

Technische Universität Dresden - Research Training Group 2861 “Planar Carbon Lattices”



TUD Dresden University of Technology, as a University of Excellence, is one of the leading and most dynamic research institutions in Germany. It offers a modern, interdisciplinary, and international working environment in the city of Dresden, one of Germany's most vibrant places. 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 Faculty of Chemistry and Food Chemistry offers, subject to the availability of resources, a position as

Research Associate / PhD Student (m/f/x)

(subject to personal qualification employees are remunerated according to salary group E 13 TV-L) starting October 1, 2025. The position is limited to 30 months with the option of extension to a total of 42 months and entails 75% of the full-time weekly hours. The period of employment is governed by the Fixed Term Research Contracts Act (Wissenschaftszeitvertragsgesetz - WissZeitVG). The position aims at obtaining further academic qualification (usually PhD). The position is offered within the Research Training Group 2861 “Planar Carbon Lattices” (<https://rtg2861-pcl.chm.tu-dresden.de>), which is a collaboration between TUD Dresden University of Technology and Friedrich-Alexander Universität Erlangen-Nürnberg (FAU), and is funded by Deutsche Forschungsgemeinschaft (DFG). Our goal is to achieve atomic-precision synthesis and exploration of new planar carbon lattices (PCLs) for next-generation quantum materials, functional precision membranes, optoelectronic and electrochemical devices, by employing advanced experimental and theoretical methods in an interdisciplinary approach bridging synthetic chemistry, condensed-matter physics, and materials science. Our research encompasses three research areas of New approaches in precision synthesis of PCL (A), PCLs' properties and functions (B), and Experimental and theoretical tools for their description (C).

City: Dresden; Starting date (earliest): 01/10/25; Duration: 42 months;

Remuneration: subject to personal qualification employees are remunerated according to salary group E 13 TV-L; Reference number: RTG2861-C2; Closing date: 22/05/25

Working field

Tasks for project RTG2861-C2 (Principal Investigator: Dr. Dorothea Golze, Chair of Theoretical Chemistry, Research area C):

Research topic: Extension of the GW+C approach to materials

In this position, you will develop highly accurate computational tools for predicting satellite features in XPS spectra of 2D framework materials. Your work will be based on the GW approximation within Green's function theory. While the GW method reliably describes photoelectric (main) peaks, it often fails to accurately capture satellite

positions, which require more advanced techniques such as the cumulant approach (GW+C). You will extend the existing core-level GW+C implementation in the FHI-aims software package. Currently, this approach is limited to molecules; your task will be to adapt and expand it for application to 2D framework materials. This development will be carried out in collaboration with the FHI-aims developer community. Applications of the method will be conducted in close cooperation with our experimental partners within the RTG2861-PCL consortium.

Requirements

Specific requirements: We are looking for a motivated candidate, preferentially with theoretical background and strong interest in electronic-structure theory and code development. Basic programming skills are expected.

General requirements:

- very good university degree (M.Sc. or equivalent) in chemistry, physics, or materials sciences; specialization theoretical chemistry/physics, condensed-matter physics
- excellent results on individual performance criteria (e.g., manuscript/publication resulting from Master thesis, awards) and timely completion of higher education
- strong motivation to independently conduct research and to work in interdisciplinary collaborations
- excellent written and verbal communication skills in the English language

What we offer

- cutting-edge research and training in the field of advanced nanomaterials with focus on PCLs beyond the state of the art;
- a dedicated supervision concept with a dual mentoring strategy of TUD and FAU (supervisor and co-supervisor from the partner university);
- dual-site research and training facilitated by a virtual research environment (VRE) where digital classes are combined with online tools to share information and research data;
- a comprehensive qualification program incorporating hybrid lectures, weekly seminars (hybrid and on-site), lab rotations and hands-on training;
- annual summer/winter schools and complementary skills workshops.
- TUD strives to employ more women in academia and research. We therefore expressly encourage women to apply. The University is a certified family-friendly university. 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.

Application

Please submit your complete application (in English or German) including:

- one-page motivation letter specifying your interest in the announced project/topic,
- curriculum vitae (CV),
- master/diploma certificate and transcript of grades (and, if available, a link to your Master's or diploma thesis),
- 2 reference letters

by May 22 2025 (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 quoting the reference number "RTG2861-C2" in the subject header to rtg2861-pcl@tu-dresden.de or to: TU Dresden, Professur für Theoretische Chemie, Frau Dr. Dorothea Golze, 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>.

More information at <https://stellenticket.de/194115/TUB/>

Offer visible until 22/05/25

