MUNICH AEROSPACE – NEW HORIZONS IN AVIATION AND SPACE

In 2010, through Munich Aerospace and its pooling of research, graduate programs and teaching an alliance has been formed between the **Technical University Munich** (TUM), the **University of the Bundeswehr Munich** (UniBwM), the **German Aerospace Center** (DLR), as well as **Bauhaus Luftfahrt** (BHL).

To promote excellent, scientific young academics, Munich Aerospace awards a PhD scholarship on

Hybrid lightweight structures by additive manufacturing

The Chair of "Materials for Additive Manufacturing" (Institute of Materials Science) at the department Aerospace Engineering of the University of the Bundeswehr Munich (UniBwM) is headed by Prof. Eric Jägle. The main focus of the chair's research is the optimization and the development of alloys for additive manufacturing. This includes steels, Al-, Ni-, Ti- and high entropy alloys. We employ laser-powder bed fusion (L-PBF) as well as laser DED methods (directed energy deposition with powders and wires). Additional projects are concerned with metal-gas-reactions during AM, multi-alloy approaches, metal matrix composites, in-situ and ex-situ heat treatments and high throughput methods for alloy development. We characterize the mechanical properties of the materials in question under static and dynamic loading conditions as well as by thermal and chemical analysis, and electron microscopy. The chair is embedded in a highly-networked research environment at UniBwM including a cross-department research lab on additive manufacturing featuring more than ten different AM machines, operated by researchers from eight complementary institutes. In this Munich Aerospace research group, we collaborate closely with Prof. Peter Mayr's chair for "Materials technology for additive manufacturing" at the Technical University Munich (TUM).

Your tasks and qualifications

Additively manufactured metallic components are being used more and more in the aerospace industry, where lightweight construction and efficient use of resources are of central importance. Therefore, a hybrid form of additive manufacturing will increasingly be established in the future. In such processes, limited yet complex structures are applied additively to conventionally-manufactured semi-finished products. This can be done either in the process itself, when a semi-finished product is used instead of a conventional substrate plate, or in a subsequent step, where two components, one conventionally and one additively manufactured, are joined.
The topic at hand relates to the additive manufacturing of multi-material specimens and parts, as well as the selection and analysis of suitable alloy combinations. These material pairs include established alloys developed for conventional manufacturing and new alloys tailormade for additive manufacturing. To ensure a quick startup of your activities, you should be familiar with (i.e., have an M. Sc. degree in) materials science or technology. Additionally, experience with additive manufacturing processes or joining of dissimilar alloys is advantageous.

The Scholarship

The Munich Aerospace scholarship amount is 1.575 € per month granted for a minimum of 12 months and limited to a maximum of 3 years. Munich Aerospace scholarship holders are entitled to attend the Munich Aerospace Graduate School, formed by the TUM Graduate School and the DLR_Graduate_Program, and have access to special events and trainings. An additional grant of up to € 6.100 per year will be available to cover expenses that are directly related to the PhD project (e.g. textbooks, laptop, conference travels, public transport, housing subsidy). The scholarship holder is part of a Munich Aerospace research group and receives additional technical support from the research group head. The PhD can be obtained at UniBwM under the supervision of Prof. Jägle and the completion of the university degree should not be more than three years prior to the application for the scholarship.

Interested?

Please send us your application including relevant documents (cover letter, CV, diplomas, transcript of records) in PDF format to eric.jaegle@unibw.de. The application deadline is April 14, 2021.

We are looking forward to your application!