Brighter Metal Halide Perovskite Light Emitting Diodes Via Heat Management

Barry P. Rand
Department of Electrical Engineering and Andlinger Center for Energy and the Environment, Princeton University, Princeton, NJ 08544 USA
brand@princeton.edu

Abstract:

Hybrid organic-inorganic halide perovskite materials are promising for light emitting applications. In this talk, I will discuss our recent work on perovskite-based LEDs, where we have established a general protocol for preparing ultrathin, smooth, passivated, and pinhole free films of metal halide perovskites with various compositions, by incorporating bulky organoammonium halide additives to the stoichiometric 3D perovskite precursors [1-7]. In addition, we have found that a major factor contributing to roll-off of perovskite LEDs is heating [8-11]. By avoiding heating through multiple strategies, we are able to reduce roll-off and report record-bright perovskite LEDs, pushing toward display, lighting, and even lasing-relevant current densities.

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