This talk will focus on our recent research results regarding applications of metasurfaces. Firstly, we will present the potential of direct laser writing for the generation of large-scale metasurfaces for applications in holography and fibre optics. Specifically, we introduce metasurface holograms which conserve orbital angular momentum, allowing a new degree of freedom for multiplexing. The laser writing fabrication technique is then applied to direct patterning of metasurfaces on the end facets of optical fibres, and applications in optical trapping and achromatic imaging are demonstrated. While metasurface allow control over light due to their intrinsic order, also disordered ensembles of nanostructures show large potential for nanophotonic applications. We show recent results of a tunable disordered cavity system that enables material-independent broadband light harvesting, while at the same time the colour of the cavity can be tuned throughout the visible spectrum. Such cavities could find applications in a context of solar light harvesting for energy conversion.

Prof. Dr. Stefan Maier  
Department of Physics, LMU  
Munich, Germany  
https://www.hybridplasmonics.org