
COLLOQUIUM

- **SPEAKER**

Dr. Younghee Kim (Sensor System Research Center, Korea Institute of Science and Technology)

- **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