Research Assistant Position

**Scalability Analysis of Hybrid-Electric Aircraft**
Temporary Position (initial contract of two years), Salary Level TV-L E13, 100%

**Background:**
This project aims to develop a landscape of opportunities and limitations of key radical hybrid-electric technologies (battery-electric, fuel cell, but also considering non-drop in fuel technologies such as Hydrogen-H2, Liquified Natural Gas) and the "switching points" associated to scaling such technologies between different aircraft classes. These classes are General Aviation, commuter aircraft, regional aircraft, short-medium range, and large passenger aircraft, where the focus is on up-scaling the key-technologies. This landscape of design solutions is supported through a "credibility assessment" of assumptions underlying the application of these radical technologies, in different technology scenarios. Additionally, the impact of radical solutions will be assessed in terms of the viability of operations, economics, and safety (certification). To achieve this, the project will use an approach of integrating novel airframe technologies with a hybrid electric energy network to apply credibility-based multidisciplinary design optimization (MDO). To provide feasible starting points for this landscape and the MDO, an integrated aircraft design approach will be used with physics-based design methods for the subsystem technologies.

**Employment:**
The position is located at the Institute of Aircraft Design and Lightweight Structures in Braunschweig. The position is part-time suitable but should be occupied 100%. The entry date is January 1st, 2021, and the initial duration is 24 months. Depending on the fulfillment of personal requirements, the remuneration is based on the salary level TV-L E13. International applicants may have to complete a visa process before hiring can take place. We are an equal opportunity employer and all qualified applicants will receive consideration for employment without regard to race, color, religion, sex, sexual orientation, gender identity, or national origin, disability status, or any other characteristic protected by German law. TU Braunschweig aims to increase the share of women in academic positions. Applications from female candidates are explicitly encouraged. Where candidates have equal qualifications, preference will be given to the female applicant. Besides, candidates with disabilities will be preferred if equally qualified.

**Task:**
The qualified candidate for this position is supposed to perform uncertainty-based MDO for a different class of passenger aircraft with novel airframe technologies and novel hybrid-electric powertrain. The open-source aircraft design environment SUAVE will be used as the main platform for this project. New reduced-order models for energy networks will be developed by other partners of this project and the candidate of this position needs to integrate those models to SUAVE. State of the art uncertainty propagation models needs to be implemented in SUAVE. The modified tool then will be used for a series of uncertainty-based MDO.
Who we are looking for:

The requirements for this position are as follows:

- A Master of Science degree in aerospace engineering.
- Knowledge and experience of (electric/hybrid electric) aircraft design.
- Knowledge and experience of multidisciplinary design optimization.
- Knowledge and experience in uncertainty quantification and uncertainty-based optimization.
- Strong programming skills (Python).
- Excellent communication skills in spoken and written English.
- Creativity, positive attitude, and perseverance.

Application Process:

Applications should be sent by e-mail to Prof. Dr. Ali Elham (a.elham@tu-braunschweig.de) 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 diploma and transcript of grades (and English translation if the original documents are not in English)
- Additional Documents must be provided on request

All documents should be in PDF format 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. The deadline for applications is October 15th 2020.