STEVENS INSTITUTE OF TECHNOLOGY
DEPARTMENT OF MECHANICAL ENGINEERING

Wednesday, September 21, 2011
Carnegie 315, 1:30 pm

Nano-/Bio-mechanical Characterization and Modeling

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Nanomechanical characterization is of central significance for the emerging applications of nanomaterials and most biomaterials. Because states of stress and deformation are rarely uniform when materials are probed at this scale, the interpretation of observations generally relies on theoretical modeling to achieve a full understanding of the quantitative relationships between the measurements and the fundamental material properties. In this lecture, I will focus on a specific nanomechanical characterization technique - nanoindentation and the related theoretical modeling. The topics include a study on the mechanical properties of nanowires, a study on the size-dependence of mechanical properties, a study on the time-dependent deformation at the nanometer scale, and a study of the mechanical properties of biological samples including bone. Moreover, I will provide a closed-form analytical solution for a classical contact mechanics problem: the stress distribution around an *elastoplastic* contact.

Dr. Feng is an Assistant Professor in Mechanical Engineering at Villanova University. He received his B.S. (1999) from Tsinghua U., M.Phil. (2001) from the U. of Hong Kong, and Ph.D. (2006, with W. D. Nix as his advisor) from Stanford U. Prior to arriving at Villanova, he was a postdoctoral fellow at Brown U. Dr. Feng's research interests focus on comprehensive understandings of the materials behavior of nanomaterials and biomaterials through experimental techniques and theoretical modeling. He has presented his work in over 40 international conferences and seminars, including 14 invited talks. His research has been published (with total citations over 400) in Journal of the Mechanics and Physics of Solids (JMPS), Acta Materialia, Scripta Materialia, Journal of Applied Physics (JAP), Journal of Materials Research (JMR), and other journals. As an expert in the areas of nanomaterials and nanomechanics, Dr. Feng has served as a reviewer for National Science Foundation (NSF) proposals, Department of Energy proposals, and over 20 journals, such as Nano Letters, JMPS, JAP, and JMR.

For more information, please contact Prof. Pochiraju at kishore.pochiraju@stevens.edu or 201- 216 - 8053