

0D-2D Nanocrystals for Efficient Optoelectronics

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Abstract

Colloidal nanocrystals are novel materials for the next generation optoelectronic devices. They offer exotic properties which are not possible using their bulk counterparts. Their high photoluminescence quantum yield, narrow spectral emission, and high extinction coefficient make them important building blocks for the colloidal optoelectronics. Amongst the important areas the nanocrystals utilized for are the solid state lighting, displays, solar energy and colloidal lasing applications. With the recent commercial products in the consumer electronics, these artificial atoms have potential to dominate the optoelectronics industry as a game-changing platform.

This talk will focus on our research efforts on the synthesis of colloidal nanocrystals, namely quantum dots [1], perovskites [2], nanoplatelets, and their integration into solid state platforms. Recent results based on photoluminescence energy down-conversion as well as electroluminescence [3], and colloidal lasing [4, 5] will be outlined.

Keywords: quantum dots, nanoplatelets, photoluminescence, electroluminescence

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References

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