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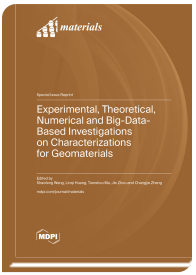
*Special Issue Reprint*

# Experimental, Theoretical, Numerical and Big-Data-Based Investigations on Characterizations for Geomaterials

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Rock and rock-like materials such as concrete, soil, and underground backfilling materials are considered to be geomaterials. Geomaterials are essential for life due to human construct extraction, mining, storage, and transport areas in the Earth's crust for raw material. Drilling and excavations of underground openings in the Earth's crust are requirements for the exploitation and utilization of mineral resources, energy resources, and underground spaces. The deepest drilling depth has exceeded 12 km, and the deepest underground excavation now operates mines with depths exceeding 4 to 5 km. Drilling, excavation, and rock support processes largely rely on the physical and mechanical properties of geomaterials. Rock excavations are faced with some instability phenomena, such as caving, rock bursts, slabbing, large deformation, and zonal disintegration, posing a serious threat to the safety of mining and tunneling operations. Rock drilling also encounters many challenges deep underground. Deformation, fracture, failure, and fragmentation are the different stages of geomaterials, the monitoring and control of which are essential for ensuring drilling and excavation safety. Therefore, understanding the response processes of geomaterials during drilling and excavation activities depends on the precise ns of geomaterials.

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