Special Issue

Symmetry/Asymmetry in Quantum Chromodynamics (QCD)

Message from the Guest Editors

QCD, the theory of the strong force, features a complex interplay of symmetries and asymmetries. It adheres to Poincaré and SU(3) gauge symmetries. Idealized scenarios, like massless quarks, suggest global flavor and chiral symmetries, but these are approximate due to quark masses. Baryon number symmetry is key. QCD also exhibits asymmetries. The conformal anomaly breaks scale invariance, leading to asymptotic freedom. The chiral anomaly impacts chiral symmetry, linked to the η' meson and the strong CP problem. Quark masses break flavor and chiral symmetries. Spontaneous symmetry breaking explains hadron mass generation, with pions as approximate Goldstone bosons. These symmetries and asymmetries define QCD's structure and hadron properties.

Guest Editors

Prof. Dr. Joao Pacheco B.C. de Melo

Laboratorio de Fisica Teorica e Computacional, Universidade Cruzeiro do Sul and Universidade Cidade de São Paulo, Sao Paulo 01506-000, Brazil

Dr. George H.S. Yabusaki

Laboratorio de Fisica Teorica e Computacional, Universidade Cruzeiro do Sul and Universidade Cidade de São Paulo, Sao Paulo 01506-000, Brazil

Deadline for manuscript submissions

31 January 2027

Symmetry

an Open Access Journal by MDPI

Impact Factor 2.2
CiteScore 5.3

mdpi.com/si/232455

Symmetry
Editorial Office
MDPI, Grosspeteranlage 5
4052 Basel, Switzerland
Tel: +41 61 683 77 34
symmetry@mdpi.com

mdpi.com/journal/symmetry

Symmetry

an Open Access Journal by MDPI

Impact Factor 2.2
CiteScore 5.3

mdpi.com/journal/symmetry

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

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

Author Benefits

Open Access:

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

High Visibility:

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

Journal Rank:

JCR - Q2 (Multidisciplinary Sciences) / CiteScore - Q1 (General Mathematics)

MDPI