



Department of Mathematics
The Chinese University of Hong Kong

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數學系
香港中文大學

Phone: (852) 3943 7988 • Fax: (852) 2603 5154 • Email: dept@math.cuhk.edu.hk (Math. Dept.)
Room 220, Lady Shaw Building, The Chinese University of Hong Kong, Shatin, N.T., Hong Kong

Seminar

A Rigorous Derivation of Oseen-Frank Theory from Molecular Theory of Liquid Crystals

Professor Yuning Liu
NYU, Shanghai

Abstract

In this talk, we investigate the relationship between the molecular theory and the Oseen-Frank theory for nematic liquid crystals. In the framework of Onsager's molecular theory for liquid crystal, we consider a molecular free energy that include the effects of nonlocal intermolecular interactions. By imposing the uniaxial boundary condition on the second moment of the distribution function, we prove the existence of non-trivial global minimizers. Moreover, we study the limit of small interaction distance and show that, the global minimizers will converge to a uniaxial distribution function predicted by the Oseen-Frank theory for uniaxial nematic liquid crystals with constant order parameter. This is a joint work with Wei Wang in Zhejiang University.

Date : December 14, 2015 (Monday)
Time : 10:30a.m. – 11:30a.m.
Venue : Room 222, Lady Shaw Building,
The Chinese University of Hong Kong

All are Welcome