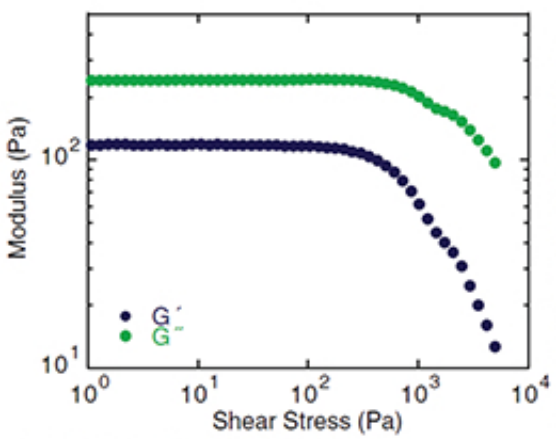
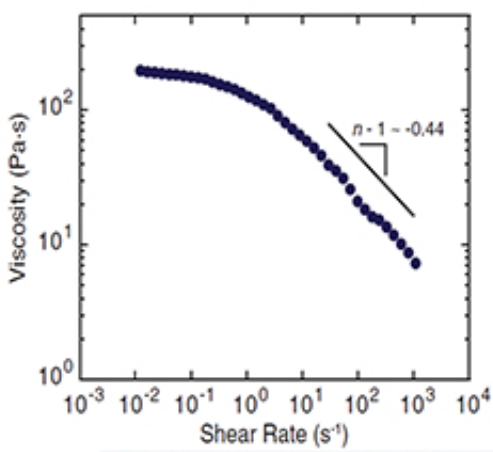
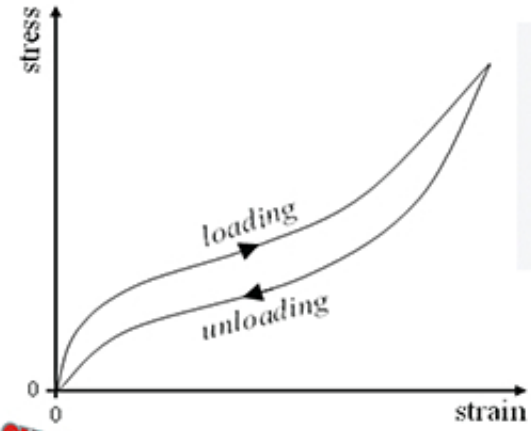
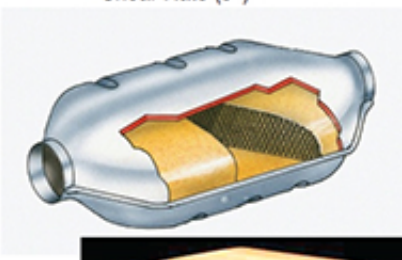
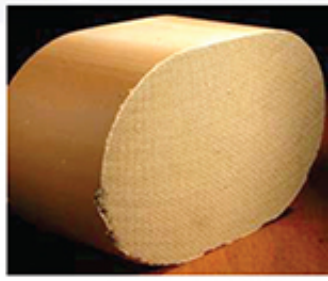


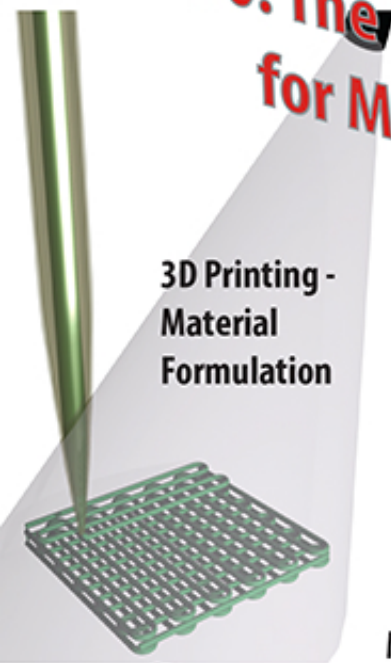




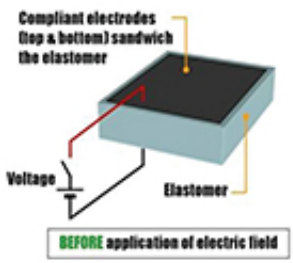


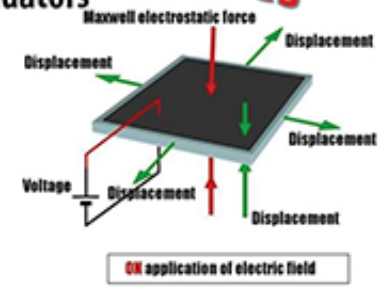


MAE 6950: The Rheology and Processing of Soft Materials for Manufacturing & Machines

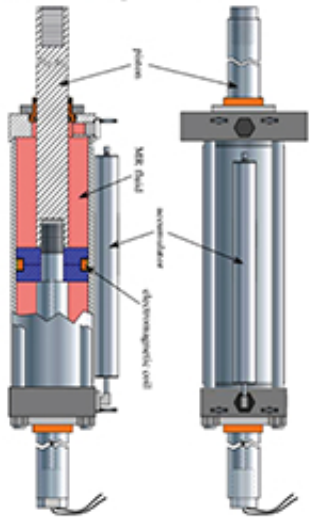


Electroactive polymer actuators

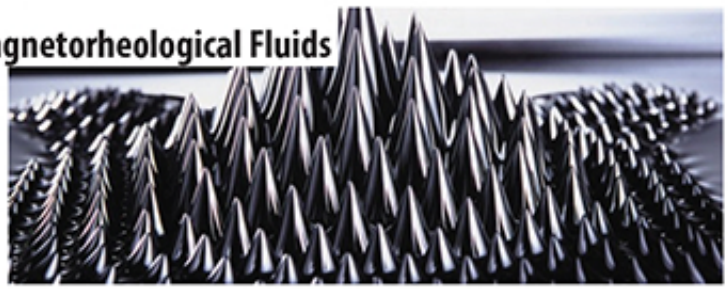




Active suspensions



Magnetorheological Fluids



Combined lecture and laboratory course on polymer and colloidal processing of soft materials into mechanical devices. The lectures will cover the intermolecular and surface forces that give rise to complex phenomenon in viscoelastic materials (emulsions, colloidal gels, and polymer networks). The underlying physics will be used as a basis for developing devices such as soft actuators and sensors (electrically, pneumatically, and hydraulically powered), and for developing material for extrusion and molding (e.g., 3D printing inks). Five laboratory experiments are planned: Building (1) electrically and (2) pneumatically powered soft actuators; Formulating 3D printing inks using (3) polymers and (4) colloids, and (5) measuring their flow properties using a newly purchased rheometer in CCMR. Course offered: SPRING 2014, TR 11:40-12:55. Prerequisites: Course open to graduate students and senior undergraduates in MAE, ChemE, MSE, AEP, and BME. Senior undergraduates interested in taking this course outside of the listed departments, may contact Professor Shepherd: rfs247 @cornell.edu.