ΠΑΝΕΠΙΣΤΗΜΙΟ ΚΡΗΤΗΣ
ΤΜΗΜΑ ΕΠΙΣΤΗΜΗΣ ΚΑΙ ΤΕΧΝΟΛΟΓΙΑΣ ΥΛΙΚΩΝ

ΠΑΡΟΥΣΙΑΣΗ ΜΕΤΑΠΤΥΧΙΑΚΗΣ ΔΙΠΛΩΜΑΤΙΚΗΣ ΕΡΓΑΣΙΑΣ

Τίτλος

«Fabricating New Perovskite Morphologies and Anchoring them on Functional Substrates»

της Σερπίλ Κιοκεκλή, μεταπτυχιακής φοιτήτριας του

Τμήματος Επιστήμης και Τεχνολογίας Υλικών του Πανεπιστημίου Κρήτης

Επιβλέπων καθηγητής: Γεώργιος Κιοσέογλου

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Τετάρτη 01/12/2021

13:00

Η παρουσίαση θα πραγματοποιηθεί στην **αίθουσα Φ2 του Τμήματος Φυσικής,** του Πανεπιστημίου Κρήτης.

ABSTRACT

In the past few years, metal halide perovskite nanocrystals have emerged due to their exceptional optical properties. The most attractive trait of these materials is the properties tunability by composition, shape or size alterations. The synthesis of highly anisotropic nanocrystals is even more promising, as strong quantum confinement imposed by one (nanorods/nanowires) or two (nanoplatelets) dimensions give rise to higher exciton binding energy and narrow emission linewidth, which are of great importance in LEDs and lasing. Nevertheless, complications concerning the ultra-thin metal halide nanocrystals are governed by instability towards environmental conditions (light and moisture) and susceptibility to aggregate and/or breaking down.

A facile, ambient-conditions chemical protocol is presented to obtain uniform and ultra- small 2D $CsPbBr_3$ nanorods. The synthesis is based on the ligand-assisted precipitation method, by combining low reaction temperature, dilution and ambient light to control the growth of the thin nanocrystals. No complex chemistry apparatus or inert gas flow are needed. The nanorods are homogeneous in size, with 7.8±1.4 nm

length and 2.7±0.5 nm width, which corresponds to 3- monolayers. The nanorod colloidal solution is strong PL active emitting in blue spectral region indicating strong quantum confinement effects, as their width is below the Bohr radius reported for this material.

These ultra-thin quantum-confined nanorods are among the thinnest in the literature andcould be promising candidate in making efficient LEDs. Furthermore, this cost-effective colloidal method by careful regulation of the three important parameters (temperature, dilution, exposure time to light) can be used for the fabrication of other 2D nanocrystals.