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# Lorentz Symmetry and General Relativity

Guest Editor:

**Prof. Dr. Chenggang Shao**
School of Physics, Huazhong University of Science and Technology, Wuhan 430074, China

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## Message from the Guest Editor

Lorentz symmetry is at the heart of Einstein's Theory of General Relativity, and it states that the outcome of any local experiment is independent of the velocity and rotation of the laboratory in which the experiment was performed. Motivated by ideas about quantum gravity, unification theories, some models of dark matter and dark energy and others, it has been conjectured that Lorentz Symmetry may be violated in the Planck scale and that many high-precision experiments have a potential sensitivity to Planck-suppressed effects.

Significant theoretical and experimental efforts have been made in testing Lorentz Symmetry since the time of Einstein. Theoretical aspects of this work include standard-model extension, modified theories of gravity and the Robertson–Mansouri–Sexl framework, and experimental aspects cover gravitational waves detections, atomic gravity, Lunar Laser Ranging, lock-comparison experiments, short-range gravity experiments, planetary ephemerides, binary pulsars, Very Long Baseline Interferometry and high energy cosmic rays, among others.

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2. Institute of Space Sciences (ICE-CSIC), C. Can Magrans s/n, 08193 Barcelona, Spain

## 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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*Symmetry* Editorial Office
MDPI, St. Alban-Anlage 66
4052 Basel, Switzerland

Tel: +41 61 683 77 34
www.mdpi.com

mdpi.com/journal/symmetry
symmetry@mdpi.com
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