

# Special Issue

## Finite and Continuous Symmetries in Quantum-Mechanical Theory

### Message from the Guest Editor

Starting from the celebrated works of Fock and Wigner on the symmetry of atomic and molecular spectra, the group theory played a crucial role in understanding degeneracies in energy lines and selection rules for transitions between energy levels. The Special Issue is designed to trace the modern developments stimulated by the aforementioned pioneering articles. Papers that are submitted to this Special Issue are expected to cover nonoverlapping approaches using irreducible representations of finite and continuous groups for the symmetry analysis of quantum-mechanical systems. Authors are especially encouraged to submit articles dealing with the invariance of Hamiltonians of a free molecule (or a molecule rotating in a crystal field) under feasible permutation rotations and the related quantum-mechanical clustering of rovibrational energy levels. Another broad topic covered by the issue is the application of Lie groups in quantum mechanics, including the use of potential algebras in the scattering theory, spectra-generating algebras, the algebraic treatment of shape-invariant potentials, and superintegrable systems in N-dimensional spaces.

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### Guest Editor

Dr. Gregory Natanson  
Independent Researcher, Silver Spring, MD 20904, USA

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### Deadline for manuscript submissions

closed (30 October 2025)



## Symmetry

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*Symmetry*  
Editorial Office  
MDPI, Grosspeteranlage 5  
4052 Basel, Switzerland  
Tel: +41 61 683 77 34  
[symmetry@mdpi.com](mailto:symmetry@mdpi.com)

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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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### Editor-in-Chief

Prof. Dr. Sergei Odintsov

1. ICREA, 08010 Barcelona, Spain

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

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