

Fall 2020 Joint Colloquium

Materials Department & Materials Research Laboratory

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for Photovoltaics

Materials and Chemical Sciences

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11:00 am via Zoom

Making metal halide perovskite photovoltaics a reality: an update on state-of-the-art

Photovoltaic (PV) devices based on metal halide perovskite (MHP) absorbers have reached outstanding performance over the past few years, surpassing power conversion efficiency of over 25% for lab cells and with large area devices in excess of 18%. For the solar application stability, the most demanding requirement to assess for PV and remains the outstanding issue for MHP based devices. The problem of stability motivates basic science driven work on MHP based PV at NREL and work by industrial partners. Material and device insight can enable MHP PV stability along with the associated opportunities to further improve efficiency with multijunction while maintaining scalability and manufacturability is critical. This talk will highlight the latest work at NREL to develop understanding of critical roadblocks, aspects of solar cell performance, device architectures, stability and operational dynamic to enable the next generation of photovoltaics.

Bio

Joseph Berry (@joe_jberry) is a principal scientist at the National Renewable Energy Laboratory working on halide perovskite solar cells. His PhD for work was on spin transport and physics in semiconductor heterostructures from Penn State University. His efforts at NREL emphasize relating basic interfacial properties to technologically relevant device level behaviors in traditional and novel semiconductor heterostructures including oxides, organics and most recently hybrid semiconducting materials. He leads the US Department of Energy (DOE) Solar Energy Technology Office's (SETO) core technology program, "De-risking Halide Perovskite Solar Cells" at NREL. He is the director of the U.S. Manufacturing of Advance Perovskites (US-MAP) consortium a collaboration between universities, and the national labs to meet the needs of US companies examining commercialization of metal halide perovskite-based technologies. Finally he is a principle investigator on the NREL lead Department of Energy, Center for Hybrid Organic Inorganic Semiconductors for Energy (CHOISE) Energy Frontier Research Center, exploring basic aspect of hybrid semiconductor materials.

www.choise-efrc.org

www.usa-perovskites.org

www.nrel.gov/pv/perovskite-solar-cells.html

Hosted by Michael Chabynec.