

**Speaker:** Walter Hahn, Fraunhofer-Institut für Angewandte Festkörperphysik IAF, Freiburg

**Title:** Spin coherence in strongly-coupled spin baths in quasi two-dimensional layers

**Date:** Monday, June 10, 15:00 pm

**Place:** Seminar room 915

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Abstract:

Spin coherence is key for quantum-technology applications but the interaction of a spin with the surrounding bath typically leads to the loss of its spin coherence, i.e., its transverse polarization. In this talk, we will discuss the spin-coherence decay of NV-spins interacting with the strongly-coupled bath of nitrogen defects in diamond layers. In particular, we will discuss the following results. For thin diamond layers, the spin-coherence times exceed those of bulk diamond, thus allowing to surpass the limit imposed by high defect concentrations in bulk. Further, the stretched-exponential parameter for the short-time spin-coherence decay is governed by the hyperfine interaction in the bath, thereby constraining effective random-noise models. We will also discuss a novel method used for the above calculations, which is based on the cluster-correlation expansion applied to strongly-interacting bath partitions. Our results facilitate material development for quantum-technology devices.