CLARK UNIVERSITY
DEPARTMENT OF PHYSICS
COLLOQUIUM

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"Nonlinear elasticity and non-affine deformation in biological polymer networks"

Abstract: Mechanical properties of cells and tissues are largely determined by the cell cytoskeleton and extracellular matrix, which are essentially hydrogels of biological polymers such as actin, microtubule and collagen. Compared to synthetic rubber-like material, gels of these biological polymers show strong nonlinear elasticity in the form of strain-stiffening, which refers to a phenomenon that material elastic modulus becomes larger at larger deformation. A major challenge is to understand the physical mechanism of strain-stiffening. One way to probe the origin of strain-stiffening is measuring the non-affine deformations in biopolymer networks. Here, I show results of measuring the nonlinear elasticity and nonaffine deformation in biopolymer networks, and discuss the possible sources of nonaffine-deformation in polymer networks.

Wednesday, March 21, 2012

4:15 pm – Sackler Sciences Center, Room S-122