

Students' Annual Seminar

Entropy in active matter: how one implements time reversal

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Active systems are held away from thermal equilibrium by free energy supplied directly to the constituent particles, which transduce it into systematic movement. This breaking of time-reversal symmetry alone at the scale of the microscopic units, while retaining spatial homogeneity and isotropy, is the defining feature of active matter and sets it apart from familiar driven systems forced by an imposed spatial gradient of temperature, potential or velocity. We construct active-particle dynamics from the Langevin equation for passive polar particles coupled to the chemical kinetics of fuel and offer a fresh perspective on their non-equilibrium character. Our aim is to make it clear precisely what observed behaviors, as defined by a suitable notion of entropy production, distinguish an active system from a passive counterpart with the same spatial symmetries.

Thursday, Apr 19th 2018

04:30 PM (Tea/Coffee at 03:30 PM)

Seminar Hall, TIFR-H