CSC-Tübingen PhD Scholarship Program

2024 application round: prospective PhD positions at the University of Tübingen

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Faculty:	Faculty of Medicine
Institute / Section / Subject:	Institute for Ophthalmic Research / Center for Integrative Neuroscience / Ophthalmic Research
Supervising Professor(s):	Prof. Dr. Thomas Euler

About the Supervisor(s): Our lab investigates how neural circuits in the retina process information and, specifically, what feature representations are extracted from the incoming visual scene and forwarded to higher visual areas in the brain. To this end, the lab pioneered two-photon imaging techniques that allow us to present visual stimuli while optically recording neural activity in all layers of the isolated retina with subcellular resolution. Yielding data from thousands of neurons, our experimental approach is complemented by large-scale data analysis and computational modelling. Dr. Euler received his PhD at the University of Mainz / MPI for Brain Research, Frankfurt/M. After postdoc positions at Harvard Medical School / MGH (Boston), and the MPI for Medical Research (Heidelberg), he started his lab in 2009 at the University of Tübingen.

For more information, see https://eulerlab.de/; for our publications, see https://tinyurl.com/eulerlab.

Specification: Holographic optogenetic stimulation in the mouse retina.

Topic Description: The retina is not just a simple light sensor; it also performs a first analysis of the image stream falling into our eye. The retina extracts not only information about, for instance, contrast, brightness, and color but also more complex visual features, such as object borders and motion directions. Hence, the retina is an excellent model system to study neural (visual) information processing at the circuit level. Our lab has established 2-photon imaging of visual stimulus-evoked neural activity in all retinal layers. To be able to manipulate retinal signal processing in a highly selective and dynamic manner, we now plan to add optogenetic manipulations to our repertoire. The aim of this project is to establish holographic stimulation of selected retinal neurons via the targeted expression of light-sensitive channels and to use this approach to test current concepts of signal integration in retinal output neurons.

Degree:	Dr. rer. nat. in Neuroscience (international Graduate Training Centre, GTC) https://www.neuroschool-tuebingen.de/phd/
Required Degrees:	Master of Science in Biomedical Engineering or a related discipline, ideally with a background in Optics.
Language Requirements:	Fluent English, verbally and in writing (IELTS 6,5 or TOEFL equivalent); German is a benefit, but not required.
Notes:	Programming skills (i.e., Python, Jupyter lab).