



INSTITUTE SEMINAR

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TITLE

Photoluminescence intermittency in micron-size hybrid lead halide perovskites

ABSTRACT

Organic-metal-Halide perovskite materials recently attracted immense attention due to its unique optoelectronic properties, easy and versatile synthesis routes and its applicability in photovoltaic and light emitting devices. The existing literature demonstrates that the device performances depend heavily on the film morphology, shape and size of the crystal and of course the stoichiometry of the synthesized material.

In this presentation, I will be discussing some interesting and unique optoelectronic properties of some “bad” perovskite materials when it is either synthesized under non-ideal conditions or as non-stoichiometric which is not ideal for high performance devices. Here I will aim to justify a distinct correlation between the surrounding ambient and the PL intermittency of isolated and conjugated formamidinium lead bromide (FAPbBr₃) microcrystals having dimension higher than the excited carrier diffusion length. A custom-built spectrally resolved epi-fluorescence microscopy is used to capture the wide-field optical emission properties of the material. With adequate experiments, we are able to describe the role of photoelectrochemically generated trap states that plays a deterministic role in PL intermittency. We further aim to establish a direct correspondence between the material degradation and the blinking.

(The seminar has been arranged in collaboration with Technical Research Centre, SNBNCBS)