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Numerical Modeling and Simulation of Multi-Phase Flows

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Message from the Guest Editor

Multi-phase flows are characterized by two or more material interfaces, including those between continuous and dispersed phases of water, air and solid. Two typical flows can be identified—disperse flows and separated flows—the former being those consisting of finite particles, water drops, or air bubbles distributed within a continuous phase. The latter is defined as consisting of two or more continuous streams of immiscible phase, such as water and air, separated by interfaces. Multiphase flow behaviors are highly influenced by the complex interactions at material interfaces.

Multi-phase flows can be described with governing equations in Eulerian–Eulerian, Eulerian–Lagrangian, or Lagrangian–Lagrangian form. Due to the presence of material interfaces and the associated complex interactions, the numerical modeling and simulation faces many challenges compared with that of traditional hydrodynamics, such as the accurate presentation and transport of material interfaces, physically sound interface interaction, reliable solutions for complex hydrodynamic problems, and high-performance computing. This Special Issue aims to address these challenges.

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Message from the Editor-in-Chief

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