

**Center for Fluid Mechanics, Division of Applied Mathematics  
Fluids, Thermal and Chemical Processes Group, School of Engineering  
Joint Seminar Series**

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**Lipid Membranes under Forces: New Aspects of Membrane Behavior**

Biological cells experience a variety of external stimuli, the response to which is governed largely by their membranes. The lipid matrix of the cell membrane, associated mainly with mechanical cell protection and with its role as a platform for receptor-specific reactions, exhibits interesting and non-trivial mechanical properties. In the first part of my talk I will discuss the mechanics of surface area regulation in cells and the associated role of the membrane confinement, as revealed by our recent experiments on supported lipid bilayers. The second part will be focused on the effects of electric fields on lipid membranes and in particular, on giant lipid vesicles. Together with the well known electro-deformation, membrane electroporation and the various electro-kinetic effects, which have found significant biotechnological applications, I will show a previously unobserved phenomenon, namely that lipid membranes can flow pronouncedly under electric field.

**TUESDAY - APRIL 12, 2011**

**4:00 PM**

**Barus & Holley, Room 190**