THE HONG KONG UNIVERSITY OF SCIENCE & TECHNOLOGY

Department of Mathematics

SEMINAR ON APPLIED MATHEMATICS

Far Field Asymptotics of Nematic Flows Around a Small Spherical Particle

By

Prof. Aaron Nung Kwan YIP
Purdue University

Abstract

Given a small spherical particle, we consider flow of a nematic liquid crystal in the corresponding exterior domain. We work in the framework of the Q-tensor model taking into account the orientational elasticity of the medium. Under a suitable physical parameter regime, the governing equations can be reduced to a system of linear partial differential equations which we call an anisotropic Stokes system. Our focus is on precise far field asymptotics of the velocity flow, in particular, its anisotropic behavior. We are able to analytically characterize the flow pattern and compare it to that of the classical isotropic Stokes flow. The expression for velocity away from the particle can be computed either numerically or symbolically. This is a joint work with Dmitry Golovaty

Date : **31 July 2025 (Thursday)**
Time : **10:30a.m.-11:30a.m.**
Venue : **Room 4504 (Lift 25/26)**

All are Welcome!