**Metasurface-enabled Multifunctional Displays**

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Metaholograms exhibit unique advantages in imaging quality, information capacity, field of view, and operational efficiency over conventional holograms, and therefore, are considered as a promising technology for the next-generation display. In this talk, I will first present a new type of waveguide-based six-channel metaholograms multiplexed by the spin and azimuthal angle of an incident guided light. Six target images are encoded in the evanescent region of the metahologram’s k-space, and they can be respectively displayed utilizing k-space translation strategy under guided light illumination with selected spin and azimuthal angle. Leveraging this strategy, we further demonstrate three-channel polarization-independent metaholograms and two-channel full-color metaholograms. I will then present a compact stereo waveguide AR display system using a single piece of thin flat glass integrated with a polarization-multiplexed metagrating in-coupler and two diffractive grating out-couplers. Incident light of opposite circular polarization states carrying stereoscopic images are first steered by the metagrating in-coupler to opposite propagation directions in the flat glass waveguide, subsequently extracted by the diffractive grating out-couplers, and finally received by different eyes, forming 3D stereo vision.

**Short Bio:**

Prof. Cheng Zhang obtained his B.S. degree in Electrical Science and Technology from Shandong University in 2010, and Ph.D. degree in Electrical Engineering from the University of Michigan-Ann Arbor in 2016. He worked as a post-doctoral associate at National Institute of Standards and Technology (NIST) from 2016 to 2020. He is currently a professor at Huazhong University of Science and Technology, where he leads a research team working on cutting-edge projects aimed at the exploitation of nanophotonic materials, devices and fabrication techniques for novel imaging, displaying, and sensing applications.