



Inorganic Chemistry Seminar Series

Tuesday, April 10, 2018, 12:30 pm

SSC 150

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Harnessing Molecular Photon Upconversion Using Self-Assembled Multilayers on Metal Oxide Surfaces

Abstract:

Photon upconversion—combining two or more low energy photons to generate a higher energy excited state—is an intriguing strategy for increasing the maximum theoretical solar cell efficiencies from 33% to greater than 43%. In this presentation we will introduce self-assembled multilayers of sensitizer and acceptor molecules on nanocrystalline metal oxide films as a new structural motif for facilitating molecular photon upconversion via triplet-triplet annihilation (TTA-UC) and directly extracting charge from the upconverted state. Under light intensities as low as ambient solar flux we demonstrate a more than four-fold increase in the short circuit current relative to the sum of the sensitizer and acceptor monolayer devices. We will discuss the dynamics events during TTA-UC, limitations of the current film, and strategies for increasing the TTA-UC efficiency and device performance.

Hosted by Professor Mark Thompson

The scientific community is invited

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