

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 **Cluster of Excellence "Physics of Life" (PoL)**, the **Heisenberg Chair of Biological Algorithms** (Prof. Benjamin M. Friedrich) affiliated with the **Center for Advancing Electronics Dresden (cfaed)** offers a position as

**Research Associate / PhD student (m/f/x)
in Theoretical Biological Physics**

(subject to personal qualification employees are remunerated according to salary group E 13 TV-L)

starting **February 1, 2024**. The position entails 65% of the full-time weekly hours and is limited to 48 months. The period of employment is governed by the Fixed Term Research Contracts Act (Wissenschaftszeitvertragsgesetz - WissZeitVG). The position offers the chance to obtain further academic qualification (usually PhD).

Tasks: How physical forces shape organs during embryonic development? We study this question right at the interface of physics and biology in the model system of the duct network of the pancreas, which remodels from an initially plexus-like network to a tree optimized for fluid transport during development – supposedly by responding and remodelling to local flow. Together with our experimental collaboration partners, director Anne Grapin-Botton at the Max-Planck Institute for Molecular Cell Biology and Genetics in Dresden, we want to find out (i) how do biological cells sense fluid flow using primary cilia? (ii) what are the flows in the duct network at every position and every point in time? (iii) how do duct networks remodel in response to flow? To tackle this multi-scale problem, you will develop mathematical and computational models of cilia flow sensing, fluid flow and dynamic network remodelling. You will analyse and integrate data from cell culture, organoids, ex vivo models to understand the physical principles that shape pancreas organ development. *More reading:* Dahl-Jensen et al. *PLoS Biology* 2017. You will work closely with an experimental PhD student in the Grapin lab, while being embedded in the national network of the recently established Forschergruppe FOR5547 on cilia dynamics, which provides additional training opportunities, as well as the PoL, which provides a vibrant and inspiring environment.

Requirements:

- outstanding university degree in physics, applied mathematics or related fields,
- experience and competence in mathematical modeling
- programming skills and experience in data and image analysis
- ideally, first exposure to biological physics and willingness to learn biology en route
- excellent communication and presentation skills in English,
- high self-motivation and independent, target- and solution-driven work attitude.

What we offer: We offer the opportunity to shape an exciting research project in Theoretical Biological Physics, while developing your academic or professional career. You will be imbedded within the highly interactive, and interdisciplinary research environment of cfaed and PoL and the wider Dresden Campus, which includes other high-quality scientific institutions. You will be exposed to world-class research on diverse topics through regular scientific seminars and occasional retreats. Employment conditions include a comprehensive package with full social benefits. Dresden offers a high-quality of life with a relatively low cost-of-living.

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 and offers a Dual Career Service. 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 applications (letter of motivation, CV, and contact details for 3 references) by **January 2, 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 recruiting.cfaed@tu-dresden.de with the **subject "PhD FOR5547"** or to: **TU Dresden, cfaed, z. Hd. Herrn Prof. Benjamin M. Friedrich, 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>.