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PHYSICS

‘Many-body effects in quantum thermodynamics’

Monday 13th March, 3pm, Berry Lecture Theatre

Quantum thermodynamics takes advantage of thermal – and quantum – fluctuations to create engines and refrigerators of sizes well below the thermodynamic limit and properties still under discussion. Indeed, quantum thermodynamics extends concepts, such as heat, work, and entropy to few-particle quantum systems. Here thermodynamic probability distributions contain information about the possible transitions between eigenstates, as well as on thermal and quantum fluctuations. Identification of nonclassical features in work and heat distributions of interacting quantum systems is a topic under investigation. In this talk, we consider microscopic models for strongly correlated systems undergoing non-equilibrium finite-time and/or sudden-quench processes at finite temperatures. First, we will discuss the effect of many-body interactions and quantum phase transitions on thermodynamic probability distributions. Here we will be observing nonhomogeneous one-dimensional Hubbard chains driven across different quantum phase transitions. Later we will describe how quantum coherences generated via many-body interactions can influence the performance of few-particle quantum engines, and in particular how it can be used to boost their efficiency.

The Colloquium will be followed by tea and coffee in the staff common room. For further details please contact phys-exec-office@bristol.ac.uk

**Physics Colloquium
Spring Term 2023**

