

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.

At the **Center for Molecular Bioengineering (B CUBE)**, the **Chair of BioNano-Tools** offers a temporary full-time position as

Research Associate / PhD Student for a MSCA-DN project (m/f/x)

starting **September 1, 2025**. The position is limited until August 31, 2028. The period of employment is governed by the Fixed Term Research Contracts Act (Wissenschaftszeitvertragsgesetz – WissZeitVG). The doctoral candidate will receive a salary, including a living allowance, a mobility allowance and a family allowance (if eligible). Applicants may be of any nationality. However, at the date of recruitment, the applicant must not have resided or carried out his/her main activity (work, studies etc.) in Germany for more than 12 months in the last 3 years immediately prior to the recruitment.

Tasks: (i) biochemical preparation of motor proteins, (ii) setup of in vitro motility assays, (iii) development of strategies to mechanically couple molecular motors, (iv) dynamic acquisition of motor-driven cargo movement by high-resolution fluorescence microscopy and/or magnetic/optical tweezers, (v) quantitative image processing, data analysis and modeling.

The project is funded by the MARIE SKŁODOWSKA CURIE ACTIONS (MSCA) Doctoral Network (DN) Motorized NANomachines: fundamentalS, InnovationS, Applications (MONALISA) within the Horizon 2020 Program of the European Commission [<https://cordis.europa.eu/project/id/101169136>]. DN MONALISA, a consortium of nine partners composed of high-profile universities, research institutions and companies located in Europe, will train 15 doctoral candidates in a highly innovative and interdisciplinary scientific network. Scientifically, artificial molecular machine research and technologies are critical fields with the potential to offer significant benefits to chemical synthesis, medical technologies and treatment, smart materials, and nanotechnology. However, due to their novelty, there is a shortage of specialists in this sector, resulting in limited research manpower. With the support of the Marie Skłodowska-Curie Actions program, the MONALISA project will bring together specialists, Nobel laureates, prestigious institutions, and various non-academic partners to develop and implement an innovative training program for doctoral candidates. This extensive, in-depth training from expert researchers will enable the candidates to gain a deep understanding of the field and transform their findings into innovative solutions.

In this research project, the doctoral candidate will aim to characterize and harness the helical movement exhibited by naturally occurring and engineered kinesin motor proteins when moving on microtubules. He/she will design specific experimental environments to recreate the three-dimensional movement of these motor proteins, such as by elevating the microtubules on micro-

structured pedestals. The primary research questions will revolve around the factors that influence this helical movement, including (i) the number motor proteins cooperating in collective transport (in the range from single motors to tens of motors), (ii) the type of cargo transported (such as vesicles, beads and DNA-origami based nanostructures), (iii) the fine structure of the microtubules (e.g. composed of different numbers of protofilaments or containing different amounts of defects), as well as (iv) environmental variables (such as temperature, ATP concentration and viscosity). The project will involve (a) the development of measurement techniques to quantify the motor-generated torque and (b) the design of systems where the linear motion of the underlying motor proteins will be transformed into a strictly rotary motion.

The key tasks of the doctoral candidate are: (i) to manage and carry out research projects, (ii) to attend and participate in research and training activities within the MONALISA network and local courses, (iii) to write scientific articles and a PhD thesis, as well as (iv) to teach and disseminate research in the scientific community.

Requirements:

- Applicants should hold a university degree (MSc or equivalent) in (bio)chemistry, (bio)physics, or (bio)engineering and have excellent English skills
- Applicants should be ambitious, curious, creative, energetic and bright minds with a strong eagerness to take part in the research and training activities of this project. Candidates will be integrated in an international multi-disciplinary team and shall therefore have excellent personal skills and be able to work in a team.
- The position will be located in Dresden, Germany. Secondments to international partner groups are envisioned.
- Applicants must, at the date of recruitment, have NOT yet been awarded the doctoral degree and have to be in the first 4 years (full time equivalent) of their research career.

A career development plan for the doctoral candidate will be prepared in accordance with his/her supervisor and will include training, planned secondments and outreach activities in partner institutions of the network.

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.

Please submit your detailed application with a motivation letter, CV, publication list and two 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 to stefan.diez@tu-dresden.de or to: **TU Dresden, Chair of BioNano-Tools, Prof. Dr. Stefan Diez, 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>.