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# Symmetry in Magnetohydrodynamic Flows and Their Applications

Guest Editor:

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## Message from the Guest Editor

Magnetohydrodynamics (MHD) is a field of study that incorporates electromagnetism and fluid mechanics. The flow of conducting fluids is substantially influenced by electromagnetic forces. This mechanism has been widely applied to various industries, such as steel-making processes, semiconductor crystal growth, liquid metal blankets in nuclear fusion reactors, electromagnetic pumps, electromagnetic levitation of drops, dynamo simulation of planets, and so on. Chandraskar studied the magnetohydordynamic stability of fundamental flows (Rayleigh–Bénard convection, Taylor–Couette flow and others). Nowadays, due to the developments of both the computational resources and its techniques, more complex MHD flows are being investigated through numerical analyses and experiments. This Special Issue focuses on various complex MHD phenomena and their applications, such as MHD turbulence, MHD flows caused by alternating magnetic fields (moving, rotating or oscillating magnetic fields) and high Hartmann number flows. It also includes breaks of flow symmetry due to various kinds of factors, such as shear stress, buoyancy, centrifugal force, and surface tension.

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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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