

Starting from 1st October 2023, the Institute of Aircraft Design and Lightweight Structures of the TU Braunschweig within the collaborative research centre Transregio SynTrac is looking for a

## Research Associate (m/f/d) in the field of **Aircraft Systems Engineering and Multidisciplinary Design Optimization**

(Full time – 3.75 years fixed-term – Doctorate)

With the major goal of climate-neutral flying, we are exploring potentials and synergies through highly integrated aircraft development in numerous sub-projects at TU Braunschweig, University of Stuttgart, LUH Hannover and DLR Braunschweig in the new research centre SynTrac. We use interactions between the disciplines of aerodynamics, acoustics, flight physics, structural mechanics and thermodynamics through a multidisciplinary, cross-system view of the aircraft development process to develop future highly efficient aircraft through innovative approaches.


The sub-project "Systematic Aircraft Preliminary Design and Multidisciplinary Design Optimisation" at the Institute of Aircraft Design and Lightweight Construction (IFL) focuses on innovative solutions for propulsion-integrated solutions, namely Boundary Layer Ingestion (BLI) and Distributed Electric Propulsion (DEP) configurations. Combining data from different disciplines, these configurations will be analysed and optimised using an integrated Multidisciplinary Design Optimisation (MDO) approach.

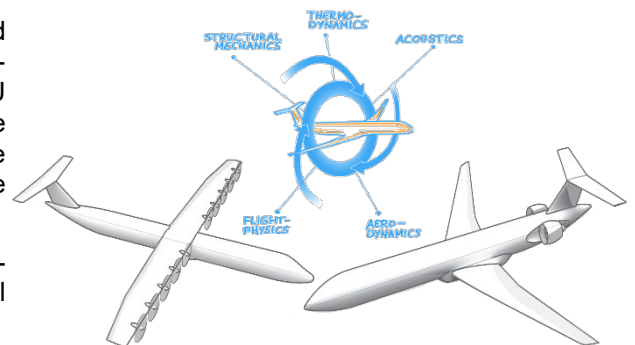
To achieve this, you will define and implement system definition and data handling strategies together with colleagues from different departments at TU Braunschweig, aircraft design experts from TU Stuttgart and system experts from LU Hannover. This work will pave the way for the integration of high-fidelity analysis methods into the conceptual aircraft design optimisation using advanced surrogate models.

In cooperation with various other SynTrac sub-projects, the methodological and technical feasibility of this design process integration will be demonstrated, thus pursuing the overall goals of SynTrac.

Your path to a doctorate in an interdisciplinary and cross-location research team will be accompanied by an integrated Research Training Group. New forms of collaboration will emerge through the applied concept of New Work.



 SynTrac



**Figure 1:** Graphical representation of the configurations to be processed: distributed electric propulsion (left) and highly integrated propulsion with boundary layer ingestion (right).

### Make a Difference

- ✓ You are conducting research in the Collaborative Research Centre on the topic of "Aircraft Systems Engineering and Multidisciplinary Design Optimization".
- ✓ You will work in a multidisciplinary team in close cooperation with TU Stuttgart.
- ✓ You will work on university and industry-relevant issues for future aircraft concepts.
- ✓ You will present your research results at national and international conferences.
- ✓ You will support university teaching by supervising student work.

### Your Qualifications

- ✓ University degree (Master's or equivalent) in Mechanical Engineering, Aerospace Engineering or a comparable engineering discipline.
- ✓ You have experience in aircraft design, optimisation, numerical simulation and structure or aerodynamics.
- ✓ You have strong oral and written communication skills and a good command of English.
- ✓ You are enthusiastic about working actively on the challenge of climate neutral aviation.
- ✓ You are open to working in an interdisciplinary, multi-site team.
- ✓ You want to do a PhD.

## Our Benefits

- ✓ Salary 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.
- ✓ Interesting and diverse tasks in a pleasant working atmosphere with a friendly and motivated team that works closely together across the locations.
- ✓ 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 programmes.
- ✓ Vibrant campus life in an international atmosphere.



Figure 2: The IFL test facility.

## Institute of Aircraft Design and Lightweight Structures (IFL)

The Institute of Aircraft Design and Lightweight Structures (IFL) deals with a wide range of different topics in the field of aircraft design and lightweight structures. The scope of research ranges from the investigation of innovative aircraft concepts within the framework of multidisciplinary optimisation tasks to numerical and experimental investigations of the characteristics of lightweight materials and functional structures. Consisting of the Chair of Overall Aircraft Design (Prof. Ingo Staack) and the Chair of Lightweight Structures (Prof. Sebastian Heimbs), we are a young, innovative and international team of about 40 employees located at two sites. Founded in 1938, the IFL is a renowned partner in the fields of conceptual and preliminary aircraft design, functional lightweight design, fibre reinforced materials, crash and safety structures, technology assessment, systems engineering and multidisciplinary design analysis and optimisation (MDAO). We conduct our research in collaboration with local and international partners and operate a large test facility equipped with experimental equipment. The IFL is a partner in the Niedersachsen Aviation Network (NFL), the Sustainable and Energy-Efficient Aviation (SE2A) and a founding member of the Transregio CRC SynTrac. A detailed list of our research projects and teaching events can be found on our website [www.tu-bs.de/ifl](http://www.tu-bs.de/ifl). The best way to keep up with the latest news and updates is through our LinkedIn channel <https://de.linkedin.com/company/tubs-ifl>.

## TU Braunschweig

With around 17,000 students and 3,800 employees, Technische Universität Braunschweig is the largest Institute of Technology in northern Germany. We are known for our strategic and performance-oriented thinking and acting, top-level research, highly committed lecturers and a successful transfer of knowledge and technologies into industry and society. We are dedicated to creating a family-friendly environment and advocate for equal opportunities.

Our core research areas are Mobility, Engineering for Health, Metrology, and the City of the Future. A strong focus is placed on engineering and the natural sciences, with a close link of our core disciplines to the economics, social and educational sciences as well as the humanities.

Our campus is located in the middle of one of Europe's research hotspots, where we have established a successful working relationship—both with the more than 20 research facilities in our neighbourhood and our international partner universities.

## Questions and Answers

For more information, please call Prof. Ingo Staack on +46 (0)531 391-9930.

## Apply by 31 August 2023!

Are you interested?

Please send your application preferably via email (PDF format) to:

[ingo.staack@tu-braunschweig.de](mailto:ingo.staack@tu-braunschweig.de)

or via mail to: **Technische Universität Braunschweig  
Institut für Flugzeugbau und Leichtbau  
Hermann-Blenk-Str. 35  
38108 Braunschweig**

## What's more to know

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.



[www.tu-bs.de/ifl](http://www.tu-bs.de/ifl)