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Higgs Bosons and Supersymmetry in High Energy Physics

Guest Editors:

Dr. Thomas Gajdosik
Institute of Theoretical Physics and Astronomy, Faculty of Physics, Vilnius University, Saulėtekio av. 3, 10257 Vilnius, Lithuania

Dr. Darius Jurčiukonis
Institute of Theoretical Physics and Astronomy, University of Vilnius, Saulėtekio av. 3, LT-10222 Vilnius, Lithuania

Dr. Vytautas Dūdėnas
Institute of Theoretical Physics and Astronomy, Faculty of Physics, Vilnius University, 9 Saulėtekio, LT-10222 Vilnius, Lithuania

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Message from the Guest Editors

Dear Colleagues,

The standard model of particle physics is currently the most accurate paradigm for the understanding of our world on the smallest scales under everyday conditions. The standard model itself has the Higgs mechanism at its core with the notion of a vacuum that exhibits the symmetries of the Lorentz group.

One example of underlying symmetry that motivates the notion of viewing the standard model as an effective field theory is supersymmetry. One can assume that supersymmetry represents the broken symmetry of nature and provides the standard model with the low-energy limit effective field theory, which results in restrictions for the parametrization of "beyond the SM" physics and even provides a "prediction" for the mass of the Higgs particle that was found in 2012.

This Special issue aims to explore and explain the constraints that symmetries enforce on the description of nature, specifically on the scalar sector of the standard model and its possible extensions.

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Editor-in-Chief

Prof. Dr. Sergei Odintsov
1. ICREA, 08010 Barcelona, Spain
2. Institute of Space Sciences (IEEC-CSIC), C. Can Magrans s/n, 08193 Barcelona, Spain

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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Contact Us

Symmetry Editorial Office
MDPI, Grosspeteranlage 5
4052 Basel, Switzerland

Tel: +41 61 683 77 34
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mdpi.com/journal/symmetry
symmetry@mdpi.com
𝕏@Symmetry_MDPI