

Seminar

New perspectives of exciton many-body interactions in perovskite lead halide nanocrystals

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Exciton many-body interactions are the fundamental elementary light-matter interaction which determines the optical response of the new class of perovskite CsPbX_3 [X = Cl, Br, I] nanocrystals. In this talk, I will present the extremely interesting results on the qualitatively different spectral and temporal features of exciton many-body interactions such as state-filling, Auger recombination, and hot phonon bottleneck. Then, we demonstrate the coherent optical coupling of the spin of the exciton states into biexciton states of antiparallel spins. The unique spin selective biexciton formation of CsPbX_3 nanocrystals may help to realize quantum information processing even in the absence of any photonic cavity, cryogenic temperatures and or applied magnetic field. A systematic fluence dependent study reveals that exciton interactions can be well described by the biexciton spin decoherence.

Friday, Mar 13th 2020

11:30 AM (Tea/Coffee at 11:00 AM)

Auditorium, TIFR-H