

# Master Thesis:

## Beam shaping in 3D-Lithography Systems

Voxel size and shape has a significant influence on 3D-Lithography and can be manipulated using spatial light modulators (SLMs) [1]. Based on such adaptive optics approaches, the shape of the three-dimensional point-spread-function can be manipulated, e.g., to reduce side lobes or to create multi foci.

In this work, we would like to explore such techniques for writing of 3D waveguides and optical devices with high speed as well as high precision and shape fidelity.

[1] J. Hering, et al., "Automated aberration correction of arbitrary laser modes in high numerical aperture systems," Opt. Express 24, 28500-28508 (2016)

### Your tasks:

- Calculation, design, and experimental verification of hologram patterns for voxel manipulation
- Incorporation of an SLM into a two-photon lithography system
- Writing of photonic wirebonds, lenses, and other structures to optical chips and fibers

### For detailed information contact:

M. Sc. Yilin Xu

[Yilin.Xu@kit.edu](mailto:Yilin.Xu@kit.edu)

Tel. 0721-608-41935

Prof. Dr. Christian Koos

[Christian.koos@kit.edu](mailto:Christian.koos@kit.edu)

Tel. 0721-608-42481

