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## Atomic Resolution Microscopy of Low Dimensional and Emerging Materials

### ABSTRACT:

As the scaling of various functional devices continues, the future of these devices will rely on new class of materials such as graphene and transition metal dichalcogenides (TMDs). In exploring and developing these emerging materials, nanoscale characterization becomes ever more important. In particular, high resolution electron microscopy-based techniques now are capable of analyzing these materials and devices with better than 0.1 nm resolution. In this talk, I will present an overview of current TEM-based state-of-the-art capabilities enabling comprehensive analysis of nanostructures including 0D, 1D and 2D layered materials. Unique in-situ TEM-based techniques enabling comprehensive analysis will also be presented. Examples will include various low dimensional materials, CdTe solar cell, and nano-pore based sequencing of biomolecules..

### BIOGRAPHY:

Moon Kim is a Louis Beecherl, Jr., Distinguished Professor of Materials Science and Engineering and a Professor of Arts and Technology (ATEC) at the University of Texas at Dallas. He also has a joint appointment as Adjunct Professor in the Simmons Comprehensive Cancer Center at the UT Southwestern Medical Center in Dallas. He is an elected fellow of Microscopy Society of America and a co-founder of 2Lux Media, Inc. He currently serves as Director the SiWEDS (Silicon Wafer Engineering and Defect Science) Industry University Collaborative Research Center (IU/CRC) and also as Director of UTD's Nano-Characterization Facility. He earned his B.S., M.S., and Ph.D. in Materials Science from Arizona State University in 1984, 1986, and 1988, respectively. Dr. Kim's current research includes heterogeneous materials integration by wafer bonding, fabrication of functional nanostructures for sensors and energy harvesting, and nano-electronics. He has co-authored over 290 refereed journal articles, 2 paper books, and 3 eBooks ("Hello, Nano" - available in Apple's iBookstore and Amazon.com, "Art & Technology" - available in Apple App Store).



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