



IBS Center for Multidimensional Carbon Materials



Prof. Gun-Do LEE

School of Materials Science and Engineering
Seoul National University

Defects in Two Dimensional Materials

JUNE 28 WED | Bldg. 101
14:00 | Seminar Room on the 1st floor

Defects in two dimensional materials have become a subject of intensive investigation. In order to observe and control the defects, many state-of-the-art transmission electron and scanning tunneling microscopy techniques have been devoted to the study of the structure and formation process. However, it is sometimes difficult to observe the detail of the formation process even within the state-of-the-art microscopy methods because the dynamics of defect and dopant structures is finished in very short time. Various simulation methods have been employed to elucidate the hidden process of defect formation and dynamics [1]. In the study of defect formation and dynamics in graphene, we performed the cooperative research of aberration corrected transmission electron microscopy (AC-TEM), the tight-binding molecular dynamics simulation and density functional theory (DFT) calculation. From the cooperative research, we studied the hydrogen-free graphene edges [2], the stability and dynamics of tetravacancy [3], bridging atom [4], and metal dopants [5] in graphene. In this talk, graphene partial dislocations [6], and the linear defects [7] and metal dopants [8] in MoS₂ will be discussed and the role of mediator atoms in two dimensional materials will be introduced.

References

- [1] G.-D. Lee et al. Phys Rev Lett 95, 205501 (2005)
- [2] K. He et al., Nature Communications 5:3040 (2014).
- [3] A. W. Robertson et al., Nano Letters, 14, 1634 (2014)
- [4] A. W. Robertson et al., Nano Letters, 14, 3972 (2014)
- [5] Z. He et al., Nano Letters, 14, 3766 (2014)
- [6] A. W. Robertson et al., Nano Letters, 15 5950 (2015)
- [7] S. Wang et al., ACS Nano 10, 5419 (2016)
- [8] A. W. Robertson et al., ACS Nano 10, 10227 (2016)

You are cordially invited to attend!

Special Guest Speaker