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Hamiltonian and Overdamped Complex Systems, Symmetry of Phase-Space Occupancy

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Message from the Guest Editors

Dear Colleagues,

Complexity naturally arises in nonlinear physics and elsewhere, for instance through processes of successive bifurcations generating complex spatiotemporal patterns, or in nontrivial configurations of the phase space of chaotic Hamiltonian systems possibly involving long-range interactions, where one typically can find a mixture of chaotic seas and regions with regular motion that can lead to statistical distributions with power-law and scale-free tails.

The same can occur in systems such as complex plasmas, superconductors or colloidal systems, which can be described by dissipative approaches including repulsive particles whose equation of motion, in the overdamped limit, takes the form of a first-order differential equations, where the velocity of the particles is proportional to the force over them. Additionally, in this case, for various kinds of repulsive potentials, anomalous distributions of the local density and of the velocities can be found, both analytically and numerically.

The aim of this Special Issue is to stimulate further investigations along these directions, particularly in connection with frameworks...

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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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