



Recent Advances of Symmetry in Computational Fluid Dynamics

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Message from the Guest Editors

Dear Colleagues,

Computational fluid dynamics (CFD) plays an important role in a wide range of science and industrial applications. Consequently, achieving accurate and efficient CFD simulations has been an active research area for the past several decades. One effective approach to enhancing the accuracy and efficiency of these simulations is through the introduction of symmetry in flow geometry or boundary conditions. Furthermore, even in the area of machine learning (ML) for CFD simulations, symmetric constraints can also be introduced to improve the performance of ML models.

This Special Issue of *Symmetry* is dedicated to exploring the role of symmetry in computational fluid dynamics. We invite contributions on a wide range of topics that utilize symmetric conditions, including geometry, boundaries, periodic flow, heat transfer, turbulence modeling, design optimization, parameter studies, group theory applications, and machine learning models for CFD simulations.





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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.

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