SPEAKER:

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TITLE:

Global existence and compactness for axisymmetric Ericksen-Leslie system in dimension three

ABSTRACT:
In this talk, I will discuss the Ericksen-Leslie system, which is the governing equation for the hydrodynamics of nematic liquid crystals, in dimension three. Mathematically, this is a dissipative system strongly coupling between the Navier-Stokes equation for the underlying fluid velocity field and the transported harmonic flow into the unit sphere for the macroscopic orientation field of liquid crystal molecules. Because of the super-critical nonlinearities induced by Ericksen stress tensors, it has been an outstanding open question to establish Leray-Hopf type global solutions for any initial data with finite energy. I will describe a recent work, joint with Joshua Kortum, that proves the existence of such a global solution in the axisymmetric setting.