

Nonequilibrium Statistical Physics: Linear Irreversible Processes (Oxford Graduate Texts)

Quantum Thermodynamics

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Quantum thermodynamics is an emerging research field aiming to extend standard thermodynamics and non-equilibrium statistical physics to ensembles of sizes well below the thermodynamic limit, in non-equilibrium situations, and with the full inclusion of quantum effects. Fueled by experimental advances and the potential of future nanoscale applications this research effort is pursued by scientists with different backgrounds, including statistical physics, many-body theory, mesoscopic physics and quantum information theory, who bring various tools and methods to the field. A multitude of theoretical questions are being addressed ranging from issues of thermalisation of quantum systems and various definitions of "work", to the efficiency and power of quantum engines. This overview provides a perspective on a selection of these current trends accessible to postgraduate students and researchers alike.

Keywords: (quantum) information-thermodynamics link, (quantum) fluctuation theorems, thermalisation of quantum systems, single shot thermodynamics, quantum thermal machines

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