

Colloquium Notice

Leonardo Ranzani

Raytheon BBN Technologies

On-chip integration of optical systems using dielectric metasurfaces

Miniaturized optical systems with planar form factors and low power consumption have many applications in wearable and mobile electronics, health monitoring devices, and as integral parts of medical and industrial equipment. Flat optical devices based on dielectric metasurfaces introduce a new approach for realization of such systems at low cost using conventional nanofabrication techniques. In this talk, I will present our work on dielectric metasurfaces that enable precise control of both polarization and phase with large transmission and high spatial resolution. Optical metasurface components such as MEMs tunable lenses, efficient wave plates, and components with novel functionalities will be discussed. I will also introduce a vertical on-chip integration platform enabled by cascading multiple metasurfaces and active optoelectronic components, and present optical systems such as cameras and spectrometers that have been implemented using this platform. This vertical integration scheme introduces a new architecture for the on-chip integration of conventional optical systems, and enables the unprecedented realization of massively parallel optical systems for computation, data storage, and biomedical sensing applications.

Monday

February 25, 2019

Starts at 12:15 PM

Coffee at 12:00 PM

Physics Conference Room, SB B326