Gisela and Erwin Sick Chair of Micro-Optics

Prof. Hans Zappe

Research Area

Optical Microsystems

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 microfabrication skills

Starting Date

Immediately

Contact Person

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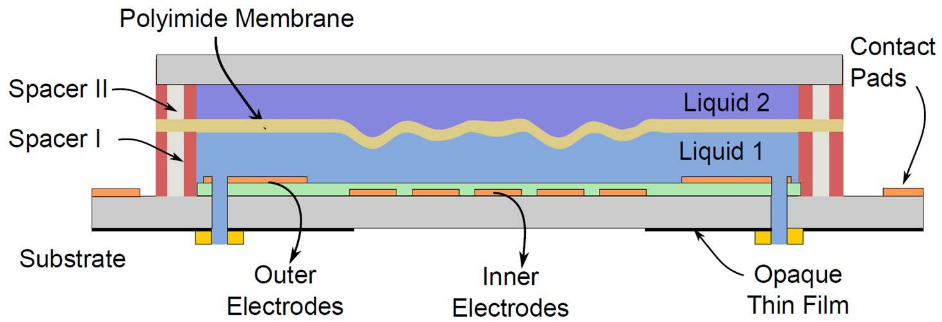
Master's Thesis

Multi-liquid optofluidic phase modulator

Phase modulators are a ubiquitous class of active optical devices used for in two-dimensional wavefront shaping. They are particularly useful in applications that require laser beam shaping or the correction of dynamic aberrations in imaging systems. The Gisela and Erwin Sick Chair of Micro-Optics have recently developed a completely new modulator technology that allows high-fidelity wavefront shaping in transmission via optofluidic means. In this project, we aim to realize a variant of this technology that uses two incompressible liquids separated by a thin polymeric membrane and hermetically encapsulated packaged inside a glass package.



A conceptual depiction of the optofluidic phase modulator to be developed in this project.

Here is what is expected from the prospective student:

- A material survey to identify the best candidates for the two liquids based on their electrical and optical properties,
- A series of FEA simulations performed to determine the optimum device design,
- Assembly of a proof-of-principle demonstrator using existing components,
- Characterization of the opto-mechanical performance of the demonstrator through interferometric measurements.

The candidate will have the chance to join a highly motivated team working on various aspects of static and dynamic waveform shaping, who will assist the project particularly in the last to steps.

If you are interested in further information, please contact Dr. Çağlar Ataman.