Exciton polarons in lead halide perovskites

Abstract: In this talk, I will review some of our recent work concerning the photophysics of the lead halide perovskites. In particular, I will discuss how their soft, polar lattices endow quasiparticle excitations like, polarons and excitons, with a number of anomalous properties. The electron-phonon coupling in this class of materials results in electrons and holes being repelled from each other in bulk materials at elevated temperatures, and generates a strongly size dependent dynamic Stokes shift in nanoparticles. In 2d materials, lattice effects renormalize exciton binding energies, bringing theoretical predictions that neglect them into better agreement with experimental measurements. The results presented are derived from simple Gaussian field theories and validated with quasiparticle path integral molecular dynamics simulations.

Please contact isaiahgtz@chem.ucla.edu for additional information.