

# Projects for Students in Nano & Quantum Optics

The laboratory for Nano & Quantum Optics has a number of projects for students, which provide ideal opportunities to acquire practical research experience for interested students in physics, photonics, and related disciplines. As examples, these student projects could be connected one of to the following topics:

- Machine learning-based design of metamaterials & Metamaterial-based machine learning systems
- Strong coupling to quantum emitters by plasmonic superfocusing
- Spatiotemporal dynamics of nano-scale light-matter interactions in metasurfaces & atomic membranes
- Quantum computing on an integrated photonic platform
- Quantum imaging and sensing
- Bio-cell imaging and light induced stimulation by topological plasmonic superfocusing microscopy
- Quantum polarimetry for biomedical and technical metrology

Usually, students will join a team of doctoral students and postdocs, who are already working on problems related to the above topics. Thus, the students will not work completely on their own on these quite complex topics. Instead, the close interaction with more experienced scientist will support a quick learning experience of the students.

In general, the lab's research targets the control of light at the single photon level and at the nanoscale using nanostructured materials and ultrafast nonlinear optical effects. Being part of the Max Planck School of Photonics, the laboratory for Nano & Quantum Optics is located at the Institute of Applied Physics and the Institute of Solid-State Physics at the Faculty of Physics and Astronomy of the Friedrich Schiller University Jena (Germany). The lab covers a broad range of research fields in experiment, technology, and theory to study interaction of light with microstructured and nanostructured matter, employing advanced methods for nanofabrication, experimental characterization, and numerical modelling.

We are constantly looking for talented students, who would like to contribute to our cutting-edge research projects on quantum photonics at the nano scale. Currently there are openings for students to work on the above topics, but other topics motivated by the interest of potential candidates can be discussed as well.

Details about the laboratory for Nano & Quantum Optics and on the open positions can be found at [www.iap.uni-jena.de/nano-quantum-optics](http://www.iap.uni-jena.de/nano-quantum-optics). If you have specific questions and interest in joining our lab, please contact either of us:

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