Special Issue

Underground Space Construction and Digital Management

Message from the Guest Editors

With the continuous development of underground space, deep underground engineering faces greater challenges. High-energy disasters, such as rockburst, fault slip, and large deformation, threaten the stability of underground structures. Underground structures are not only affected by the mechanical properties of the rock itself but also by the number and geometry of joints. A large number of experiments have shown that the influence of joint properties on structural stability is more significant. Deep rock is in a high-stress state before excavation and exhibits highly nonlinear mechanical behavior when disturbed, which cannot be effectively explained by traditional shallow rock mechanics theory. Therefore, the stability study of underground structures under high-stress and high-energy environments is particularly important. With the increase in excavation depth, underground structures will inevitably be subject to dynamic disturbances caused by earthquakes, blasting, fault activity, etc., resulting in large deformation and rockburst, threatening construction safety.

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Message from the Editor-in-Chief

Current urban environments are home to multi-modal transit systems, extensive energy grids, a building stock, and integrated services. Sprawling neighborhoods are composed of buildings that accommodate living and working quarters. However, it is expected that the cities and communities of the future will face complex and enormous challenges, including maintenance, interconnectivity, resilience, energy efficiency, and sustainability issues, to name but a few. A smart city uses advanced technologies and a digital infrastructure to improve the outcomes in every aspect of a city's operations. A smart building optimizes the experience of occupants, staff, and management by using a modern and connected environment. Innovations in technology that can bring dramatic improvements to design, planning, and policy are critical in developing the cities and buildings of the future.

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