Mathematics, Statistics, and Computer Science **@ UIC**

Mathematics and its Applications Seminar

Nematic liquid crystals: from Onsager model to vortices

Ibrahim Fatkullin (University of Arizona)

Abstract: In 1949 Lars Onsager introduced a variational model describing isotropic-nematic phase transition in liquid crystals. In this model equilibrium states of a liquid-crystalline system correspond to minimizers of a free energy functional. I will review the model and present a complete classification of all critical points of the Onsager functional with Maier-Saupe interaction. Then I will present an extension of Onsager's theory which takes into account spatial variations of nematic ordering and provide a detailed description of vortex-like patterns which appear in a two-dimensional model.

Wednesday, November 11 at 4:00 PM in SEO 636