Gisela and Erwin Sick Chair of Micro-Optics

Prof. Hans Zappe

Research Area
Optofluidic Devices

Relevant Tasks
- ☐ Optical experiments
- ☐ Test setup development
- ☒ Device characterization
- ☐ Material characterization
- ☒ Optical simulations
- ☐ FEA simulations
- ☒ Clean room fabrication
- ☒ CAD/CAM
- ☒ Polymer fabrication
- ☒ Programming
- ☐ Analytical analysis / Theory
- ☐ Literature research
- ☐ Teaching

Eligible Departments
- ☒ Microsystems technology
- ☒ Mechanical engineering
- ☒ Process engineering
- ☒ Chemistry
- ☐ Physics
- ☒ Electronics and IT
- ☐ Computer science
- ☐ Industrial engineering

Requirements
Ability to work independently

Basic knowledge of optics and electronics would be desired

Starting Date
Immediately

Master's Thesis

Anamorphic optofluidic imaging system demonstrator

The Gisela and Erwin Sick Chair of Micro-optics is specialized in the area of tunable micro-optics, with extensive activities in liquid optics and optofluidics. Based on extensive work on Tubular Optofluidics technology, a large variety of tunable elements has been realized. In the DFG-funded project TOFU2re, we aim to extend this work to develop an optofluidic imaging system, as shown in Fig.1 (Left). The system consists of two cylindrical lenses inside a tubular housing and a CMOS sensor.

The candidate student is expected to model and simulate the cylindrical system using *Surface Evolver* and *ZEMAX*. Extensive micro fabrication processing for multi-level wiring on a flexible substrate, as shown in Fig.1 (Right), will be undertaken based on prior experience. At the end of the project, the student is expected to assemble a complete optofluidic device, together with electrical interfaces, and characterize it extensively. The work will be coordinated by an internal team of researchers who will support the project in terms of optical simulation, fabrication and characterization of the prototype devices. The project duration is 6 months.

If you are interested in further information, please contact Dr. Pengpeng Zhao.

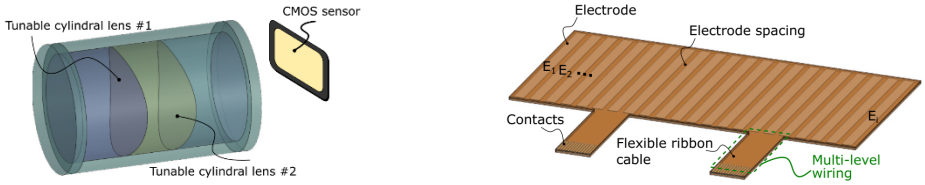

Fig.1 (Left) Visualization of the tunable anamorphic optofluidic imaging system, containing two cylindrical lenses and a CMOS sensor. (Right) CAD drawing of a flexible foil containing 64 electrodes and the associated wiring on flexible ribbon cables. To manage and address the individual electrodes, multi-level wiring approaches are needed in the highlighted region (green dashed line).

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