Special Issue

Symmetry in Multiphase Flow Modeling

Message from the Guest Editors

This Special Issue aims to explore the fundamental and applied aspects of symmetry in multiphase flows, with a particular emphasis on powder processing and handling operations. Symmetry principles—whether geometric, dynamic, or statistical—play a crucial role in understanding and optimizing complex multiphase systems involving gas–solid, liquid-solid, gas–liquid, and even three-phase flows. We invite contributions that address symmetry-invariant modeling, experimental validation, and computational approaches applied to industrial powder-related processes such as pneumatic conveying, mixing, sieving, and drying. These operations often exhibit symmetric behavior in flow patterns, phase distribution, or scaling laws, which can significantly enhance predictive accuracy and design efficiency. Topics of interest include but are not limited to: symmetric and broken symmetry flow regimes, scale-invariant models, symmetry-preserving numerical methods, and the role of symmetry in reducing model complexity. This issue seeks to bridge fundamental research with industrial applications, fostering advancements in the modeling and control of multiphase systems across engineering disciplines.

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About the Journal

Message from the Editor-in-Chief

Symmetry is ultimately the most important concept in natural sciences. It is not surprising then that very basic and fundamental research achievements are related to symmetry. For instance, the Nobel Prize in Physics 1979 (Glashow, Salam, Weinberg) was received for a unified symmetry description of electromagnetic and weak interactions, while the Nobel Prize in Physics 2008 (Nambu, Kobayashi, Maskawa) was received for the discovery of the mechanism of spontaneous breaking of symmetry, including CP symmetry. Our journal is named *Symmetry* and it manifests its fundamental role in nature.

Editor-in-Chief

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