



Technische  
Universität  
Braunschweig



**PhD-Researcher Position (m/f/d) within the SE<sup>2</sup>A Research Cluster**  
***Extension of Correlation-based Transition Transport Models  
for Laminar Aircraft Design***

**Temporary Position (up to 3 years), up to Salary Level EG 13 TV-L, 100%**

**Background:**

The Cluster of Excellence SE<sup>2</sup>A - *Sustainable and Energy-Efficient Aviation* is a DFG-funded interdisciplinary research center investigating technologies for a sustainable and eco-friendly air transport system. Scientists from aerospace, electrical, energy and chemical engineering as well as economics and social science are working on the reduction of drag, emissions and noise, life-cycle concepts for airframes, improvements in air traffic management and new technologies for energy storage and conversion. Technische Universität Braunschweig, the German Aerospace Center (DLR), Leibniz University Hannover (LUH), the Braunschweig University of Art (HBK) and the National Metrology Institute of Germany (PTB) have joined forces in this extraordinary scientific undertaking. The overall project is structured into the three core research areas “Assessment of the Air Transport System”, “Flight Physics and Vehicle Systems” and “Energy Storage & Conversion”.

([www.tu-braunschweig.de/en/se2a](http://www.tu-braunschweig.de/en/se2a))

**Employment:**

The position is located at the *Institute of Aerodynamics and Flow Technology at DLR* ([www.dlr.de/as](http://www.dlr.de/as)) in *Göttingen*. The entry date is as soon as possible, and the duration is initially limited until the end of 2025. The position is part-time suitable, but should be occupied 100%. Active participation in SE<sup>2</sup>A's own doctoral program complementary to the programs of the institutions is an integral part of this position. The payment is made according to task assignment and fulfillment of personal requirements up to salary group EG 13 TV-L. International applicants may have to successfully complete a visa process before hiring can take place. Applications from international scientist are welcome. The Cluster SE<sup>2</sup>A aims to increase the share of women in academic positions. Applications from female candidates are very welcome. Where candidates have equal qualifications, preference will be given to female applicants. Candidates with handicaps will be preferred if equally qualified. Please enclose a proof.

**Task:**

Your task is to develop and implement extensions for correlation-based, CFD-compatible transport equation models into DLR's flow simulation software for the prediction of laminar-turbulent transition on arbitrary, three-dimensional geometries for flows with and without suction (NLF/HLFC concepts). The goal of this work is to apply these transport equation models in the optimization of complete aircraft configurations including three-dimensional effects e.g. at fuselage, wing-fuselage intersection or in areas

affected by engine integration. In addition to the development and implementation of appropriate concepts to extend the models, the identification of missing validation data and the cooperation in the preparation of a targeted validation experiment is part of the job. Validation test cases have to be prepared for numerical simulation and validation simulations have to be performed. In addition, identification of uncertain parameters in the models is necessary to enable robust optimization as well.

**Who we are looking for:**

- University degree (Master/Diploma) in engineering (aerospace engineering, mechanical engineering, or equivalent)
- Expertise and experience in the field of laminar-turbulent transition and the numerical simulation of transitional flows
- Good knowledge in advanced programming languages (Python, C/C++)
- Very good oral and written communication skills in English, German skills are a plus
- Experience in analyzing and/or conducting wind tunnel tests and validating numerical models would be an advantage

**Application Process:**

Applications should be sent by e-mail to ([cornelia.grabe@dlr.de](mailto:cornelia.grabe@dlr.de)) and must contain the following documents until 15.11.2022.

- Motivation Letter
- Curriculum Vitae including complete address, phone number, email address, educational background, language skills, and work experience
- Copies of bachelor and master diploma and transcript of grades in original language and in English or German translation
- Additional Documents must be provided on request

All documents should be in PDF format, preferably in a single file. Personal data and documents relating to the application process will be stored electronically.

Please note that application costs cannot be refunded. For the purpose of carrying out the application process, personal data will be stored.

For more information, please call Cornelia Grabe on +49 (0) 551 709 2628.