

Speaker: Marvin Merk, University of Freiburg
Title: Exact master equation of the Caldeira-Leggett model - Towards quantum thermodynamics of the Caldeira-Leggett model
Date: Friday, August 07, 12 pm (s.t.)
Place: Seminar room 915

Title: Exact master equation of the Caldeira-Leggett model - Towards quantum thermodynamics of the Caldeira-Leggett model

Abstract:

We investigate the quantum thermodynamic behavior of the Caldeira-Leggett model, a paradigmatic microscopic model for an open quantum system. To cover arbitrary parameter regimes, including strong coupling and low temperature, we derive an exact time-convolutionless master equation for the open system states. This derivation is based on the Heisenberg equations of motion for the total system, which not only allow for an analysis of the system's time evolution, but also for the construction of an exact non-Markovian time-convolutionless master equation. Using this approach, we suggest an alternative and technically much easier derivation than the well-known one proposed by Hu, Paz and Zhang (1992) employing path integrals. Finally, we will give an outlook on the thermodynamic quantities we want to investigate as part of this ongoing master project.