

Perturbations and boundaries in flocking systems

Friday, 13 December 2019 11:30 (30 minutes)

Polar flocking is one of the simplest but at the same time richer examples of collective behaviour in active matter systems. Its physical behaviour —stemming from the spontaneous breaking of a continuous symmetry and the nonequilibrium coupling of density and orientation fluctuations —has been thoroughly investigated in the last two decades, and we now have a good understanding of the asymptotic behaviour of isolated systems, at least in the dry and dilute approximation.

Considering flocks that are not isolated, but rather immersed and interacting with the external world, on the other hand, forces one to consider the effect of boundaries, surface tension and/or the response to external perturbations. Surface tension, for instance, is needed to maintain flock cohesion, and due to their non-equilibrium activity, finite flocks exhibit faster than equilibrium surface fluctuations. The information inflow from the boundary, moreover, may also alter bulk correlations, both for isolated flocks or in the presence of an external perturbations. Asymptotic linear response theory will also be discussed and compared with recent experimental results in active colloids.

Primary author: GINELLI, Francesco (Università dell'Insubria)

Presenter: GINELLI, Francesco (Università dell'Insubria)

Session Classification: Session 10