

Multidimensional and lead-free perovskites for photovoltaics and light-emitting devices

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Perovskite metal halides (CH₃NH₃PbI₃), have yielded unprecedented advances in photovoltaics with power conversion efficiencies close to 20%, rivaling the performance of industry standard silicon. The excellent electronic properties, especially the balanced electron and hole diffusion lengths, has positioned this material at the forefront of solution processed photovoltaics, as well as an excellent candidate for light emission and lasing applications.

It is essential to expand the family with new materials that can match the advantages of CH₃NH₃PbI₃ and address some of its drawbacks, such as moisture stability and toxicity.

This talk will focus on elemental substitutions, and multidimensional halide perovskite systems. Challenges and opportunities in perovskite materials beyond methyl ammonium lead iodide with particular emphasis on their optoelectronic properties would also be addressed.