

Perovskite Photovoltaics. Research Opportunities and Challenges

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Metal halide perovskites have drawn significant attention because of its ability to deliver high efficiency solar cells. Since the appearance of the first metal halide perovskite solar cell paper in the April 2009 significant efforts have been made to develop solar cells with efficiencies surpassing 24%. As the field is becoming mature in terms of the solar cell design, it is important to gain insight into the factors governing the operation of the solar cell. Of particular interest are the research opportunities to investigate the excited state dynamics, new hybrid perovskites, bandgap tuning through halide ion composition, thermal and photo induced halide ion mobility, remediation of surface defects and long term stability. The lecture will discuss these aspects and map out opportunities to engage in future research. A better understanding of the photo and thermally controlled processes within the perovskite film would pave the way for the design of next generation solar cells with greater stability.