

IQSE AMO QO Seminar Series

Tuesday, February 7th, 11:30 am ZOOM & IQSE
seminar room (MPHY 578)

Pizza will be served for IQSE members at 11:00 am. The talk will start around 11:30 am

Dr. Noah A. Rubin
(Harvard University)

Metasurface polarization optics

EVENT DETAILS: Metasurfaces are an emergent class of subwavelength diffractive optics. The individual elements comprising a metasurface may be designed with polarization sensitivity [1, 2] – in this way, metasurfaces can enable optical elements whose far-fields exhibit custom polarization-dependence. Using relatively simple design heuristics based on the Jones calculus, a variety of polarization-dependent optical elements can be realized. These include gratings (of particular interest for polarimetry [3, 4]), lenses, and holograms (the most general case [5]). In this talk, we discuss these metasurface polarization optics, their historical antecedents, their design, and new polarization-sensitive optical elements based on metasurfaces. Metasurfaces ideally provide new additions to the traditional toolkit of polarization optics and may soon reach a level of maturity that sees their inclusion in practical optical systems for polarimetric remote sensing and other applications.

1. Rubin, N. A. et al., 2021: Polarization in diffractive optics and metasurfaces. *Opt. and Phot.* 13(4), 836-970.
2. Arbabi, A. et al., 2015: Dielectric metasurfaces for complete control of phase and polarization with subwavelength spatial resolution and high transmission. *Nature Nanotechnology*, 10 (11), 937-943.
3. Rubin, N. A., et al., 2019: Matrix Fourier optics enables a compact full-Stokes polarization camera. *Science* 365(6448), eaax1839.
4. Rubin, N. A., et al., 2022: Imaging polarimetry through metasurface polarization gratings. *Optics Express*. 30 (6) 9389-9412.
5. Rubin, N.A., et al., 2021: Jones matrix holography with metasurfaces. *Science Adv.*, 7 (33).

ZOOM information:

<https://tamu.zoom.us/j/98156251523?pwd=QVdSdGxtL1UyY0g1L083SU5QR0QrUT09>

Meeting ID: 981 5625 1523

Passcode: 297578

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