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Quantum Thermodynamics: Fundamentals and Applications

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Deadline for manuscript submissions:
closed (18 February 2024)

Message from the Guest Editors

The early investigations on engineering efficient classical heat engines paved the way for a fundamental understanding of thermodynamic regularities in the macroscopic world. Similarly, the current efforts toward designing energy-efficient quantum devices raise fundamental questions on the validity and possible modifications of the thermodynamic laws in the quantum domain, where quantum effects such as correlations, coherence and fluctuations can no longer be ignored. Thus, the two apparently independent paradigms of physics(viz., i) thermodynamics, developed to study the limitations of macroscopic phenomena; and ii) quantum mechanics, which describes microscopic systems) bring much to each other.

QT has been witnessing rapid developments by amalgamation from diverse branches of physics. The development of new tools and techniques to study strongly coupled open quantum systems are further revolutionizing this field. This Special Issue therefore solicits contributions (regular or review articles) which are directly related to QT or can enrich it (e.g., open quantum systems) from various disciplines of physics.

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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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