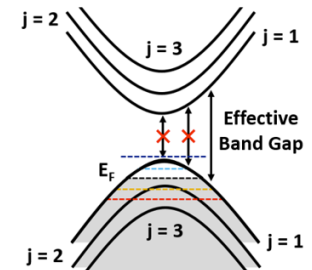
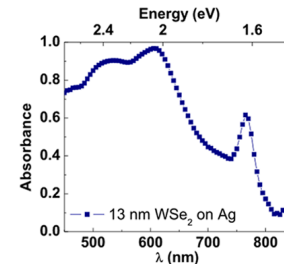
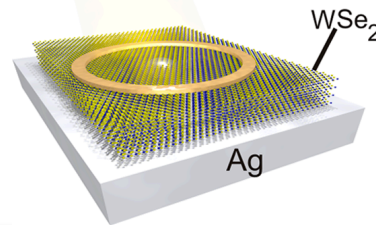
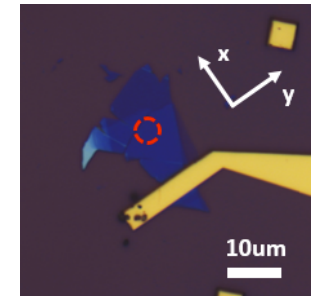
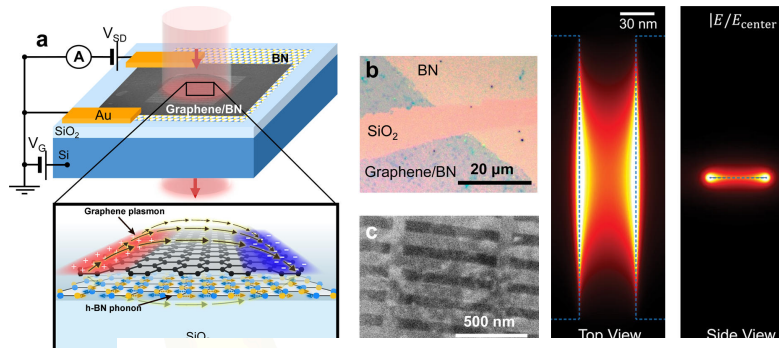


“Tuning Light-Matter Interactions in Nanostructures Approaching the Atomic-Thickness Scale”



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Progress in understanding resonant subwavelength optical structures has fueled a worldwide explosion of interest in both fundamental processes and nanophotonic devices for imaging, sensing, solar energy conversion and thermal radiation control. However, for most nanophotonic materials, the optical properties are fixed at the time of fabrication. Achieving active tunable of the optical properties to modify the light matter interaction at the nanoscale which is an emerging opportunity to bring metamaterials and metasurfaces to life as dynamic objects composed of tunable nanoscale resonators and antennas for various application. Electrical tuning of the carrier density in conducting oxides, transition metal nitrides and two-dimensional materials enables the optical dispersion of individual structures to be altered from dielectric to plasmonic, yielding active nano-antenna arrays with gate tunable phase and amplitude modulation of absorption, radiative emission and scattering. Operation of individual patch antennas and beam steering phased arrays of antennas will be discussed.