FURUKAWA LAB.

[Physics of complex fluids: from glasses, colloids, granular systems to bacteria]

Department of Fundamental Engineering

www.complexfluid.iis.u-tokyo.ac.jp

Physics of Complex Fluids

Department of
Applied Physics,

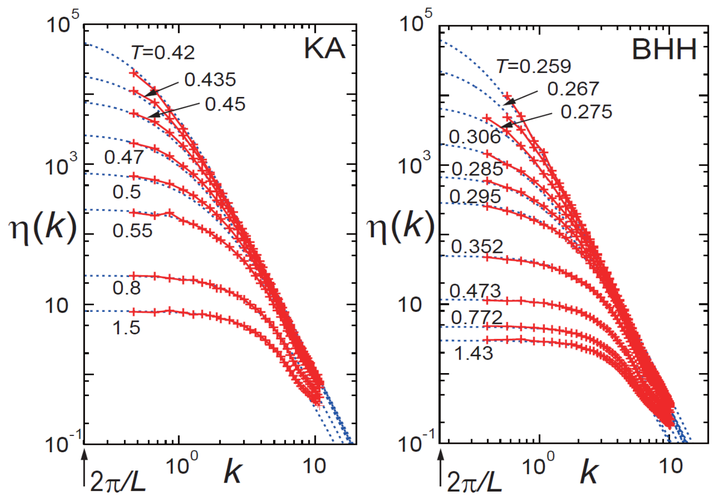
Nolinear and nonequilibrium phenomena in complex fluids

We theoretically investigate nonlinear and non-equilibrium phenomena in various soft materials and complex fluids, from glasses, colloids and granular systems to bacteria. In recent years, we have primarily focused on the following problems:

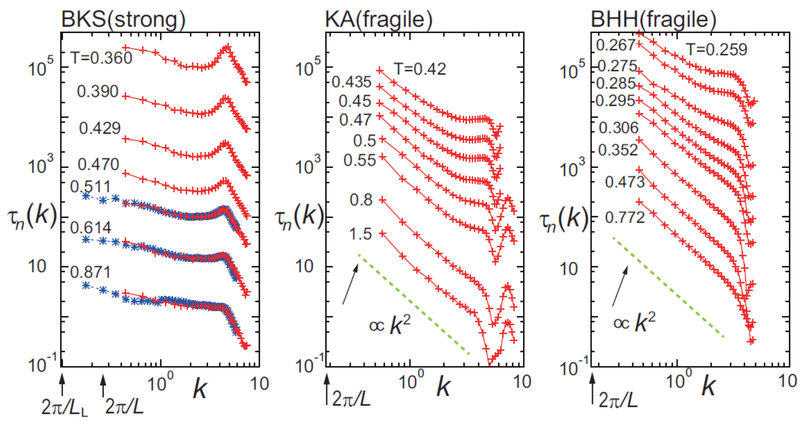
1. The origin and role of spatial correlations of anomalous hydrodynamic transport in supercooled liquids

2. Non-Newtonian rheology of glassy and granular materials (shear-thinning, shear-thickening, fracture, etc.)

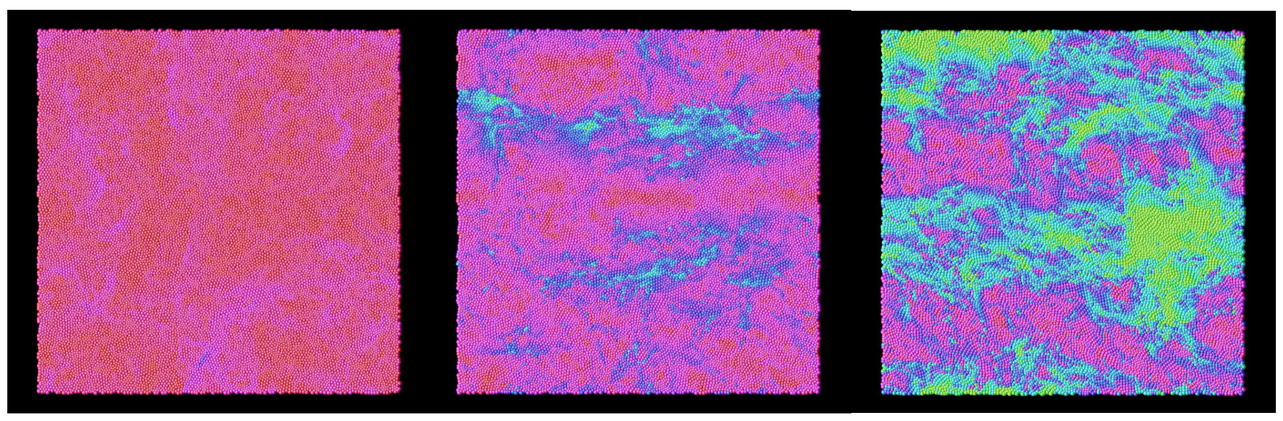
3. The effects of (near-field) hydrodynamic interactions on the collective dynamics of bacterial suspensions.



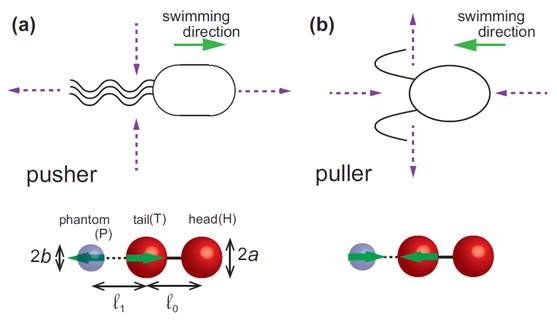
Wavenumber dependent shear viscosity



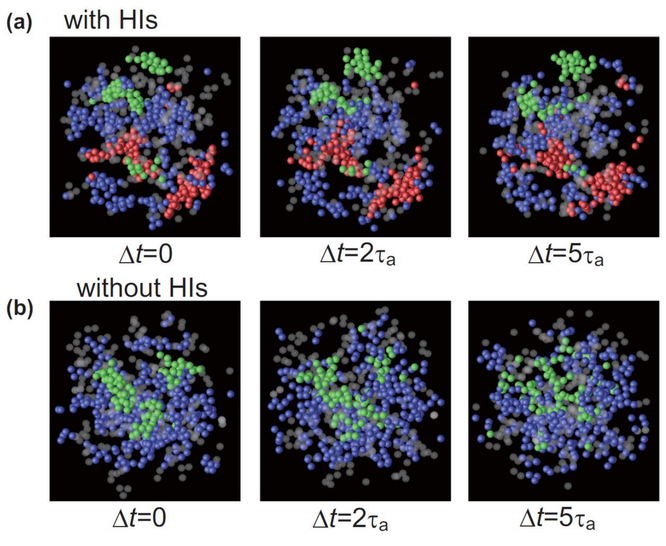
Relaxation time of density fluctuations



Shear band formation in supercooled liquids:



Minimal microorganism model



Hydrodynamic effects on the collective dynamics of bacterial suspensions