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Next generation "smart materials" - where are the niches for SHU

K Vernon-Parry, B Heller, A Hassan, L Campbell
Sheffield Hallam University

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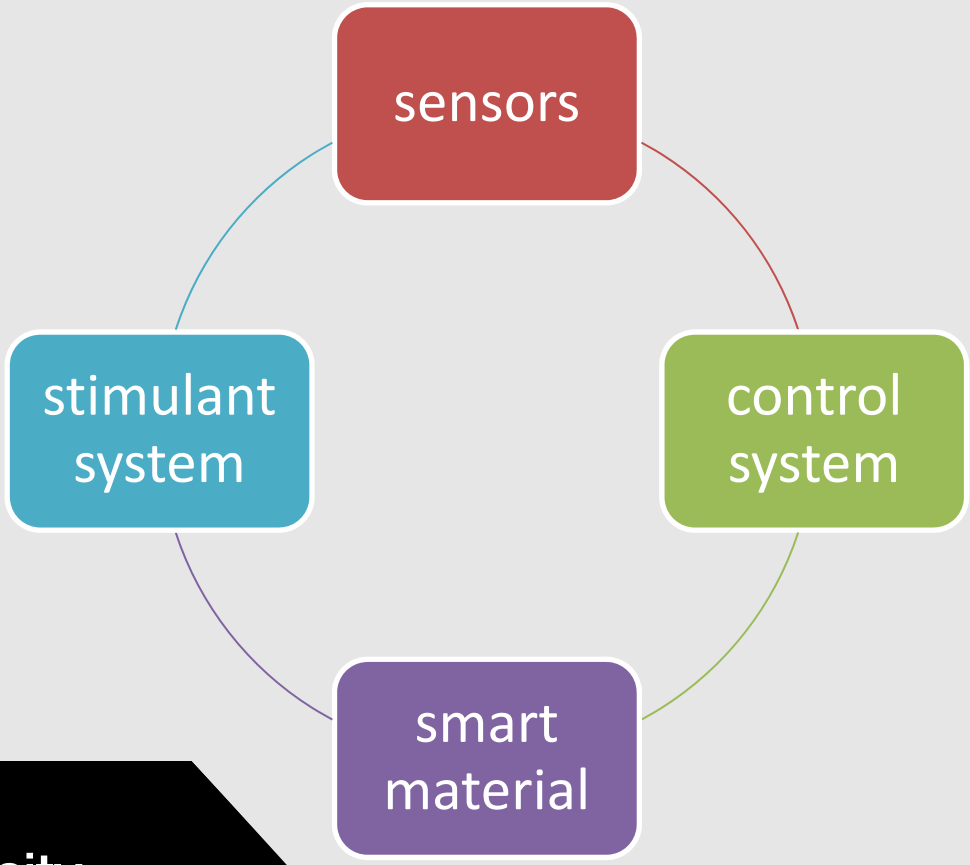
"Intelligent systems" respond autonomously and intelligently to a changing environment



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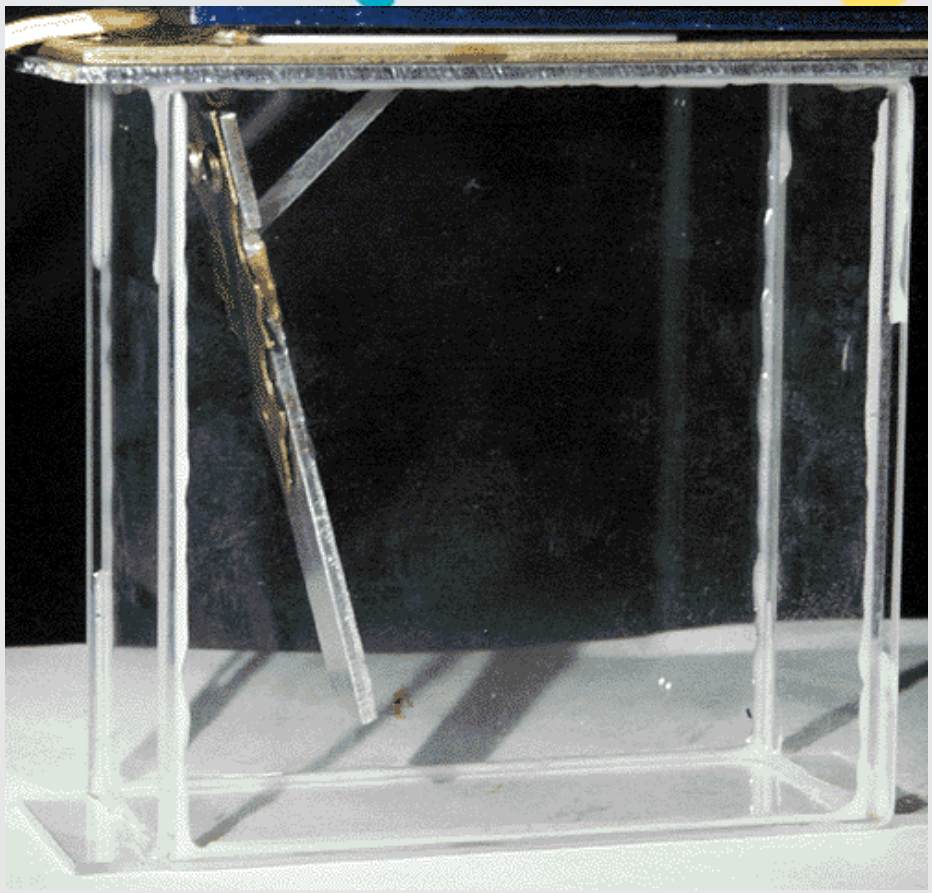

courtesy Patrick Keller, Institut Curie, CNRS, Paris

- Nematic elastomers are smart organic materials
- They undergo a large reversible change in shape as temperature (or light level) is altered
- When the stimulus is removed, the elastomer returns to its original dimensions

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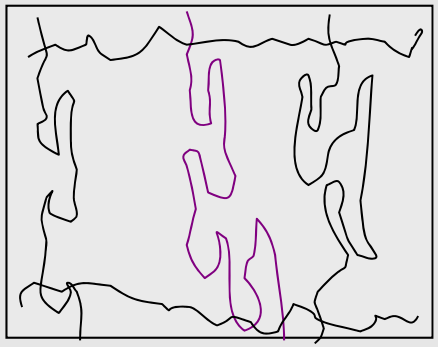
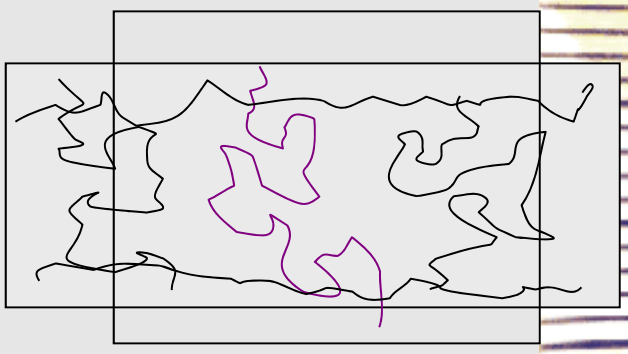
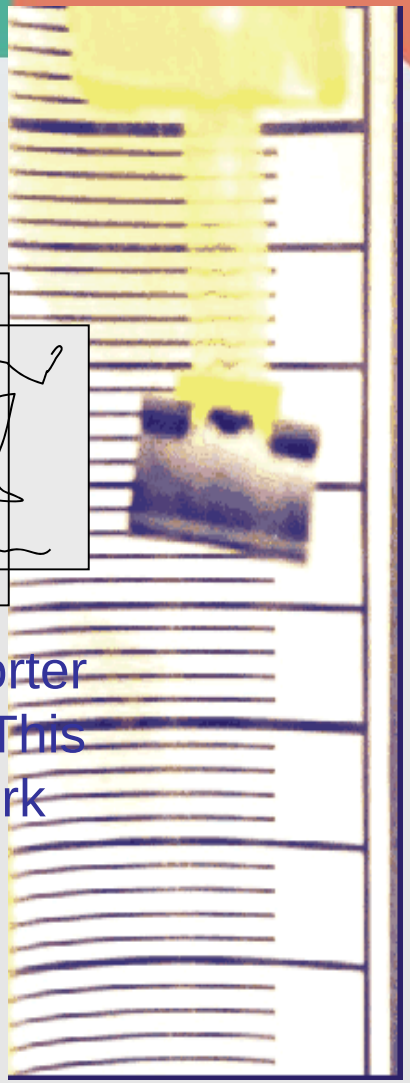


Reduce the anisotropy (temperature or light)



Polymer chains, *on average*, make more steps in the preferred direction.

The sample becomes shorter in the principal direction. This creates an equilibrium work cycle, driven by external signal/stimulus



courtesy Eugene Terentjev, Cambridge University, UK