

CAN I COMBINE SCIENCE AND BUSINESS IN A SINGLE JOB?

YES.

We'll show you how at Fraunhofer.

STARTING NOW, THE FRAUNHOFER INSTITUTE OFFERS YOU AN EXCITING JOB OPPORTUNITY AS A:

MASTER THESIS / RESEARCH ASSISTANT IN APPLIED QUANTUM OPTICS AND QUANTUM INFORMATION PROCESSING

The Fraunhofer Institute for Applied Optics and Precision Engineering (IOF) in Jena conducts applied research in optical system technology on behalf of the industry and as part of publicly funded joint projects. The range of services offered by the Fraunhofer IOF includes system solutions, starting with new design concepts, through the development of technologies, manufacturing and measuring methods to the construction of prototypes and pilot series for applications in the wavelength range from millimeter to nanometer.

The Fraunhofer IOF is a pioneer in the field of applied research for optical quantum technology and offers innovative solutions for applications in science and industry wherever quantum-technological systems have the potential to enable revolutionary applications. Quantum states of light, in particular entangled photons, are an enabling resource in many applications in quantum technology: as low-noise probes in quantum imaging and sensing, as versatile information carriers in quantum information processing and quantum networks, or as tamper-proof padlocks in quantum cryptography.

For the Department of Precision Engineering at Fraunhofer IOF we are looking for candidates to join the »Photonic Quantum Communication« group as a MSc. student / research assistant. The group conducts applied research in the field of photonic quantum information processing, with emphasis on long-distance quantum communication in fibre networks and optical satellite links. We develop practical quantum technologies, in particular efficient entangled photon sources for quantum communication and quantum sensing, robust quantum state processing devices for deployment in existing optical telecommunication infrastructure, as well as scalable methods for the transmission of quantum states over long distances.

What you can expect from us

Quantum technology research combines a range of capabilities from optical engineering to applications in quantum communication and sensing. Photonics is a sophisticated quantum technology that leads to clear development paths, and provides more time for implementations and practical applications. Moreover, as a result, students will have opportunities in quantum information science, technology development, applied photonics, and even in industry.

The following topics are available for a master thesis / research assistant:

- improvement of pair generation efficiency and coherence times of polarization-entangled photon sources
- development of a short-wavelength photon source for quantum-enhanced sensing
- study of high-dimensional- and hyperentangled quantum states in long-distance quantum communication
- development of on-chip quantum sources and state processing tools
- engineering robust quantum hardware for quantum key distribution in telecom fibre networks and satellite links

What we expect from you

With studies of physics, laser technology, or a similar photonic study program successful candidates will be enthusiastic to work in a multi-disciplinary team with several collaborators in local research groups as well as international partners in academia and industry.

Prior knowledge in any of the following fields is preferable:

- optics & metrology, nonlinear optics, electronics, electro-optics, optical communications, laser technology, quantum optics, integrated optics
- basic scientific programming skills (e.g. MatLab, Python)
- Experimental skills and familiar handling in the laboratory

Remuneration according to Remuneration at student assistant level.

In case of identical qualifications, preference will be given to severely disabled candidates.

The Fraunhofer-Gesellschaft is committed to providing equal career opportunities for men and women.

Fraunhofer is Europe's largest application-oriented research organization. Our research efforts are geared entirely to people's needs: health, security, communication, energy and the environment. As a result, the work undertaken by our researchers and developers has a significant impact on people's lives.

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