

## Invitation to IQ<sup>ST</sup> Seminar

on Wednesday, May 9th, 2018, 2.15pm  
Ulm University  
Institute for Complex Quantum Systems, N25, 4413  
Albert-Einstein-Allee 11



**Dr. Philipp Strasberg**  
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Physics and Materials Science Research Unit

### **Quantum and information thermodynamics: A unifying framework based on repeated interactions**

Thermodynamic processes at the nanoscale force us to rethink the traditional role of an ideal heat reservoir, which is typically assumed to be macroscopically large, weakly coupled, memoryless and equilibrated. In this talk it will be shown how to incorporate a new type of reservoir into a thermodynamically consistent description. This type of reservoir consists of a collection of small, out-of-equilibrium objects put sequentially into strong contact with the system. This constitutes the framework of repeated interactions. We will see how this framework can be used to understand many different phenomena -- ranging from the micromaser to Maxwell's demon -- within one unified description. Finally, special emphasis is put on the question how to equip a quantum master equation with a consistent thermodynamic description, even if it has an apparent non-thermal character and does not result from a conventional perturbative treatment of the system-bath interaction.

Host: PD Dr. Jürgen Stockburger, Prof. Dr. Joachim Ankerhold, Institut für Komplexe Quantensysteme, Universität Ulm