

Friday, March 27, 2009

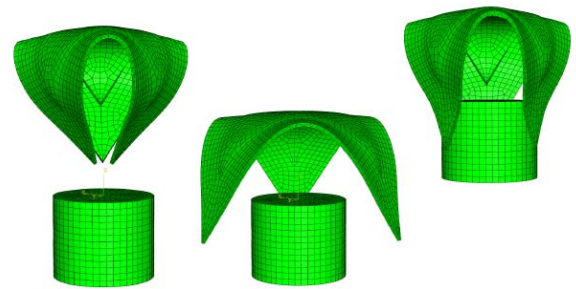
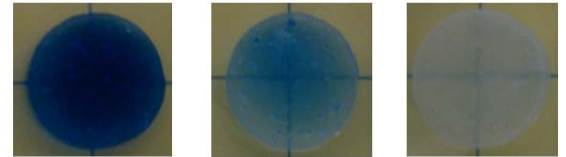
3:00 pm

in Room 201 NEB

Soft Active Materials*Xuanhe Zhao**Harvard University***Abstract**

Soft active materials are being developed to mimic a salient feature of life: movement in response to diverse stimuli. For example, when an electric voltage is applied across a layer of a dielectric elastomer, the layer reduces in thickness and expands in area, giving a strain greater than 100%. As another example, in response to a small change of pH or temperature, a hydrogel may absorb a large amount of water and increase its volume over 100 times. Soft active materials possess a unique combination of attributes: high sensitivity, high flexibility, large deformation, and biocompatibility. I will present our studies on the

fundamental mechanics of soft active materials, including coupled large deformation and electric field, as well as electromechanical instability in dielectric elastomers. I will talk about our experiments on controlled release of drugs using self-healable hydrogels stimulated by ultrasound. I will also describe applications of soft active materials, such as humanoid robots, MRI-compatible devices, and drug delivery systems.

**Biography**

Xuanhe Zhao is a PhD candidate in Mechanical Engineering from Harvard University. He received his Master degree in Materials Engineering from The University of British Columbia and Bachelor degree in Electrical Engineering from Tianjin University. He is the recipient of the AAM Founder's award from American Academy of Mechanics in 2008, and the MRS graduate student award from Materials Research Society in spring 2009. His current research is focused on understanding and exploiting the fundamental mechanics in soft active materials, and designing active structures and systems with extraordinary functions.