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Symmetry, CPT and Astroparticles

Guest Editor:

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Message from the Guest Editor

Dear Colleague,

Charge–parity–time (CPT) violations and the study of particle and astroparticle physics constitutes one of the challenges of modern physics. Among all the fundamental symmetries, CPT in fact holds a special status as being the only symmetry which is known to hold for every fundamental interaction: breaking of P, CP, and T has in fact been directly measured, and all found to be in consistent agreement with CPT conservation. While a great variety of CPT tests is being performed in terrestrial laboratories, in testing masses, lifetimes, and other properties of particles, the recent role of the astroparticles and multimessenger physics can hardly be overestimated. Cosmic rays, gamma particles, gravitational waves, and neutrinos can be detected from astronomical sources to provide decisive hints about particle–antiparticle symmetry—one of the cornerstones of the CPT theorem. In addition, ...

Prof. Dr. Marco Giammarchi
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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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