DEPARTMENT OF PHYSICS

Spring 2016 seminar series

NANOSCOPIC MANIPULATION AND NANOIMAGING OF LIQUID CRYSTALS

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Thursday, February 25th, 2016
2:00 pm
Ayer Hall 112

Liquid crystals present a remarkable array of fascinating physical phenomena, and are now a >200 billion dollar world-wide industry. As liquid crystals most often are housed in a closed cell or sit atop a substrate, the treatment of the substrate plays a pivotal role. For the past fifteen years we have developed and exploited scanning probe microscope techniques to manipulate the liquid crystal's orientation and order parameter at a surface on length scales down to a few tens of nanometers, and performed optical imaging with volumetric resolution 1000 times better than confocal microscopy. In this talk I will present an overview of liquid crystals, our experimental techniques at the nanoscale, and a sampling of our results that include phase transition behavior, chiral properties, and creation of controlled arrays of topological defects.