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Nuclear Symmetry Energy: From Finite Nuclei to Neutron Stars

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Message from the Guest Editors

Dear Colleagues,

Nuclear symmetry energy (NSE) is the basic regulator of the isospin properties of neutron-rich nuclei and neutron stars. It is expected to affect mainly the isovector properties of finite nuclei including the neutron skin thickness, the coefficient of the asymmetry energy in the Bethe–Weizsacker formula, etc. In addition, the density dependence of the nuclear symmetry energy is the main component of the equation of the state of neutron-rich nuclear matter. Actually, there are a variety of neutron star properties that are sensitive to NSE including the radius and tidal deformability of a neutron star, which influence gravitational signals from their mergers, the NS crust's thickness, the thermal relaxation time, the onset of the direct URCA process during the cooling of a neutron star, and the crust–core transition density and pressure.

In the last few years, there have been extended theoretical and experimental efforts for constraining the values of the nuclear symmetry energy and the slope parameter L close to the value of the saturation density of nuclear 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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