FACOLTÀ DI SCIENZE MATEMATICHE, FISICHE E NATURALI
DIPARTIMENTO DI MATEMATICA E FISICA "NICCOLÒ TARTAGLIA"
INTERNATIONAL DOCTORAL PROGRAM IN SCIENCE

Seminar lecture in the framework of International doctoral school in Science

Federica COSTANTINO, PhD student @IIT Genova and Università Cattolica del Sacro Cuore (Brescia), *will deliver a lecture entitled:*

Hybrid 2D black phosphorus/polymer materials: new platforms for device fabrication

Chairperson: Ph.D student Sonia FREDDI

Abstract
Hybrid materials, where a 2D filler is embedded in a polymeric matrix, attracted great interest in past years, because of the wide variety of matrix and filler properties and combinations, the possibility of synergic effect among them, and the easy accessibility to scalable production methodologies. Mostly, the bulk properties of these materials have been studied so far, especially looking at how the filler changes the matrix properties. Here will be propose a change in perspective, by using the hybrid material as a platform to exploit the full potential of the filler regarding device applications. In particular, black phosphorus (bP) flakes are embedded in a poly (methyl methacrylate) matrix.
Black phosphorus is a very interesting layered material, thanks to its properties such as in-plane anisotropy of optical and transport properties as well as direct band gap tuneable with layer number. The application of bP has so far been severely limited by its high sensitivity to oxygen, moisture, and light, which increases going from bulk material to thin flakes. In this work is presented a low cost scalable method, which involves exfoliation of bulk bP in the monomer and in situ polymerization, and which allows to obtain electronic-grade bP nanoflakes, embedded in a polymeric matrix that protects them from the environment and allows their processing into devices without degradation.

Seminario

Martedì 20 novembre 2018
Sala Riunioni, ore 14.00
Via dei Musei 41 - Brescia

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