

Internal Webinar

Nonperturbative Nonreciprocal Metaphotonics

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My research explores two frontiers of nonlinear metaphotonics: (i) tunable high-harmonics generation (HHG), achieved by modulating light-matter interactions across metasurfaces, and chiral HHG^[1,2]; and (ii) nonlinearity-induced nonreciprocal self-action by leveraging the ultrafast response of epsilon-near-zero materials^[3]. These findings pave the way for nanoscale tunable HHG sources and compact nonreciprocal devices.

References:

- [1] P. Jangid, F.U. Richter, M.L. Tseng *et al.*, Spectral Tuning of High-Harmonic Generation with Resonance-Gradient Metasurfaces, *Adv. Mater.* 36, 2307494 (2024)
- [2] P. Jangid, M.A. Vincenti, L. Carletti *et al.*, Chiral High-Harmonic Generation in Metasurfaces, *ACS Photonics* 12(8), 4342-4348 (2025)
- [3] A. Mathew, R. Aschwanden, A. Tripathi *et al.*, Nonreciprocal Metasurfaces with Epsilon-Near-Zero Materials, *Nano Letters* 25(8), 3259-3264 (2025)

Wednesday, Feb 11th 2026

14:30 Hrs

