Special Issue

Symmetry/Asymmetry in Extra Dimensions and Brane Worlds

Message from the Guest Editor

The suggestion that our observed four-dimensional universe is a brane embedded in a higher-dimensional spacetime can provide new insights for solving the gauge hierarchy problem and cosmological constant problem. In brane scenarios, gravity is free to propagate in all dimensions, while all matter fields are confined to a 3–brane. In 1999, Randall and Sundrum proposed a brane world model with a warped extra dimension to address the hierarchy problem, which is now known as the RS model. There is only one extra spatial dimension, which is compactified on an S1/Z2 orbifold with a radius RED. When the extra dimension is infinite (RED tends to infinite), the four-dimensional gravity on a thin brane can be recovered. Most five-dimensional thick branes are generated by one or more scalar fields with kink-like and/or bump-like configurations, but a few brane models are based on vector fields or spinor fields. Thick branes also arise from pure geometry. Symmetric and asymmetric brane worlds can be constructed, respectively, by considering the symmetric and asymmetric warp factor of extra dimensions.

Guest Editor

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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.

Editor-in-Chief

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