Post-Doc Position in NV center magnetometry for the solid state physics problems

The quantum materials group of the Condensed Matter Physics Department at Institute Jožef Stefan is looking for a postdoctoral candidate. Nitrogen Vacancy (NV)-center magnetometry at the nanometer scale has driven world-wide attention since enhanced spatial resolution and high sensitivity opens numerous possibilities to address statics and dynamics of local spins and/or magnetic field distributions as they appear in the physics of correlated-electron materials and devices.

In this project, we are developing low-temperature probe based on diamond NV centers with a specific aim to address condensed-matter problems of unconventional superconductivity. These NV centers are nanoscale spin qubits possessing long spin coherence time and high magnetic field sensitivity even at ambient conditions. We will utilize the NV center as a probe, enabling three dimensional mapping of superconducting and magnetic samples. In 2022, we are integrating this NV magnetometry with a low temperature cryostat targeting the low-temperature physcis of quantum materials. Although the NV centers exhibit excellent quantum properties at ambient condition, the quantum properties of the NV centers could be greatly enhanced at low temperatures. For instance, low temperature experiments will reduce thermal and mechanical drift, minimize phonon background, and lengthen spin coherence time, enabling sub-nanometer spatial resolution with greater magnetic field sensitivity. In this project we would like to apply such probe to investigate vortices in type-II superconductors, e.g. iron-pnicitide or alkali-doped fulleride superconductors.

The candidate will be fully involved in the instrumentation development and optimisation and then studies of target quantum materials. The position is initially open for the period starting on **1.1.2022 to 31.12. 2024.**

Requirement

- Ph.D. in Physics
- Excellent experimental skills
- Strong communication and interpersonal skills for interacting with a diverse group of researchers

Preferred requirements

- Experiences with optical measurement techniques
- Low temperature experiments
- Programming in Labview, MATLAB or Python

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