

Invited Talk

Xiangping Li

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Biography

Dr. Xiangping Li completed his PhD at Swinburne University of Technology in 2009. His research is focused on nanophotonic techniques for high capacity optical information technologies including optical multiplexing, plasmonics and superresolution microscopy. Dr. Li has published over 60 internationally referred journal publications including Science, Nature Photonics, and Nature Communications. He joined the Institute of Photonics Technology in Jinan University as a full professor and research leader in nanophotonic devices group in 2015.

Diatomic metasurface for multi-functional light field manipulation

Metasurface composed of arrays of subwavelength scale optical antennas emerges as a new paradigm for light field manipulation and unpins various flat optical diffractive devices. Based on their phase modulation mechanisms, the reported metasurfaces can be classified into three categories: resonance phase, propagation phase and geometric phase. In this talk, we propose a new metasurface design allowing to fully control the phase, amplitude, polarization and frequency of visible light simultaneously. This is achieved through a generalized geometric phase mechanism which combines the detour phase and the Pancharatnam–Berry phase. Utilizing a diatomic design strategy, the in-plane displacements and orientations of two identical meta-atom in each unit meta-molecules are fully exploited enabling light field manipulation at multi-dimensions. Leveraging this appealing feature, we experimentally demonstrated the broadband vectorial holographic images with spatially-varying polarization states, dual-way polarization switching functionalities, and full-color complex-amplitude vectorial holograms. Our work may suggest a new route to achromatic diffractive elements, polarization optics and ultra-secure anti-counterfeiting.

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