

## Special Issue

# Advances in Black Holes, Symmetry and Chaos

### Message from the Guest Editor

Black holes, as the most extreme and enigmatic objects in the universe, provide profound insights into the fundamental laws of physics. Their event horizons, singularities, and thermodynamic properties reveal surprising connections between gravity, quantum mechanics, and statistical mechanics. The holographic principle has improved our understanding of black holes, offering a dual perspective through lower-dimensional quantum field theories and uncovering the chaotic nature of black holes. Many quantum systems, particularly those related to black holes, demonstrate chaotic behaviors marked by thermalization, entanglement dynamics, scrambling, and spectral statistics. Quantum chaos bridges the complex dynamics of strongly correlated systems with the semiclassical dynamics near black hole horizons and the contributions of wormhole geometries. Symmetry is crucial for understanding the structure and dynamics of chaotic quantum systems and black holes.

---

### Guest Editor

Dr. Zhuo-Yu Xian

Institute for Theoretical Physics and Astrophysics and Würzburg-Dresden Cluster of Excellence ct.qmat, Julius-Maximilians-Universität Würzburg, 97074 Würzburg, Germany

---

### Deadline for manuscript submissions

closed (31 December 2025)



## Symmetry

---

an Open Access Journal  
by MDPI

---

Impact Factor 2.2  
CiteScore 5.2



[mdpi.com/si/225254](https://mdpi.com/si/225254)

*Symmetry*  
Editorial Office  
MDPI, Grosspeteranlage 5  
4052 Basel, Switzerland  
Tel: +41 61 683 77 34  
[symmetry@mdpi.com](mailto:symmetry@mdpi.com)

[mdpi.com/journal/  
symmetry](https://mdpi.com/journal/symmetry)





# Symmetry

---

an Open Access Journal  
by MDPI

---

Impact Factor 2.2  
CiteScore 5.2



[mdpi.com/journal/  
symmetry](https://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)