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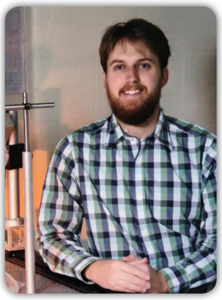

Chase T Ellis

U S Naval Research Laboratory, USAChina

Light-matter interactions in 2D materials throughout the infrared-THz spectral regime

Two-dimensional materials have been shown to support many remarkable electrical and optical phenomena, where for the latter, our group has demonstrated the ability to significantly modify the polarization of light with a single graphene monolayer. In this talk, I will discuss the results of magneto-optical Kerr effect measurements, which elucidate the interactions between polarized infrared light and mono-/multi-layer graphene. In general, these measurements are extremely sensitive to the number and the stacking arrangment (AA, AB, ABC, etc) of graphene layers. We also find that the graphene doping density plays a major role in turning on and off the changes in polarization, which opens up the opportunity to produce fast, graphene-based polarization modulators by employing an electrically tunable gate. In addition, I will discuss our recent work on highly anisotropic nanostructured two-dimensional materials, such as hexagonal BN pillars, which are able to strongly confine infrared light beyond the diffraction limit. When combined, these two materials systems can potentially result in near-field polarization control.

Biography

Chase T Ellis completed his PhD in the Department of Physics at the University of Buffalo (SUNY) in 2013, where he studied the magneto-optical properties of mono- and multi-layer epitaxial graphene. After completing his PhD, he served as a National Research Council Postdoctoral Fellow at the U S Naval Research Laboratory (NRL) in Washington, DC, and is now a Staff Scientist in the Electronics Science & Technology Division at NRL. His current research interests focus on the photonic properties of both 2D and 3D polar-dielectric materials that support plasmonic-like resonances that operate in the long-wave infrared spectral regime.

chase.ellis@nrl.navy.mil

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