Slow-Fast Dynamical Systems

Guest Editor:

Deadline for manuscript submissions:
closed (31 January 2022)

Message from the Guest Editor

Dear Colleagues,

Slow–fast systems, i.e., nonlinear dynamic systems in which two or more variables are governed by very different time scales, appear in many branches of natural science. Examples are found in chemical systems (the most familiar of which is the Belousov–Zhabotinsky reaction), in models of the electrical activity of neuron and cardiac cells, population dynamics, plasma physics, lasers, and nonlinear optical systems, to name just a few. Mathematically, they are typically characterized by the existence of critical manifolds on which the slow dynamics takes place.

This Special Issue is intended to collect contributions on slow–fast dynamics at mathematical, numerical, and experimental levels, with models and experiments ranging from biology to chemistry to physics.

Topics of interest include, but are not limited to, canard explosions and excitability in higher dimensions, bursting and mixed-mode oscillations, symmetries in the context of singular perturbation problems, symmetry-breaking phenomena, model-reduction techniques, etc. Both research and review papers are welcomed.

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Special Issue

Editor-in-Chief

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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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