



## PhD on Active control of functional metadevices using liquid crystals

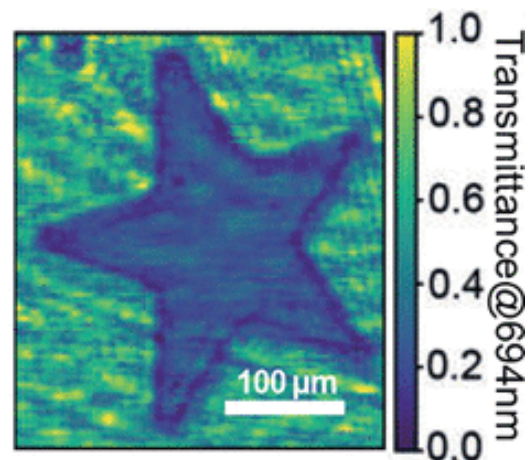
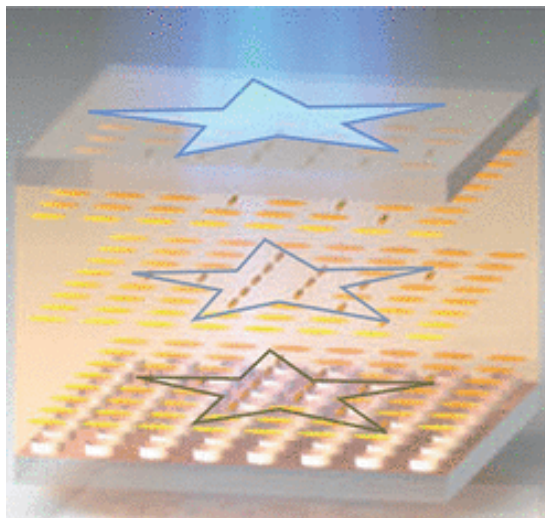
Photonic metasurfaces integrated into nematic liquid crystal (LC) cells have been established as a viable route to actively control the properties of incident light fields. However, most structures realized so far are based on simple, spatially homogeneous metasurface designs, thereby strongly limiting the accessible functionalities. Building on the existing experience of LC integrated functional metasurfaces in my group [see e.g. 1-3], this doctoral project targets the experimental demonstration of active tuning of complex wavefront-shaping functionalities by establishing LC tunability for inversely designed spatially variant designs. For the inverse design aspects, this experimental project involves close collaboration with theoretically oriented researchers.

In this doctoral project the following techniques and tasks will be applied and developed further:

- Design of active functional photonic devices based on metasurfaces
- Fabrication of optimized designs using electron-beam lithography and other clean-room techniques
- LC cell integration and characterization
- Performance evaluation

Required qualification:

- Master in physics, photonics, electrical engineering, or comparable.
- Previous experience in optics labs and/or nanofabrication are advantageous.



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3. C. Zou, A. Komar, S. Fasold, J. Bohn, A. A. Muravsky, A. A. Murauski, T. Pertsch, D. N. Neshev and I. Staude, "Electrically Tunable Transparent Displays for Visible Light Based on Dielectric Metasurfaces", *ACS Photonics* 6, 1533 (2019).
4. C. Zou, C. Amaya, S. Fasold, A. A. Muravsky, A. A. Murauski, T. Pertsch, and I. Staude, "Multi-responsive dielectric metasurfaces", *ACS Photonics* 8, 1775–1783 (2021).