

Faculty of Engineering and Applied Science

Chemical Engineering Seminar Series



Shape Memory and Smart Rubber

Dr. Patrick T. Mather/ Syracuse University

Thursday, January 14, 2015, 2:30pm

Dupuis Hall, Room 215



ABSTRACT

Many crosslinked polymers exhibit a shape memory (SM) effect wherein a permanent shape can be prescribed during crosslinking and arbitrary temporary shapes may be set through network chain immobilization. Applications abound for such materials and a significant fraction of the studies in this area concern application-specific characterization. In this presentation, I will first discuss our electrospinning approach to make shape memory composites ranging from shape memory rubber, to electrically triggered SM. Next, I will introduce anisotropic rubber laminates featuring unique, mechanically-triggered shape change. Finally, I will introduce multi-jet electrospinning as a versatile processing platform to produce multifunctional polymeric composites. An emphasis will be placed on material design principles and structure-property relationships.

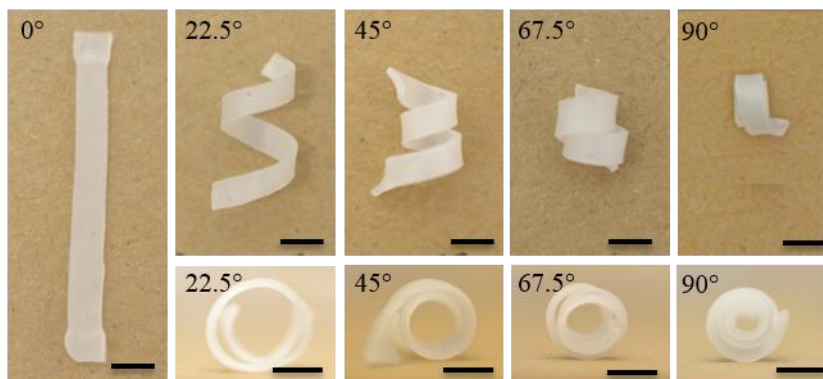


Figure: Mechanically programmed shapes achieved by simple tensile deformation of anisotropic elastomeric laminates bonded as bimorphs with varying orientation angle between the two layers. JM Robertson et al *Soft Matter* **11** 5754-5764 (2015)