
Five lectures & five sets of lecture notes

- Kinetic theory
 - Distribution functions*
 - Boltzmann equation*
 - Transport equations
- Lattice-Boltzmann (LB) method
 - Discrete space, time & velocity
 - An LB algorithm
 - Chapman-Enskog analysis*
- Practical aspects of the LB method
 - Dimensional analysis
 - Boundary conditions
 - Coding
- Forces, collision operators
- Multiphase flow
 - Free energy LBM & interfaces*
 - Volume-averaged Navier-Stokes equation

Distribution function

mass of molecules at location \mathbf{x} at moment t
traveling with velocity ξ

$$f(\mathbf{x}, \xi, t)$$

$$\frac{\partial f}{\partial t} + \xi_{\beta} \frac{\partial f}{\partial x_{\beta}} + \frac{F_{\beta}}{\rho} \frac{\partial f}{\partial \xi_{\beta}} = \Omega(f)$$

change transport force collisions

