Abstract Submitted
for the MAR16 Meeting of
The American Physical Society

Discontinuous fluidization transition in dense suspensions of actively deforming particles ELSEN TJHUNG, Univ of Cambridge, LUDOVIC BERTHIER, CNRS, Universite Montpellier — Collective dynamics of self-propelled particles at high density have been shown to display a glass-like transition with a critical slowing down of 2 to 4 orders of magnitude. In this talk, we propose a new mechanism of injecting energy or activity via volume fluctuations. We show that the behaviour of actively deforming particles is strikingly different from that of self-propelled particles. In particular, we find a discontinuous non-equilibrium phase transition from a flowing state to an arrested state. Our minimal model might also explain the collective dynamics in epithelial tissues. In particular, without needing self-propulsion or cell-cell adhesion, volume fluctuations of individual cells alone might be sufficient to give rise to an active fluidization and collective dynamics in densely packed tissues.

Elsen Tjhung
Univ of Cambridge

Date submitted: 06 Nov 2015 Electronic form version 1.4