

Statistical Mechanics and Fluid Dynamics

Group Lead: Dr. Subhadeep Roy & Dr. Rickmoy Samanta

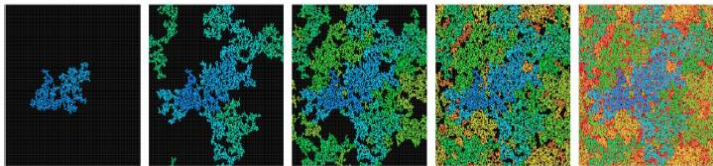
The research group is studying statistical mechanical systems in presence of disorder and acted by an external perturbation. Observing the time evolution of such disordered systems is fascinating owing to their rich dynamics, including highly nonlinear, out-of-equilibrium behavior. The origin and dynamics of such a disorder systems provides insight into phenomena such as failure of solids, multi-phase flow, snow avalanches, seismic events, and more, making such studies important from the point of view of various branches of material science, geophysics and biophysics.

- ❖ Statistical Mechanics of Disordered Systems
- ❖ Phase Transition and Critical Phenomena.
- ❖ Seismic events & Earthquake Statistics.
- ❖ Porous Media – Computation and Experiment
- ❖ Effective Rheology of Multi-phase Flow.
- ❖ Interface Propagation Through Heterogeneity.
- ❖ Transport of Electron Fluid
- ❖ Dynamics of Particles in Membrane Biofluids.

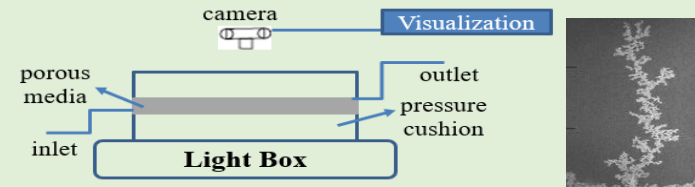
Collaborators: Prof. Souri Banerjee, Dr. Chanchal Chakrabarty, Prof. Meenakshi Viswanathan

Computation – Mechanical System

Simulation of fiber bundle model and mechanical systems for different disorder.



Experiment – Complex Fluid System



Multi-phase flow in Hele Shaw cell which acts as a prototype of porous media.

PhD Students: Find more about the group [here](#)



Anjali



Viswakannan

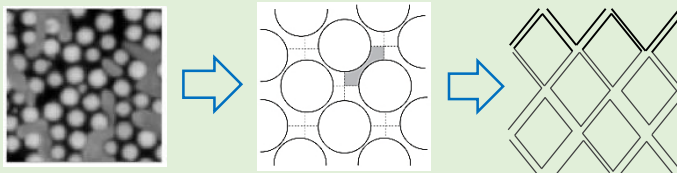


Geetika



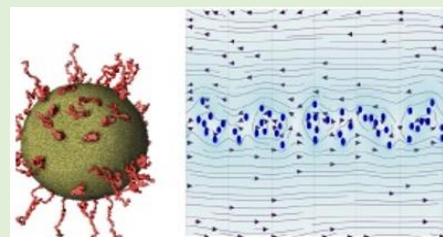
Shyamapada

Computational Fluid Dynamics



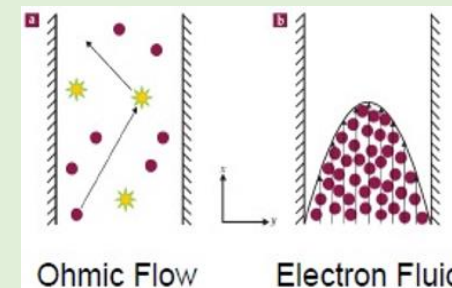
Simulation of multi-phase flow, Pore network model, Lattice Boltzmann, Interface Model

Particles in Membrane Biophysics



Simulation of active matter in fluid media.

Transport of Electron Fluid



Theoretical computation of electron fluid viscosity