A Symposium on
MODELING AND SIMULATION MICRO AND NANO SYSTEMS

To be held at the 6th US National Congress on Computational Mechanics, Dearborn, MI, August 1-4, 2001
http://www.usnccm.org

This purpose of this symposium is to foster interaction among those working in universities, industries and government laboratories in the general area of micro and nano system, and to provide an opportunity for the exchange of ideas in an interdisciplinary forum.

Modeling and simulation of micro and nano systems, advanced materials and fabrication processes at small scales has emerged as a powerful tool in applications ranging from sensors, actuators, bio-chips to design of biomaterials and optimization of lithographic methods.

Advances in computer power facilitate the development of new methods to examine processes occurring at the atomic scale and predictions of the collective dynamics of ensembles of particles on a mesoscopic scale. Linking atomic scale processes -- modeled with interatomic potentials, and *ab initio* methods -- to micro and mesoscopic manifestations still remains a significant challenge. This symposium will focus on recent developments in this direction within the larger scope of assessing research needs in applications of interest. Leading researchers, not necessarily computational mechanics experts, in the areas of nanomaterials, biological systems, nanotechnology, microelectromechanical systems, and nanolithography will open each one of the five scheduled sessions.

Topics of particular interest include, but are not limited to, the following areas:

- Simulation methods for length scale linking; coupling quantum to atomistic and atomistic to continuum simulations
- Modeling of indentation, scratch and wear test techniques from nanometer to micrometer length scales
- Mechanisms of surface and thin film coarsening; self-organized pattern formation in thin films, driven atomic motion
- Modeling of adhesion, fracture and plasticity of thin films and coatings
- Creep and stress relaxation mechanism identification
- Modeling method for printing, imprinting, molding and embossing
- Modeling of photonic devices, sensors, actuators, bio-chips, fluidic systems and MEMS in general
- Modeling the mechanical behavior of nanostructured materials; defect structure and interface structure of nanocomposites
- Simulation of in-situ AFM/SEM/HRTEM experiments performed on thin films and multi and single walled nanocarbon tubes
- Collective dynamics of defects and interplay between phase composition, phase transformations and plasticity

Organized by

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