Master thesis

"Design, Simulation and Optimization of photonic components for C-band operation in 45nm CMOS SPCLO EPIC Technology"

The research group
**Circuit and System Technology** offers a
**Master thesis**

**Task Description:**
- Literature research focusing on EM-simulation techniques, operation and geometries of standard photonic components (waveguides, couplers, photodetectors)
- EM simulations performed with Ansys Lumerical
- Adaption of given Lumerical scripts towards:
  a) Re-simulation of given geometries for O-band operation (validation of the scripts)
  b) Simulation of C-band components (waveguides, coupler)
  c) Parameter optimization
- Writing of own Lumerical scripts for photodiode design
- Geometry transfer to Cadence Virtuoso
- Design Rule check in Cadence Virtuoso
- Optional: VerilogA modelling (Transfer of EM-simulation results to Cadence Virtuoso compatible models)
- Finally, an evaluation of the work as well as an outlook should be given.

**Requirements:**
- CV & grade sheet
- Lectures: Circuit & System Design (DE: Schaltungstechnik) and Fields & Waves (DE: Theoretische Elektrotechnik)
- Project Silicon Photonics
- Experience in Ansys Lumerical is advantageous
- Further courses from Theoretical Electrical Engineering (Prof. Förstner) are advantageous

In case of interest, please send an e-mail containing your latest transcript of records to Tobias Schwabe (schwabet@hni.uni-paderborn.de, room F0.411)

![Figure 1 Simulated electrical fields in a multimode interferometer](https://optics.ansys.com/hc/en-us/articles/360042305194-Multi-Mode-Interference-MMI-Coupler)