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Symmetry Energy in Nuclear Physics and Astrophysics

Guest Editors:

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Message from the Guest Editors

Dear Colleagues,

In nuclear physics, symmetry energy is an important parameter in the equation of state describing the nuclear structure of heavy nuclei and neutron stars. Symmetry energy characterizes the variation of the binding energy when the neutron to proton ratio of a nuclear system is varied. Symmetry energy plays an important role in nuclear astrophysics, ranging from the structure of nuclei to gravitational collapse to neutron stars. This is one of the most important features of nuclear physics in general, since it is just related to the two-component nature of the nuclear systems. As such, it is one of the most relevant physical parameters that affect the physics of many phenomena and nuclear processes. Recently, a great amount of interest has been devoted not only to the nuclear matter symmetry energy at saturation density but also to its whole density dependence, which is an essential ingredient for our understanding of many phenomena. To date, the parameters of nuclear symmetry energy are tightly constrained by a concordance achieved from nuclear experiments, astrophysical observations, and ab initio theoretical calculations of neutron matter...

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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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