



Einladung zum Vortrag

anlässlich des Fast Tenure Track Verfahrens
„Far-from-equilibrium Quantum Systems“

“Far-from-equilibrium thermodynamics using levitated optomechanics”

Nikolai Kiesel

Fakultät für Physik, Universität Wien

Termin: Freitag, 12.04.2019, 10:00 Uhr

Ort: Ludwig-Boltzmann-Hörsaal
9. Boltzmannngasse 5, EG

Abstract:

Optical tweezers provide a powerful tool to manipulate objects at the microscale. They find applications in biophysics, material science and quantum optics. Optically trapped nano- and microparticles also offer a well-controlled experimental model system in stochastic thermodynamics, for example to investigate Brownian heat engines. Combining optical micromanipulation in vacuum with cavity optomechanics offers completely new possibilities, like quantum engineering of a “reservoir of light” to substitute the thermal environment.

In my talk, I will present our first steps towards a versatile experimental platform for far-from-equilibrium thermodynamics in the classical as well as the quantum regime based on levitated cavity optomechanics. I will discuss how this enables, amongst others, a single particle heat engine that operates near maximum efficiency at low friction and in the quantum regime. Finally, I will present our experimental implementation of a method to determine free energy differences in a system that is thermally driven far from equilibrium using the William-Searls-Evans fluctuation theorem.

Im Rahmen des Vortrages findet eine Lehrprobe zum Thema
„Der (quantenmechanische) harmonische Oszillator“ statt.