



Kinetic Theory-Based Methods in Fluid Dynamics

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Message from the Guest Editors

The kinetic theory stems from the statistical mechanics established at the mesoscopic scale. In the area of fluid dynamics, the kinetic theory outperforms the macroscopic interpretations (represented by the Navier-Stokes equations) in theoretical generality: no restrictions from the continuum assumption. Various methods have been developed within the framework of kinetic theory. These methods play unique and important roles in almost all studies of fluid dynamics. However, their broader applications to engineering problems are often hindered by intrinsic limitations. Kinetic theory-based methods usually consume larger virtual memory than macroscopic methods. And high-fidelity simulations of flows beyond the continuum regime are still time-consuming. Therefore, developing robust and efficient kinetic theory-based methods are urgent needs in the fluid dynamics community.

This Special Issue aims to be a forum for presenting recent progresses in the very active area of kinetic theory-based methods in fluid dynamics. Papers dealing with the development of kinetic-theory-related numerical schemes and their applications to fluid dynamics problems are particularly welcome.





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Message from the Editor-in-Chief

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