

### **C3 – Metasurface-enabled quantum polarization imaging and object discrimination Improve quantum sensing with nanophotonics**

Join an international research team developing quantum sensing techniques that exploit the advantages of nanophotonic optical elements and the quantum nature of light. This PhD project combines nanophotonics, quantum optics, and research in optical sensing to extract more information from samples under test.

The position is hosted at the **Institute of Applied Physics, Friedrich Schiller University Jena (Germany)** and is part of the International Research Training Group **Meta-Active – Tailored Metasurfaces and Metasystems for Active Light Control**, funded by DFG.

#### **Your Research Project**

In this project, you will explore novel concepts for metasurfaces that can manipulate light in order to facilitate novel quantum sensing techniques.

Key research topics include:

- Design of metasurfaces for polarization control and phase sensing
- Quantum imaging and quantum microscopy with metasurfaces
- Quantum polarimetry
- Applications of quantum sensing techniques
- Optimal quantum probe states for sensing and imaging

#### **What You Will Gain**

During your PhD, you will develop expertise in:

- Nanophotonic design and simulation
- Quantum Optics and quantum sensing
- Optical imaging and microscopy
- Optical characterization and data analysis
- Scientific communication and international collaboration

#### **Supervisory Team**

Main Supervisor

Dr. Frank Setzpfandt (Friedrich Schiller University Jena)

Co-Supervisors / Collaborators

Prof. Andrey Sukhorukov (Australian National University)

Prof. Dragomir Neshev (Australian National University)

Prof. Thomas Pertsch (Friedrich Schiller University Jena)

### **What We Offer**

- Fully funded 3-year PhD position
- Salary according to TV-L E13 (75%)
- Joint supervision by leading researchers in Germany and Australia
- Minimum 12-month research stay at the Australian National University (Canberra)
- Access to world-class nanofabrication and optical characterization facilities
- International training workshops and networking opportunities
- Participation in a highly interdisciplinary and collaborative research environment
- A jointly supervised international PhD experience

### **Who Should Apply?**

We welcome applications from candidates with a Master's degree in Physics, Photonics, Electrical Engineering, Materials Science, Optical Engineering or related disciplines.

Experience in optics, nanophotonics, numerical simulations, micro- and nanofabrication, or experimental physics is advantageous but not required.

### **Diversity and Inclusion**

Meta-Active and Friedrich Schiller University Jena are committed to equal opportunities and fostering an inclusive and family-friendly research environment. We particularly encourage applications from women and other underrepresented groups in science.

### **Application Information**

Start Date: July 2026 or as soon as possible thereafter.

Application Deadline: 20 July 2026

For detailed information about the research project, eligibility requirements, and the application procedure, please visit:

<https://www.meta-active.uni-jena.de/apply>

### **Ready to Apply?**

Join an international team at the forefront of the use of nanophotonics for quantum sensing and help develop the next generation of quantum sensing modalities.