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The Chinese University of Hong Kong
Department of Chemistry
Research Seminar Series

Speaker: Dr. REN Yi
Department of Chemistry
Rutgers University

Title: From Molecules to Functional Materials

<< Abstract >>

π-conjugated materials have attracted significant attention in the area of organic electronics. Modifying molecular chemical/electronic structures and their solid-state molecular organization have been demonstrated as effective means to fine-tune the optoelectronic properties of these π-conjugated materials for specific functionalities. In this talk, I will present our efforts to design, synthesize and characterize new functional materials at both molecular and supramolecular level for applications in organic electronics.

The first part of my talk will focus on new approaches to construct non-planar and hybrid materials that form supramolecular structures having efficient energy and charge transport characteristics. In the second part of my talk, I will describe recent work on a series of new seven-membered heterocyclic system, namely diazaphosphepines where a new functionalization protocol, namely the [d]-C-C double bond engineering is utilized to fine-tune both chemical and electronic structures of heteropines. Concurrent device fabrication and testing has afforded the first example of organic solar cells comprising heteropines.

Date: April 6, 2016 (Wednesday)

Time: 11:30 a.m.

Venue: LT3, Lady Shaw Building

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Contact Person:
Prof. Qian Miao

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The Chinese University of Hong Kong
Department of Chemistry
Research Seminar Series

Speaker: Dr. Xi Ling
Department of Electrical Engineering and Computer Science
Research Laboratory of Electronics
Massachusetts Institute of Technology

Title: Two-Dimensional Materials and Heterostructures: Synthesis and Spectroscopy

<< Abstract >>

Atomically thin two-dimensional (2D) materials, due to its ultra-flexible nature and diverse properties covering from metal (e.g. graphene), to semiconductor (e.g. MoS2) to insulator (e.g. hexagonal boron nitride), have been considered as promising candidates not only to advance the forefront of semiconductor industry, but also as the key elements for future ubiquitous electronics. For their practical application, some challenges should be solved, such as the large-area synthesis and assembly, properties study, and applications exploration. In this talk, I will first introduce the synthesis of 2D materials (e.g. MoS2) using chemical vapor deposition (CVD) method, and my recent research progress in direct assembly of diverse 2D materials into both vertically stacked and horizontally stitched heterostructures during growth process. The methodology enables the large-scale fabrication of diverse heterostructures with arbitrary patterns, and clean and precisely aligned interfaces, regardless of lattice matching between the components, which offers tremendous potential for its application in integrated circuits. In the second part of this talk, toward the properties study, I am interested in using spectroscopy techniques to reveal the physical nature of materials. Particularly, I will introduce using Raman spectroscopy to study a new member of semiconducting 2D material--black phosphorus, with properties strongly depend on the thickness and crystalline orientation. Not only spectroscopy techniques are helpful for 2D materials characterization, in the last part of the talk, I will demonstrate that 2D materials are also useful for the development of spectroscopy techniques, based on the "graphene enhanced Raman scattering (GERS)" technique developed during my PhD study.

Bio:

Xi Ling is currently a postdoctoral associate in the Research Laboratory of Electronics at Massachusetts Institute of Technology (MIT) since September 2012, under the supervision of Professors Mildred Dresselhaus and Jing Kong. She obtained her PhD degree in physical chemistry from Peking University in July 2012. Her research interest focuses on the synthesis of two-dimensional (2D) van der Waals materials, their characterization through spectroscopy, and their implementation to develop novel nanodevices.

Date: April 27, 2016 (Wednesday)

Time: 10:30 a.m.

Venue: L3, Science Centre

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Contact Person:
Prof. Y.Y. Yeung