

Abstract for an Invited Paper
for the MAR09 Meeting of
The American Physical Society

Self Propelled Particles: from microdynamics to hydrodynamics¹

APARNA BASKARAN, Syracuse University

In this talk I will illustrate the derivation of a unified continuum description of the large scale collective behavior of active matter from two specific physical microscopic dynamical models: stroke-averaged swimmers moving through a viscous fluid and self-propelled hard rods moving on a substrate. New results at large scales include a lowering of the density of the isotropic-nematic transition, an enhancement of longitudinal diffusion of the self-propelled orientable units, and a strong enhancement of boundary effects in confined self-propelled systems.

¹This work was done in collaboration with M. Cristina Marchetti, with support of NSF grants DMR-0705105 and DMR-0806511.