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Symmetry and Symmetry Breaking in Nuclei

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Message from the Guest Editor

Nuclei are very complex systems, without even going to the levels of quarks and gluons. They are many-body systems of strongly interacting protons and neutrons, which give rise to both the spin and isospin degree of freedoms. The nucleus is a self-organized substance with finite spatial extension, showing various shapes, spherical, prolate, oblate, and octupole deformations, derived by the Jahn–Teller effect. Thus, nuclei manifest unique properties under these symmetries of spin, isospin, and shapes. Recent developments of radioactive-beam facilities have expanded the opportunities for the study of various aspects of symmetries and their breaking in exotic nuclei, which may evolve into the extreme conditions for experimental study. In this Special Issue, we will address theoretical and experimental progress on the following topics: isospin symmetry and its breaking in nuclei; spin-Isospin symmetry and experimental evidence in nuclei; SSB in shapes and its coexistence in nuclei; chirality in triaxial nuclei; symmetry breakings under the extreme conditions of spin and isospin; dynamical symmetry and shape evolution.

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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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