
The Accelerator Physics chair, lead by Prof. Oliver Boine-Frankenheim, in the Department of Electrical Engineering and Information Technology at 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 involves tasks mainly in the context of scientific research on laser-driven electron acceleration in dielectric structures and its modeling with modern artificial intelligence (AI) methods. Additional tasks include participation in teaching and public outreach.

Dielectric laser accelerators (DLAs) are nanostructures based on silicon or fused silica and represent an implementation of a scalable particle accelerator on a microchip. Techniques from the semiconductor industry are used in their fabrication.

The applicant shall work in the BMBF funded project: "Pulse Shaping and (virtual) Diagnostics for Dielectric Laser Acceleration (DLA-PSD)". The project includes the modeling of DLAs for highly relativistic electron beams as experimentally tested by the project partner DESY in Hamburg. A fast "digital twin" shall be developed, which runs in parallel with the experiment and enables "virtual diagnosis". Thus, electron beam parameters, which are not accessible in the experiment itself, shall be determined from this surrogate model. The parameters of the fast surrogate model shall be determined from experimental as well as numerical data by using modern machine learning (ML) techniques. The applicant should also participate in the international ACHIP project, funded by the American Gordon and Betty Moore Foundation, which aims to experimentally demonstrate such an electron accelerator on chip. International guest stays are possible in case of scientific need.

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 electromagnetic fields in connection with charged particles. English language skills, both written and spoken, are required. Knowledge of German is helpful. Knowledge of machine learning and artificial intelligence as well as lasers and optics is helpful. Programming skills, preferably in Matlab, are required. Since this project aims at developing a digital twin of the experimental setup at 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.

Code No. 536

Published on: August 02, 2022

Application deadline: August 31, 2022
