Special Issue

Symmetry and Gravitational Waves in Black Hole Physics

Message from the Guest Editors

- Black holes, the most dramatic predictions of General Relativity (GR), play a very important role in physics, astronomy, and mathematics. In astrophysics, massive stars collapse into black holes at the end of their lives due to the inability of the pressure of their internal matter to resist gravity. Their extremely strong gravitational fields warp spacetime to such a degree that even light cannot escape, creating environments where fundamental symmetries and dynamical processes collide.

- The recent developments of gravitational wave astronomy, epitomized by groundbreaking observations from LIGO, Virgo, and KAGRA (LVK), as well as LISA, Tianji, and Tianjin that are in development, have revolutionized our ability to probe black hole physics in detail. These observations not only confirm the existence of binary black hole mergers but also provide a unique laboratory for testing the symmetries that underpin spacetime structure, gravitational radiation, and quantum gravity.

- Please read more details here: https://www.mdpi.com/journal/symmetry/special_issues/5E094003KM

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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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