

Metasurfaces: New Generation Building Blocks for Emerging Optics

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Abstract

Metasurfaces are composed of a single-layer of periodic subwavelength nanostructures that resonantly couple to the incident light. Such nanostructured surfaces can reproduce the functions of bulk optics, and on occasions, offer new functionalities that are not possible with conventional diffractive optics. In this keynote, I will review my journey in employing metallic to dielectric and semiconductor metasurfaces in both linear and nonlinear regimes. I will show how an ultra-thin surface of various subwavelength nanostructures can manipulate the light behaviour in demand. Finally, I will discuss several exciting applications, including night vision, flat optics and ultra-sensitive biochemical sensing.