The Chair of Semiconductor Nanostructures and Quantum Systems at Walter Schottky Institute, TU-München invites applications for PhD positions in Experimental Quantum Computing using Photons (m/f/d).

Description of the Positions

We are seeking a total of **three highly motivated PhD candidates** to join our teams working on sources and detectors for photon based quantum technologies and many-body quantum systems in nanostructured optical lattices in 2D-materials. The group led by Jonathan Finley, conducts state-of-the-art experimental research in the development of quantum materials, quantum information science and quantum optics using optically active semiconductors (www.wsi.tum.de)

As one of the successful candidates you will get the opportunity to develop cutting edge technologies allowing entanglement between spins and photons and perform collaborative research contributing to the grand goal of building universal, photon based quantum devices, including Q-computers, Q-simulators and modular components for Q-communication. Depending on your interests and skills you will engage with a set of specific research topics chosen from the following areas:

- Design, fabrication and testing of nanophotonic structures to facilitate high efficiency spin-photon coupling and linking using optical fiber sources…
- Understanding of the physics underpinning spin dephasing and decoherence in complex semiconductor noise environments…
- Development of modular sources and detectors for fiber and chip based photonic quantum computing…
- Imaging and control of real-time dynamics in many body quantum systems built using atomically thin 2D-materials with opto-electrical control…
- Exploration of chip-based quantum simulators based and application of machine learning techniques…

Your research will benefit from an excellent academic environment in the Munich area and will be embedded in a rapidly evolving quantum ecosystem in Bavaria. You will have opportunities to interact with partners and collaborators in academia and industry and to participate in ongoing Quantum Technology Initiatives such as the Munich Quantum Valley and the DFG cluster of excellence Munich Center of Quantum Science and Technology. Two of the three PhD positions is funded by the lighthouse projects supported by Munich Quantum Valley. The third is funded by a DFG project.

Your profile and qualification

- You hold a Master degree in Physics, Quantum Engineering, Chemistry, Micro- and Nanotechnology, Computer Science or a related field.

- You have a strong interest in experimental realizations of systems needed for the implementation of quantum technologies.
- You are dedicated to pursue a successful career in research, development or education either in academia or in industry.

Ideally, you have experience in one or more of the following areas: semiconductor quantum dots or color centers, trapped atoms or ions, superconducting circuits, experimental quantum optics and atomic physics, cavity quantum electrodynamics, micro- and nano-scale electronic devices and their fabrication (clean room, deposition, lithography, etching techniques), mesoscopic solid-state physics, low-temperature physics, operation of dilution refrigerators, CW and ultrafast optics, digital electronics, FPGAs and software development.

How to apply

We look forward to receiving your application documents sent to as a single pdf-file to Jonathan Finley (finley@wsi.tum.de) . Application documents should include

- a motivation letter,
- a curriculum vitae,
- certificates and transcripts,
- a list of publications,
- electronic copies of bachelor and master theses (as available),
- contact information of two references.

Please arrange for two reference letters to be sent directly to Jonathan Finley.

Applications will be considered immediately and until the three positions have been filled.

The Technical University of Munich promotes professional equality for women. Women are therefore expressly invited to apply. Severely disabled persons within the meaning of the Severely Disabled Persons Act will be given preferential consideration with the same professional qualification and personal suitability if the advertised position is suitable for severely disabled persons. If the applicant wishes, the Equal Opportunities Officer can be called in for the interview without any disadvantages for the applicant. Advertised positions are generally part-time capable, unless otherwise stated in the tender text.