

PhD position in neutron quantum physics

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

Advanced neutron-interferometry

The neutron quantum physics group at the TU-Wien is using the Si perfect-crystal interferometer station at the ILL and has been making significant contributions to the fundamental experimental studies in quantum mechanics. In this PhD project, after completing the upgrade of the neutron interferometer beamline S18 and its characterization, two particularly interesting phenomena, i.e., emergence of non-classicality and the simultaneous weak and projective measurements will be studied.

The key experimental tool is the neutron interferometer instrument installed at the beamline S18. Recent notable developments of quantum information and communication technology have brought a new flavor of understanding fundamental perceptions of quantum mechanics. The use of matter-wave optical setups, in particular neutron interferometers, can open up new perspectives on the experimental accessibility of fundamental quantum measurements. This project will include the instrumental development of the neutron optics elements and application of advanced data-analysis techniques such as determination of weak-values, disturbance of quantum measurements, and quasi-probability distribution.

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 will work at the ILL to optimally embed the candidate in a broad neutron research environment at the ILL, to contribute to beamline development and taking part in the ILL Graduate School. 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 neutron and/or quantum physics and ideally with strong experimental skills and interest in precision and fundamental physics.

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. Yuji Hasegawa, yuji.hasegawa@tuwien.ac.at, Atominstitut, TU Wien.

For inquiries, please contact Yuji Hasegawa (yuji.hasegawa@tuwien.ac.at), as well as Hartmut Lemmel (hartmut.lemmel@tuwien.ac.at, lemmel@ill.fr) or Michael Jentschel (jentsch@ill.fr).

Working place: ILL, Grenoble (www.ill.eu).

Starting date: As soon as possible.

Application deadline: Applications will be considered until the position is filled.