

The Leibniz Institute for Solid State and Materials Research Dresden – in short IFW Dresden – is a non-university research institute and a member of the Leibniz Association. The IFW employs approximately 600 people (m/f/d) and one focus is on the training of young scientists besides enhancing fundamental and applied research development. At the highest international level, the IFW operates modern materials science on a scientific basis and makes the obtained results useful for the economy. The complex and interdisciplinary research work is carried out within the IFW by five scientific institutes, which are supported by a highly developed technical infrastructure. The IFW supports its employees (m/f/d) in reconciling work and family life and regularly submits to the berufundfamilie® audit. Further information at: <http://www.ifw-dresden.de>.

## **Doctoral Researcher Position (m/f/d) Development of bright GaAs quantum dot entangled photon sources**

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 to single source entanglement swapping 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:

**“Development of high quality charge-tunable GaAs quantum dot based entangled photon pair sources using molecular beam epitaxy”.**

### **Your profile:**

We are looking for a highly motivated and team-oriented student, who holds a masters degree in physics, nanoscience, chemistry or material science. Basic knowledge of solid state and semiconductor systems, thin film growth as well as optical lithography is welcome. The successful candidate is enthusiast about fundamental and material science as well as enjoys practical work. Very good communication skills in written and spoken English are required.

### **Project description:**

The successful PhD candidate will be responsible for the optimization of high quality droplet etched GaAs quantum dots using molecular beam epitaxy (MBE) as well as their structural and optical characterization using spectroscopic techniques. This task comprises the growth of GaAs quantum dots in different heterostructures to improve and control their properties according to the requirements. Recently, charge-tuning of these quantum dots embedded in micro-membranes using sophisticated lithography and growth techniques has been envisioned. Realizing such a device by employing lithographic sample processing techniques will be a secondary focus of the successful PhD candidate. The candidate will be integrated into the nanophotonics team of Prof. Oliver Schmidt and will be able to develop his/her skills as a young scientist.

### **Conditions:**

The employment contract is starting on 1st of September 2020 and is limited to 12 months. The salary is based upon the TV-L rules (EG 13; 50%).

The IFW would like to increase the proportion of women in science. Qualified women are therefore explicitly invited to apply. Severely disabled applicants (m/f/d) are given preferential treatment if they have the same qualifications.

If you are interested in the position, please send your application (in English) including a CV, a motivation letter describing the research career goals, skills and experience, copies of certificates and recommendation letters citing the **reference number 4000-1/20** no later than **16th of August 2020** as a single pdf file (other formats will not be accepted) exclusively to:

[bewerbung@ifw-dresden.de](mailto:bewerbung@ifw-dresden.de)

For further information please contact Dr. Caspar Hopfmann: [c.hopfmann@ifw-dresden.de](mailto:c.hopfmann@ifw-dresden.de).