ICTS Fluid Dynamics Seminar

Title : Inclusions in momentum conserving active fluids

Speaker : Dr. Thibaut Arnoulx de Pirey (Indian Institute of Science, Bengaluru)

Date : Friday, 29 November 2024

Time : 2:00 PM (IST)

Abstract : We show that an inclusion placed inside a dilute Stokesian suspension of microswimmers induces power-law number-density modulations and flows. These take a different form depending on whether the inclusion is held fixed by an external force, for example an optical tweezer, or if it is free. When the inclusion is held in place, the far-field fluid flow is a Stokeslet, while the microswimmer density decays as $r^{-2-\epsilon}$, with r the distance from the inclusion, and ϵ an anomalous exponent which depends on the symmetry of the inclusion and varies continuously as a function of a dimensionless number characterizing the relative amplitudes of the convective and diffusive effects. When the inclusion is free to move, the far-field fluid flow is a stresslet and the microswimmer density decays as r^{-2}. These long-range modulations mediate long-range interactions between inclusions.

Venue : Feynman Lecture Hall
Zoom link: https://icts-res-in.zoom.us/j/94170686497?pwd=qqQejybQQxcsnzJOUtaBIjkOORMTDO.1
Meeting ID: 941 7068 6497
Passcode: 616110