

Project B4 - Exciton-polariton condensates in metasurfaces with modified dispersion relations and exceptional points

Shape the future of active light control

Join an international research team developing next-generation optical metasurfaces that can dynamically manipulate light. This PhD project combine basic concepts of optics and nonlinear dynamics and apply them to photonic devices.

The position is hosted at the **Institute of Solid State 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 model and theoretically analyse fundamental dynamical processes of light-matter interaction in resonant nanostructures

Key research topics include:

- Tuning the dispersion relation of optical nanostructures to Forster light-matter interaction
- Modelling field propagation and lightmatter interaction in semiconductor structures
- Developing concepts to support condensation of light in metasurfaces
- Modeling self-pulsing of metasurfaces

What You Will Gain

During your PhD, you will develop expertise in:

- Wave propagation in nanophotonic structures
- Light-matter interaction in semiconductors
- Modeling and understanding nonlinear dynamics
- Inverse design and computational optimization
- Scientific communication and international collaboration

Supervisory Team

Main Supervisor

Prof. Ulf Peschel (Friedrich Schiller University Jena)

Co-Supervisors / Collaborators

Prof. Elena Ostrovskaya (Australian National University)

Prof. Daria Smirnova (Australian National University)

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 active nanophotonics and help develop the next generation of programmable optical devices.