The seminar will be given in English

Photonic metasurfaces are metamaterials of reduced dimensionality, composed of subwavelength-scale meta-atoms, enabling a custom-tailored electromagnetic response of the medium. Geometric phase based on Pancharatnam-Berry phase is a promising approach for achieving an abrupt phase change by space-variant polarization manipulations. In previous works by Hasman’s group, the generation and manipulation of multiple functions from a single geometric phase metasurface was extensively studied, by utilizing and comparing various multiplexing techniques. Nevertheless, the efficiency of such multiplexing techniques towards multi-functionality is limited by the number of functions incorporated within the metasurface. We present a shared-aperture extinction cross-section approach relying on interleaving of spectrally selective nano-antenna arrays, each having a large extinction cross-section, thus allowing to overcome this limitation.

We report on the spectral interleaving of an ordered and a disordered system within a geometric phase metasurface. Using the shared-aperture extinction cross-section approach, we realize a Silicon based spectrally interleaved metasurface for spectrum dependent disguise, holographic tagging and imaging of a target object.

We present the spectral interleaving of topological states of light using a geometric phase metasurface. We realize a dielectric spectrally interleaved metasurface generating multiple interleaved vortex beams at different wavelengths. By harnessing the space-variant polarization manipulations enabled by the geometric phase mechanism, a vectorial vortex array is implemented. The shared-aperture extinction cross-section approach paves the way for the generation of multiple, efficient, and spectrally-resolved functions in an ultra-thin photonic device. The presented order-disorder interleaving concept offers new prospects for the manipulation of light’s entropy. The multiplexed topologies approach can greatly enhance the functionality of advanced microscopy and communication systems.

בברכה,

מרצה: מיכאל ינאי
מנחה: פרופ’ ארז חסמן

על הנושא:
 olması ספקטרלי באמצעות מסה-משטחים מבוססי פאז גאומטרית
Spectrally Interleaved Geometric Phase Metasurfaces

The faculty is open to questions and discussions after the presentation.