Tata Institute of Fundamental Research
Survey No. 36/P, Gopanpally Village, Serilingampally, Ranga Reddy Dist., Hyderabad - 500107

Students' Annual Seminar

Instabilities and turbulence in self-propelled fluids with inertia

Rayan Chatterjee

We study the hydrodynamics of self-propelled fluids with polar orientational order, using linear stability analysis and direct numerical simulations. We show that fluid inertia at the linearised level and system dimension lead to a threshold for the instability of such systems to spontaneous distortion, with a diffusive growth rate at small wavenumber, and we confirm numerically the prediction (Simha & Ramaswamy 2002) of long-wavelength propagating modes. We illustrate the varieties of disturbance growth and explore the effects of self-propulsion and fluid inertia on active turbulence.

Friday, Apr 13th 2018

05:00 PM (Tea/Coffee at 04:30 PM)

Seminar Hall, TIFR-H