



With around 17,000 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 Jet Propulsion and Turbomachinery (IFAS) is looking for a

## Doctoral Candidate (m/f/d) in the field of Modeling and numerical simulations of Sustainable Aviation Fuel combustion (EG 13 TV-L, full-time)

The position is to be filled on a fixed-term basis for a period of 3 years. The successful applicant will be given the opportunity to pursue a doctorate.

Climate change imposes a drastic reduction of greenhouse gas emissions and urges for a rapid transition towards carbon-neutral technologies with the final aim to minimize pollution and preserve life on the planet. Aviation propulsion, as a hard-to-decarbonize sector, requires a multifaceted approach to address diverse aircraft missions. This involves various carbon-neutral and carbon-free energy carriers such as hydrogen, sustainable aviation fuels (SAFs), and innovative propulsion concepts like electric systems. While electric propulsion will be a game-changer technology for short-range flights, jet fuels remain essential for mid-to-long-range aircraft.

Synthetic fuels, particularly sustainable aviation fuels (SAFs), are currently emerging as promising replacements for fossil jet fuels. These fuels can be produced from sustainable feedstocks or synthesized with renewable energy. SAFs have the advantage of being drop-in fuels, minimizing the need for engine and distribution system modifications. However, despite their carbon emission mitigation capabilities, SAF combustion may still generate soot particles, posing health and environmental challenges.

Different sustainable aviation fuels are currently being investigated at the Institute of Jet Propulsion and Turbomachinery (IFAS) within the excellence Cluster SE2A (Sustainable and Energy-Efficient Aviation). Advanced numerical simulations on supercomputers are performed to achieve a comprehensive understanding of the various sustainable aviation fuels and their pollutant formation, in order to support the development process of new environmental-friendly technologies.

### Your tasks

- You will carry out research in the area of numerical simulations of laminar and turbulent flames of pure and blended SAF mixtures under various operating conditions. The open-source OpenFOAM software will be employed.
- You will publish research findings and participate in national and international conferences.
- You will be involved in teaching at the University (preparation and implementation of courses as well as supervision of students' work).

## Your Qualifications

- You have a degree (Master's or equivalent) in aerospace engineering, mechanical engineering, computational engineering, or equivalent.
- You have very good knowledge of the German and English language.
- You have knowledge in computational fluid dynamics and fundamentals of combustion
- You have experience with OpenFOAM, Python, Unix operating systems. Programming skills (preferably C++) are required.
- You are flexible, can perform under pressure and work well in a team.
- You are aiming for a doctorate.

## 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
- 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.

## Further notes

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 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

For more information, please contact Jun.-Prof. Dr.-Ing. Federica Ferraro at [federica.ferraro@tu-braunschweig.de](mailto:federica.ferraro@tu-braunschweig.de).

## Deadline for applications is 25 February 2024

Are you interested? Please send your application preferably via email to [federica.ferraro@tu-braunschweig.de](mailto:federica.ferraro@tu-braunschweig.de)

or via mail to

Technische Universität Braunschweig  
Institut für Flugantriebe und Strömungsmaschinen  
Hermann-Blenk-Straße 37  
38108 Braunschweig

The application should include:

- A motivation letter (max 1 page)
- Detailed curriculum vitae, including work experience, educational background, language and computer skills.
- Copies of bachelor and master diploma and the transcript of grades in English or German.