

Flatland: 2-D materials beyond Graphene

15 Esfand 1394 (Mar. 5, 2016)

Condensed Matter National Laboratory, IPM, Tehran

Workshop Series

Program

9:30 – 10:15	10:15 – 10:30	10:30-11:45	11:45 -14:00	14:00 – 15:00	15:00 – 15:30	15:30 – 16:45
Registration	opening	Zahra Gholamvand	Lunch	Zahra Gholamvand	Break	Zahra Gholamvand

Abstract: The possibility to produce and process graphene, related two-dimensional (2D) crystals and heterostructures in the liquid phase makes them promising materials for an ever growing class of applications as composite materials, sensors, in energy storage and conversion and flexible (opto) electronics. In particular, the ability to formulate functional inks with on demand rheological and morphological properties, i.e. lateral size and thickness of the dispersed 2D crystals, is a step forward towards the development of industrial-scale, reliable, inexpensive printing/coating processes, a boost for the full exploitation of such nanomaterials. Here, in my first talk I review the exfoliation strategies of graphite and other layered crystals, to produce liquid suspensions of two-dimensional materials such as graphene, BN, WS₂, MoS₂, MoO₃, MoTe₂ and Black phosphorous, the advances in the sorting of lateral size and thickness of the exfoliated sheets together with the formulation of functional inks using spectroscopic techniques. In the second talk the current development of printing/coating/composite processes of interest for the realization of 2D crystal-based devices for various applications in areas such as: reinforced composites, transparent conductors, sensors, optoelectronic devices and electrodes for batteries, solar cells, supercapacitors and fuel cells etc.

Practical Demo: Producing 2D inks using Kitchen Blender and processing them into actual devices