**Speaker:** Felix Riesterer, BSc Colloquium

**Title:** Thermodynamic Processes: The Swap Engine

**Abstract:**

In the presentation we will investigate simple model for a quantum thermodynamic process known as the swap engine. The model consists of two qubits (spin-1/2 particles) coupled to two heat baths at different temperatures, while the swap operation is realized through a spin-spin interaction. The process is separated into two strokes. In the first stroke the swap operation is performed while the particles are uncoupled from their heat baths. In the second stroke the particles are coupled to their heat baths again and relax into the equilibrium state. We construct a quantum master equation for this model for two different scenarios. The first scenario covers the ideal process, whereas in the second scenario the particles stay coupled to their heat baths during the swap operation for a more realistic picture of the process. From that we carried out numerical simulations in order to determine the relevant thermodynamic quantities, such as work, heat and the efficiency of the process.

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