

PhD Position: Nanoelectronics from bottom-up synthesized graphene nanoribbons

The Nanoelectronics group in the Department of Synthetic Materials and Functional Devices at the Max Planck Institute for Microstructure Physics in Halle (Saale), Germany, is seeking a motivated PhD to work on the project of **Nanoelectronics from bottom-up synthesized graphene nanoribbons**. Ideal candidates will have expertise in nanoelectronics, including nanofabrication and charge transport.

Bottom-up synthesized graphene nanoribbons (GNRs) offer precise control over edge structures and topology, surpassing traditional top-down nanofabrication methods. This project seeks to develop an atomic-scale electronics platform leveraging GNRs for next-generation semiconductor applications. With semiconducting properties ideal for scaled logic transistors and unique magnetic and spin-polarized edge states promising advances in spintronics, GNRs represent a transformative opportunity. In this project, we will explore the novel fundamental transport physics of graphene nanoribbons and related carbon nanostructures.

Your tasks

- Lead the development of novel electronic devices based on bottom-up synthesized graphene nanoribbons.
- Perform nanofabrication and charge transport measurement on these novel nanodevices.
- Collaborate closely with other members of the department to advance the new functional nanoelectronic devices.
- Drive the design and optimization of experimental setups, including nanofabrication tools, transport measurement tool, and related programming script.
- Disseminate your experimental findings through publications in scientific journals and oral presentations at international conferences and workshops.

Your profile

- Hold an M.Sc. or B.Sc. degree in physics, electrical engineering, materials science, or a related discipline.
- Ideally experience with nanofabrication and experimental condensed matter physics, particularly in electron beam lithography, charge transport measurements, and cryogenics.
- Understanding of charge transport physics, such as semiconductor and quantum transport.
- Possess programming skills (e.g., MATLAB and Python,) for data analysis and experimental control.
- Communicate effectively and thrive in a collaborative research environment.
- Proficiency in English scientific writing, including but not limited to the preparation of scientific journal articles.

We offer

- Access to leading research groups in the emergent field of quantum materials and devices.
- Competitive salary package aligned with your qualifications and experience.
- Access to cutting-edge research facilities and resources at the Max Planck Institute of Microstructure Physics.
- Opportunities for professional growth, networking, and international collaboration.

Additional information:

The positions are available immediately, although the start date can be negotiated. The initial contract duration is 36 months for the PhD position. The contract can be extended for at least another 12 months based on your performance.

The Max Planck Society is Germany's premier research organization dedicated to basic research and to supporting and developing early career scientists. It offers an excellent infrastructure and a very international environment that enables research at the highest level. The Max Planck Society seeks to increase the number of women in those areas where they are underrepresented and therefore explicitly encourages women to apply.

Your application

Please send your application Dr. Jian Zhang (jian.zhang@mpi-halle.mpg.de) including the following documents:

- A cover letter
- Your CV, including a publication list
- Contact details of two scientists who can provide references