Effective Field Theory of Interacting $\pi$-Electrons in Highly-Conductive Molecular Junctions  
JOSHUA BARR, University of Arizona, JUSTIN BERGFIELD, University of California, Irvine, CHARLES STAFFORD, University of Arizona — We present an effective field theory (π-EFT) that allows the two-body Hamiltonian for a $\pi$-electron system to be expressed in terms of three effective parameters: the $\pi$-orbital quadrupole moment, the on-site repulsion, and a dielectric constant. As an application of this, we then present a model of screening effects in single-molecule junctions based on the image multipole method, and review our recent application of this to highly-conductive molecular junctions wherein the transmission eigenchannel distribution calculated for an ensemble of Pt-benzene-Pt junctions is in excellent agreement with experiment.