IQSE AMO QO Seminar Series

Tuesday, March 22nd, 11:30 am ZOOM & IQSE seminar room (MPHY 578)

Pizza will be served for IQSE members at 11:00 am. The talk will start around 11:30 am

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Texas A&M University

Excitons in strongly quantum confined perovskite quantum dots

EVENT DETAILS: Perovskite quantum dots (QDs) are emerging as an excellent source of photons and charge carriers for photonic and photovoltaic applications that are superior to many existing semiconductor quantum dots. In this presentation, I will discuss the energetics and relaxation dynamics of bright and dark excitons in strongly quantum confined cesium lead halide perovskite QDs that dictate various photophysical properties in this new family of QDs. For this purpose, we prepared the QDs with varying degree of confinement in non-interacting ensemble and electronically coupled arrays of QDs as well as in the magnetically doped non-interacting QDs. The effect of confinement-enhanced electron-hole exchange interaction in strongly confined QDs on bright-dark level splitting and the rates of bright and dark exciton emission were studied via time-resolved photoluminescence (PL) of exciton in the non-interacting ensemble. The effect of electronic coupling in the 2-dimensional QD arrays that alter the electron-hole exchange interaction and the exciton fine structure was studied via the time-resolved exciton PL obtained at cryogenic temperatures. The possibility of generating ferromagnetism via formation of exciton magnetic polaron in magnetically doped perovskite QDs has also been examined via temperature-dependent magneto-PL study in strongly quantum confined Mn-doped $CsPbI_3$ QDs.

ZOOM information:

https://tamu.zoom.us/j/98156251523?pwd=QVdSdGxtL1UyY0g1L083SU5QR0QrUT09

Meeting ID: 981 5625 1523
Passcode: 297578

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