Technische Universität Braunschweig - Institute of Semiconductor Technology

With around 16,000 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 Doctoral Candidate (m/f/d) in the field of “Nitrous Oxide Metrology - in support of controlling the super climate pollutant N2O”.

Doctoral Candidate (m/f/d) in the field of “Nitrous Oxide Metrology - in support of controlling the super climate pollutant N2O”

(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 in joint supervision with the Physikalisch-Technische Bundesanstalt (PTB). As a PhD Student in J. Daniel Prades’ group, you will work on setting the grounds of “Ubiquitous Metrology”, a pioneering approach to sensing focused on bringing the best possible metrology practices to sensor devices operating in the field, that has recently been distinguished and financed by the exclusive Alexander von Humboldt Foundation Professur program. You will have the opportunity to be part of the early stages of this field, shaping the future of distributed sensing and metrology. The work will be mainly experimental, developing laser spectroscopy instrumentation and optimizing spectroscopic analysis techniques to improve the accuracy and metrological traceability of N2O concentrations. The candidate will be involved in research and development of hardware and software. This involves the assembly of the optical components of the spectrometer including quantum technological elements and the development of spectral processing algorithms that enable online and postprocessing analysis. We expect you to bring in your talent, enthusiasm, and ingenuity to the team, and undertake appropriate responsibilities. The group is based in the Institute of Semiconductor Technology (IHT), specialized in nitride processing with dedicated own clean-rooms (Nitride Technology Center and Epitaxy Competence Center). We are part the Laboratory for Emerging Nanometrology (LENA) research center, which offers state-of-the-art facilities in micro-nano characterization; and also members of the Cluster of Excellence QuantumFrontiers and the Quantum Valley Lower Saxony (QVLS). We maintain close collaboration and exchanges with the Department of Electronic and Biomedical Engineering of the University of Barcelona. The group is based in the Institute of Semiconductor Technology (IHT), specialized in nitride processing with dedicated own clean-rooms (Nitride Technology Center and Epitaxy Competence Center). We are part the Laboratory for Emerging Nanometrology (LENA) research center, which offers state-of-the-art facilities in

micro-nano characterization; and also members of the Cluster of Excellence QuantumFrontiers and the Quantum Valley Lower Saxony (QVLS). We maintain close collaboration and exchanges with the Department of Electronic and Biomedical Engineering of the University of Barcelona. This PhD work will be carried out mostly at the Physikalisch-Technische Bundesanstalt (PTB), at its site in Braunschweig. The PTB is the National Metrology Institute of Germany, the second largest metrology institute in the world, where its experts have pioneered a new kind of optical gas standards based on spectroscopy.

City: Braunschweig; Starting date (earliest): At the earliest possible; Duration: 3 years; Remuneration: EG 13 TV-L; Closing date: 09/05/25

Working field

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the second largest metrology institute in the world, where its experts have pioneered a new kind of optical gas standards based on spectroscopy.

- You will conduct research in advanced new spectroscopy methods to define a new kind of optical standard for N2O.
- Your developments will be implemented in lab-scale demonstrators and validated in cooperation with international metrology institutes.
- You will be strongly involved in experimental set-up definition and assembly, as well as operation and data analysis.
- You will get in touch with quantum technology.
- You will work with experts in-house in spectroscopy and climate metrology.
- You will collaborate with world-class centers in metrology, sensing, and quantum technology.
- You will actively participate in collaborative projects with external partners and integrate yourself into a large team of metrologists and technologists of the TUBS – PTB environment.
- You will gain international experience with the opportunity to carry out research stays at the University of Barcelona, if interested.
- You will have the chance of publishing abundantly and in top journals; and participate in national and international conferences.
- You can be involved in teaching (preparation and implementation of courses as well as supervision of theses).

Requirements

- A scientific university education (Master's degree or equivalent) in the field of electrical engineering, physics, computer science or similar.
- Experience in optics, optical sensing, spectroscopy, optical imaging and image processing will be highly appreciated.
- Very high proficiency in English, fluency in the German language is preferable.
- You are flexible and work well in a team.

What we offer

- Pay in accordance with the collective agreement TV-L, pay grade up to E13 with 75%, depending on the assignment of tasks and fulfilment of personal requirements.
- 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.
- Counting with the support of 1-2 Master students under your supervision, that will help you boost your scientific productivity.
- Interesting and diverse tasks in a pleasant working atmosphere with a friendly and motivated team.
- A workplace that is basically suitable for part-time work, although the position is to be filled full-time, as well as flexible working and part-time options and a family-friendly university culture, awarded the “Family-friendly university” audit since 2007.
- A wide range of continuing education and company health care programs as well as a vibrant campus life in an international atmosphere.
- Financial support to carry out research stays abroad.

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 form of evidence of your handicap 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 and diverse-gender individuals 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 www.tu-braunschweig.de/datenschutzerklaerungbewerbungen. Application costs cannot be reimbursed.

Questions and Answers:
Do you have any questions? For more information, please contact Judith Krakowski: +49 531 391 65323 or j.krakowski@tu-braunschweig.de

Closing date: 09 May 2025

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

Technical University of Braunschweig
Institute of Semiconductor Technology
Attn: Prof. Dr. J. Daniel Prades
Hans-Sommer-Str. 66
38106 Braunschweig

More information at https://stellenticket.de/193897/HTWB/
Offer visible until 09/05/25