Special Issue

Symmetries/Asymmetries in Particle Physics

Message from the Guest Editor

The LHCb/LHC-CERN experiment specializes in the study of B hadrons, particles that contain a bottom quark or its antiparticle, and the researchers have developed expertise in measuring parameters that can be used to determine the probability that a quark will transform into another via a weak interaction. The CKM matrix is made up of four free parameters—like the masses of particles—that are measured in experiments. Measurements can be carried out via different processes to test the robustness of the Standard Model. The structure of the CKM matrix can be represented graphically by triangles, with the parameters represented by the lengths of the sides and the angles. This work is linked to work on the phenomenon of charge-parity (CP) violation, which is at the origin of differences in behaviour between matter and antimatter.

It is well understood that many of experimental and theoretical data pertaining to symmetries and asymmetries in particle physics have been obtained in the last 50 years . Individual authors and research groups are therefore invited to contribute current research to this special issue.

Guest Editor

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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.

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