

Draft of Bachelor / Master Project

Project title: Directional Quarter-wave Plate Based on Metasurface

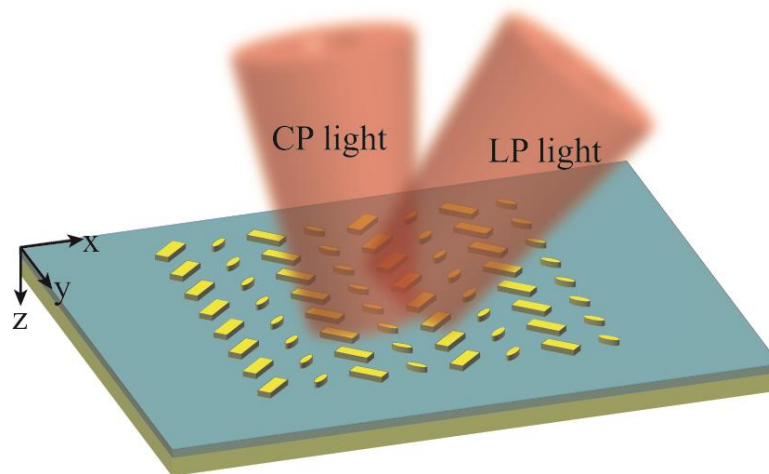
Proposed by: Fei Ding and Yuanqing Yang

Possible supervisor (s): Fei Ding and Yuanqing Yang

Project Description:

Metasurfaces have been gaining increasing attention due to their remarkable abilities in light manipulation, versatility, ease of on-chip fabrication, and integration owing to their planar profiles. Many exotic phenomena and useful flat optical devices have been demonstrated. In general, metasurfaces can release our dependence on the propagation effect by introducing abrupt phase shifts with arrays of optical resonators, allowing spatial control over the phase of light, which can serve as ultrathin optical components for optical integration.

Optical wave plates, one of the most important optical components, have attracted constant attention, where various metasurfaces-based wave plates have been successfully investigated and demonstrated, thus providing unprecedented opportunities to manipulate the polarization states of light along a subwavelength optical path.



This project deals with design, fabrication, characterization and modeling of directional quarter-wave plate (QWP) supercell with phase gradient, which consists of discrete QWPs with different phase responses. The goal is to obtain directional QWP in a wavelength range of 800nm, which can convert the circularly-polarized (CP) light (at normal incidence) into linearly-polarized (LP) light with a designed angle. Depending on interests and on whether the project is chosen as bachelor or master, there is of course a possibility to go more or less into details with various parts of the project, including for instance planar metadevices with multiple functionalities.