IX International Conference on Particle-Based Methods, PARTICLES 2025
October 20-22, 2025, Barcelona, Spain

COMPUTATIONAL GRANULAR MECHANICS

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ABSTRACT

Granular materials are ubiquitous in nature and engineering applications. Their behavior is highly complex due to their inherent nonlinearity, discontinuity, and heterogeneity. Particle methods have emerged as a powerful tool for modeling granular materials, offering unique advantages in capturing the complex interactions between particles and the surrounding fluid or solid medium. This mini symposium aims to bring together active researchers from academia and industry to discuss recent advances and challenges in computational granular mechanics using particle methods. Topics of interest include, but are not limited to:

- Material Point Method (MPM) for granular flow and phase transition
- Smoothed Particle Hydrodynamics (SPH) for fluid-granular interactions
- Moving Particle Simulation (MPS) for granular dynamics and particle transport
- Particle Finite Element Method (PFEM) for granular deformation and failure
- Discrete Element Method (DEM) for granular mechanics and particle-particle interactions
- Molecular Dynamics (MD) for granular materials at the microscale
- Lattice-Boltzmann Method (LBM) for fluid-particle interactions in granular media
- Peridynamics (PD) for particle crushing and fracturing in granular solids
- Multiscale and multiphysics modeling of granular materials
- Data-driven and machine learning approaches for granular mechanics

We believe that this mini symposium will provide a valuable platform for researchers to exchange ideas, share their latest findings, and establish collaborations in the field of computational granular mechanics. We thank you for considering our proposal and look forward to your positive response.