

PhD position to explore frustration effects in one- and two-dimensional spin systems

Jozef Stefan Institute, Ljubljana, Slovenia

The [quantum materials group](#) has an exciting opportunity for a PhD student position to investigate frustration effects in one- and two-dimensional spin systems.

Project description

Frustrated spin systems offer one of the most direct insights into the exotic nature of quantum mechanics. In them we can observe both disordered intertwined spin-fluid states as well as complex spin arrangements. One of the most intriguing topics is the spin-nematic phase, for which the theory predicts behavior similar to that in liquid crystals, still it has not yet been experimentally confirmed. Even more fascinating are the magnetic excitations in these systems. In ordered magnetic structures excitations can be described as collective fluctuations of individual magnetic moments, but in some cases, they can be much more complex and can only be describe by abstract quasi-particles.

In our group, we investigate these phenomena with neutron scattering and magnetic resonance techniques (NMR and ESR). With support of basic magnetic-characterization techniques this combination allows us to determine the leading magnetic mechanisms and perturbations in investigated materials. Such insights help us to understand and finally to describe unusual physical phenomena and associate them with structural properties of materials. In short, we not only explore new physical phenomena, but also develop guidelines for the optimization of the desired material properties.

We expect from you:

We are looking for a highly motivated, self-driven and, above all, curious candidate who has no fear of new and as yet unresolved physical puzzles. You have an **MSc degree** (or equivalent) in **physics** with strong interest and experience in quantum spin systems. A high level of written and spoken **English** and good **programming skills** are essential. An ideal candidate would additionally possess practical experience in collecting and analyzing neutron and/or NMR data.

You should expect from us:

- Mentoring, supervision and training.
- Access to state-of-the art infrastructure.
- A stimulating international research environment.

Appointment

We offer an exciting job at a dynamic research institute and an attractive package of fringe benefits. The position is for a period of 4 years in total for a PhD student. The first appointment is for half a year with the option for an extension for the remaining period pending on an evaluation.

Interested?

You can apply until 30 August via the application form. For details contact matej.pregelj@ijs.si