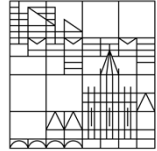


Physikalisches Kolloquium

Universität
Konstanz



Di 6.11.18
15:15 Uhr
14:45 Uhr, Kaffee/Tee
R 513



Prof. Dr. Jukka Pekola
Aalto University, Finland

Thermodynamics of superconducting quantum circuits



Superconducting circuits provide a platform for stochastic thermodynamics experiments in both classical and quantum regimes (“circuit Quantum Thermodynamics”). I first review the ideas, principles and examples of classical experiments utilizing single electron charge as the stochastic variable. I present experiments over the past several years on classical fluctuation relations and Maxwell Demons (MD), the latter in form of both non-autonomous Szilard Engines and autonomous MDs. In the second part of the talk I focus on open quantum systems formed of superconducting qubits and resonators, coupled to heat baths. In this context microwave photons carry the heat between the system and bath. I present experiments on quantum heat transport mediated by a transmon qubit, progress on superconducting quantum heat engines and refrigerators, and on detecting single microwave photon quanta. Success on the last topic would allow us to perform true stochastic thermodynamics experiments in the quantum regime, and to realize quantum MDs.