasizing the quantitative evaluation of geo-energy resources, integrated utilization of underground spaces (e.g., hydrogen storage, compressed air energy storage, CO2 sequestration), and optimization of underground gas storage (UGS) systems. We would particularly like to highlight theories, methods, and key technologies for the efficient utilization of underground space, including but not limited to the following: underground gas storage (UGS), hydrogen/helium reservoirs in geological formations, strategic oil reserves in salt caverns, and the deep geological disposal of nuclear waste, all requiring interdisciplinary integration of geoscience, energy engineering, and computational analytics to address challenges in sealing integrity, thermal-fluid dynamics, and long-term stability for a sustainable energy transition and hazardous material management.

Guest Editor

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