# Lead chalcogenide solar cells inspired by multiple exciton generation

*Joseph M. Luther*
***National Renewable Energy Laboratory (NREL)***
*joey.luther@nrel.gov*

Multiple exciton generation provides a promise to extend the efficiency of a single junction solar cell beyond the Shockley Quisser limit of ~33% by using a high-energy photon to generate multiple electrons. This effect is most commonly studied in colloidal nanocrystals or quantum dots of PbSe. Over the past 3 years, lead chalcogenide based solar cells have seen rapid progress, encompassing the highest measured photocurrents under 1-sun conditions for nanostructured solar cells. The open circuit voltages of devices have been measured higher than the bulk bandgap indicating quantum confinement can help create a fascinating thin film with new collective properties. This talk will discuss coupling strategies for creating conductive quantum dot networks, alloying strategies to improve device metrics, as well as various device structures and contacts to collect electrons from the light absorbing quantum dot arrays. We will present the recent advances as well as NREL certified device efficiency, which set the benchmark for future improvements in this field.