

Special Issue

Nonlinear Systems from Classical and Machine-Learning Perspectives: Modeling, Dynamics, and Applications

Message from the Guest Editors

Nonlinear phenomena are inherent to numerous physical systems and pivotal in modern science and engineering. In electronic circuits, communications, biology and neural processing, nonlinear dynamics produce behaviors such as multistability, bifurcation, chaos and hidden attractors—challenging traditional analytics while enabling new modeling, control and technological innovation. Recent advances in data-driven methods, especially ML and AI, have opened new avenues for studying nonlinear systems. Integrating these with classical analytical and numerical approaches enhances identification, prediction and real-time implementation, even for complex or partially observed systems. This Special Issue invites theoretical, computational and experimental works advancing nonlinear system understanding from classical and ML perspectives. Topics include (but not limited to) nonlinear/chaotic dynamics, complex/networked systems, fractional-order models, control/synchronization strategies, and physics-informed ML frameworks. Contributions on practical and interdisciplinary applications are highly encouraged.

Guest Editors

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Physics plays a crucial role in our understanding of the world and is of huge significance for the development of other sciences. This ensures that physics is always attracting heightened attention and is at the center of human interest. *Physics* is devoted to all aspects of physics and looks into news and progress of modern physics, seeking new horizons and future discoveries. The journal aims to provide an advanced forum for discussion of contemporary problems in physics and its development.

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