

Halide Perovskite based room temperature solid state detectors using flexible paper electronics & single crystals

Abstract: There is a considerable surge in exploration of emerging class of material called Halide perovskite in recent past. The attributes like high carrier mobility, long carrier diffusion lengths, and tunability of the band gap with suitable dopants make perovskite halides attractive materials for investigating the basic physics as well as other interesting device applications. In this presentation, the two important aspects of halide perovskites will be discussed. In first one, the focus will be on how a same class of material (i.e halide perovskite) can be used for multifunctional applications under several external stimuli like optical illumination, hard radiation, and specific gas molecule by structural, ionic & charge carrier tuning. Another aspect is growth of solution processed halide perovskites on substrate like a piece of paper making them compatible with cost effective, low power flexible electronics based devices for next generation. This presentation will encompass **optoelectronic, radiation detection and gas sensing properties** of halide perovskite family (ABX_3 $A=MA, FA$; $B=Pb, Sn$; $X=Br, I$ & their compositions) that includes fabrication of solid state sensors & optoelectronic devices using **innovative flexible paper electronics based broadband photodetector, solid state gas sensor as well as single crystal based radiation detector, optical FET(phototransistor)** that are operable at ambient condition. Subsequently underlying science behind **multifunctional applications** as well as **technological aspects** of such application potentials through developing **prototypes** also will be discussed.

References:

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