Institute for Basic Science

IBS Center for Molecular Spectroscopy and Dynamics

COLLOQUIUM

■ SPEAKER

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■ TITLE

Optical and electronic properties of two-dimensional materials probed by optical spectroscopy

■ ABSTRACT

Novel two-dimensional (2D) materials such as graphene and transition metal dichalcogenides have intrigued a significant attention due to their optoelectronic properties like unusual electronic spectrum and sizable band gaps. Among many other experimental methods, optical spectroscopy offers a variety of powerful probes to investigate structure and electronic properties of solids. In particular, Raman and photoluminescence (PL) spectroscopies have become one of the most efficient, non-contact, spectroscopic and analytical techniques to study 2D materials. In this presentation, I will discuss our high-field magneto-Raman study of graphene and graphite providing a comprehensive experimental evidence of magneto-phonon resonance on circularly polarized phonons in graphene depending on Fermi energy levels [1, 2]. Moreover, PL spectroscopy is employed to demonstrate reversible and repeatable transition between neutral and charged excitons in monolayer MoS2 is chemically achieved via complementary chlorine-hydrogen plasma functionalization as a consequence of reversible charge doping [3].

[References]
[1] Y. Kim et al., Phys. Rev. Lett. 110, 227402 (2013)
[2] Y. Kim et al., Phys. Rev. B Rapid Communications 85, 121403 (2012)
[3] Y. Kim et al. Sci. Rep. 6, 21405 (2016)

■ DATE AND VENUE

June 21, 2016 (Tuesday, 4:00-5:00 p.m.)
Seminar room 116, R&D Center