

Abstract Submitted  
for the DFD15 Meeting of  
The American Physical Society

**Emergence of collective motion in suspensions of swimming cells**

MARIA CHIARA ROFFIN, PETR DENISSENKO, VASILY KANTSLER, University of Warwick, UK — Collective motion is one of the most fascinating manifestations of self-organization in non-equilibrium systems. The phenomena emerges with the increase in concentration of motile individuals ranging from molecular motors to large animals like fish and humans. We have studied the suspension of swimming sperm cells in a microfluidic device which gradually concentrates motile cells in the region of interest. The onset of collective motion is identified by investigating correlations of fluid velocity and image brightness associated with the cell orientation. Cell concentration and the noise parameter are varied to switch on/off the collective interaction. The level of noise is controlled by adjusting the cell motility which depends on the temperature in the microfluidic chip. Fluid velocity is measured by tracing passive fluorescent beads in the suspension.

Petr Denissenko  
University of Warwick, UK

Date submitted: 06 Oct 2015

Electronic form version 1.4