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David Adler Lectureship Award in the Field of Materials Physics: Electrically Tunable Nanoantennas for Control of Absorption, Emission and Scattering¹

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Progress in understanding resonant subwavelength structures has fueled an explosion of interest in both fundamental processes and nanophotonic devices for imaging, sensing, solar energy conversion and thermal radiation control. Achieving electronic tunability of the optical properties is also an emerging opportunity to bring nanoscale resonators and antennas to life as dynamic objects. While the optical properties of photonic and plasmonic nanostructures are typically fixed at the time of fabrication, gated field effect tuning of the carrier density in conducting oxides and two-dimensional materials enables the optical dispersion of individual structures to be altered from dielectric to plasmonic, yielding active nano-antenna arrays with electrically tunable absorption, radiative emission and scattering properties.

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