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Broken Symmetry in Curved Spacetime and Gravity

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Message from the Guest Editor

Modern physics rests on a foundation of two fundamental theories: General Relativity (GR) and the Standard Model (SM). Each theory agrees extremely well with experiments in a certain domain. However, the predictions of the theories disagree with each other in certain situations. Therefore, GR and the SM are likely to be low-energy approximations to some more fundamental theory. A major current goal in physics is to determine the nature of this more fundamental theory.

Local Lorentz symmetry is an assumption of both GR and the SM. However, it may be possible for it to be broken in the more fundamental theory. Therefore, any observation of local spacetime symmetry violation would provide evidence for the more fundamental theory.

For this Special Issue of Symmetry, we seek to provide an overview of theoretical, phenomenological, and experimental issues in broken spacetime symmetry.

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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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