

POZIVNICA ZA SEMINAR CENTRA IZVRSNOSTI STIM

Srijeda, 18.10.2017., 12 h, PMFST, amfiteatar AF1-1
Ruđera Boškovića 33, 21000 Split

PREDAVANJE: „From Synthesis to Application of Photovoltaic Perovskite Nanowires”

PREDAVAČ: Prof. László Forró, Laboratory of Physics of Complex Matter, Ecole Polytechnique Fédérale de Lausanne, CH-1015, Lausanne

Abstract: In the last few years, the organo-lead halide perovskite $\text{CH}_3\text{NH}_3\text{PbI}_3$ and its derivatives have been found to be very efficient light harvesters and ambipolar semiconductors revolutionizing the field of solid-state solar cells. Its low temperature fabrication process allowed to design simpler solar cell structures (i.e. from mesoscopic to planar junctions) which yielded efficiencies exceeding 20%. The major research area in this field is photovoltaic device engineering although other applications as solar water splitting, field effect transistors (FETs), ultra-broadband photodetectors, thermoelectric devices, light emitting diodes and lasers are being explored as well.

Recently, we have shown that nanowires of this photovoltaic perovskite can be synthesized [1], which in association with carbon nanostructures (carbon nanotubes and graphene) make outstanding composites with rapid and strong photo-response. They can serve as conducting electrodes, or as central components of detectors. The performance of several miniature devices based on these composite structures will be demonstrated [2,3]. Our latest findings on the guided growth of perovskite nanowires by solvatomorph graphoepitaxy will be presented [4]. This method turned out to be a fairly simple approach to overcome the spatially random surface nucleation. The process allows the synthesis of extremely long (centimeters) and thin (a few nanometers) nanowires with a morphology defined by the shape of nanostructured open fluidic channels. This low-temperature solution-growth method could open up an entirely new spectrum of architectural designs of organometallic-halide-perovskite-based heterojunctions and tandem solar cells, LEDs and other optoelectronic devices.

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[1] Horvath et al. Nano Letters, 2014, 14 (12), 6761-6766

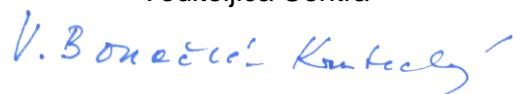
[2] Spina et al. Nanoscale, 2016, 8, 4888

[3] Spina et al. Small, 2015, 11, 4824-4828

[4] Spina et al. Scientific Reports, 2016, 6

DISKUSIJA, DRUŽENJE I SASTANAK (učionica B3-55) : 13^h-15^h

Voditeljica Centra



Prof. dr. dr. h. c. Vlasta Bonačić-Koutecký