

The Leibniz Institute for Solid State and Materials Research Dresden e. V. (IFW Dresden) conducts modern materials research on a scientific basis for the development of new and sustainable materials and technologies. The institute employs an average of 500 people from over 40 nations and, in addition to its scientific tasks, is dedicated to promoting young scientists and engineers. Further information at: <http://www.ifw-dresden.de>.

Doctoral Researcher Position (m/f/d) Engineering of compact quantum light sources for industrial applications

The Institute for Integrative Nanosciences (IIN), Leibniz IFW Dresden e.V. is one of the world leaders in the domain of semiconductor quantum light sources and provided pioneering contributions to the design, fabrication and characterization of self-assembled quantum dots. Quantum dots are a promising platform for the realization of devices of the quantum internet, such as sources of entangled photon sources, quantum repeaters and one-way quantum computing. In order to realize these devices, high quality droplet etched GaAs quantum dots with specific properties are used. Recently, we have demonstrated single source entanglement swapping and GHz-clocked emission using our leading quantum dot-based entanglement photon sources. We aim to deepen and diversify the investigations of quantum dot-based quantum information systems and therefore offer a PhD position on the topic:

“System development of efficient and ultra-compact quantum light sources based on GaAs quantum dots for industrial environments”

Your profile: We are looking for a highly motivated and team-oriented student (m/f/d), who holds a master's degree in physics or in an engineering discipline such as mechanical, optical, electronic or aerospace engineering. Basic knowledge of cryogenic systems, optics as well as mechanical engineering is desired. Additionally, a basic understanding of solid state and semiconductor systems as well as microstructuring techniques would be beneficial. The successful candidate (m/w/d) should be interested in applied sciences and enjoys practical work. Very good communication skills in written and spoken English are required.

Project description: The successful PhD candidate (m/f/d) will be responsible for the development of an ultra-compact entangled photon pair source system based on GaAs quantum dot devices. For this purpose, the candidate (m/f/d) will design and implement a custom integration solution of the optical quantum light sources in a cryostat in cooperation with industry partners. The candidate (m/f/d) will be responsible to integrate and operate three of these systems in quantum communication network testbed. The performance of these systems will be characterized and their long-term performance will be investigated/improved. The candidate (m/f/d) will join the "Solid-State Quantum Photonics" team of Dr. Caspar Hopfmann and will be able to develop his/her skills as a young scientist (m/f/d). The active participation of the candidate (m/f/d) in internal and external conferences, workshops and seminars is explicitly desired.

Conditions: The employment relationship, including remuneration, is based on the federal public employment standard (TV-L) according to pay group 13. We offer a weekly working time of 26 hours (65%). For exceptionally well qualified candidates an up to a 100% (40 hours) contract may be possible. The employment is initially limited to 1 year, an extension for another 2 years is possible.

The IFW would like to increase the number of women in the scientific field. Qualified women are therefore explicitly invited to apply. Severely disabled applicants (m/f/d) will be given preferential consideration in case of equal suitability and qualification.

Please send your application with informative documents (letter of motivation, curriculum vitae, proof of education, references, etc.) by **September 30, 2022**, exclusively in electronic form and in a PDF file (other formats will not be considered), quoting the **reference number 054-22-4320** to:

bewerbung@ifw-dresden.de.

For technical queries, please contact Dr. Caspar Hopfmann: c.hopfmann@ifw-dresden.de.

