



LIQUID CRYSTAL MATERIALS
RESEARCH CENTER
SPECIAL SEMINAR SERIES

On the Stability of Large Angle Grain Boundaries

Randall D. Kamien

Vicki and William Abrams Professor in the Natural Sciences
University of Pennsylvania

Abstract

The theory of smectic liquid crystals is notoriously difficult to study. Thermal fluctuations render them disordered through the Landau-Peierls instability, lead to anomalous momentum dependent elasticity, and make the nematic to smectic-A transition enigmatic, at best. I will discuss recent progress in studying large deformations of smectics which necessitate the use of nonlinear elasticity in order to preserve the underlying rotational symmetry. By recasting the problem of smectic configurations geometrically it is often possible to exploit topological information or, equivalently, boundary conditions, to confront these highly nonlinear problems. Specifically, I will discuss edge dislocations, disclination networks in three- dimensionally modulated smectics, and large angle twist grain boundary phases. Fortuitously, it is possible to make intimate comparison with experimental systems!

Friday July 27, 2007 at 2:00pm
Duane Physics 11th Floor Reading Room



*Sponsored by the Liquid Crystal Materials Research Center
Department of Physics, University of Colorado.*

<http://lcmrc.colorado.edu>