Experimental Investigation of Synergetic Lift and Thrust Production on Propeller-Wing Configurations
TU Braunschweig

Job Title	Experimental Investigation of Synergetic Lift and Thrust Production on Propeller-Wing Configurations
Department	Department of Mechanical Engineering, Institute of Fluid Mechanics https://www.tu-braunschweig.de/en/ism
Institution	TU Braunschweig Braunschweig, , Germany
Date Posted	Sep. 10, 2024
Application Deadline	Open until filled
Position Start Date	Available Immediately
Job Categories	Graduate Student Post-Doc
Academic Field(s)	Engineering Physics Aerospace/Aeronautical/Astronautics Engineering - Other
Job Website	http://lnk.tu-bs.de/cFOVNp
Apply By Email	a.bauknecht@tu-braunschweig.de

Job Description

The Institute of Fluid Mechanics at TU Braunschweig is searching for a

Research Associate (PhD/Postdoc, m/f/d)

(EG 13 TV-L, full-time)

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on the topic

“Experimental Investigation of Synergetic Lift and Thrust Production on Propeller-Wing Configurations”

The position is to be filled on a fixed-term basis for a period of up to 2 years. Applications of both PhD candidates and postdoctoral researchers are explicitly encouraged.

Background and Research Objectives

Climate-neutral mobility, in particular climate-neutral air transport, is necessary to achieve the Sustainable Development Goals. A substantial increase of the overall aircraft efficiency is a prerequisite for achieving the vision of a future climate-neutral air transport system. The synergies associated with a greatly increased integration of the propulsion systems in future transport aircraft contribute significantly to this goal, with a high potential of up to 20% additional energy savings. At the Institute of Fluid Mechanics at the TU Braunschweig, we seek to explore novel and high-risk approaches for the integration of thrust-generating elements into the airframe, going beyond the current research on distributed propulsion (see Figure 1 on the right). The successful candidate will first develop the theoretical framework to explore novel approaches for synergistically combining lift and thrust generation. Based on this initial exploratory work, experiments will be developed for our state-of-the-art wind tunnels with which to perform a detailed analysis of these high-risk concepts. The acquisition and detailed processing of high quality, time-resolved flow field measurement data, e.g. obtained with stereoscopic Particle Image Velocimetry (PIV), will be conducted through these wind-tunnel campaigns.

The position will be connected with a large research consortium referred to as the Collaborative Research Center TRR SynTrac (“Synergies of Highly Integrated Transport Aircraft”). The successful candidate will collaborate and interact with the researchers in SynTrac and will have the opportunity to participate in the qualification programs offered by both SynTrac as well as the TU Braunschweig.

About TU Braunschweig

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With more than 16,000 students and 3,800 employees, the Technische Universität Braunschweig is one of Germany´s leading engineering schools. The University excels in strategic and performance-oriented 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 foci are mobility, engineering for health, metrology, and city of the future. Strong engineering and natural sciences are our core disciplines. These aforementioned research foci are closely interconnected with research on economics, social and educational sciences as well as the 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 such as the German Aerospace Center (DLR), the Leibniz University Hannover, the National Metrology Institute (PTB), the Fraunhofer-Gesellschaft, and the Max Planck Society in our neighborhood as we do with our international partner universities.

About the Host Institution

The Institute of Fluid Mechanics (ISM) is an active member of both the Aeronautics Research Centre Niedersachsen (NFL) as well as the Automotive Research Centre Niedersachsen (NFF). As part of the NFL, we have an internationally unique infrastructure with research aircraft, wind tunnels, simulators and test rigs with which our scientists and dedicated students conduct cutting-edge research. One of the major research foci at the NFL and TU Braunschweig is mobility of the future and, in particular, the factors of environmental compatibility, safety and economic efficiency of air transport. In several national and international research projects, the ISM has carried out both fundamental and applied research in the field of fluid mechanics, investigating for example aspects of flow control, load reduction, distributed propulsion, and high-lift devices on current and future transport aircraft.

Your Tasks

- You will carry out research in the area of experimental aircraft aerodynamics.
- You will apply optical flow field measurements and conduct wind tunnel tests.
- You will collaborate with other national research institutions.
- You will publish research findings and participate in national and international conferences.
- You will be involved in teaching at the University (contribution to courses as well as supervision

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of student research).

Your Qualifications

- You have a degree (Master’s or equivalent) in Aerospace Engineering, Mechanical Engineering, Applied Physics or a related field.
- You either seek to obtain or already hold a doctoral degree in one of the aforementioned fields.
- You have very good knowledge of the English language.
- You have practical experience in experimental measurement methods such as PIV, PTV, force and pressure measurements and wind-tunnel studies. Knowledge in aircraft aerodynamics is desirable.

We offer

- Work on exciting future-oriented research topics in an inspiring work environment as part of a friendly and motivated team as well as the university community.
- A vibrant campus life in an international atmosphere with intercultural offers and international cooperations.
- You receive up to 2-year full-time employment with 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.

EEO/AA Policy

What’s more to know

We welcome applicants of all nationalities. At the same time, we encourage people with severe

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disabilities to apply. Applications from severely disabled persons will be given preference if they are equally qualified. Please attach a proof of 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.

Selection Process

Applications can be in German or English and should contain the following documents:

- a CV (including list of publications, if any);
- a motivation letter;
- copies of degree and academic transcripts (with grades and rankings), for both the Bachelor's and Master's degrees. Academic records not written in English should be accompanied by a translation into English (it can be either an official translation or self-translation). If the candidate has not been awarded the qualifying degree yet, he/she should provide a document proving the expected date of award;
- Master's thesis report or a summary of it; and
- names and email addresses of two referees.

Optional documents include:

- English Proficiency Certificate;
- copy of doctoral certificate, if available;
- publications: maximum 3 journal papers or conference proceedings; and
- reference letters.

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Contact Information

Please reference Academickeys in your cover letter when applying for or inquiring about this job announcement.

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