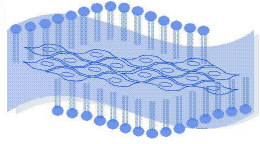




**Center for Biologically Inspired Materials and  
Material Systems (CBIMMS)**



**Center for Biomolecular and Tissue  
Engineering (CBTE)**

## **SEMINAR**

**Jacob Israelachvili, FRS, FAA, NAE, NAS**

Professor, Department of Chemical Engineering, Materials Department,  
and BioMolecular Science & Engineering Program (BMSE)  
University of California, Santa Barbara

“Differences between non-specific and bio-specific, and between equilibrium and non-equilibrium, interactions of biological membranes”

The interaction forces between biological molecules and surfaces are much more complex than those between non-biological molecules or surfaces, such as colloidal particle surfaces. This complexity is due to a number of factors: (i) the simultaneous involvement of many different molecules; (ii) the simultaneous involvement of different non-covalent forces – van der Waals, electrostatic, solvation (hydration, hydrophobic), steric, entropic and ‘specific’, and (iii) the flexibility of biological macromolecules and fluidity of membranes. Biological interactions are better thought of as ‘processes’ that evolve in space and time and, under physiological conditions, involve a continuous input of energy. Such systems are therefore not at thermodynamic equilibrium, or even tending towards equilibrium. The talk will focus on measurements of specific and non-specific forces between model biomembranes, as well as the role and biological importance of time and rate effects on many of these non-equilibrium interactions. Recent Surface Forces Apparatus and Atomic Force Microscopy measurements on supported protein-containing lipid bilayers will be presented that illustrate these effects.

**Thursday, Feb 08 – 203 Teer Building – 3:05–5:00 PM**