

Composite Functional Metasurfaces for Multispectral Achromatic Optics

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Summary

A new technology for producing flat optical components based on optical metasurfaces. These components can potentially serve high resolution imaging, spectrometry, light processing and beam shaping devices. The optical metasurfaces that we develop are composed of closely spaced optical nanoantennas which can be deposited on a wide variety of rigid and flexible surfaces. The engineered nanoantennas allow capturing and directing light at specific colors and polarizations and by that create surfaces with engineered and unnatural optical functionality. The active area of the component can be ultrathin allowing in addition to the unique optical properties to reduce the size of the optical components. Moreover, functionality can be enhanced by creating multilayered components.

Applications

The proposed technology can be used to generate a wide variety of novel diffractive optical elements including flat lenses with multispectral and polarization dependent functionality, multifocal components, beam shapers etc. So far we have demonstrated in the lab the use of this technology to correct chromatic aberrations from a diffractive lens and to generate multifunctional laser beam shapers.

Patent Status

USA Granted: 11,841,520
