Special Issue

Cosmology and Quantum Vacuum

Message from the Guest Editor

This Special Issue, “Cosmology and Quantum Vacuum”, will focus on aspects of Theoretical Cosmology which are related with properties of the Quantum Vacuum. The longstanding question: Why we do not see vacuum fluctuations at cosmological scale? is still without an answer that is accepted by everybody. We have indeed detected an acceleration in the cosmic expansion which could be most easily understood as a vacuum effect (dark energy), but the numbers still do not match by many orders of magnitude. Alternative approaches to this problem involve cosmological models which modify the Einstein-Hilbert Lagrangian by adding terms of higher-order in the curvature. Terms of this kind should probably be there, since they appear in most attempts of calculating quantum corrections to General Relativity. At this stage, however, modified gravity models should be confronted both with fundamental theories and with the most recent astronomical data. There is a lot of work to be done to clarify all these questions and this Special Issue will be devoted to them.

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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