

**Speaker:** Lidija Petrovic, University of Freiburg  
**Title:** Non-Markovianity in the Spin-Boson Model at Finite Temperature  
**Date:** Wednesday, September 4th, 14:30 pm  
**Place:** Seminar room 915

**Title:** Non-Markovianity in the Spin-Boson Model at Finite Temperature

**Abstract:**

This bachelor thesis aims to investigate the non-Markovianity in the spin-boson model at finite temperatures. The time evolution of the spin system is calculated using the hierarchical equations of motion approach. The non-Markovianity of the system is investigated as a function of the coupling strength. The results illustrate that non-Markovian dynamics are present for a coherently decaying spin at weaker couplings. Nevertheless, the dynamics at strong couplings are characterized by the absence of non-Markovian effects. The maximum value of non-Markovianity is observed to vary with temperature and cutoff frequency. An increase in temperature has a similar effect to a greater coupling strength, leading to faster dissipation of the system and a reduction in the maximum value of the non-Markovianity. The effects observed at higher cutoff frequencies exhibit similarities to those observed at lower frequencies. The primary difference lies in the decreased transfer of information from the environment to the system, consequently reducing the maximum value of non-Markovianity.