

The Functional Materials Division headed by Prof. O. Gutfleisch at the Department of Materials and Earth Science at TU Darmstadt is offering a position as

**Research Assistant/Ph.D. Student (all genders) - Development of rare earth free hard magnetic powder for the production of permanent magnets – 75 %**

with a fixed-term contract of 3 years.

The transition to sustainable energies requires advanced magnetic materials that reduce or eliminate dependence on critical raw materials, such as rare earths and cobalt. The aim of this project is to develop a new rare-earth-free hard magnetic powder for use in sustainable permanent magnets. The research will focus on the key scientific and technical challenges in the phase formation, the kinetics of chemical ordering and the microstructural control at the nanoscale, as well as the processing. A PhD position is currently available in a project led by Prof. Oliver Gutfleisch, which aims to design and develop nanocrystalline permanent magnets based on rare-earth free hard magnetic powder.

**The position** is based in the internationally renowned Functional Materials Division, which focuses on the development of resource-efficient functional materials. The topics of interest of the group range from permanent and soft magnets, magnetocaloric materials and ferromagnetic shape memory alloys to magnetic materials for biomedical applications with a focus on synthesis, characterization, and modeling of magnetic, thermal and (micro-) structural properties.

**Your tasks** within this highly ambitious and possible ground-breaking project will be to investigate the fundamental principles of phase formation and synthesis of rare earth free hard magnetic material. Your work will include use and development of advanced synthesis and characterization techniques (from traditional melting and powder metallurgy to various non-equilibrium methods) and advanced characterization routes to understand their (micro-) structural and magnetic properties as well as their mechanical, thermodynamic and corrosion stabilities.

In addition to the scientific work, the candidate will be expected to proactively collaborate with our extended academic and industrial partner network and within our Functional Materials Division, to present high quality research at conferences and to publish the results in peer-reviewed journals.

**Your profile:** We are seeking an outstanding and highly motivated Ph.D. candidate with a master's degree in materials science, or physics, or chemistry to join our research team. Knowledge of alloy design principles and advanced characterization techniques would be an advantage. Fluency in English, both written and spoken, is required to effectively present research results, contribute to discussions and collaborate with researchers from diverse backgrounds. The ability to work in an international group, with individuals from different cultures and disciplines, is highly valued as it

fosters a rich and collaborative research environment that encourages the exchange of ideas and perspectives.

We offer the opportunity to do a doctorate on a highly topical research subject in the field of functional materials for energy conversion and excellent working conditions in an international team with integration in a scientific network of renowned experts in the magnetic materials community. The Technical University of Darmstadt offers a varied, multifaceted working environment, independent work, demand-oriented further training opportunities and individual personnel development. A company health management system and work-life balance are a matter of course. In addition, you will receive a free travel pass for local and regional public transport in the state of Hesse (LandesTicket Hessen) in accordance with current regulations and the advantage of the deferred compensation scheme in favour of a "Job Rad" leasing model.

The Technical University of 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 Technical University of Darmstadt (TV-TU Darmstadt).

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

Please apply via this link: <https://www.career.tu-darmstadt.de/tu-darmstadt/apply/53356>

The website of the FM Group can be found at <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.