

## Master Thesis:

# Integrated multi-channel optical coherence tomography system with printed optical components

Optical coherence tomography (OCT) looks back on great advances in the past decades. Its microscopic resolution in **volumetric imaging** opened a wide field of applications reaching from ophthalmology in medical diagnostics to **particle and defect characterization** in material sciences. Current systems are however bulky and expensive, which limits the ability to up-scale to multiple measurement axis. The goal of this thesis is to assemble a multi-channel OCT system based on a silicon photonic chip and characterize the system performance.

### Your tasks:

- Pre-characterization of integrated OCT circuits
- Build up chip integrated OCT systems with 3D-printed interconnects
- Characterization of system performance
- Demonstration of OCT measurements with different sample materials

The thesis is focused on realization of integrated OCT systems and the demonstration of the system performance by acquiring volumetric images of various samples.

### For detailed information contact:

M. Sc. Christian Bremauer  
[christian.bremauer@kit.edu](mailto:christian.bremauer@kit.edu)  
Tel. 0721 608-41935

Prof. Dr. Christian Koos  
[christian.koos@kit.edu](mailto:christian.koos@kit.edu)  
Tel. 0721-608-42481

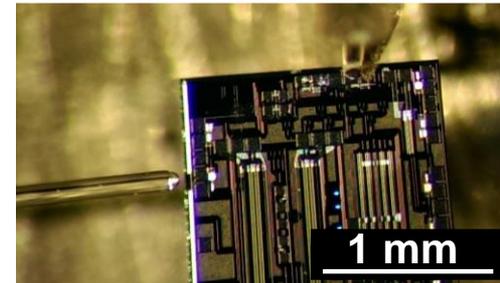


Fig. 1: OCT system integrated on silicon photonic chip. [1]

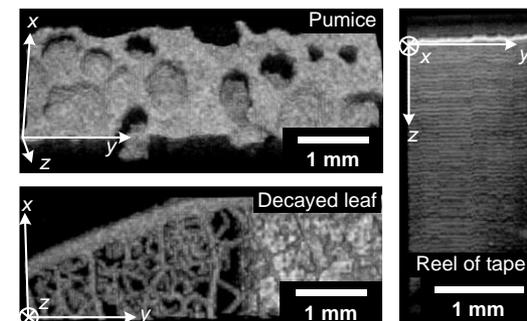


Fig. 2: Cross-sectional scans of different materials. [1]

One cent coin to scale

[1] S. Schneider et al., CLEO, ATu2P.4, San Jose, CA, USA, 2014.