Deformation Mechanisms of Nanostructured Materials

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Nanostructured materials have been found to deform via mechanisms not accessible to their coarse-grained counterparts. Partial dislocation emissions from grain boundaries, stacking faults and deformation twinning may occur in metals such as Al, which does not deform by twinning in its coarse-grained state. In this talk I’ll discuss several deformation mechanisms in nanomaterials as well as their formation conditions. Specifically, I shall give a brief overview on the deformation mechanisms, observed by both molecular dynamic simulations and experiments. I shall then present a dislocation-based model to describe the nucleation and growth of deformation twins in fcc metals. I shall also discuss other nanocrystalline-related deformation features such as wide stacking faults and five-fold twins.

BIO: Dr. Zhu has received his Ph.D. on Materials Science and Engineering from the University of Texas at Austin, Austin, TX. in 1994. From 1994 to 1997 he was Director’s Fund Postdoctoral Fellow at Los Alamos National Laboratory, and since then he has been working as Staff Scientist. His research interests include nanocrystalline materials; thermal analysis of metals and alloys; processing and analytical modeling of composites; and carbon nanotubes and their composites. He has authored/coauthored more than 130 peer-reviewed papers, and received 4 patents.

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Refreshments and pastries will be available before the seminar starts.

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