

Technische Universität Braunschweig - Institute of Semiconductor Technology



With more than 15,000 students and 3,800 employees, the Technische Universität Braunschweig is one of Germany's leading institutes of technology. It stands for strategic and performance-oriented thinking and acting, relevant research, committed teaching, and the successful transfer of knowledge and technologies to the economy and society. We consistently advocate for family friendliness and equal opportunities. Our research focuses are mobility, engineering for health, metrology, and city of the future. Strong engineering and natural sciences are our core disciplines. These are closely interconnected with economics, social and educational sciences and humanities. Our campus is located in the midst of one of the most research-intensive regions in Europe. We work successfully together with over 20 research institutions in our neighborhood as we do with our international partner universities. Starting from the earliest possible date, the Institute of Semiconductor Technology is looking for a

Research Associate (m/f/d) in the field of "Optofluxonics - Patterned light shaping in cryogenic environment for opto-fluxonic measurements"

(EG 13 TV-L, 75%) The position is to be filled on a fixed-term basis for an initial period of 3 years. The successful applicant will be given the opportunity to pursue a doctorate at TU Braunschweig. This position is located at the exciting intersection of three subject areas in which TU Braunschweig excels and which form a strategic partnership to investigate whether Abrikosov vortices can be manipulated with structured light fields provided by micro-LED arrays and/or meta-optics. The focus of this project will be on investigating the interaction between light and superconducting vortex dynamics at cryogenic temperatures. Three groups at TU Braunschweig are collaborating on this project. The first group of Prof. Stefanie Kroker, a leading expert in integrated photonics, is developing next-generation photonic systems with functionality enabling the next generation of precision sensing. This long-term scientific vision is supported by the highly regarded ERC Consolidator Grant "MightyMirrors"

(<https://cordis.europa.eu/project/id/101170022>). The second group of Prof. Oleksandr Dobrovolskiy, a leading expert in Cryogenic Quantum Electronics (<https://www.tu-braunschweig.de/emg/cryoquant>). His group researches physical phenomena in the dynamics of magnetic and superconducting systems and develops quantum electronic components based on this research. Their research combines experimental physics with sensor technology and measurement technology in electrical engineering. The third group of Prof. Andreas Waag, a leading expert in light emitting nitride technology, will advance a new generation of energy-efficient artificial intelligence through approximately €15 million in funding from the state of Lower Saxony and the Volkswagen Foundation.

Within the project BRIGHT (Bringing Light to Microelectronics - <https://magazin.tu-braunschweig.de/en/pi-post/15-million-euros-for-a-brilliant-ai-revolution/>), researchers are developing a neuromorphic computer based on microscopic LEDs. The work will be mainly experimental and will involve developing axial optical access to cryogenically compatible free-space and meta-optics. This includes, for example, the assembly of optical components and the development of methods for coupling patterned light fields

into a cryostat for optically controlled fluxonics measurements. The micro-LEDs will be provided by the Nitride Technology Center. The project involves close collaboration with specialists in optics, cryogenic magnetics, and microtechnological LED manufacturing. We expect you to contribute your talent, enthusiasm, and ingenuity to the team and to take on appropriate responsibility.

City: Braunschweig; Starting date (earliest): At the earliest possible; Duration: 3 years;
Remuneration: EG 13 TV-L; Closing date: 31/03/26

Tasks

- You will carry out research in the area of optical integration.
- You will be strongly involved in the definition and assembly of the optical experimental setup, as well as its operation and data analysis.
- You will get in touch with cleanroom microfabrication and Cryogenic Quantum Electronics.
- You will work with experts in-house in light-emitting nitride technology, optical integration, and superconductivity.
- You will actively contribute to collaborative projects with external partners and integrate into a dynamic, interdisciplinary team of optics and superconductivity researchers within the groups of Prof. Kroker and Prof. Waag at IHT and Prof. Dobrovolskiy at EMG.
- You will have the opportunity to publish extensively in leading scientific journals and participate in national and international conferences.
- You may also be involved in teaching activities, including course preparation and supervision of student theses.

Requirements

- You have a degree (Master's or equivalent) in the field of physics, electrical engineering, optics/photonics or similar.
- You have very good knowledge of the German and English language.
- Experience in optics, optical imaging and programming of driving electronics will be highly appreciated.
- You are flexible, can perform under pressure and work well in a team.

What we offer

- Work on exciting future-oriented research topics in an inspiring work environment as part of the university community
- A vibrant campus life in an international atmosphere with lots of intercultural offers and international cooperations
- Pay in accordance with the collective agreement TV-L (a special payment at the end of the year as well as a supplementary benefit in the form of a company pension, comparable to a company pension in the private sector) including 30 days' vacation per year
- Advantage portal for employees of TU Braunschweig with attractive offers from strong brand
- Flexible working and part-time options and a family-friendly university culture, awarded the "Family-friendly university" audit since 2007
- Special continuing education programs for young scientists, a postdoc program, as well as other offerings from the Central Personnel Development Department and sports activities.

Application

We welcome applicants of all nationalities. At the same time, we encourage people with severe disabilities to apply. Applications from severely disabled persons will be given preference if they are equally qualified. Please attach a proof of disability to your application. We are also working on the fulfilment of the Central Equality Plan based on the Lower Saxony Equal Rights Act (Niedersächsisches Gleichberechtigungsgesetz—NGG) and strive to reduce under-representation in all areas and positions as defined by the NGG. Therefore, applications from women are particularly welcome in this case.

The personal data will be stored for the purpose of processing the application. By submitting your application, you agree that your data may be stored and processed electronically for application purposes in compliance with the provisions of data protection law. Further information on data protection can be found in our data protection regulations at <https://www.tu-braunschweig.de/datenschutzerklaerung-bewerbungen> . Application costs cannot be reimbursed.

Questions and Answers

Do you have any questions? For more information, please contact +49 531 391 3760 (Celina Hellmich)

Deadline for applications is 31.03.2026

If we have aroused your interest, please send your application with informative documents in PDF format, preferably by e-mail to celina.hellmich@tu-braunschweig.de or by post to

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More information at <https://stellenticket.de/202041/TUB/>
Offer visible until 31/03/26

