



The Functional Materials Working Group under the leadership of Prof. O. Gutfleisch at the Department of Materials and Geosciences of TU Darmstadt offers a position as

Research Assistant / PhD Student (all genders) - Upscaling the 2-powder method for production of NdFeB-based permanent magnets with less critical elements – 75%

with a fixed-term contract of 3 years.

The position is within the framework of a collaborative project between the Functional Materials Group, TU Darmstadt, and the Fraunhofer Research Institution for Materials Recycling and Resource Strategies IWKS Hanau. The aim of the project is to investigate the 2-powder method [1] as a new route for production of NdFeB-based magnets with reduced amounts of critical elements for sustainable electrical mobility and wind energy. Reduction of the resource-critical heavy rare earth elements dysprosium and terbium as well as partial substitution of the light rare earth elements neodymium and praseodymium with cheap and abundant cerium and lanthanum in permanent magnets will be systematically studied.

The position is hosted by the internationally renowned group Functional Materials, which focusses on the development of resource-efficient functional materials. The group's topics of interest range from permanent magnets over magnetocaloric materials and ferromagnetic shape-memory alloys to magnetic materials for biomedical application with focus on synthesis, characterization and modeling of the magnetic, thermal and (micro-)structural properties.

Your tasks within the project will be synthesis and characterization of NdFeB-based powders and bulk magnets. Jet milling will be used for powder production followed by magnetic field alignment, pressing and sintering studies. Chemical composition (ICP-OES, EDX), magnetic properties (VSM, PPMS) and microstructure (SEM, TEM) will be characterized.

Your profile: We expect you to integrate into our interdisciplinary team and contribute actively to the overall progress of the project's objectives in close collaboration with your colleagues of the consortium while, at the same time, pursuing your own thesis highly motivated and self-reliantly. Requirements are an excellent scientific degree (master or comparable) in Materials Science, Physics or Chemistry, possibly with a focus on synthesis and characterization of magnetic materials, and very good English competencies (fluent in spoken and written). You are highly motivated to publish your results, present them at international project meetings and conferences. You bring excellent communication skills and enjoy working in interdisciplinary and international teams.

We offer the opportunity to work towards a PhD degree on the cutting-edge research topic in the field of functional materials for energy conversion and the excellent working conditions in an international team with integration into a scientific network of well-renowned experts of the magnetic materials community. The Technical University of Darmstadt offers a varied, diverse working environment, independent work, demand-oriented training opportunities and individual personnel development. Company health management and the compatibility of family and career are a matter of course. In addition, you will receive free travel authorization for local and regional transport in the area of the state of Hesse (LandesTicket Hessen) according to the applicable regulations. All university employees can use the offer of deferred compensation in favor of a "Job Rad" leasing model.

Opportunity for further qualification (doctoral dissertation) is given. The fulfillment of the duties likewise enables the scientific qualifications of the candidate.

The Technische Universität Darmstadt intends to increase the number of female employees and encourages female candidates to apply. In case of equal qualifications applicants with a degree of disability of at least 50 or equal will be given preference. Wages and salaries are according to the collective agreements on salary scales, which apply to the Technische Universität Darmstadt (TV-TU Darmstadt).

Applications (all in a single PDF-file) should be sent including all usual documents, stating the above identification number, in the form of a pdf by e-mail to info@fm.tu-darmstadt.de.

If you have any questions, please contact Dr. Imants Dirba (imants.dirba@tu-darmstadt.de) or Prof. Oliver Gutfleisch (oliver.gutfleisch@tu-darmstadt.de).

For the website of the FM group, see → <https://www.mawi.tu-darmstadt.de/fm>.

By submitting your application, you agree that your data may be stored and processed for the purpose of filling the vacancy. You can find our → [privacy policy](#) on our webpage.

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Application deadline May 22, 2023