



About the cover: *Advanced Photonics* Volume 5, Issue 6

Metasurfaces offer a unique playground for tailoring the electromagnetic field at subwavelength scale to control polarization, wavefront, and nonlinear processes. Tunability of the optical response of these structures is challenging, due to the nanoscale size of their constitutive elements. A long-sought solution to achieve tunability at the nanoscale is all-optical modulation by exploiting the ultrafast nonlinear response of materials. However, the nonlinear response of materials is inherently very weak, and, therefore, requires optical excitations with large values of fluence.

New research reported in *Advanced Photonics* demonstrates that, by properly tuning the equilibrium optical response of a nonlocal metasurface, it is possible to achieve sizable variation of the photoinduced out-of-equilibrium optical response on the picosecond timescale employing fluences an order of magnitude

lower than previous studies with comparable reflectivity variations in silicon platforms. These results pave the way to fast devices with large modulation amplitude.

The image on the cover for *Advanced Photonics* Volume 5 Issue 6 illustrates a schematic of a silicon nonlocal high-contrast grating illuminated by a probe beam whose reflection is modulated by a higher frequency pump beam. The image is based on original research presented in the article by Andrea Tognazzi, Paolo Franceschini, Olga Sergaeva, Luca Carletti, Ivano Alessandri, Giovanni Finco, Osamu Takayama, Radu Malureanu, Andrei Lavrinenko, Alfonso C. Cino, Domenico de Ceglia, and Costantino De Angelis, “[Giant photo-induced reflectivity modulation of nonlocal resonances in silicon metasurfaces](#),” *Adv. Photonics* 5(6), 066006 (2023), doi 10.11171/AP.5.6.066006