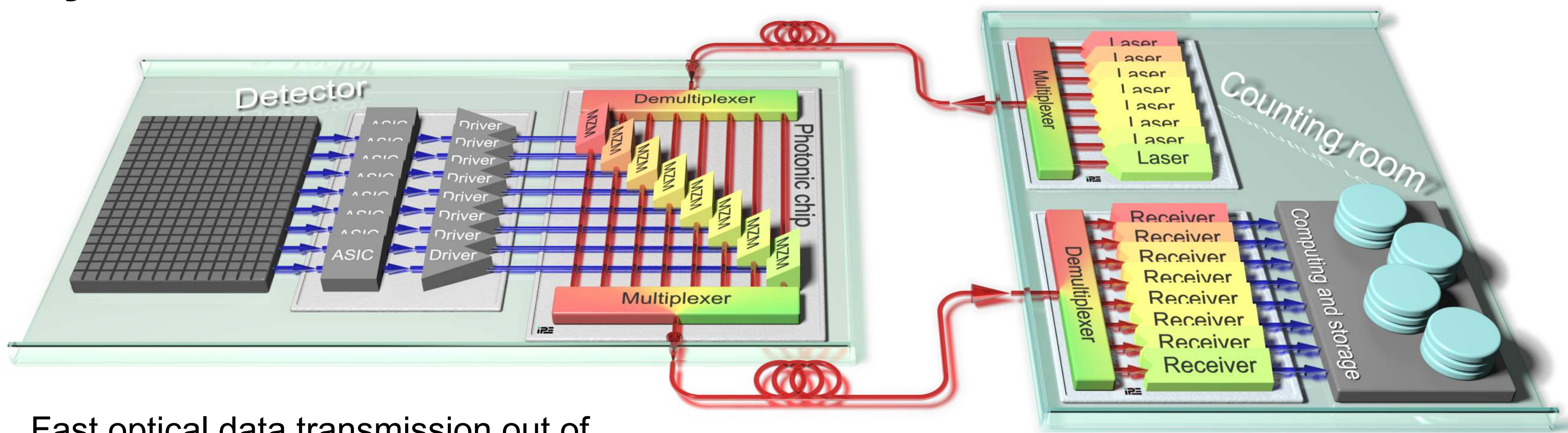


Marc Schneider, Djorn Karnick, Lars Eisenblätter, Yunlong Zhang, Julius Hartmann, Thomas Kühner, Marc Weber

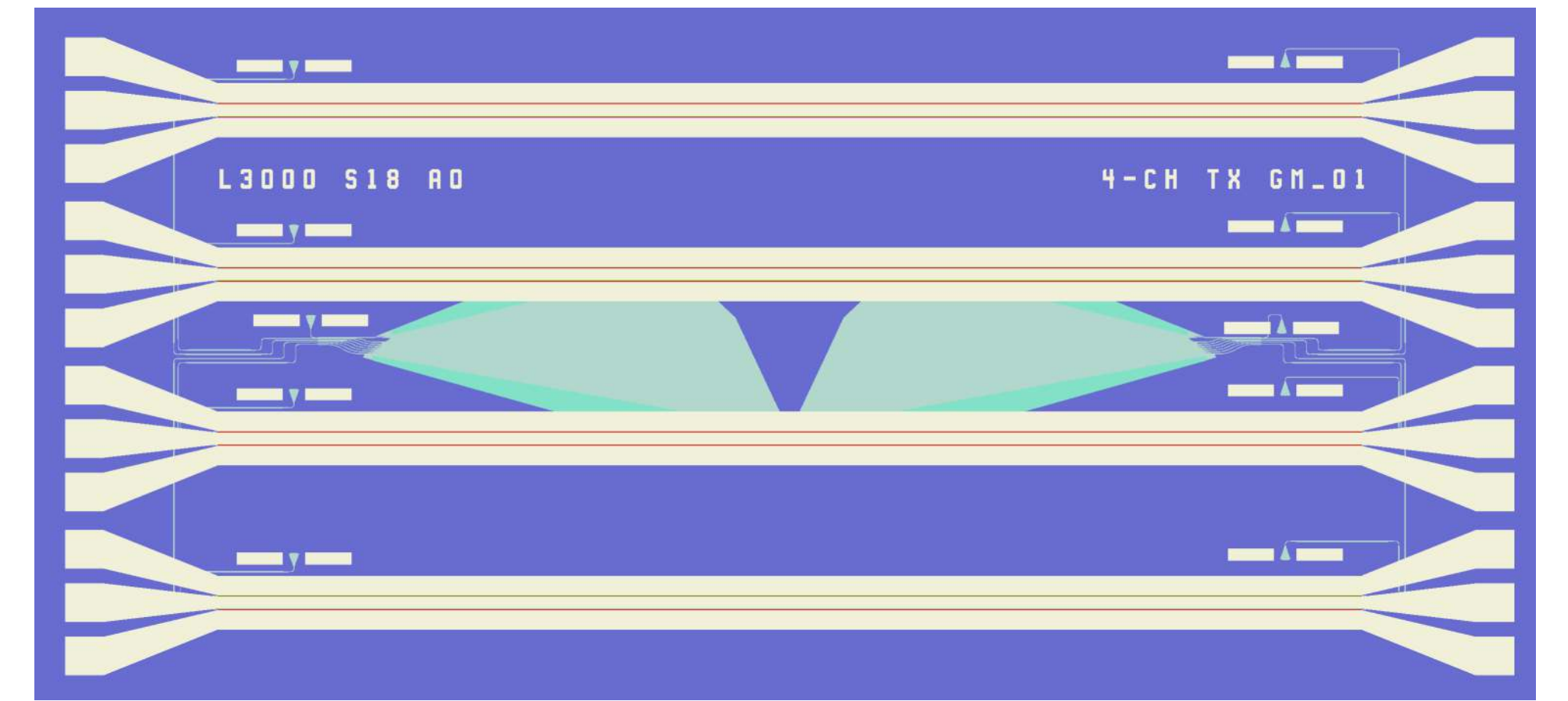
Karlsruhe Institute of Technology, Institute for Data Processing and Electronics, Karlsruhe, Germany

System Schematic



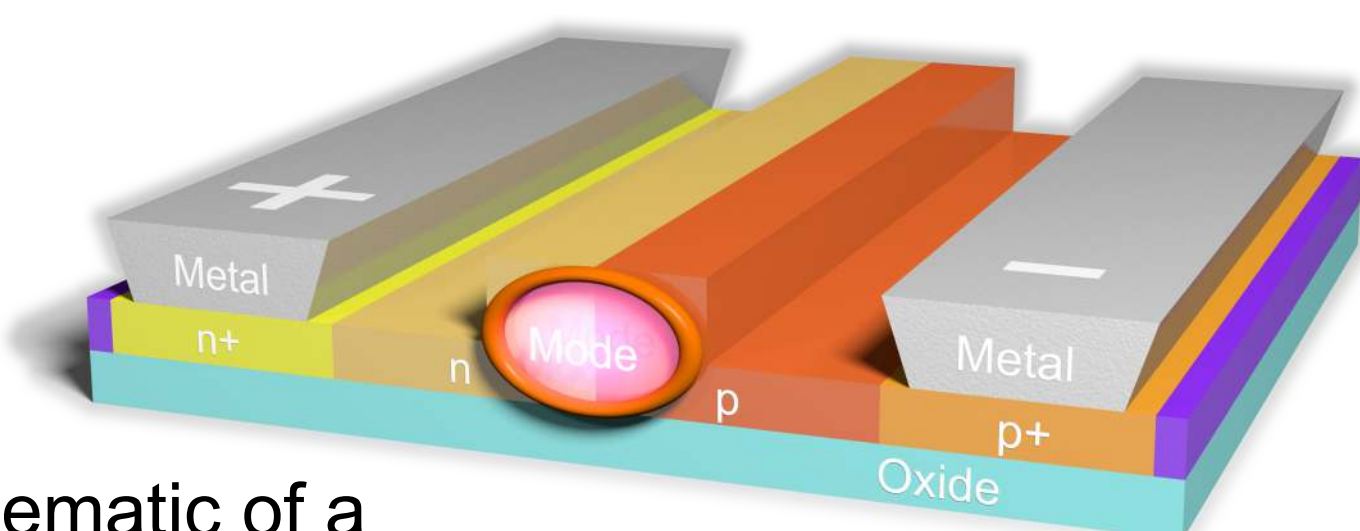
Fast optical data transmission out of detectors for high energy physics, astroparticle physics and photon science

Integrated WDM System

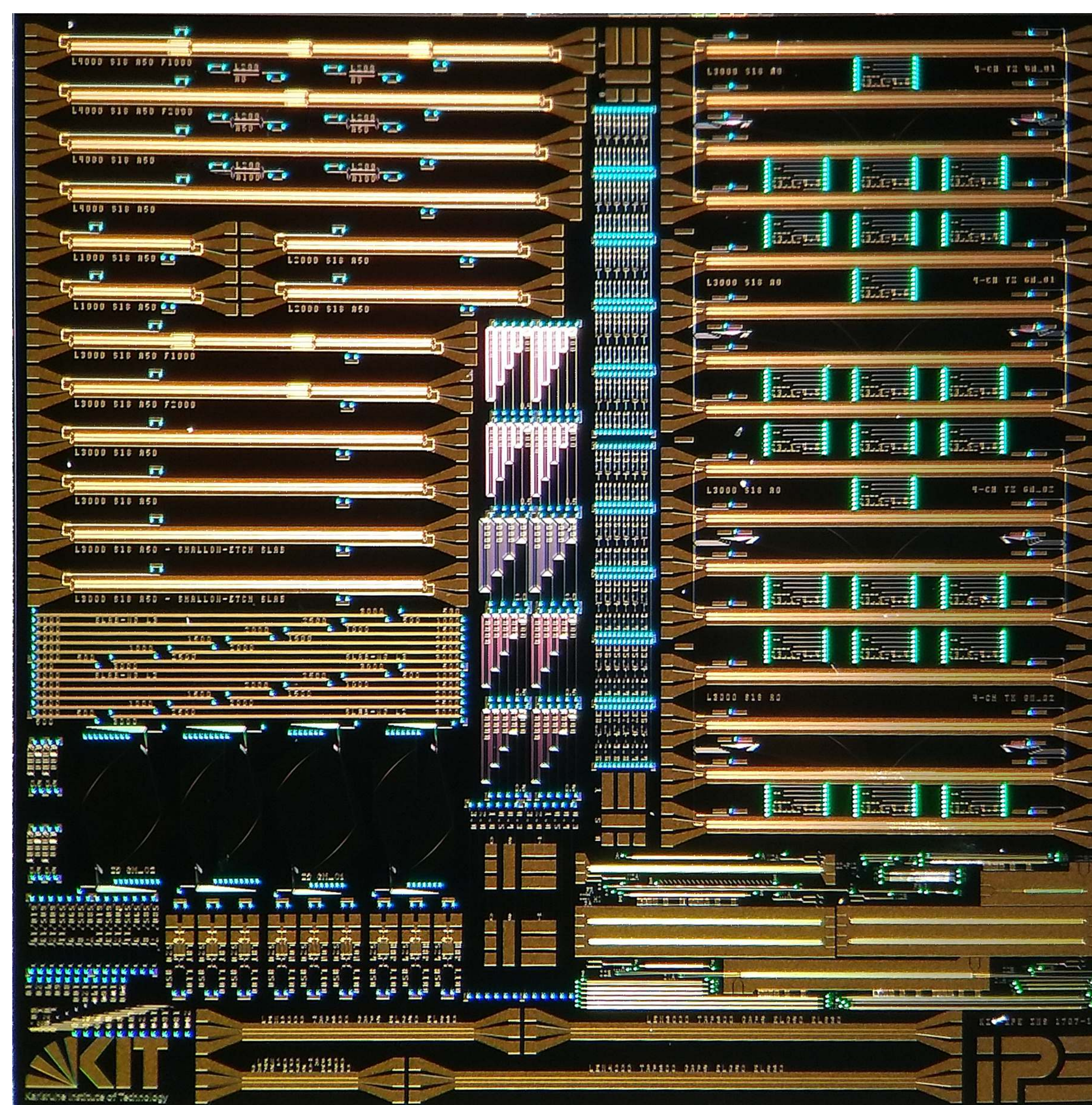
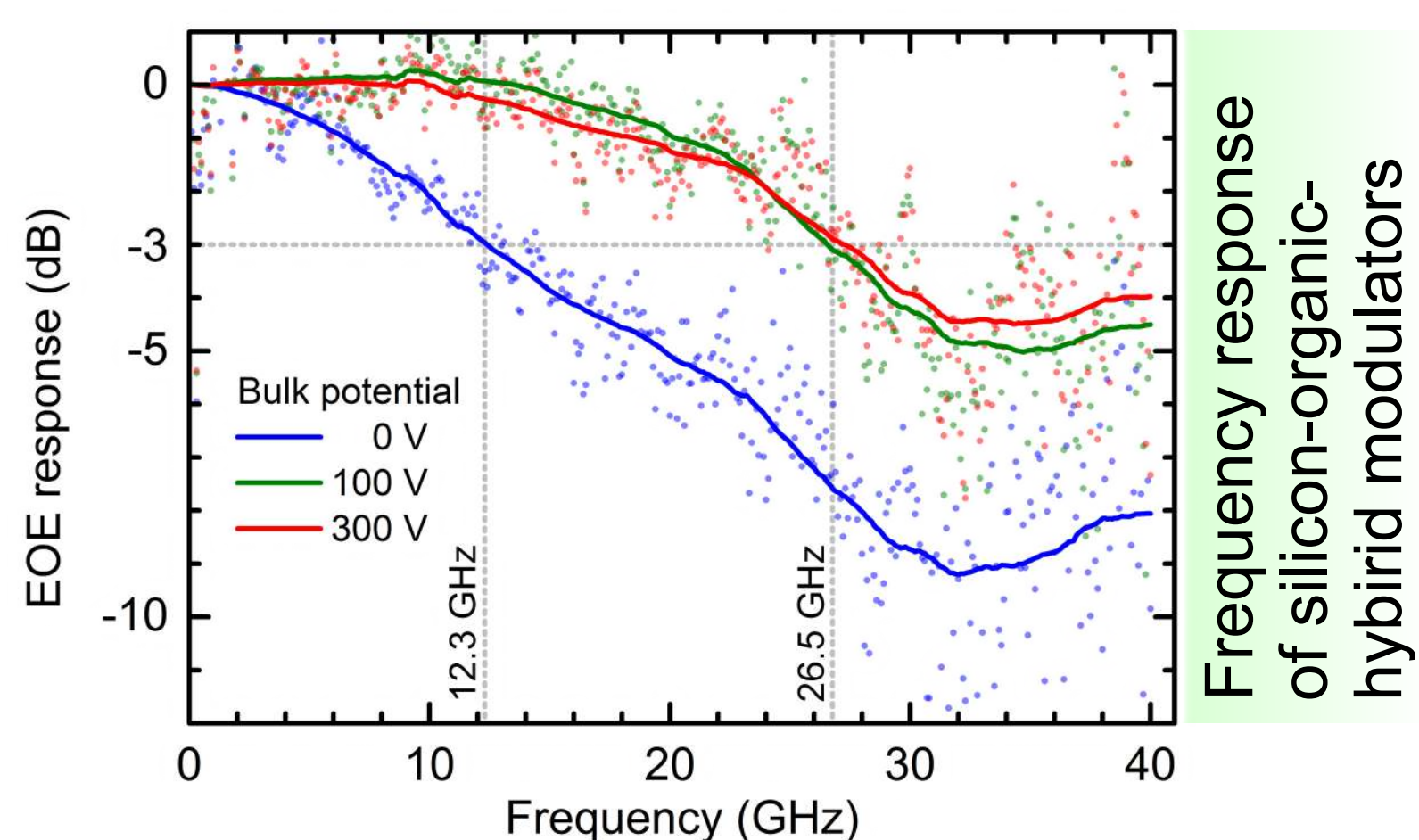
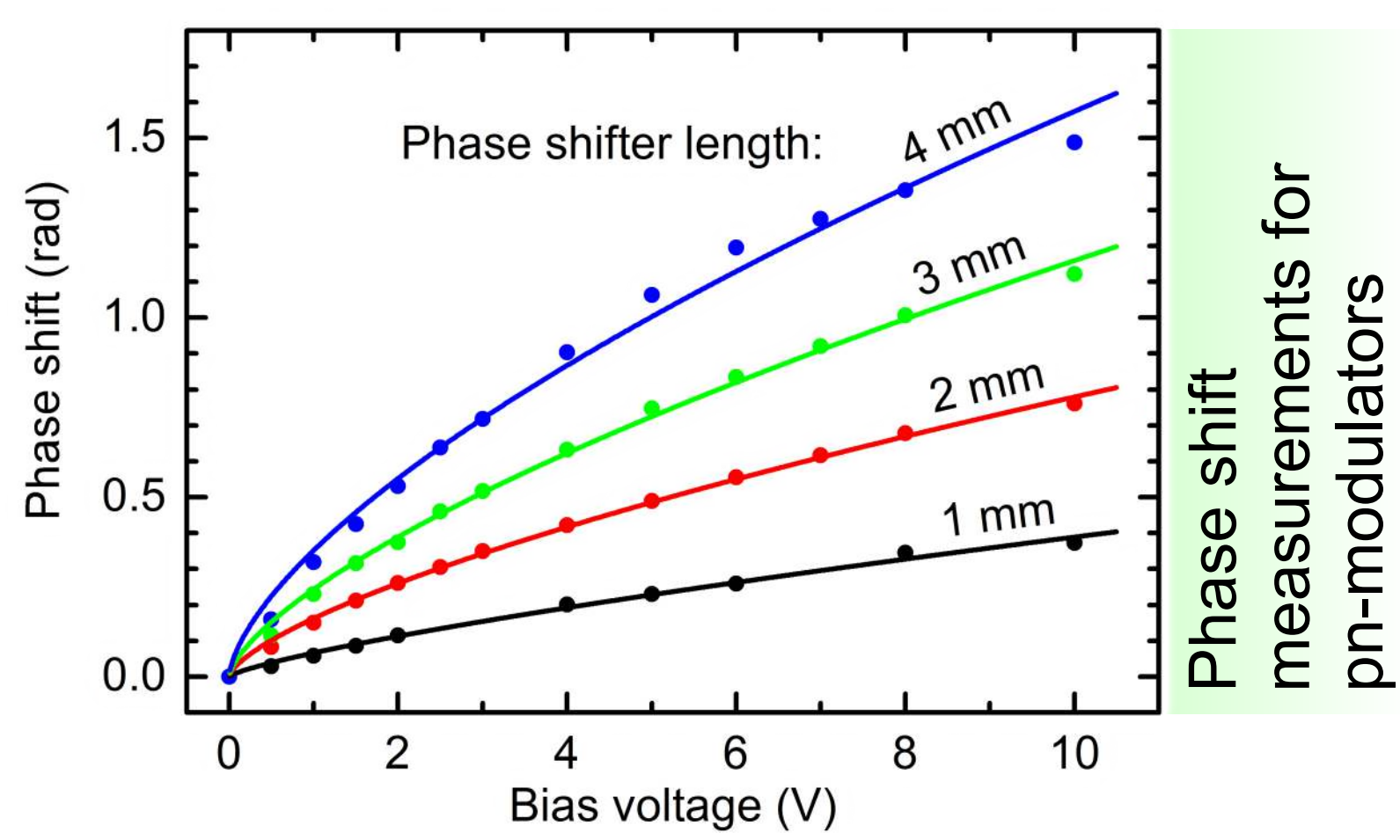


Goal: 40 Gb/s (4x10 Gb/s), potentially up to 128 Gb/s with second generation driver

Electrooptic Modulators

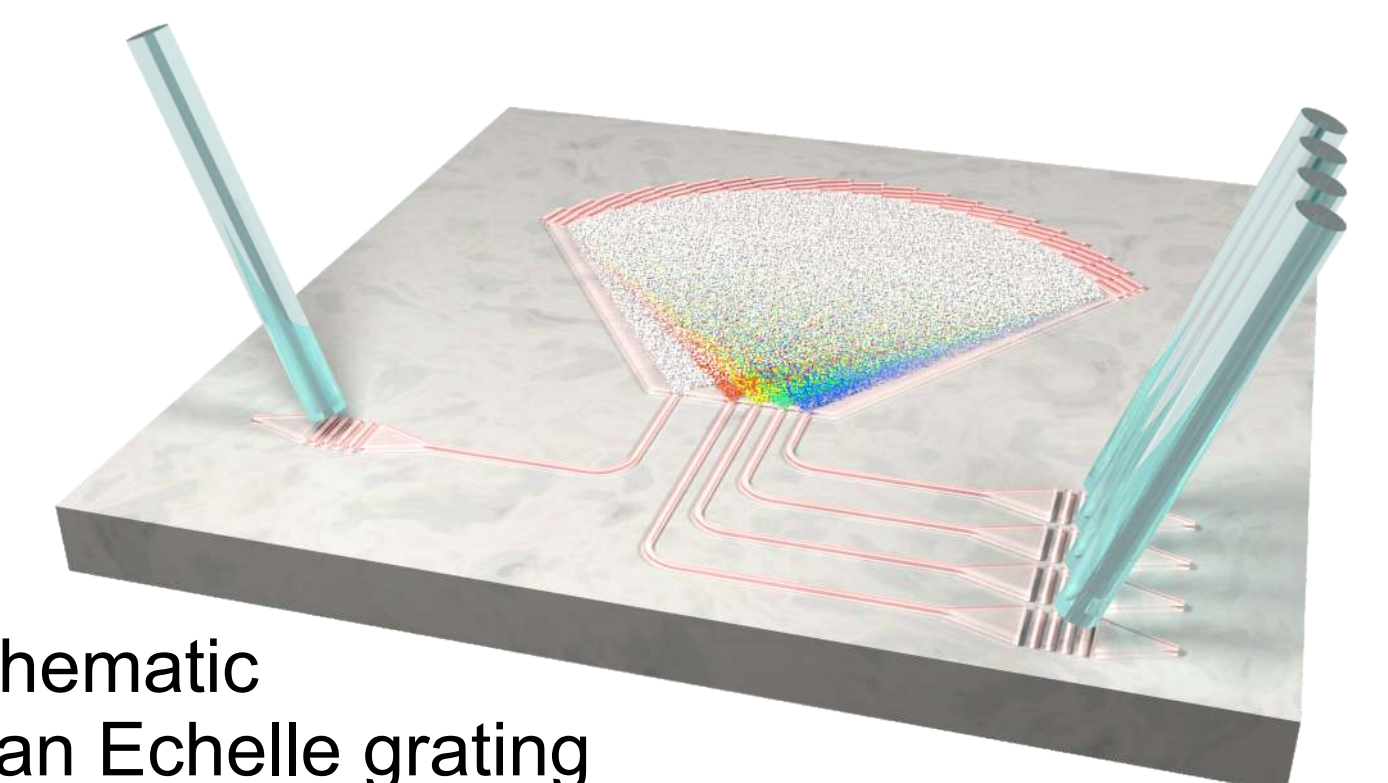


Schematic of a pn-phase-modulator: optical mode concentrated around pn-junction

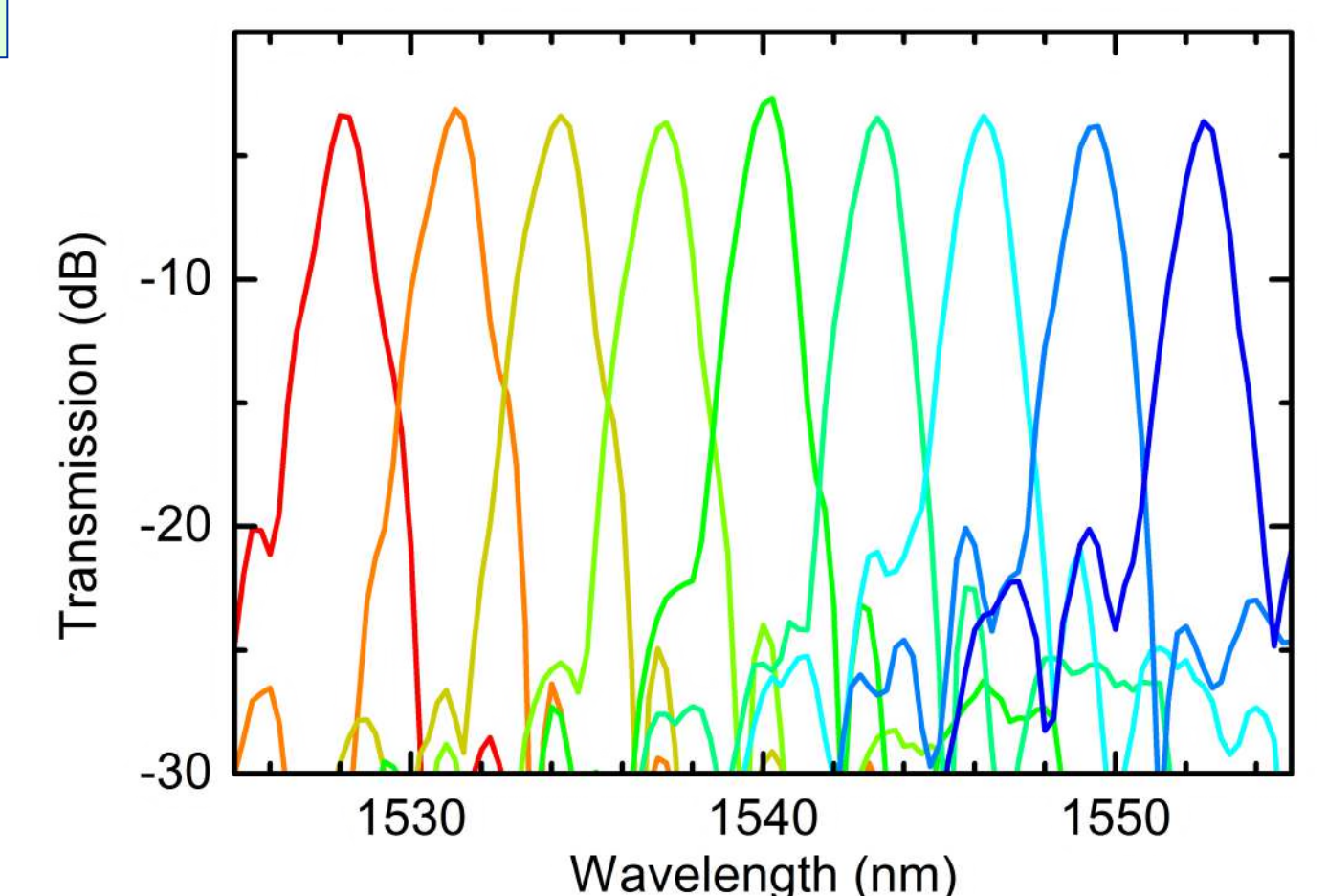
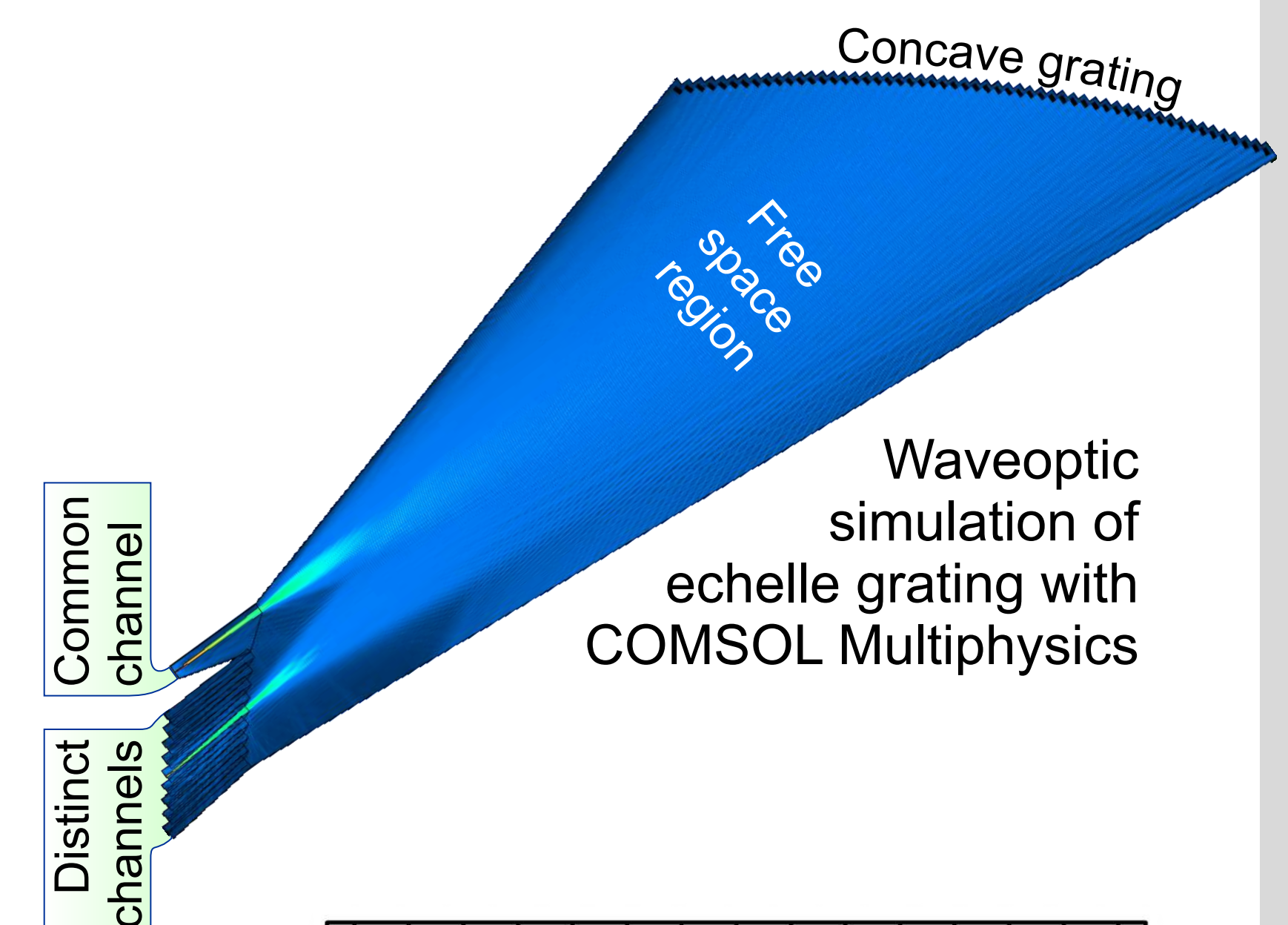


Photonic system chip (9.3 × 9.3 mm²) with 4-channel WDM systems, single pn-modulators, thermal modulators, Echelle gratings, and test structures.

(De-)Multiplexers



Schematic of an Echelle grating multiplexer or demultiplexer

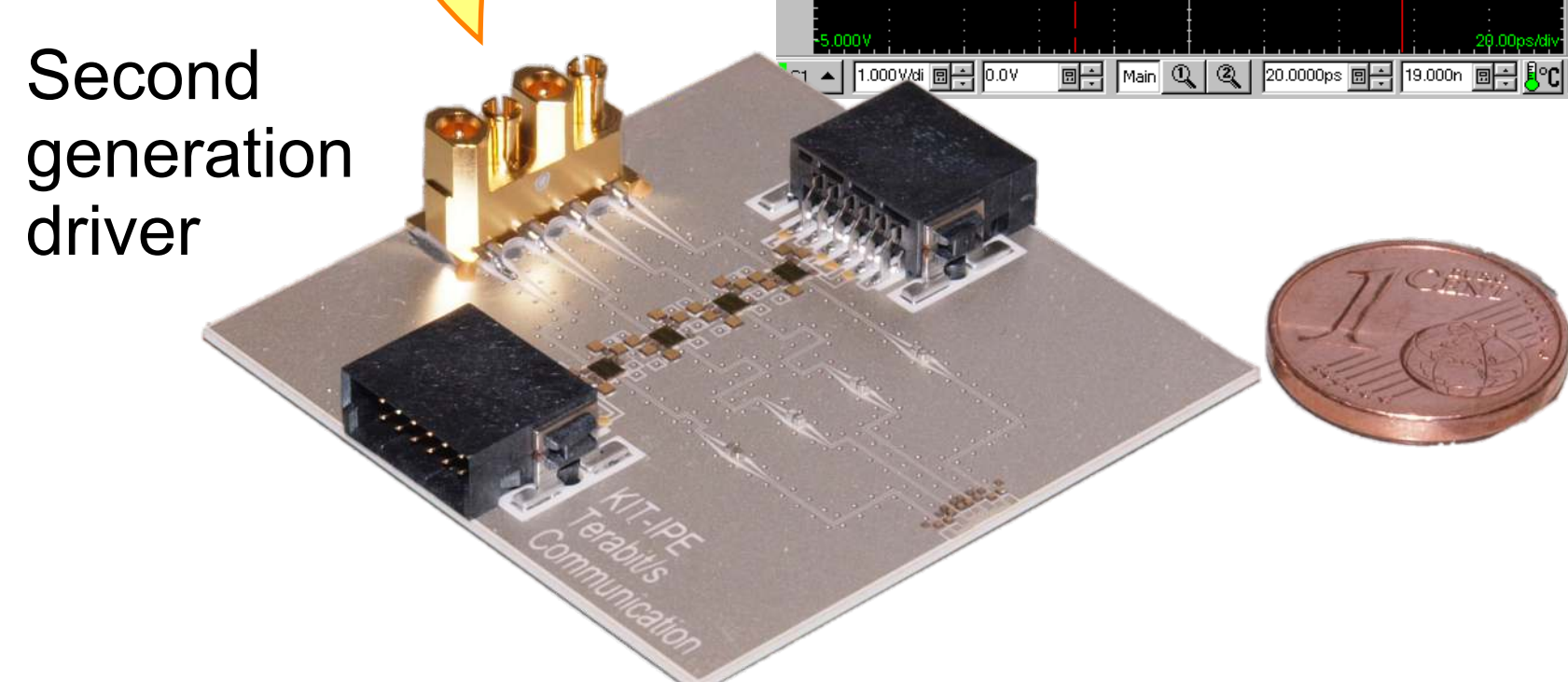


Measured transmission spectrum of 9-channel Echelle grating

Modulator Drivers

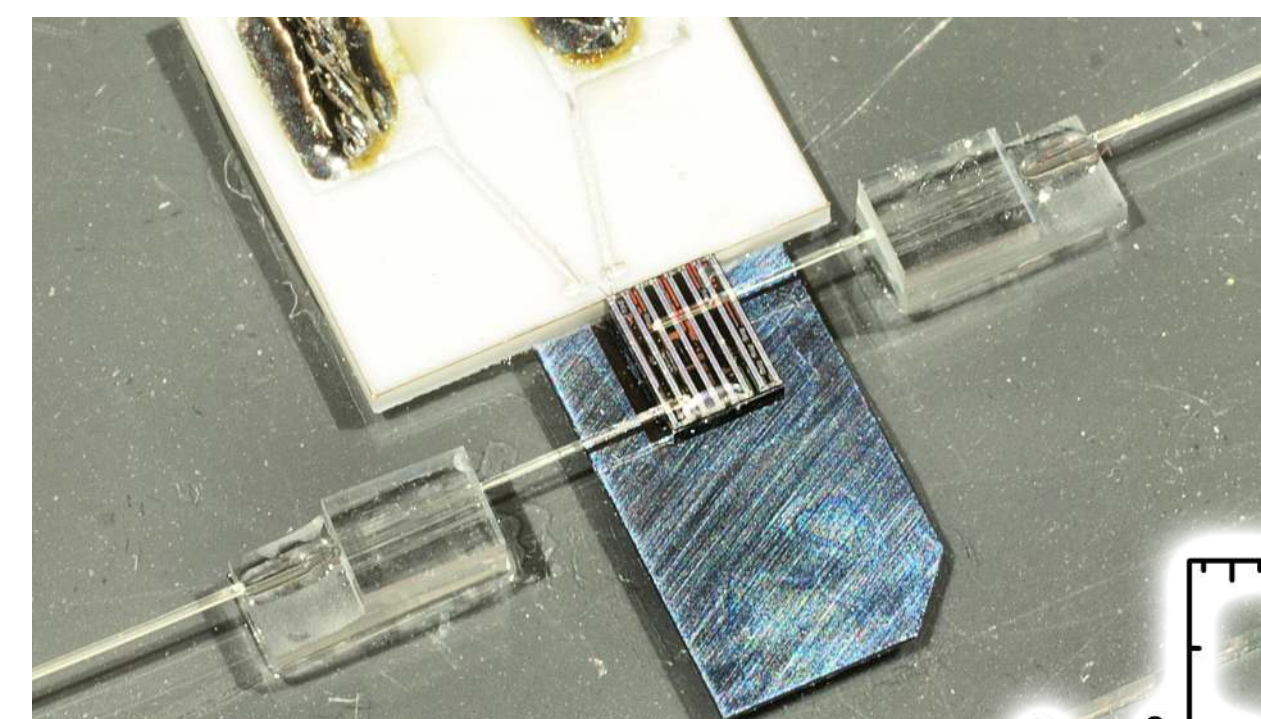


4-channel transmitter demonstrator with discrete modulator drivers

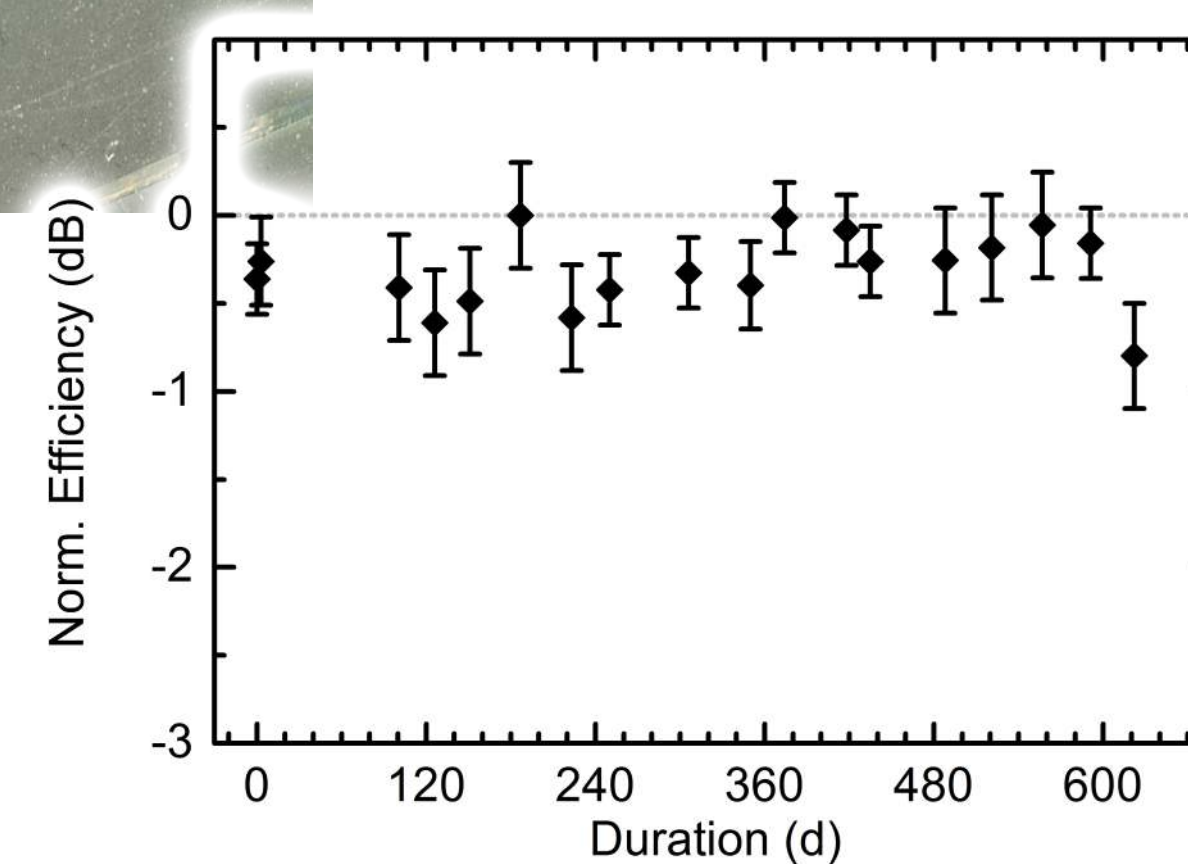
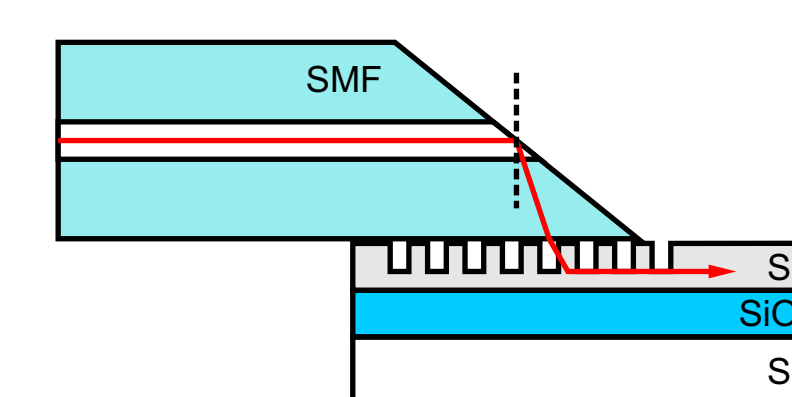


Second generation driver

Packaging



Planar fiber-chip-coupling using angle polished fibers



Vision

- Downlinks with monolithically integrated Ge-photodiodes
- Dynamically reconfigurable Rx and Tx channels
- Advanced modulation formats for higher speed
- Monolithic integration of sensors, ASICs, and photonics

Partners

