TECHNISCHE UNIVERSITÄT DARMSTADT

The Accelerator Physics chair, lead by Prof. Oliver Boine-Frankenheim, in the Department of Electrical Engineering and Information Technology at the Technische Universität Darmstadt offers a position in the research group of Dr. Uwe Niedermayer for a

Scientific Employee/PhD student (all genders)

with a fixed-term contract for 3 years.

The position includes tasks mainly in the context of scientific research on terahertz diagnostics of ultrashort electron bunches in high-energy accelerators. Additional tasks include participation in teaching and public relations.

Ultra-short electron pulses in the single-digit femtosecond range can be produced in modern electron accelerator facilities and are mostly used to generate coherent X-rays for research in materials science, chemistry, and biology. Because these pulses are so extremely short, more effort is required to diagnose them, i.e., to determine their exact shape. This project approaches pulse-diagnostics by lateral deflection using the slope of a resonating terahertz wave.

The applicant shall work in the BMBF funded project: "Compact transverse-deflecting system for ultra-short electron bunch diagnostic (Compact-TDS)". The project includes the modeling of the Terahertz-Streaking system, as it will be set up by the project partner KIT (Karlsruhe) in the FLUTE accelerator. 3D electromagnetic simulation software shall be used for modeling and replacement models shall be created in scripting languages like Matlab or Python. Different types of setups will be analyzed and optimized. Theory and methods for this are to be further developed. In parallel, different setups and structures will be tested experimentally by the project partner. In case of scientific need, visits or stays at the project partner as well as at international partners are possible.

In addition to a completed university degree in electrical engineering or physics or a similar subject, the applicant should have very good knowledge in the field of analytical and numerical calculation of high-frequency electromagnetic fields. Written and spoken English as well as German language skills are required. Knowledge of electron accelerators, lasers and optics is helpful. Programming skills, preferably in Matlab, are required. Since this project aims at building a terahertz diagnostic system together with the project partner, experimental knowledge is helpful but not mandatory.

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). Part-time employment is generally possible.

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.

How to apply: Please send your detailed application with the usual documents (Coverletter, CV, university degree and grade records, publication list…) and the job vacancy ID to the DLA working group leader Dr. Uwe Niedermayer (please send electronically as a single PDF to uwe.niedermayer@tu-darmstadt.de), Institute for Particle Acceleration and Electromagnetic Fields (TEMF), Chair of Accelerator Physics, Schlossgartenstrasse 8, 64289 Darmstadt, Germany.

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