

Optomechanics of ultra-thin photonic metasurfaces

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Abstract

Metasurfaces have a remarkable capability to synthesize complex wavefronts, with diverse applications in beam focusing, imaging, and flat optics. Complementing established applications, we show how the ability to steer waves can be seen as a mechanical phenomenon, and how the underlying metasurface physics can be harnessed to shape optomechanical forces. We discuss the potential of metasurfaces as ideal platforms for optomechanics because of their large-area and ultra-lightweight form factor. Such metasurface control of optical forces can facilitate novel approaches to optical levitation and propulsion at the macro scale.