Paul-Drude-Institut für Festkörperelektronik (PDI) - https://www.pdi-berlin.de/

Paul-Drude-Institut für Festkörperelektronik

PDI is a research institute in Berlin, Germany. We perform basic and applied research at the nexus of materials science, condensed matter physics, and device engineering.

Hybrid two-dimensional materials: fabrication and investigation of heterostructures from ferromagnetic and non-magnetic materials

Master Thesis Topic, Semiconductor Spectroscpy

City: Berlin; Starting date (earliest): At the earliest possible; Duration: 1 year; Remuneration: 13,90€/hour; Closing date: 31/03/26

Tasks

2D-Materials have gained tremendous attention, at the latest, since the Nobel price was awarded to
A. Geim and K. Novoselov in 2010 for the isolation and investigation of single layer graphite, “graphene”, which was theoretically predicted to be thermodynamically instable.
Ever since, many other layered structures have been identified and their single-layered crystals isolated and studied. Furthermore, careful but simple mechanical manipulation has been developed, allowing to fabricate multi-layered meta-materials, unknown to nature.

In this project we aim to investigate the heterostructures created from magnetic and non-magnetic layered materials. A prime candidate for the magnetic material is FeGeTe3-5 (FGT), as it is ferromagnetic, even at room temperature, and its magnetization remains out-of-plane without external fields. This material can be grown in-house, yielding the possibility to grow specific material combinations or to provide FGT as a substrate to transfer arbitrary materials, giving a wide choice of parameters to tune the meta-materials properties.
We are currently designing a transfer-station for 2D-materials to be operated in a glovebox, in which the Master’s student can take part in, learning about optics and the alignment of optical systems.

Requirements

Required Qualifications and Skills:

1. Solid state physics
2. Knowledge about spin dynamics is a plus
3. Patience and dedication

What we offer

Opportunities and Benefits:

- Collaboration opportunities: The project is part of the DFG priority program 2244: 2D Materials –
  Physics of van der Waals [hetero]structures.
- Access to state-of-the-art facilities and experts in the respective fields to learn from
- Co-authorship of a scientific publication is highly likely
- Mater’s students will be offered a one-year contract.

Application

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More information at https://stellenticket.de/201885/BEUTH/
Offer visible until 26/03/26