

Special Issue

Mathematical Aspects in Non-equilibrium Thermodynamics

Message from the Guest Editors

Non-equilibrium thermodynamics is a relatively new field of research and beginning to be increasingly important in engineering applications as well. However, in addition to the many approaches developed in recent decades, all of them raise questions from a mathematical point of view, such as the proper definitions of initial and boundary conditions, analytical and numerical solution methods, as well as the geometrical background, which is a very interesting aspect. These questions cover numerous topics, such as the mathematical analysis of various thermodynamic approaches, the investigation of the resulting governing equations, symmetry analysis of the solutions, and how the numerical methods can be built on the geometrical background. The aim of this Special Issue is to offer the possibility to discuss and present up-to-date problems that may not be constrained only to the previously mentioned aspects but must be connected to non-equilibrium thermodynamics. Thus, in the present Special Issue, we aim to collect open mathematical questions and characteristics for different thermodynamic approaches; therefore, both original and review papers are welcome.

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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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