SEMINAR ANNOUNCEMENT

Liquid Crystals and Rubber: Combining Scientific Fields for New Technologies

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Abstract: In recent years, scientists and engineers have developed new materials, called "liquid crystal elastomers," which combine the features of liquid crystals with those of rubber. Like conventional rubber, liquid crystal elastomers are crosslinked polymer networks that can be highly extended. Like liquid crystals, these materials have orientational order, with molecules that spontaneously align in some direction. The combination of these properties leads to surprising new types of behavior, including:

- Coupling between temperature and sample shape, so that a temperature change can induce an extension of 400%.
- Coupling between mechanical stress and the orientation of the molecules.
- Coupling between mechanical stress and the helical pitch of twisted elastomers, and hence the color of the resulting laser light.
- Coupling between optical illumination and sample shape in elastomers that are doped with dye.

This talk will provide a survey of the science and technology of liquid crystal elastomers, with an emphasis on the fundamental statistical mechanics. Undergraduates are warmly invited to attend!

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Thursday, November 4, 2010
12:00 – 1:00 pm
Room SI 117

Pizza and refreshments will be served before the seminar.