



## **Walther-Meißner-Seminar**

**Walther-Meißner-Institut, Seminar Room 143**

**Date:** Thursday, 16 April 2020, 10:00 h (via Zoom conference)

**Speaker:** Leon Koch

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**Title:** Positioning and Investigation of Magnetic Nanoparticles

**Abstract:**

Superconducting Quantum Interference Devices (SQUIDs) are one of the best examples for the manifestation of macroscopic quantum coherence in the solid state. They combine the Josephson effect with the quantisation of magnetic flux in superconductors. In addition, especially nano scaled SQUIDs are highly sensitive sensors allowing us to transduce magnetic flux into a measurable voltage. Therefore, nanoSQUIDs are ideal for the investigation of magnetic nanoparticles located close to the SQUID. Magnetic Nanoparticles are highly interesting with a broad field of applications ranging from (quantum) information technologies to medical diagnostics and cancer therapy. However, handling and precise positioning of individual magnetic nanoparticles (MNPs) is demanding. During this talk a way to position single MNPs with a precision of a few nanometres is presented. To handle the MNPs electrochemically etched tungsten tips, micromanipulators and a dual beam FIB are used. Furthermore, the magnetisation reversal of an individual Fe<sub>3</sub>Ga-Nanoparticle, detected by a nanoSQUID, is discussed.