PhD position in solid state physics (correlated quantum materials)

A PhD position jointly supervised by the Institute of Solid State Physics of Technische Universität Wien (TU Wien) in Vienna and the Institut Laue-Langevin (ILL) in Grenoble is available on the following subject:

Entanglement and topology in Kondo systems

Quantum materials are increasingly pursued for next-generation quantum devices. In this PhD project, two particularly intriguing phenomena—multipartite entanglement and emergent topology—and their interplay will be studied. The work builds on the recent discoveries of high multipartite entanglement in a strange metal and a Weyl-Kondo semimetal phase emerging from strange metallicity.

The key experimental tool will be high-resolution inelastic neutron scattering under stringent conditions (very low temperatures, high magnetic fields, potentially high pressures). Experiments will be conducted primarily at the three-axis spectrometer ThALES at ILL, complemented by time-of-flight measurements. The project will include the development and application of advanced data-analysis techniques, such as precise background subtraction, determination of absolute units, and possibly polarization analysis.

Working conditions

The successful candidate will be based at the ILL, Grenoble, France but will be enrolled as a PhD student at TU Wien. The PhD student's time will be split between TU Wien and ILL in the most practical way to enable extended research stays at the ILL to contribute to beamline development and taking part in the ILL Graduate School while also being embedded in the scientific and academic environment of TU Wien. Here the candidate will be part of the Quantum Materials research unit at the Institute of Solid State Physics and have full access to its infrastructure for supporting research related to the neutron experiments—such as crystal growth, characterization, and complementary property measurements. The position is funded by the ILL for an initial period of three years, with a likely extension supported and managed by TU Wien.

Required skills

We are seeking a highly motivated candidate with an excellent background in solid state physics, strong experimental skills, and ideally, prior knowledge or experience with (neutron) scattering experiments.

Application

To apply, please send an email including your CV, a list of publications and presentations, a short statement of research experience and interests, and two letters of recommendation (emailed separately by the referees) to Prof. Dr. Silke Bühler-Paschen, paschen@ifp.tuwien.ac.at, Quantum Materials research unit, TU Wien.

For inquiries, please contact Silke Bühler-Paschen (paschen@ifp.tuwien.ac.at), as well as Arno Hiess (hiess@ill.fr) or Paul Steffens (steffens@ill.fr).

Working place: TU Wien, Vienna (www.tuwien.at), and ILL, Grenoble (www.ill.eu).
Starting date: As soon as possible.
Application deadline: Applications will be considered until the position is filled.