Special Issue

Generalized Symmetries and Fractons in Gauge Theories

Message from the Guest Editors

Symmetries have fundamental roles in physical models. Recently a new class of symmetries, known as generalized symmetries, has attracted interest in the community, and collects those cases whose definition departs from the definition of ordinary symmetry. This generalization of the notion of symmetries can be explicitly realized in many instances exploiting Lagrangian field theory techniques, uncovering a rich and unexpected landscape of physical effects in condensed matter, high energy physics, and quantum gravity. A particularly relevant example is represented by a new kind of quasiparticles called “fractons”, which are characterized by restricted mobility. Thanks to their peculiar features, fracton models are becoming more and more popular in many areas of physics and mathematical physics, with applications. This Special Issue aims to collect contributions that share insights on these topics, highlighting the wide physical spectrum involved, and unifying them through the “fil rouge” of generalized symmetries.

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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.

Editor-in-Chief

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