PhD & Postdoc Positions
Optical Quantum Technologies

Friedrich Schiller University is a traditional university with a strong research profile rooted in the heart of Germany. As a university covering all disciplines, it offers a wide range of subjects. Its research is focused on the areas Light-Life-Liberty. It is closely networked with non-research institutions, research companies and renowned cultural institutions. With around 18,000 students and more than 8,600 employees, the university plays a major role in shaping Jena's character as a cosmopolitan and future-oriented city.

The Institute of Applied Physics is looking for several motivated and creative

PhD students and Postdoctoral Researchers (m/f/d)

as soon as possible for projects around single photon sources and optical quantum technologies.

Two-dimensional materials are currently a hot topic in science as they exhibit many unique properties. They promise to benefit diverse applications, ranging from electronics, optoelectronics, biomedicine, sensing and many more. Recently, it was discovered that defects in 2D materials can host stable quantum emitters, which emit single photons on demand. For wide-band gap materials such as hexagonal boron nitride (hBN), the defect states are well-isolated from the band edges, allowing for high quantum efficiencies and operation at room temperature. The single photon sources based on hBN have diverse applications; our research focus is on quantum communication, quantum imaging, and quantum sensing applications. The successful candidates will work on the combination of room temperature quantum emitters with integrated optical systems that tailor the photophysical properties. The demonstrator devices will be benchmarked and tested in realistic scenarios. One of our key experiments is the verification of our single photon source in space on a satellite and performing a test of quantum gravity theories. We are embedded in a large international collaborative network that gives us access to a broad variety of quantum technologies, including quantum memories and state-of-the-art quantum computers.

Your tasks:

- Development and characterization of optical systems (free-space and fiber)
- Fabrication and characterization of quantum emitters, assembly of heterostructures and nanooptical systems
- Emitter integration with resonant structures
- Simulations of devices / structures using wave-optical and ray-tracing methods
- Publishing / presenting results in scientific journals and conferences

Your qualifications (not all apply for applicants for the PhD positions):

- an above average PhD or master's degree in physics, photonics, nanoscience, or a related discipline
- experience with the development / operation of optical setups or nanofabrication and analysis is obligatory
- background knowledge in quantum optics and solid-state physics and / or 2D materials is obligatory
- genuine interest in planning, executing, and analyzing experiments and simulations
- experience with optical design, fiber optical systems, optical communication systems is a plus
- excellent communication skills in written and spoken English (German is a plus)

We offer:

- Work in an exciting and interdisciplinary research environment
- Participation in diverse experimental and theoretical research projects around optical quantum technologies
- Excellent equipment and infrastructure
- Participation in international conferences
- A unique collaborative environment
- Flexible working hours (flexitime and, if applicable, teleworking)
- A Graduate Academy for doctoral candidates and postdocs

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- A family-friendly working environment with a variety of offers for families: University Family Office 'JUniFamilie' and flexible childcare ('JUniKinder)
- University health promotion and a wide range of university sports activities
- Attractive fringe benefits, e.g. capital formation benefits (VL), Job Ticket (benefits for public transport), and an occupational pension (VBL)
- Remuneration based on the provisions of the Collective Agreement for the Public Sector of the Federal States (TV-L) at salary scale EG13 - depending on the candidate's personal qualifications-, including a special annual payment in accordance with the collective agreement.

We offer a full-time position (40 hours per week) for the postdoc and part-time position (75%, 30 hours per week) for the PhD student, limited initially for 3 years.

Candidates with severe disabilities will be given preference in the case of equal qualifications and suitability. We strongly encourage women to apply to increase the diversity in STEM subjects.

Are you eager to work for us? Then submit your detailed written application including the usual documents, preferably by email (one PDF file), stating the vacancy ID 476/2021 by 31.01.2022 or until the positions are filled to Dr. Tobias Vogl:

tobias.vogl@uni-jena.de

Since all application documents will be duly destroyed after the recruitment process, we ask you to submit only copies of your documents.