Technische Universität Dresden - Faculty of Mechanical Science and Engineering, Institute for Lightweight Engineering and Polymer Technology (ILK), Chair of Lightweight Systems Engineering and Multi Material Design

Technische Universität Dresden

TUD Dresden University of Technology, as a University of Excellence, is one of the leading and most dynamic research institutions in the country. Founded in 1828, today it is a globally oriented, regionally anchored top university as it focuses on the grand challenges of the 21st century. It develops innovative solutions for the world's most pressing issues. In research and academic programs, the university unites the natural and engineering sciences with the humanities, social sciences and medicine. This wide range of disciplines is a special feature, facilitating interdisciplinarity and transfer of science to society. As a modern employer, it offers attractive working conditions to all employees in teaching, research, technology and administration. The goal is to promote and develop their individual abilities while empowering everyone to reach their full potential. TUD embodies a university culture that is characterized by cosmopolitanism, mutual appreciation, thriving innovation and active participation. For TUD diversity is an essential feature and a quality criterion of an excellent university. Accordingly, we welcome all applicants who would like to commit themselves, their achievements and productivity to the success of the whole institution.

Research Associate / PhD Student (m/f/x) within the MSCA Doctoral Network Coupled Problems for Decarbonisation in Industry and Power Generation – Combine

(due to funding, the salary is calculated according to MSCA regulation) At the Faculty of Mechanical Science and Engineering, Institute for Lightweight Engineering and Polymer Technology (ILK), the Chair of Lightweight Systems Engineering and Multi Material Design offers a full-time project position as Research Associate / PhD Student (m/f/x) within the MSCA Doctoral Network Coupled Problems for Decarbonisation in Industry and Power Generation – Combine starting September 1, 2026. The position is limited to 36 months. The period of employment is governed by § 2 (2) Fixed Term Research Contracts Act (Wissenschaftszeitvertragsgesetz – WissZeitVG). About the Individual Research Project (IRP): The scientific work within this project focuses on the experimental investigation of the interactions between fibre and resin that occur during the injection pultrusion process. The primary objective is to analyse the physical processes within the injection chamber and especially within the fibre structure. The results obtained will provide the basis for designing injection pultrusion pro-cesses with a view to highly efficient processing and effective utilisation of fibre properties.

City: Dresden; Starting date (earliest): 01/09/26; Duration: The position is limited to 36 months.; Remuneration: due to funding, the salary is calculated according to MSCA regulation; Reference number: w26-071; Closing date: 12/06/26

Tasks

About the Individual Research Project (IRP): The scientific work within this project focuses on the experimental investigation of the interactions between fibre and resin that occur

during the injection pultrusion process. The primary objective is to analyse the physical processes within the injection chamber and especially within the fibre structure. The results obtained will provide the basis for designing injection pultrusion pro-cesses with a view to highly efficient processing and effective utilisation of fibre properties.
The research work comprises the following individual tasks:

- Development of specialized experimental in-situ methods: Design and construction of innovative test facilities for investigating fiber-resin interaction within the injection chamber of a pultrusion plant, for example utilizing computer tomography.
- Analysis of FSI during injection: Detailed description of the fluid-structure interaction (FSI) phenomena that occur during the injection process and can lead to process-critical fiber displacements or waviness.
- Experimental parameter determination: Determination of specific material and structural parameters under the real conditions of injection pultrusion in order in order to replace trial-and-error methods with physically based simulations.
- Validation of sensory monitoring: Evaluation of material-integrated optical sensors for online process monitoring, especially during resin injection.
- Scientific exchange: Active participation in the MSCA network, conducting research stays (secondments) at scientific and industrial partner institutions, in particular to support the development of numerical simulation models, and international publication of the results.
- Investigation of the wetting behaviour of the thermoset matrix to fibre reinforcement depending on the degree of cross-linking and temperature.
  This involves activities in the areas of composite manufacturing, materials testing, data evaluation, quality assurance, simulation and modelling. You will be responsible for selecting and preparing the necessary experimental investigations and evaluation methods, for which extensive measurement technology is available at the institute and within the MSCA network. The work will be carried out in close cooperation with the partners of the MSCA network, including several secondments, which requires independent communication and proactive collaboration. The results achieved in the project are to be published in international journals and presented at national and international scientific conferences. In addition to the project work, you will also support project-related student work and participate in the training activities of the MSCA network.

Requirements

- very good university degree, preferably in mechanical engineering, lightweight design, polymer engineering or materials engineering
- good knowledge of fibre composite technology, common design and simulation software (Solidworks, Abaqus, SiemensNX)
- good knowledge of programming languages (Matlab, Python) and Microsoft Office
- The successful candidate will be expected to work independently with a high degree of initiative and be willing to actively participate in interdisciplinary research teams.
- Due to the high experimental component, practical skills and theoretical know-how are an advantage.
- Cooperation with partners in the MSCA network and the presentation of project results will require business trips to network partners and conferences, as well as

longer stays as part of secondments.
- The willingness to pursue a doctorate is a fundamental requirement for employment.
- language skills: Fluent written and spoken English (B2)

The EU Mobility Rule applies. That is, the candidate must not have resided or carried out her/his main activity (work, studies, etc.) in the host country for more than 12 months in the 3 years immediately before the recruitment date. Compulsory national service, short stays such as holidays, and time spent as part of a procedure for obtaining refugee status under the Geneva Convention are not taken into account.

What we offer

Within the COMBINE project, a total of 17 PhD positions are available at the premises of 14 European institutions from academia and industry: https://euraxess.ec.europa.eu/jobs/401249

TUD strives to employ more women in academia and research. We therefore expressly encourage women to apply. The university is a family-friendly university. We welcome applications from candidates with disabilities. If multiple candidates prove to be equally qualified, those with disabilities or with equivalent status pursuant to the German Social Code IX (SGB IX) will receive priority for employment.

Application

Application: Please submit your detailed application with the usual documents by June 12, 2026 (stamped arrival date of the university central mail service applies) to:
TU Dresden, Institute for Lightweight Engineering and Polymer Technology, Mrs. Barbara Röllig – personal–, Helmholtzstr. 10, 01069 Dresden, Germany.
Please submit copies only, as your application will not be returned to you. Expenses incurred in attending interviews cannot be reimbursed.
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TUD is a founding partner in the DRESDEN-concept alliance.
Reference to data protection: Your data protection rights, the purpose for which your data will be processed, as well as further information about data protection is available to you on the website:
https://tu-dresden.de/karriere/datenschutzhinweis.

More information at https://stellenticket.de/202586/BEUTH/
Offer visible until 12/06/26