Seminarankündigung

Dienstag, 27. Juni 2017
17:15 Uhr

WSI, Seminarraum S 101

“NV centers in diamond – Magnetic sensing and quantum thermodynamics”

Nitrogen Vacancy (NV) centers in diamond have emerged over the past few years as well-controlled quantum systems, with promising applications ranging from quantum information science to magnetic sensing.
In this talk, I will first introduce the NV center system and the experimental methods used for measuring them and controlling their quantum spin dynamics. I will then present our work on using the NV centers as magnetic sensors, in the context of measuring quantitative, vectorial magnetic fields of geological samples (as a new tool for paleomagnetometry, in collaboration with Prof. Ron Shaar), and prospects for incorporating them into spintronic devices. Finally, I will describe the NV system as a platform for quantum thermodynamic experiments, presenting recent experiments on cooling of an electronic spin bath through polarization transfer from the NVs to the bath, based on an analog of the Hartmann-Hahn double-resonance scheme. In these experiments, we demonstrate enhanced polarization transfer from the NV to the bath, manifest as a two-order of magnitude reduction of the NV lifetime. I will also mention current and future efforts in studying thermalization control in driven systems and dissipative dynamics in driven open quantum systems, based on the NV platform.

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