



PhD-Researcher Position (m/f/d) within the SE²A Research Cluster

Erforschung der Dinge im Hinblick auf ihr Wesen

Temporary Position (4 years)

Background:

The Cluster of Excellence SE²A - *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), the National Metrology Institute of Germany (PTB), and Delft University of Technology 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”.

This project falls within the core research area “Energy Storage & Conversion” and aims at developing a methodology for the design of highly integrated thermal management systems (TMS) in aircraft, serving both the propulsion system, whatever concept is adopted, and the environmental control system (ECS), and exploiting advanced cooling technologies and possibly energy harvesting. The need for integrating many distributed heat sources and the design of a lightweight system call for the development of a design methodology and the related simulation and optimization infrastructure to systematically assess different TMS configurations and technologies in an early stage of the aircraft design.

www.tu-braunschweig.de/en/se2a

Employment:

The position is located at *Delft University of Technology*. 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%. For all doctoral researchers of the cluster, an active participation in SE²A's own qualification program is mandatory. The time effort for this training entails 10% of the working time. International applicants may have to successfully complete a visa process before hiring can take place. Applications from international scientists are welcome. The Cluster SE²A 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 proof.

Task:

The outcome of the project is the identification of the best TMS configurations for a given aircraft by means of an advanced preliminary design methodology that is targeted to the optimal trade-off between efficiency, minimum drag and weight associated with the TMS.

- *Development of a preliminary design and optimization methodology for TMS configurations, accounting for weight estimation and induced drag assessment.*
- *Study of different TMS configurations given the aircraft and the related propulsion system specifications.*
- *Evaluation of hybrid-electric propulsion systems embedding waste heat recovery units*
- *Assessment of innovative solutions to make vapour compression cycle system suitable for use aboard aircraft*

Who we are looking for a candidate with:

- *MSc in Aerospace/Mechanical engineering*
- *A passion for propulsion / energy conversion systems and thermodynamics.*
- *An aptitude for software development with object-oriented programming languages, e.g. Modelica.*
- *An aptitude for teamwork and effective communication in an international environment.*

Application Process:

The application must be sent by e-mail by 31.01.2023 to Carlo De Servi (c.m.deservi@tudelft.nl) and must contain the following documents:

- Motivation Letter
- Curriculum Vitae including complete address, phone number, email address, educational background, language skills, and work experience
- Copies of bachelor and master diplomas and transcript of grades in original language and in English (if applicable)
- Copy of master thesis dissertation
- Additional Documents must be provided on request

All documents should be in PDF format, preferably in a single file.

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

For more information, please contact Dr. ir. Carlo De Servi by email (c.m.deservi@tudelft.nl).