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Nanomaterials Research in a TEM-based Nanolab

Nov 7 | Bldg. 101
Tues 16:00 | Seminar Room on the 1st floor

Abstract: With the continuous improvement of *in situ* techniques for transmission electron microscope (TEM), the capabilities of TEM now extend beyond structural characterization to high-precision nanofabrication and measurement of properties. Based on the idea of "setting up a nanolab inside the TEM", we present our recent progress in nanomaterials research including in situ growth, nanofabrication with atomic resolution, in situ characterization of physical properties, nanodevice construction and possible applications (e.g., making a 5-nm diameter hole in a graphene film for third-generation gene sequencing, observing liquid-like behavior of Ag nanoparticles less than 10 nm in diameters, that show that the TEM can be used as a very effective nanoscale tool). I also will briefly present our work on spongy graphene as an ultra-efficient sorbent for oils and organic solvents, and time permitting, a few other projects of possible interest to the CMCM and UNIST.

Reference:

- [1] L. Sun, F. Banhart, *et al.*, **Science** 312, 1199 (2006)
- [2] J. R-Manzo, M. Terrones, *et al.*, **Nature Nanotechnology** 2, 307 (2007)
- [3] X. Liu, T. Xu, *et al.*, **Nature Communications** 4, 1776 (2013)
- [4] J. Sun, L. He, *et al.*, **Nature Materials** 13, 1007 (2014)
- [5] W. Zhou, K. Yin, *et al.*, **Nature** 528, E1 (2015)
- [6] Q. Zhang, K. Yin, *et al.*, **Nature Communications** 8, 14889 (2017)

Litao Sun is Changjiang Distinguished Professor and serves as the head of the School of Electronic Science and Engineering, Southeast University (SEU), and the director of SEU-FEI Nano-Pico Center. Currently, his research interests focus on: (1) Dynamic in-situ experimentation in the electron microscope; (2) Novel properties from sub-10nm materials (traditional and graphene-related 2D materials); (3) Applications nanomaterials in environment, renewable energy and nanoelectromechanical systems. He is the author and co-author of around 150 peer-reviewed papers including 2 in *Science*, 12 in *Nature* and *the Nature* series journals, and so on. He holds around 70 patents and has given more than 60 invited talks at international conferences. He is a Review Panel member of Graphene Flagship, European Union and Member of European Science Foundation College of Expert Reviewers. He has obtained National Science Fund for Distinguished Young Scholars, Young Leading Talent in Science and Technology Innovation etc.

You are cordially invited to attend!

Tuesday Colloquium