



At the Institute of Jet Propulsion and Turbomachinery (IFAS) we are seeking for a

Research Associate (m/f/d) in the field of

## Modeling and numerical simulations of sustainable fuel combustion

to join our team. The position is available at the earliest possible date in a temporary employment for 3 years and with the possibilities of achieving 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. A promising strategy, the power-to-fuel-to-power concept, uses the excess of renewable energy to produce fuels as chemical energy carriers. One option is represented by hydrogen carriers. They can be produced from renewable energy sources to be then employed in gas turbines with no CO<sub>2</sub> emissions.

Hydrogen carriers, pure or blended, cannot be used in today's engines as drop-in fuels for their remarkably complex combustion properties compared to hydrocarbons. They have different reactivity, flame speeds, and flammability limits as well as may promote different flame stabilization mechanisms.

Highly-resolved numerical simulations on supercomputers offer the unique opportunity to achieve a comprehensive knowledge of different environmental-friendly fuels with reduced costs and faster than in the past, supporting the development process of new technologies.

### Main responsibility:

The successful applicant is expected to carry out numerical simulations of laminar and turbulent flames of pure and blended hydrogen carrier mixtures under various operating conditions and develop reduced order combustion models for Large-Eddy simulations. The open-source OpenFOAM software will be employed.

### Required Qualification:

Applicants should have a degree (Master's or equivalent) in aerospace engineering, mechanical engineering, computational engineering, or equivalent. We are looking for applicants with a very good degree, with strong ability to work in a team, creativity, and good communication skills. Programming skills (preferably C++) are required. English language skills complete your profile.

Knowledge and experience in the following areas are desirable:

- Computational fluid dynamics
- Fundamentals of combustion
- OpenFOAM
- Python
- Experience with unix operating systems

## **Our benefits:**

- Pay in accordance with the collective agreement TV-L, pay grade 13, 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.
- Interesting and diverse tasks in a pleasant working atmosphere with a friendly and motivated team that works closely together.
- Part-time employment is generally possible.
- The TU Braunschweig has a family-friendly university culture, awarded the “Family-friendly university” audit since 2007.
- A wide range of continuing education and company health care programmes as well as a vibrant campus life in an international atmosphere.

## **Additional Information**

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 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.

For further information, please contact Jun.-Prof. Federica Ferraro (details below).

Are you interested in this position? Please send your application in German or English with the relevant documents by 15.08.2023 to:

**Jun.-Prof. Dr.-Ing. Federica Ferraro**, Alternative Aviation Propulsion Systems

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