

Nonlinear Optics with Metasurfaces and Epsilon Near Zero Materials

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Abstract: Nonlinear optics is a decades-old, well-established discipline that normally relies on macroscopic media and propagation lengths that are much longer than the wavelength. Recent progress in artificially structured materials has enabled a resurgence of this field into new directions and phenomena. Examples are increased efficiencies using materials that were not useful for bulk nonlinear optics, complete relaxation of phase matching conditions, and nonlinear processes that go beyond simple harmonic generation but add frequency shifts and broadening due to electronic nonlinearities. In this talk I will cover some of these new developments in nonlinear optical metasurfaces, hybrid nonlinear structures that include semiconductor quantum wells and high harmonic generation in epsilon near zero materials.

References

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