Special Issue

Nonlinear Dynamics and Symmetry: Topics and Applications

Message from the Guest Editor

This Special Issue focuses on the interplay between nonlinear dynamics and symmetry in mathematical models and real-world systems. Symmetries often underlie conservation laws, bifurcation structures, and the emergence of coherent patterns in nonlinear systems. Their presence (or breaking) can profoundly influence system behavior, stability, and long-term evolution. We aim to gather contributions that explore how symmetry principles can be used to classify, simplify, and better understand nonlinear dynamical phenomena across a variety of domains, including physics, biology, engineering, and social sciences. Topics of interest include group-theoretic methods in dynamical systems, equivariant bifurcation theory, symmetry-breaking instabilities, geometric mechanics, and invariant manifolds. Both theoretical developments and application-driven studies are welcome, especially those that reveal how symmetry considerations lead to novel insights, analytical simplifications, or enhanced numerical strategies.

Guest Editor

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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.

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