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Experiments and Theories of Radioactive Nuclear Beam Physics

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Message from the Guest Editors

Dear Colleagues,

There are about 250 stable isotopes of the 90 elements. Up to now, the number of radioactive isotopes produced in the laboratory is 3000~4000, and there may be 8000~10,000 as predicted by theory. Compared to the stable nuclei, new phenomena and new physics appear in the weakly bound nuclei far from the beta-stability line. It becomes a challenge to explain the exotic phenomena for the traditional nuclear theory built on the properties of stable nuclei. Thus, radioactive nuclear beam (RNB) physics has become one of the most important frontiers of nuclear science. Through systematic experimental and theoretical studies, the most important open questions in nuclear physics could be revealed and understood: the nuclear shell structure evolution with increasing isospin; clustering and halo structure; new forms of collective motion and shape coexistence in neutron-rich nuclei; the exotic radioactivity in nuclei close to the proton and neutron drip-line; the existence limit of nuclei; the synthesis of heavy elements and their influences on the properties of stars; etc.

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Special Issue

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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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