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# Nonlinear Science and Numerical Simulation with Symmetry

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## Message from the Guest Editors

Dear Colleagues,

Nonlinear science is a huge research area, which comprises a wide variety of topics in modern physics, mathematics, engineering, biology, etc. In most cases, the theoretical models of nonlinear systems with local interactions are based on ordinary or partial differential equations (ODEs or PDEs), or coupled systems of such equations. Nonlocal nonlinear models are typically represented by integral equations. A fundamental problem in this area is that, with the exception of a few celebrated integrable models, the underlying nonlinear ODEs, PDEs, and integral equations do not admit analytical solutions. Therefore, a majority of studies in nonlinear science rely on numerical simulations (which are often combined with the use of approximate analytical methods once exact solutions are no longer available). Many algorithms are used for the numerical solution of diverse nonlinear problems, with well-known examples including the split-step and Newton's methods for the dynamical and static settings, respectively...

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Special Issue

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## 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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