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Symmetries and the Pauli Exclusion Principle

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Message from the Guest Editors

Dear Colleagues,

The Pauli Exclusion Principle, as a manifestation of the spin–statistics relation, is deeply connected to space–time symmetries. Possible violations or deformations of these symmetries may refect in violations of the Pauli Exclusion Principle. Recent experiments set strong limits on the probability that the principle gets violated. In this issue we shall focus on the relation between various symmetries and their possible violations or deformations and the consequences of the Pauli Exclusion Principle for various classes of fermions, such as (but not only): electrons, nucleons and neutrinos. In particular, we shall consider the CPT and Lorentz symmetries, as well as noncommutative theories, also inspired from quantum gravity scenarios. Recent experimental results from experiments searching for small violations of the Pauli Exclusion Principle will be discussed, together with the limits they impose on symmetries/asymmetries embedded in our theories about nature and the universe.

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Dr. Kristian Piscicchia
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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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