UCI Samueli School of Engineering

Department of Materials Science and Engineering UCI

UNIVERSITY OF CALIFORNIA, IRVINE

DEPARTMENT OF MATERIALS SCIENCE AND ENGINEERING

IS PROUD TO HOST A SEMINAR BY

"IDENTIFICATION AND ENGINEERING OF INTERLAYER STACKING CONFIGURATIONS IN VAN DER WAALS CRYSTALS"

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Thursday, April 9, 2026

2:00 PM - 3:20 PM

McDonnell Douglas Engineering Auditorium

Abstract: Crystals with layered structures have recently attracted tremendous research interest. In these materials, individual layers are held together by relatively weak van der Waals interactions and can be exfoliated into atomically thin sheets. A variety of metastable stacking configurations can emerge in such systems, which can be further exploited to tune their physical properties through twistronics and slidetronics. In this seminar, I will present our recent efforts to identify and engineer stacking geometries in various types of van der Waals crystals. Transmission electron microscopy (TEM), combined with complementary characterization techniques, enables layer-by-layer investigation of interlayer stacking configurations. Representative examples—including CrI_3, γ-GeSe, $GdTe_3$, and $GeSe_2$—will be discussed. The seminar will also highlight the roles of stacking faults, temperature-dependent structural transitions, strain-induced effects, and rotational-twin-driven twisting, providing insights into the rich configurational landscape and its implications for accurate structural characterization of layered materials.

Bio: Dr. Kwanpyo Kim is a Professor in the Department of Physics at Yonsei University, Korea. His research focuses on atomic-scale characterization and manipulation of two-dimensional materials and their electronic applications. He received his B.S. in Physics from Seoul National University in 2006 and his Ph.D. in Physics from the University of California, Berkeley in 2012. From 2012 to 2014, he conducted postdoctoral research at Stanford University. He subsequently served as a faculty member in the Department of Physics at the Ulsan National Institute of Science and Technology (UNIST) from 2014 to 2018. Dr. Kim has published more than 130 peer-reviewed articles in leading scientific journals. He received the Young Investigator Award from the Korean Graphene Society in 2020 and the TJ Park Science Young Investigator Fellowship in 2017–2018. He currently serves as an editor for Nano Convergence and Current Applied Physics. Since 2023, he has been a member of the Samsung Foundry Future Technology Council.