



## Recent Advances of Symmetry in Cosmic Rays

Guest Editor:

**Dr. Luisa Arruda**

Laboratório de Instrumentação e  
Física Experimental de Partículas,  
Lisbon, Portugal

Deadline for manuscript  
submissions:

**31 August 2024**

### Message from the Guest Editor

Since their discovery by the Austrian physicist Victor Hess in 1912, cosmic rays have opened a new window on matter in the Universe, with a brand-new world of unknown particles unveiled. The positron, discovered in 1932, was the first antimatter particle. New particles followed such as the muon, the pion, the kaon and several more. Until the appearance of the first high-energy particle accelerators in the early 1950s, utilizing cosmic rays was the only means of probing these highly energetic particles. Nowadays, even with the development of powerful accelerators on Earth, cosmic rays remain a unique observatory from which to probe new areas of physics, whether looking for the missing antimatter in the Universe, understanding the dark matter quest, or unpicking fundamental interactions at ultra-high energies. In addition, the measurements of cosmic rays allows researchers to perform tests to assess possible violations of the Lorentz symmetry and the related CPT symmetry, and also...





an Open Access Journal by MDPI

## Editor-in-Chief

### Prof. Dr. Sergei D. Odintsov

1. Institució Catalana de Recerca  
i Estudis Avançats (ICREA),  
Passeig Luis Companys, 23,  
08010 Barcelona, Spain  
2. Institute of Space Sciences  
(ICE-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.

## Author Benefits

**Open Access:** free for readers, with article processing charges (APC) paid by authors or their institutions.

**High Visibility:** indexed within Scopus, SCIE (Web of Science), CAPlus / SciFinder, Inspec, Astrophysics Data System, and other databases.

**Journal Rank:** JCR - Q2 (*Multidisciplinary Sciences*) / CiteScore - Q1 (General Mathematics)

## Contact Us

---

*Symmetry* Editorial Office  
MDPI, Grosspeteranlage 5  
4052 Basel, Switzerland

Tel: +41 61 683 77 34  
www.mdpi.com

mdpi.com/journal/symmetry  
symmetry@mdpi.com  
X@Symmetry\_MDPI