Tata Institute of Fundamental Research
Survey No. 36/P, Gopanpally Village, Serilingampally, Ranga Reddy Dist., Hyderabad – 500 046

Webinar

Inertial swimmer suspensions: Instability and turbulence

Purnima Jain

TIFR, Hyderabad

Fluids whose constituents are motile display spectacular spontaneous flows that resemble turbulence. The hallmark feature of this turbulence is the presence of topological defects. But what causes a suspension of flow-aligned swimmers to become unstable? In this talk, I will discuss a novel instability that can answer the above question for the suspension of mesoscale swimmers like zooplankton, where viscous and inertial forces are comparable. This instability leads to the emergence of concentration-wave turbulence, where concentration waves coexist with defects. I will discuss these different regimes of hydrodynamic instabilities and turbulence in extensile, polar active fluids.

Tuesday, Jul 22nd 2025

16:00 Hrs