Special Issue

Symmetry in Particle Physics

Message from the Guest Editors

Particle physics is science about symmetries of our world. The Standard Model is the fundamental theory of microworld. Particle dynamics in the Standard Model obeys strict symmetry laws with explicit experimental consequences. Priority problems of particle physics based on the Standard Model are more accurate theoretical predictions, experimental measurements and data analysis, proof of existence or non-existence of supersymmetry, properties of top quark, exotic quark states and physics of neutrinos. The flavor symmetry is special among symmetries of the Standard Model. It is violated because of different quark masses. The beautiful picture describing mesons as quark-antiquark pairs has changed after the discovery of many charmonium- and bottomonium-like XYZ states not fitting in the quark-antiquark paradigm. Many other top quark properties can be directly measured and compared with theoretical predictions. And supersymmetric generalization of the Standard Model and other possible symmetries in particle physics remain intriguing. Last but not least, neutrinos play a specific role in the standard model and beyond. Study of their dynamics can lead to emergence of new physics.

Guest Editors

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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.

Editor-in-Chief

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