# NanoPico Photonic Computing

Selected topics for internships, research labs and Master's theses

Institute of Applied Physics
Friedrich-Schiller-Universität Jena

## 3D nanofabrication with 2PP

Two-photon polymerization for photonic structures

**Design and modelling:**

- Turn CAD models into printable toolpaths and explore new writing strategies.
- Design 3D photonic structures and diffractive networks with fabrication constraints in mind.

**In the lab:**

- Calibrate 2PP systems and investigate resolution, reproducibility and printing parameters.
- Fabricate and characterize 3D optical elements using custom or commercial 2PP platforms.

## Optical computing

Programmable optical networks and photonic learning

**Design and modelling:**

- Train optical neural networks in Python and adapt selected layers to new tasks.
- Explore hybrid optical–digital vision, structured light, reservoir computing or Ising machines.

**In the lab:**

- Implement programmable networks using spatial light modulators or digital micromirror devices.
- Test deeper or modular layouts, hardware-aware training and misalignment compensation.

If you are interested in 2PP or optical computing, please get in contact to learn more about available topics.

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