Special Issue

Quantum Information—Quantum Optics and Statistics

Message from the Guest Editors

Many phenomena in nature studied by physics are symmetric with respect to time reversal. This does not hold for phenomena described in statistical terms, which are associated with an increase of entropy. Despite the statistical interpretation of the quantum wave function, the evolution of pure quantum systems is unitary and thus symmetric with respect to time reversal, as long as no measurement is performed. The only exception is related to CPT symmetry in high energy physics. In this Special Issue, one focus will be on this time reversal symmetry of quantum physical systems. There is a close link to classical wave phenomena, and we intend to invite contributions also in this context. The time reversal symmetry of a quantum system is closely related to the predictability of its evolution and, thus, to quantum information science applications all the way to quantum computing.

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Deadline for manuscript submissions

closed (15 August 2022)

Symmetry

an Open Access Journal by MDPI

Impact Factor 2.2
CiteScore 5.3

mdpi.com/si/52327

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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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