

The *Laboratory of Measurement and Sensor System Technique (MST)* and the *Competence Center BIOLAS* of the *Faculty of Electrical and Computer Engineering* offer a position as

Research Associate: Optogenetic System Engineering

+++ *Volumetric Microscopy* +++ *Temporal Focusing* +++ *Digital Holography* +++ *Organoids* +++

The position offers the chance to obtain further academic qualification (Dr. rer. nat. / habilitation).

The Laboratory MST and the Competence Center BIOLAS is conducting research on the light stimulation and read-out of cardiomyocytes (cardiac muscle cells). This research field at the interface between laser-optical system engineering and biomedicine is called optogenetics, where the activity of transgenic cells is controlled by means of light-sensitive proteins. Our aim is to study the onset and termination of light-induced spiral excitation waves in cardiomyocyte networks and organoids by means of in-vivo experiments.

Your possible tasks (selection):

- ❖ setup a holographic, three-dimensional, two-wavelength light excitation system based on fast ferroelectric spatial light modulators (SLM)
- ❖ implement an axial sectioning strategy for volumetric samples by using ultrashort-lasers and temporal pulse shaping ("temporal focusing")
- ❖ investigate novel approaches like structured illumination microscopy for sub-wavelength resolved sample imaging
- ❖ compensate aberrations by adaptive optics to achieve subcellular resolution
- ❖ make experiments on optogenetic in vitro samples (from cellular monolayers to organoids)
- ❖ own research interests like AI / deep neural networks can be considered

We offer:

- ❖ a diverse, ambitious, and burning research issue
- ❖ an interdisciplinary and international research team
- ❖ creative possibilities and room for self-development and own research interests
- ❖ visits of international conferences
- ❖ cooperation with excellent partners from biotechnology
- ❖ modern laboratories with state-of-the-art equipment

Your requirements: Above-average university degree in physics or similar studies; ability for working autonomously and goal-driven within a team; great commitment, analytical thinking and taking joy in practical work and basic research are expected. Prior knowledge in wave optics and holography is advantageous.

Please address topical questions to Lars Büttner (e-mail lars.buettner@tu-dresden.de, phone +49 351 463 35314). Submit your comprehensive application including the usual documents preferably as a single pdf file by mail to: grp-mst-sekretariat@msx.tu-dresden.de.