

TUD Dresden University of Technology, as a University of Excellence, is one of the leading and most dynamic research institutions in the country. Accordingly, we welcome all applicants who would like to commit themselves, their achievements and productivity to the success of the whole institution.

At the **Faculty of Electrical and Computer Engineering, Institute of Circuits and Systems**, the **Chair of Measurement and Sensor System Techniques (MST)** offers a position as

Research Associate / PhD Student / PostDoc (m/f/x)

Multidimensional Optical Information Processing

(subject to personal qualification, employees are remunerated according to salary group E 13 TV-L)

within the Reinhart-Koselleck project award starting **as soon as possible**. The position is limited to 3 years. The period of employment is governed by the Fixed Term Research Contracts Act (Wissenschaftszeitvertragsgesetz - WissZeitVG). The position comprises up to 100% of the fulltime weekly hours. Balancing family and career is an important issue. The position is generally suitable for candidates seeking part-time employment. Please indicate your request in your application. The position offers the chance to obtain further academic qualification (usually PhD / habilitation thesis).

Tasks: Programmable optical diffractive neural networks are inspired by the principles of biological neural networks; while they are trained using GPU-based optimization methods, the actual information processing takes place without a GPU, making them energy-efficient and fast. Diffractive networks are to be designed using novel, ultra-fast phase modulators to process high-dimensional structured light carrying orbital angular momentum. MEMS phase modulators should be investigated for optical routers and multiplexers. By using multiple wavelengths and spatial modes in multimode fibers for the Internet of Things and the quantum internet new paradigms will be studied.

Your responsibilities include:

- experimental and simulation-based investigations of optical diffractive neural networks based on MEMS-Phase Light Modulator
- application of the of the diffractive neural network with multimode fibers for novel routers and multiplexers
- publication of research results in international scientific journals, filing of patents, and presentation of conference contributions; the position can be flexibly tailored to focus on experimental laboratory work or simulation-based studies

Requirements:

- above-average university degree in the subject physics, information systems technique, electrical engineering, or related areas
- ability and willingness to work independently and conceptually in a team, in a goal-oriented manner, with a high level of commitment
- excellent written and spoken German and English skills
- interest in practice-oriented, interdisciplinary collaboration with international cooperation partners from research and industry
- knowledge of software development, deep learning, computational imaging, Fourier optics
- previous knowledge of quantum optics, waveguide optics, multiplane light conversion, MATLAB or Python is advantageous

We offer:

- a diverse, cutting-edge and challenging research position with your own externally funded research project, dedicated funding and opportunities to shape and develop your research
- an interdisciplinary research group whose pioneering paradigm shifts have been recognized with prestigious awards like Bertha Benz Prize of Daimler Benz Foundation, Körber Prize, Gabor award of Optica and Fraunhofer award of SPIE; the Czarske Lab has delivered more than 100 invited talks on all continents in recent years

- 9 excellent laboratories and research facilities
- opportunities to publish in high-quality scientific journals and attend international conferences for scientific exchange; excellent connections with research and industry partners
- flexible working hours; participation in the supplementary public-sector pension scheme through VBL

TUD strives to employ more women in academia and research. We therefore expressly encourage women to apply. The university is a family-friendly university. We welcome applications from candidates with disabilities. If multiple candidates prove to be equally qualified, those with disabilities or with equivalent status pursuant to the German Social Code IX (SGB IX) will receive priority for employment.

Application: Please submit your detailed application with the usual documents by **October 15, 2026** (stamped arrival date of the university central mail service or the time stamp on the email server of TUD applies), by sending it as a single pdf file to grp-application-mst@mx.tu-dresden.de (Please note: We are currently not able to receive electronically signed and encrypted data) or to:

TU Dresden, Chair of Measurement and Sensor System Technique, Prof. Juergen Czarske, Helmholtzstr. 10, 01069 Dresden, Germany.

Please submit copies only, as your application will not be returned to you. Expenses incurred in attending interviews cannot be reimbursed.

TUD is a founding partner in the DRESDEN-concept alliance.



Reference to data protection: Your data protection rights, the purpose for which your data will be processed, as well as further information about data protection is available to you on the website: <https://tu-dresden.de/karriere/datenschutzhinweis>.