Patterning and Actuating Soft Materials

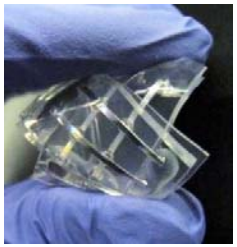
Dr. Michael Dickey, Department of Chemical and Biomolecular Engineering NC State University, Raleigh, NC 27695
http://www.che.ncsu.edu/dickeygroup/index.html

Topics

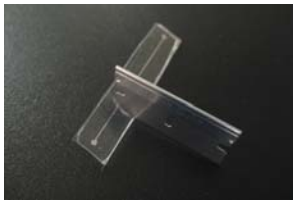
- **Patterning**
  - **Polymers**
    - Unconventional patterning of ions, metals, polymers
  - **Electronics**
    - Soft, stretchable, and flexible electronics
- **Photopolymerizations and Interfaces**
  - **Free Radical Chemistry**
  - **Surface Modifications / Wetting**
  - **Rheology**
- **Actuation**
  - **Self-Folding**
    - Converting 2D surfaces into 3D structures

Flexible Electronics

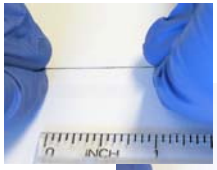
Flexible and Stretchable Antenna



Soft Memory Device (Memristor)

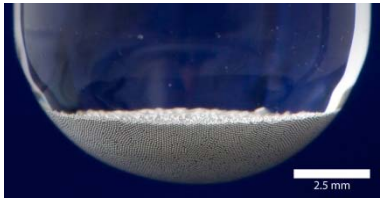


Self-Healing Wires

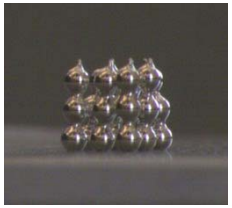


Conductive Stretchable Fibers

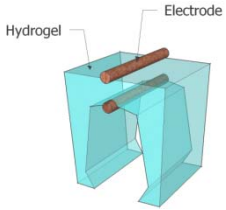
Soft Matter Actuation and Patterning

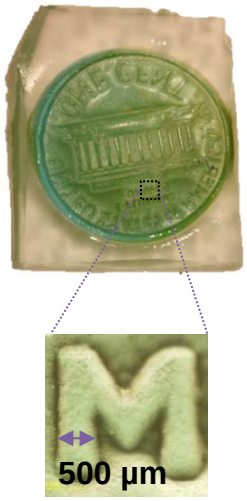


Liquid Metal Colloids



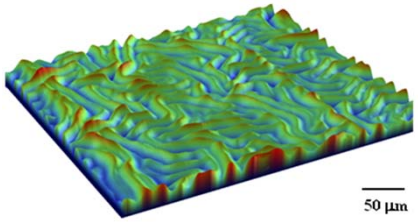
Direct Write of Metals



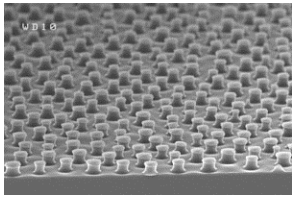


Patterning (ions) in gels

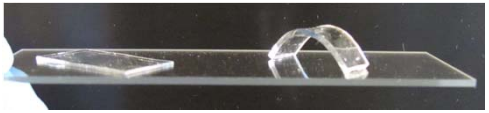
Surface Patterning



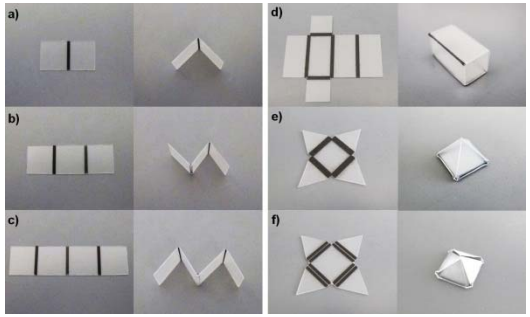
Surface Instabilities for Light Harvesting



Polymer pillar arrays formed by electrohydrodynamics



Photocurable Systems (w/ Genzer) (converting elastomers to glass)



Self-Folding of 2D Patterns to 3D Shapes