



The Institute of Space Systems (IRAS) at TU Braunschweig is offering

**an assistant position (m/f/d)
(100 % -TV-L up to 13)**

**in the research field “In-Space Manufacturing”,
at the earliest possible date for a duration of two years.**

The Institute of Space Systems at the University of Braunschweig currently has two PhD positions available. Interested applicants in pursuing a PhD in Space Systems and performing research related to In-Space Manufacturing at the University of Braunschweig are encouraged to apply.

The proposed research is aimed at exploring and developing the capabilities of In-Space sustainable manufacturing, assembly, and operations of large sensor networks in space. Strong emphasis is placed on the development, experimental testing, and validation process to utilize 3D printing technologies to create sensors and structures at the Experimental Lab for Proximity Operations and Space Situational Awareness (ELISSA). A possible application of a 3D printed sensor is a magnetometer that operates by having a conducting coil measure the varying magnetic flux over time. The creation of an array of such sensors in space could be used to measure the magnetic field fluctuations over a large area.

Proposed Dissertation Research Topics:

The design, and development of an In-Space Manufacturing proof of concept demonstrator that is able to utilize additive manufacturing and 3D printing techniques, to create sensors, such as a magnetometer.

The investigation and experimental validation of how to account for thermal and dynamics effects during In-Space manufacturing and assembly, as well as a compact form factor for proof of concept CubeSat demonstrator mission.

Deliverables:

The design, development, and creation of a working concept demonstrator in four years. With the desired goal that this will lead to a CubeSat demonstration mission within 7 years. Some of the fundamental research questions related to In-Space Manufacturing we would like to address:

- How can we use additive manufacturing to make 3D printed components for sensors and structures?
- How do we account for thermal and dynamic effects related to material cooling?
- How do we ensure a compact form factor such that a CubeSat demonstration mission is possible?
- How do we ensure that the Manufacturing In-Space and robotic assembly of structures is sustainable?

Qualifications:

- Education, research, and/or work experience in Mechanical, Aerospace, Robotics, Electrical, and related engineering fields is highly desired.
- A Master's degree in one of the above fields is required.
- Experience in the use of 3D printing, interest in exploring its applications for sustainable In-Space Manufacturing is highly desired.
- Enthusiasm for exploring In-Space Manufacturing technologies, as well as the publication of conference and journal papers is required.
- The desire to learn, program (C, C++, Matlab/Simulink, Arduino), and control the actuation of microcontrollers, servos, and motors for In-Space manufacturing applications.
- Experience in the use and application of Geometric Dimensioning and Tolerancing for Computer Aided Design and manufacturing applications is recommended.

Severely disabled persons are preferred if they are equally suitable. Proof must be enclosed.

At TU Braunschweig we want to increase the proportion of women in scientific positions and therefore particularly welcome applications from women. Candidates with equivalent qualifications are given preference. Applications from international scientists are welcome.

We offer exciting and diversified activities.

Application costs cannot be reimbursed. A return of your application is only possible if you include a self-addressed stamped envelope.

For further information please contact Dr. Carsten Wiedemann (details below). Please send your written application in English by **09.09.2022** together with the relevant documents (in one pdf file, max. 50 MB) by email to aerospace@tu-braunschweig.de.

By submitting your application documents electronically, you agree that they will be stored digitally and processed for the application procedure.

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