Freie Universität Berlin - Fachbereich Physik - SFB 1772: Heterostrukturen aus Molekülen und zweidimensionalen Materialien

Research assistant (praedoc) (m/f/d)

with 75%part-time job limited to 30.06.2029 salary grade (Entgeltgruppe) 13 TV-L FU
reference code: CRC-PhD2026

City: Berlin; Starting date (earliest): At the earliest possible; Duration: befristet bis 30.06.2029; Remuneration: Entgeltgruppe 13 TV-L FU; Reference number: CRC-PhD2026; Closing date: 27/01/26

Working field

Are you passionate about cutting-edge fundamental research at the intersection of 2D materials and molecular nanoscience? Are you looking to pursue your PhD in an excellent, interdisciplinary research environment at a leading German university? If so, we invite you to apply!

The newly established Collaborative Research Center CRC 1772 "mol2Dmat" investigates novel collective states and quantum phenomena in heterostructures of molecules and two-dimensional materials. Our interdisciplinary consortium brings together 20 research groups from Freie Universität Berlin, Humboldt-Universität zu Berlin, Technische Universität Berlin, and the Max Planck Institute in Hamburg. Our work combines physics, chemistry, and materials science – pushing the frontiers of quantum materials research. The Bolotin research group in the Physics Department of Free University Berlin specializes in nanoscale electronics and optoelectronics of two-dimensional materials and heterostructures. Our focus is to find new ways to manipulate these materials to build systems with designer Hamiltonians – and enable new quantum technologies. Our main experimental tools include nanofabrication, electrical transport measurements, static and time-resolved optoelectronic measurements. Our unique strengths are platforms for nanomechanical manipulation, approaches to reach high carrier densities and electric fields, and techniques to control 2D moirés in situ.

Job description:

You will work within the Collaborative Research Center “Heterostructures of Molecules and 2D materials”. In that center, experimental and theoretical research groups from physics and chemistry collaborate to develop a new type of matter – organic molecules interfaced with two-dimensional material. Within the Bolotin research group, your project will be to explore a new type of excitons – interlayer hybrid excitons -- in the molecule/2D heterostructures.

The objectives will be:

- Fabricate hybrid structures and integrate them with field-effect transistor geometry
- Prove the interlayer character of the excitons via field-effect transistor measurements, and explore inter-excitonic coupling
- Drive system toward the regime of excitonic condensation and explore the regime of excitonic coherence – potentially culminating in the elusive Excitonic Insulator state.

Requirements

Requirements:
Master's degree in natural sciences (Physics or related fields)

Desirable:

- Hands-on experience with 2D materials, nanofabrication approaches (e.g., lithographies, microscopies)
- chemical techniques and experience with organic chemistry (desired)
- Building and developing an experimental setup from scratch
- numerical simulations and computer programming (e.g., Python and LabVIEW)
- Developing back-of-the-envelope estimates for complex physical problems.

Application

Applications should be sent by e-mail, together with significant documents (motivation letter, CV, MS/BS transcripts, and MS thesis), indicating the **reference code, no later than**
January 27th , 2026 in PDF format (preferably as one document) to Prof. Dr. Kirill Bolotin: applications@crc1772.de or postal to

Freie Universität Berlin
Fachbereich Physik
SFB 1772: Heterostrukturen aus Molekülen und zweidimensionalen Materialien
Herrn Prof. Dr. Kirill Bolotin
Arnimallee 14
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With an electronic application, you acknowledge that FU Berlin saves and processes your data. FU Berlin cannot guarantee the security of your personal data if you send your application over an unencrypted connection.
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More information at https://stellenticket.de/200648/BUA/
Offer visible until 27/01/26