



Technische Universität Berlin



Technische Universität Berlin offers an open position:

Research Assistant - salary grade E13 TV-L Berliner Hochschulen

part-time employment may be possible

Faculty V - Institute of Fluid Dynamics and Technical Acoustics / Flow Instabilities and Dynamics

Reference number: V-65/25 (starting at 01/04/25 / for max 36 months / closing date for applications 28/03/25)

Working field:

In order to meet future climate goals, combustion processes, such as gas turbines for energy generation or as engines for aircraft, need to be fully converted to green hydrogen. Due to the high reactivity of hydrogen flames and their different physical properties, hydrogen flames generate significantly higher noise emissions compared to conventional methane flames. This leads to negative effects on both humans and the environment.

This research project aims to investigate the generation of sound from turbulent hydrogen flames in a fundamental way. Reduced dynamic models for turbulent flow and their interaction with hydrogen flames, as well as the resulting sound emissions, will be studied in detail. The project will employ empirical modal decomposition methods (SPOD/DMD and others), linear methods (stability analysis and resolvent analysis) in combination with acoustic hybrid methods, and data assimilation techniques. Data will be generated through acoustic experiments on a turbulent jet flame in a anechoic chamber, as well as high-resolution numerical simulations (LES/DNS). The project is funded by the German Research Foundation and the French National Research Agency (ANR). Close collaboration with the group of Peter Jordan and colleagues at CNRS Poitiers will provide opportunities for multiple international stays.

Job Responsibilities:

- acoustic measurements and laser-based flow and flame measurements of a turbulent hydrogen flame
- LES simulations of the flame using OpenFOAM
- data assimilation using machine learning to determine closure models
- data-driven analysis of coherent structures and their interaction with the flame
- modeling of flow and flame dynamics using linear stability analysis and resolvent analysis
- continuous publication of results in relevant scientific journals and presenting findings at conferences
- opportunity for a PhD

Requirements:

- a successfully completed scientific university degree (Master, Diplom or equivalent) in Engineering Science, Mechanical Engineering, Aerospace Engineering, Data science or something similar
- experience in the following areas: Experimental and numerical methods in fluid mechanics, data analysis of turbulent flows, stability theory, aeroacoustics, turbulent combustion, theory of dynamic systems, data assimilation using machine learning
- programming skills (OpenFOAM, Python)
- good command of German and/or English required; willingness to learn either English or German is expected

Please send your application, stating the **reference number**, with the usual documents (summarized in a PDF document, max. 5 MB) **by e-mail to Prof. Dr. Kilian Oberleithner via office@hfi.tu-berlin.de**.

By submitting your application via email you consent to having your data electronically processed and saved. Please note that we do not provide a guaranty for the protection of your personal data when submitted as unprotected file. Please find our data protection notice acc. DSGVO (General Data Protection Regulation) at the TU staff department homepage: https://www.abt2-t.tu-berlin.de/menue/themen_a_z/datenschutzerklaerung/ or quick access 214041.

To ensure equal opportunities between women and men, applications by women with the required qualifications are explicitly desired. Qualified individuals with disabilities will be favored. The TU Berlin values the diversity of its members and is committed to the goals of equal opportunities. Applications from people of all nationalities and with a migration background are very welcome.

Technische Universität Berlin - Die Präsidentin - Fakultät V - Institut für Strömungsmechanik und Technische Akustik, Prof. Dr. Kilian Oberleithner, Sekr. HF 1, Müller-Breslau-Straße 8, 10623 Berlin

The vacancy is also available on the internet at <https://www.personalabteilung.tu-berlin.de/menue/jobs/>

