



## Opening, Max-Planck-Institut für Eisen- forschung in Düsseldorf, Germany

### **OPEN POSITION** (PhD or Postdoc) in **Crystal Plasticity Simulation**.

The position is part of the project “Electro-plastic deformation of Al-Cu eutectic alloys” within the DFG priority programme “Manipulation of Matter Controlled by Electric and Magnetic Fields: Towards Novel Synthesis and Processing Routes of Inorganic Materials” (SPP 1959).

The **aim of this project** is to unravel some of the underlying mechanisms facilitating enhanced plasticity during electro-mechanical deformation in otherwise brittle materials. A complementary experimental and theoretical investigation of the electromechanical deformation behaviour of Al-Cu eutectic alloys will be performed. Specifically, Al-Cu alloys with varying microstructures will be synthesized using rapid alloy prototyping, and their electro-mechanical behavior characterized using in-situ methods. Experimental data are used as input and validation parameters for multi-physics simulations of the electro-plastic effect. Here a constitutive theory for electro-plasticity will be developed within a crystal plasticity framework, incorporating factors such as electron wind forces, joule heating and thermal effects. The computational implementation is performed within the flexible simulation toolkit DAMASK, and is applied to study the electro-mechanical deformation mechanisms in relation to the underlying microstructure of the Al-Cu alloys.

**Applicants:** The candidate should have a master degree in materials science or physics as well as a strong background in physical metallurgy or solid state physics. Programming skills are beneficial. Excellent English skills are mandatory. We are an equal-opportunity employer and offer an international, ambitious environment for basic research-oriented candidates who want to perform competitive and cutting-edge research. Salary is determined by the TVöD, level 13. We invite excellent candidates (materials science, physics, engineering) to send a scientific CV including full course and grade documentation as well as transcripts (including grade scale), concise specific motivation letter, publications, at least 2 letters of reference and 2 further names & contacts of scientists as references to

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