Contact: Chuin-Shan Chen (Tel) 02-3366-4275, (Fax) 02-2367-2558, (Email) dchen@ntu.edu.tw

Agenda for Prof. J.S. Chen's Visit

Wednesday, February 22, 2006

Time (02/22/2006)	Activity	Place
12:00 – 13:20	Lunch (Profs. J.S. Chen, K.C. Chang, L.J. Leu, S.H. Hsieh, C.S. Chen, S.C. Kang etc.)	The Lu-Ming-Tun Restaurant on campus 台大鹿鳴堂餐廳
13:30 – 13:50	NTU CE Intro: Chairman K.C. Chang	Room 203, CE
13:50 – 14:10	UCLA CE Intro: Prof. J.S. Chen	Room 203, CE
14:10 – 14:30	Coffee Break	Room 203, CE
14:30 – 16:00	Seminar delivered by Prof. J.S. Chen Multi-scale Computational Methods for Mechanics and Materials	Room 203, CE
16:00 – 17:00	Multi-scale research highlights at NTU (speakers to be invited)	Room 203, CE

Multi-scale Computational Methods for Mechanics and Materials

J. S. Chen, Professor
Civil & Environmental Engineering Department
5713 Boelter Hall
University of California, Los Angeles (UCLA)
Los Angeles, CA 90095-1593, USA

In this presentation, multi-scale computational methods for continuum mechanics are first introduced. In particular, the "reproducing kernel" and the "wavelet" based multi-scale numerical methods as well as an energy based consistent asymptotic expansion formulation will be presented. Methods for bridging physics on different scales for solving problems ranging from continuum to quantum scales will then be discussed. Model problems include coupling of coarse and fine scale responses in continua, multiscale eigenvalue problems, bridging of continuum and meso scales, multi-scale wavelet projection method for continuum-meso and molecular structures, and adaptive partition of unity method in quantum calculation. Several examples will be given to demonstrate the proposed multi-scale methods. This include modeling of damage and fragment processes, grain structure evolution in polycrystalline materials, wrinkling formation in sheet metals, coupling of meso-scale dislocation and continuum mechanics, coarse graining of DNA molecules, and solution of Schrödinger equation in quantum physics.