

Invitation to IQST Seminar

on Tuesday, June 28th, 2022 at 1 pm
Universität Stuttgart
Pfaffenwaldring 57, Raum 2.136

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Exploring novel superconductors with hybrid quantum circuits

Superconducting circuits (SCs) are quantum devices that display many of the effects of atomic systems but are made up of macroscopic microwave circuit elements. Their tunability, high coherence, and strong coupling has led to their rapid development as a leading implementation of quantum hardware. The same advantages also make these circuits ideal sensors, which can be designed to measure a material property with sensitivity limited by their quantum coherence. In this talk, I will focus on the use of SCs as probes of the superfluid density, by integrating them into the circuit through their kinetic inductance. Such measurements allow us to explore the superconducting gap structure of new unconventional superconductors using μm -sized samples, which have thus far been inaccessible. The talk will introduce the concepts of SCs and kinetic inductance, present preliminary superfluid density measurements of hybrid superconductors, and discuss the perspectives and scope of this novel sensing technique.