

TUD Dresden University of Technology, as a University of Excellence, is one of the leading and most dynamic research institutions in the country. Founded in 1828, today it is a globally oriented, regionally anchored top university as it focuses on the grand challenges of the 21st century. It develops innovative solutions for the world's most pressing issues. In research and academic programs, the university unites the natural and engineering sciences with the humanities, social sciences and medicine. This wide range of disciplines is a special feature, facilitating interdisciplinarity and transfer of science to society. As a modern employer, it offers attractive working conditions to all employees in teaching, research, technology and administration. The goal is to promote and develop their individual abilities while empowering everyone to reach their full potential. TUD embodies a university culture that is characterized by cosmopolitanism, mutual appreciation, thriving innovation and active participation. For TUD diversity is an essential feature and a quality criterion of an excellent university. Accordingly, we welcome all applicants who would like to commit themselves, their achievements and productivity to the success of the whole institution.

The **Collaborative Research Centre (CRC) 1415 "Chemistry of Synthetic Two-Dimensional Materials"** is seeking to employ one student per project as

**Student Assistant** (m/f/x) (max. 10hrs./week)

starting **as soon as possible**. The position is limited to 12 months. The period of employment is governed by the Fixed Term Research Contracts Act (Wissenschaftszeitvertragsgesetz – WissZeitVG) as well as the Higher Education Act in the Free State of Saxony (Sächsisches Hochschulgesetz – SächsHSG) in conjunction with the TdL guidelines (collective bargaining association for the German federal states) for Student Assistants and Research Assistants dated February 28, 2024.

**About the CRC 1415:** The CRC 1415 aims for the development of novel synthetic two-dimensional materials (2DMs) and bridges the research areas A) material synthesis, B) structural and property characterization, and C) theory. In terms of the synthesis of 2DMs, the CRC is focusing on 1) the bottom-up synthesis of layer-stacked crystalline materials followed by exfoliation into thin nanosheets and assembly into 2D heterostructures and 2) the direct synthesis of single-layer or few-layer 2DMs and their 2D heterostructures *via* solution-based construction. Furthermore, the CRC focus on developing new or optimizing established *in-situ* and *ex-situ* characterization methods to analyse the structure and physical and chemical properties of the synthetic 2DMs. Finally, the CRC strives to develop and use advanced theoretical methods and models to predict the 2DM's formation and their chemical and physical properties. Additionally, the central project "Sustainable Research Data Management" elevates systematic managing and handling of research data. For detailed information about all research projects and the principal investigators involved, the candidates should visit the CRC website (<https://tu-dresden.de/mn/chemie/sfb1415>) or contact the program office ([crc1415@tu-dresden.de](mailto:crc1415@tu-dresden.de)).

#### **Research area A – Material Synthesis**

**Project:** A01  
**Project title:** 2D Conjugated Polymers:  $\pi$ -Conjugation, Nontrivial (Opto)Electronic and Magnetic Properties  
**Principal investigator:** Prof. Dr. Xinliang Feng  
**Task:** academic support, esp. assistance in the synthesis and characterization of functionalized monomers, linear polymers and layered 2D conjugated polymers.

**Project:** A03  
**Project title:** On-Liquid Surface Synthesis of 2D Polymers and Their van der Waals Heterostructures  
**Principal investigator:** Prof. Dr. Xinliang Feng  
**Task:** academic support, esp. support the air-liquid interface synthesis of 2D polymers and 2D polymer heterostructures.

**Project:** A11  
**Project title:** 2D Networks and Heterojunctions with Controllable Morphology from Nanosheet Inks  
**Principal investigator:** Dr. Kevin Synnatschke  
**Task:** academic support, esp. assistance in the Langmuir-type technique for depositing 2DMs. Study how optical properties change for different film morphologies.

#### **Research area B – Structural and Property Characterization**

**Project:** B04  
**Project title:** Potential Landscape and Electronic Properties of Twisted and Curved 2D Materials  
**Principal investigator:** Prof. Dr. Axel Lubk  
**Task:** academic support, esp. focus on revealing the atomic structure and potential landscape in real space.

**Project:** B06  
**Project title:** Local-Scale Optoelectronics of Synthetic 2D Materials  
**Principal investigator:** Prof. Dr. Lukas Eng  
**Task:** academic support, esp. assistance in the Kelvin probe force microscopy and scattering-type near-field optical microscopy measurements.

**Project:** B08  
**Project title:** Mechanistic Insights into Electrocatalytic 2D Framework Materials *via In-Situ* Vibrational Spectro-Electrochemistry  
**Principal investigator:** Prof. Dr. Inez Weidinger  
**Task:** academic support, esp. for the mechanical characterization of 2DMs with focus on strain engineering of (opto)electronic properties.

**Project:** B10  
**Project title:** Revealing Ion Transport and Storage Properties of 2D Materials  
**Principal investigator:** Dr. Minghao Yu  
**Task:** academic support, esp. support in concentration- and electric field-driven permeation measurements to evaluate the ion transport properties of 2D polymers.

## Research area C – Theory

**Project:** C06  
**Project title:** Magnetism and Electrostatic Gradients in 2D Polymers and Their Heterostructures  
**Principal investigator:** Prof. Dr. Thomas Heine  
**Task:** academic support, esp. support in setting up computational protocols, in making high-quality figures, and in preparing 3D printed structure models.

**Project:** C07  
**Project title:** Accurate Prediction of Vibrational Spectra for 2D Materials  
**Principal investigator:** Dr. Dorothea Golze  
**Task:** academic support, esp. support calculating vibrational spectra of 2DMs.

**Project:** C08  
**Project title:** Functional 2D Heterostructures by Data-Driven Design  
**Principal investigator:** Dr. Rico Friedrich  
**Task:** academic support, esp. assistance the high-throughput calculations of oxide and 2DM interfaces.

## Central Projects

**Project:** INF  
**Project title:** Sustainable Research Data Management  
**Principal investigator:** Prof. Dr. Wolfgang Nagel  
**Task:** academic support, esp. support the encompass of complex research data management structures, requirement analysis and preparation of training material.

## General requirements

- enrolled student at a university,
- independent and structured working attitude,
- interested in contributing to an excellent interdisciplinary research project with focus on novel synthetic 2D materials

## We offer:

- excellent student support & supervision,
- flexible working hours

We welcome applications from candidates with disabilities. If multiple candidates prove to be equally qualified, those with disabilities or with equivalent status pursuant to the German Social Code IX (SGB IX) will receive priority for employment.

Please submit your application including a CV with a note about your research interest(s) by **September 30, 2024** (stamped arrival date of the university central mail service or the time stamp on the email server of TUD applies), preferably via the TUD SecureMail Portal <https://securemail.tu-dresden.de> by sending it as a single pdf file to [crc1415@tu-dresden.de](mailto:crc1415@tu-dresden.de) or to: **TU Dresden, Fakultät Chemie und Lebensmittelchemie, Sonderforschungsbereich 1415, Helmholtzstr. 10, 01069**

**Dresden, Germany.** Please submit copies only, as your application will not be returned to you. Expenses incurred in attending interviews cannot be reimbursed.



---

**Reference to data protection:** Your data protection rights, the purpose for which your data will be processed, as well as further information about data protection is available to you on the website: <https://tu-dresden.de/karriere/datenschutzhinweis>.