

TUBAF
Die Ressourcenuniversität.
Seit 1765.

# PhD position (m/f/d) in 4D Printing of Biodegradable Parts by Multi-Ink Binder Jetting (MultiMAM-101309938, DC-15)

**reference number 191/2026 is to be filled from 01.07.2027 or later.**

Pay grade: E13 TV-L

Hours: 1.0 FTE (40 h/week)

Contract type: limited to 36 months

Technical University Bergakademie Freiberg (TUBAF), Chair of Additive Manufacturing, invites applications for a fully funded PhD position within the Marie Skłodowska-Curie Doctoral Network MultiMAM (Multi-Material Additive Manufacturing).

## About MultiMAM Project

MultiMAM (project no: 101309938) is a European Doctoral Network dedicated to accelerating the industrial adoption of Multi-Material Additive Manufacturing (MMAM), a key enabling technology for next-generation healthcare, aerospace, automotive, energy, electronics, and multifunctional products. Bringing together leading universities, research institutes, and industrial partners from 10 European countries, MultiMAM addresses critical scientific and technological challenges across the MMAM value chain through 15 pioneering doctoral projects focusing on materials, processes, and sustainability.

As a Doctoral Candidate in MultiMAM, you will benefit from world-class scientific training, international collaboration, interdisciplinary supervision, and industry-focused secondments. Working within a highly diverse and interdisciplinary network, you will develop advanced technical expertise, practical research experience, and transferable skills while contributing to innovative solutions for sustainable digital manufacturing. Upon completion, you will be well positioned to become a future leader in MMAM, advanced manufacturing, and industrial innovation.

## About MultiMAM Doctoral Candidate Project 15 (DC15):

Binder Jetting (BJT) is an AM technology that uses liquid binders to join powder particles. This PhD project aims to develop sustainable alternatives to conventional materials by upcycling biobased waste for BJT. A key focus is the integration of multiple functional inks to create components with locally tailored properties, such as embedded electrical wiring, magnetic sensing and responsive behaviour. Furthermore, 4D printing will be explored to enable components to change their properties in response to external stimuli, such as temperature or moisture. The overall goal is to combine sustainable materials, functional integration and circular economy principles to develop adaptive components with self-repairing capabilities and controlled end-of-life disintegration.

## Research focus and responsibilities:

• Implement BJT using upcycled, bio-based materials from renewable resources.
• Apply functional inks with electrical, magnetic and responsive properties for externally triggered and fixed-time biocompatible degradation. These inks will be optimized for BJT printing parameters.
• Advance BJT through the integration of 2-4 distinct inks and produce printed parts with multiple ink functionalities.
• Contribute to project deliverables, scientific publications, dissemination, network-wide events, and collaboration across the MultiMAM doctoral network

## Proposed Doctoral Supervision Panel:

Prof. Henning Zeidler, TUBAF, Germany, Dr. Katja Heise, TUBAF, Germany
Prof. Rocco Lupoi, Trinity College Dublin, Ireland

## Working Conditions, Benefits and Career Development

The successful candidate will be employed for 36 months as a research scientist within the Marie Skłodowska-Curie Doctoral Network project at TUBAF. Starting date is 1st of July, 2027 (or according to mutual agreement). The position is a full-time position.

Working at the Resource University - regionally based and internationally networked.
TU Bergakademie Freiberg is the university of resources and at the same time the oldest university of mining sciences in the world. Since its foundation in 1765, teaching and research have been oriented along the entire raw materials value chain. Today, this includes handling of natural raw materials from exploration, extraction, preparation and processing to recycling. The scientific fields represented at the university, which are reflected in the core fields of geo, materials, energy, environment and economics, are interlinked along the entire raw material value chain. The idea of sustainability, which was coined more than 300 years ago by Freiberg's chief miner Hans Carl von Carlowitz, was then as now the guiding principle in education and research. Think globally, act globally.

- Access to world-class research infrastructure, six international training events across Europe and dual secondments.
- Work at a family-friendly university with flexible working hours and Work in a committed and motivated team
- Remuneration according to the Collective Agreement for the Public Service of the German Federal States (TV-L), depending on personal qualifications
- Attractive additional benefits, e.g., capital-forming payments (VL), company pension scheme (VBL), health management, further training opportunities, “Job-Ticket”)

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## Secondments

Industrial Secondment (4 months) at C-MARX GmbH, Chemnitz, Germany.
Academic Secondment (2 months) at Trinity College Dublin, Ireland.

## Qualifications

Applicants must have:

- A two-year master's degree (120 ECTS points) or a similar degree with an academic level equivalent to a two-year master's degree in in Mechanical Engineering, Mechatronics, Manufacturing Engineering, Materials Science, Physics, or a closely related discipline.
- Excellent academic achievements and strong analytical and problem-solving skills.
- Excellent English communication skills, both written and oral.
- Interest in interdisciplinary research and international collaboration, and interest in getting science applied in industries

Applicants with experience in one or more of the following topics will be preferred:

- Additive manufacturing, mechanical engineering, or machine design.
- Process engineering and biobased material knowledge
- Knowledge of stimuli-responsive materials.
- Experimental work involving mechanical, optical, or chemical setups.
- CAD modelling, mechanical design, or design optimisation.
- Programming, automation, machine learning or real-time process control.
- Thermal management, experimental design, or statistical data analysis.

## Approval and Enrolment

Enrolment for the PhD degree is subject to academic approval by the faculty board. The candidate will be enrolled in the PhD degree programme (“Promotionsstudium”) at TUBAF.

## Assessment

The assessment of the applicants will be made by the Doctoral Supervision Panel led by Prof. Henning Zeidler.

## Eligibility Requirements:

Applicants must:

- not already hold a doctoral degree, and fulfil the requirements for enrolment in TUBAF’s PhD programme.
- comply with Marie Curie Mobility Rule: At the recruitment date, applicants must not have resided or carried out their main activity (work, studies, etc.) in Germany for more than 12 months during the 36 months immediately before recruitment

For the MultiMAM Doctoral Network project, a total of 15 PhD positions are available within the consortium. Applicants may apply for a maximum of two positions and must clearly indicate their first and second choices in each of the applications.

## Further information

Further information may be obtained from Professor Dr.-Ing. Henning Zeidler,
Head of the Chair of Additive Manufacturing:
henning.zeidler@imkf.tu-freiberg.de,
Phone +49 3731 39-3066.
You can read more about the Chair of Additive Manufacturing at https://tu-freiberg.de/en/fakult4/imkf/chair-additive-manufacturing.

## Your application:

with quoting the reference number **(191-E/2026)** must be submitted no later than 05.02.2027 (23:59 CET)
**by email to:** bewerbungen@tu-freiberg.de
or by conventional mail:
**TU Bergakademie Freiberg**
**Dezernat Personalangelegenheiten**
**09596 Freiberg, Germany**

Please attach **all your materials in English in one PDF file**. The file must include:

- A motivation letter (cover letter) describing interest in the position and alignment with the DC-15 project.
- Curriculum Vitae (without photo and without information unrelated to professional qualifications).
- Grade transcripts and BSc/MSc diploma (in English) including official description of grading scale.
- Documentation of English-language proficiency.
- Contact details of two referees.
- Relevant publications, portfolio, thesis work, project reports, or other supporting documentation, if available.

You may apply prior to obtaining your master's degree but cannot begin before having received it.

Severely disabled persons or persons of equal status (m/f/d) will be given preferential consideration if they have the same qualifications, performance, and abilities. Please include proof of this. The TU Bergakademie Freiberg specifically promotes the proportion of women and expressly invites qualified.

**Applications received after the deadline will not be considered.**

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