Freie Universität Berlin - Fachbereich Physik - Institut für Experimentalphysik

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

with 75% half-time job limited to 4 years salary grade (Entgeltgruppe) 13 TV-L FU
reference code: CCE-PhD2026_Bolotin

City: Berlin; Starting date (earliest): At the earliest possible; Duration: befristet auf 4 Jahre; Remuneration: Entgeltgruppe 13 TV-L FU; Reference number: CCE-PhD2026_Bolotin; Closing date: 02/02/26

Working field

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 timeresolved optoelectronic measurements. Our unique strengths are platforms for nanomechanical manipulation, approaches to reach high carrier densities and electric fields, and techniques to control 2D moires in situ.

Job description:
You will work within the recently founded Cluster of Excellence "Center for Chiral Electronics". In that cluster, more than 25 research groups from physics, chemistry, and engineering collaborate to exploit materials' chirality (the difference between a material and its mirror image) to store, manipulate, and transport quantum and classical information. Your project within the Bolotin research group will be to develop a new class of 2D material heterostructures with on-demand tunable chirality. To accomplish this, you will develop a nanomanipulation setup to stack and twist 2D materials inside a cryostat, an optical "quantum twist microscope". Using this technique, you will study emergent structural chirality in 2D magnetic, excitonic, and spin systems. You will also create hybrid 2D material/molecular systems and study the Chirality Induced Spin Selectivity (CISS) effect in them.

The main experimental tools will be a new 2D material nanomanipulation platform, static and time-resolved optical spectroscopies, and nanofabrication approaches.

- Work in one of the most active research fields with a flourishing international community, in Berlin, one of the most vibrant cities in the world.

- Broad support through the Cluster of Excellence graduate school programs.
- Rich infrastructure: top nanofabrication, spectroscopy, and microscopy facilities.

Requirements

Requirements:
Master's degree in natural sciences (Physics or related fields)
(Professional) Experience:
Hands-on experience with 20 materials, nanofabrication approaches (e.g., lithographies, microscopies) or optical spectroscopies (e.g., ultrafast or Raman spectroscopies)

Desirable:

- Scanning probe techniques; cryogenic techniques
- 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, indicating the **reference code, no later than February 2nd , 2026** in PDF format (preferably as one document) to Prof. Kirill Bolotin (bolotini@zedat.fu-berlin.de) or postal to

Freie Universität Berlin
Fachbereich Physik
Institut für Experimentalphysik
Herrn Prof. Dr. Kirill Bolotin
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More information at https://stellenticket.de/200646/BUA/
Offer visible until 02/02/26