Special Issue

Dynamics, Diffusion Modeling, and Intelligent Control of Coal Mining Dust Particles

Message from the Guest Editors

This Special Issue explores the kinetic behavior of dust particles, multi-scale diffusion modeling, and intelligent control technologies, aiming to integrate global research advancements in dust monitoring, numerical simulations, and emission reduction strategies. Key areas of focus include mechanistic analysis of dust formation, coupled environmental–equipment interactions, multiphase flow simulations, real-time monitoring systems, and novel dust suppression materials, providing scientific and technical insights for sustainable mining practices. **Themes**

- Dynamic mechanisms and evolution of dust generation during coal mining operations;
- Multiphysics-coupled numerical modeling of ventilation systems and dust dispersion;
- Real-time dust monitoring and intelligent early-warning technologies;
- Green chemical and engineering approaches for efficient dust suppression.

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