

Charge Carrier Transport and Recombination in Nanocrystal Solids

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In this talk, I will explain our group's recent findings on charge transport and recombination in thin films made of nanocrystal-based semiconductors. We combine temperature dependent current-voltage measurements, temperature-dependent time-of-flight measurements, thermal admittance spectroscopy, inelastic neutron scattering, and *ab-initio* molecular dynamics. This combination of experimental and computational work enables us to confirm the fundamental origins of charge transport and gain insights into the role of electron-phonon interactions in transport and recombination. These findings guide the bottom-up engineering of next generation semiconductors, where optical, electronic, and phononic properties can be tailored.