

Scientific assistant – Material modelling and simulation

With around 8,200 students, Brandenburg Technical University (BTU) Cottbus-Senftenberg is the second largest and the only technical university in the federal state of Brandenburg. It is a research-oriented technical university that offers excellent research opportunities. In the **Chair of Mechanical Design and Manufacturing** of the **Faculty of Mechanical Engineering**, we are looking for a candidate as:

Scientific assistant (m/w)

For a fixed term contact with a possibility of obtaining a doctoral degree.

The remuneration is paid according to salary level 13-TVL.

The position is full-time and comprises 40 hours per week.

Project description:

Within the process chains of the semi-finished production, hot forming is used to eliminate pores and voids from the casting process under compressive stresses and to modify the microstructure for further processing. However, some deformation conditions contribute to further void formation and damage on non-metallic inclusions. De-cohesion of matrix and inclusion in pore formation is determined by local stresses acting on the interface. In contrast to cold forming, recovery, recrystallization and diffusion processes occur during hot forming, which can relieve local stresses. Depletion, detachment and damage are mostly un-coupled in currently available material models. The project aims at developing a multi-scale material model describing the influence of recovery and recrystallization on the development of damage during hot forming process. The goal of the project is to understand the interactions between recrystallization and damage during hot forming and to provide quantitative results on damage evolution.

Specific responsibilities:

- Development of coupled material model for recovery, recrystallization and damage
- Crystal-plasticity finite element simulations on the micro-level to understand the interaction of inclusions with the matrix and thus a physically-based description of damage generation

Requirements:

- Master's degree in Mechanical Engineering or Material Science with specialization in computational mechanics
- Experience with material model development
- In-hand knowledge of finite element simulations, ideally crystal-plasticity simulation
- Very good knowledge of damage mechanics
- Understanding of crystal- and microstructure
- Ability to interpret and report scientific results
- Software skills: Abaqus, CP-FEM (DAMASK), Matlab

Applicants should submit their curriculum vitae with letter of application, copies of all relevant degree certificate(s), experience and recommendation letters to the following postal address:

Prof. Dr.-Ing. habil. Markus Bambach
BTU Cottbus-Senftenberg
Lehrstuhl Konstruktion und Fertigung
Konrad-Wachsmann-Allee 17
03046 Cottbus

or e-mail to rapkow@b-tu.de