Micro-Nano Sensors and Actuators Lab
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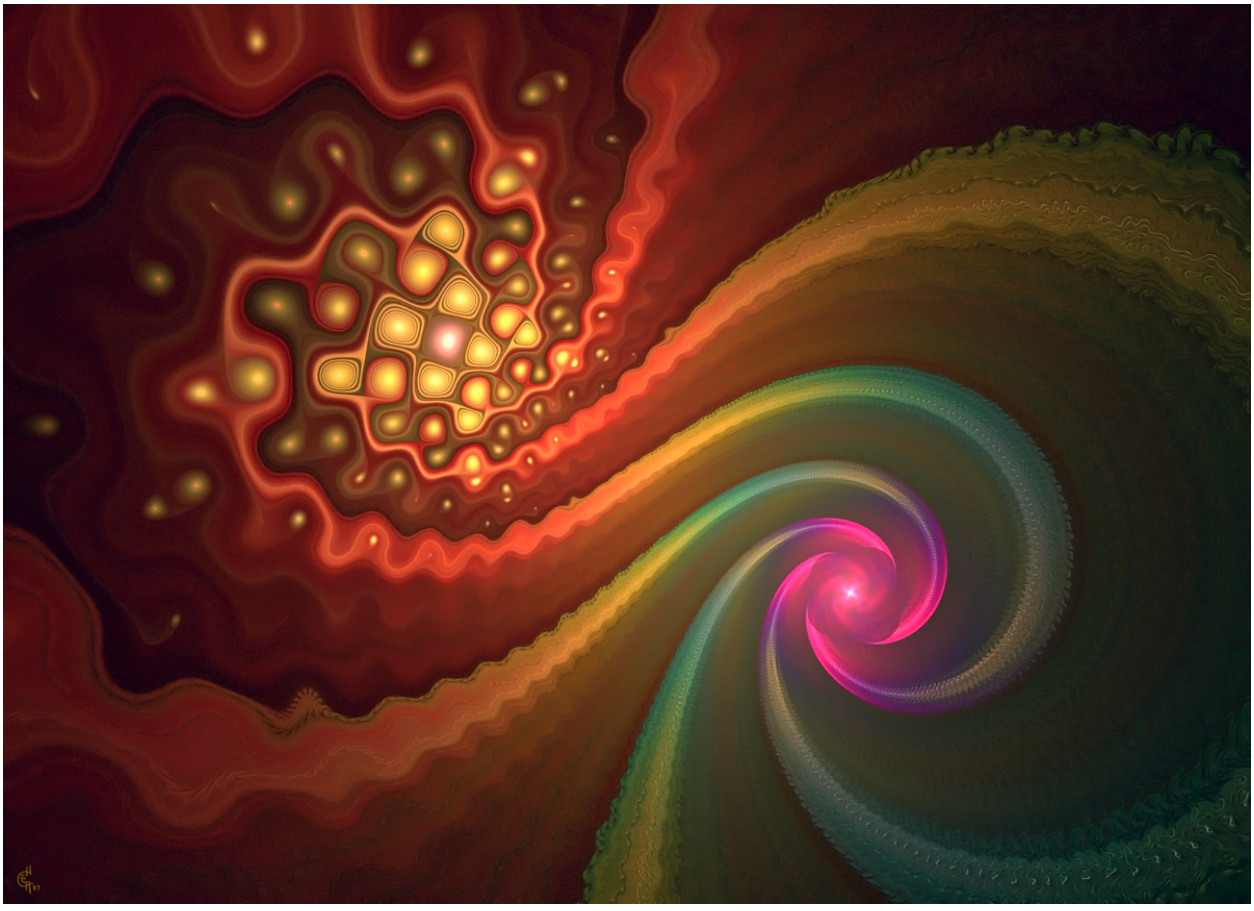
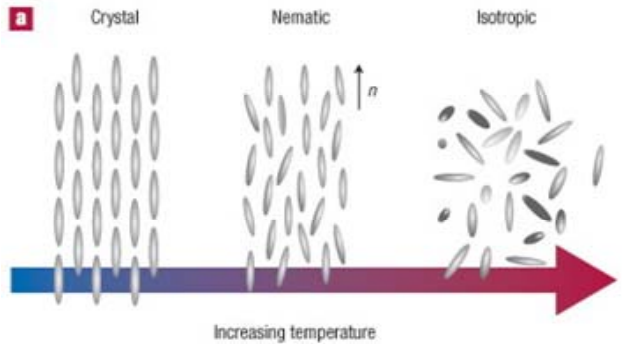
Liquid Crystal Elastomers

The white, semitransparent film we show here is made of Liquid Crystal Elastomers. Liquid Crystal Elastomers are rubbery networks composed of long, crosslinked polymer chains that are also liquid crystalline. Since they are liquid crystalline, they also have nematic, cholesteric or smectics states.



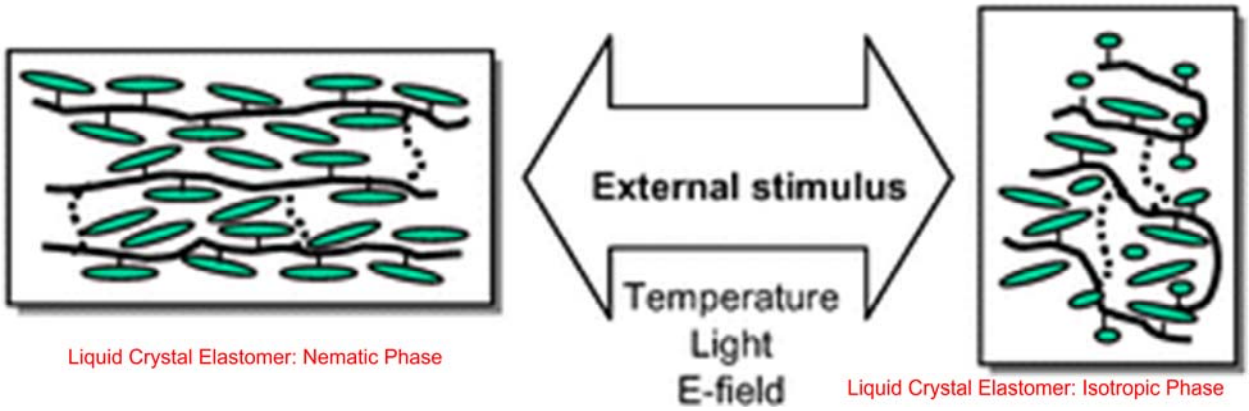
www.enchgallery.com/.../liquid-crystal1.jpg

This picture above illustrates the transition from nematic (left) phase to isotropic phase (right).



S. J. Woltman, G. D. Jay & G. P. Crawford, *Nature Materials* **6**, 929 - 938 (2007)

Thus, when the LCE films were heated above a certain temperature (80°C here), it switches from their nematic phase to isotropic phase. That is, they re-arrange the order of their molecules, that's why they are shrinking.



P. Xie and R. Zhang, *J. Mater. Chem.*, 2005, **15**, 2529

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