Special Issue

Symmetries in Quantum Mechanics and Statistical Physics

Message from the Guest Editor

Symmetry is a fundamental concept in science and has played a significant role since the early days of quantum physics. For example, the rotational symmetry of Coulomb interactions is key in the group theoretic classification of atomic spectra, and its dynamical SO(4) symmetry accounts for the accidental degeneracy of the H atom spectrum. In physics, symmetry characterises the invariance of a system under certain transformations, being either discrete like mirror symmetry or continuous like rotational symmetry. In mathematics, symmetries are described by group theoretic means. Symmetry methods are still powerful tools in contemporary problems of quantum mechanics and statistical physics, and they go beyond the classical Lie groups and algebras. Examples are the so-called supersymmetric quantum mechanics and the PT invariance of non-Hermitian Hamiltonians. In this Special Issue of *Symmetry,* we invite original contributions which utilise symmetry methods to understand and solve problems related to the keywords listed below. However, it is also open to other topics related to quantum mechanics and/or statistical physics where symmetry plays a key role.

Guest Editor

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About the Journal

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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