

Research Staff Member / PhD Student or Postdoc - (m/w/d)

We look for a research staff member / Phd-Student for our Joint-Lab Photonic Quantum Technologies, which is part of the Integrated Quantum research division.

The proposed project will focus on the selective creation and modification of defects in two-dimensional (2D) materials, especially in graphene on silicon carbide. The defects will serve as nucleation centers for epitaxial growth of hexagonal boron nitride (hBN) constituting a platform for the scalable fabrication of 2D van der Waals heterostructures. Such heterostructures are expected to lead to atomically thin electronic sensors or devices.

The defects are introduced by localized material removal upon focused He ion beam impact. This technique is mask-free therefore reducing contamination and relies on the direct control of a focused ion beam in a He ion microscope. Together with our collaboration partners the fabricated van-der-Waals heterostructures will be characterized using atomic force and Kelvin probe force microscopy concerning the structural and electronic properties. The possibility of in-situ or ex-situ termination of the defects will be explored. Placement and chemical termination of the defects shall be optimized such that first device prototypes (here: quantum Hall devices) can be fabricated. The epitaxial growth, the device fabrication and the modeling of defect creation and termination are carried out in a complementary part of the project.

The project is funded by the Leibniz Association within the framework Collaborative Excellence relying on close collaboration with our partners of the Paul Drude institute (epitaxy, device fabrication) and of the Helmholtz-Zentrum Dresden-Rossendorf (modeling).

Applicants are expected to hold a very good (top 20%) degree (Master or Diploma) in Physics with in-depth knowledge in electrodynamics and solid-state physics.

We are looking for a highly motivated student with strong problem solving skills, the ability to work independently and good organizational skills. Knowledge in Python programming, scanning electron microscopy or focused ion beam patterning are a plus. Good English is mandatory.

The position can be filled immediately and is initially limited to **2 years**. Remuneration is based on TVöD (German federal government standard pay scales). Qualified women are particularly encouraged to apply. Severely disabled people with the same qualification will be given preference.

Interested? Then we look forward to receiving your online application. To apply, please click on "Apply online" and send us your complete application documents by **15.11.2022**.

If you have any questions about the application, please contact Mrs. Katja Höflich,
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Profile

The Ferdinand-Braun-Institut gGmbH, Leibniz-Institut für Höchstfrequenztechnik is a leading international research institute that studies diode lasers, LEDs and microwave devices.

On the basis of III/V semiconductors, it researches and implements components and systems for applications in communications, traffic and production technology, medicine and biotechnology. It covers the entire value chain from design to ready-for-delivery systems.

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