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Hamiltonian Thermodynamics as a Unifying Theory of Dynamical and Phenomenological Methods

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Deadline for manuscript submissions:
closed (31 March 2022)

Message from the Guest Editors

This is an important area of research if one considers that after more than a century of evolution of Hamiltonian theory, a modern geometrical (differential) description has been obtained, and important theorems and techniques for locating time invariant structures in phase space, i.e., constants of motion, have been found. Chemical reactions and spectroscopy have tremendously benefited from the application of these methods and the general investigation of the properties of highly excited molecules.

In the field of modeling multi-physics systems, a Hamiltonian theory named port-Hamiltonian systems theory has been developed with applications in mechanical, chemical, electromagnetic, hydraulic, and control domains. It is also worth mentioning the advances in quantum thermodynamics for modeling quantum mechanical systems–bath systems consistent with the principles of thermodynamics.

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Message from the Editor-in-Chief

The concept of entropy is traditionally a quantity in physics that has to do with temperature. However, it is now clear that entropy is deeply related to information theory and the process of inference. As such, entropic techniques have found broad application in the sciences.

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