

Students' Annual Seminar

Aligned active suspensions: super-diffusion and anisotropic criticality

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We consider a collection of uniaxial swimmers, distributed uniformly in space and free to translate in all directions in an ambient incompressible viscous fluid medium, but with body axes permanently aligned along a fixed (z) direction. Our important results are (i) The dynamics is asymptotically super-diffusive for dimension $d < 4$. (ii) The polarity created by inhomogeneous velocity gradients gives rise to active particle currents that compete with diffusion. (iii) This self-shear-induced active current, if large enough, changes the sign of diffusivity in certain directions, destabilising the uniform state.

Friday, Apr 5th 2019

10:30 AM (Tea/Coffee at 10:00 AM)

Seminar Hall, TIFR-H