



Nonequilibrium Statistical Mechanics

Tentative program

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◆ General Topics

- ◆ Brief review of Equilibrium Statistical Mechanics
- ◆ Fluctuations
- ◆ Brownian Motion.
- ◆ Langevin equation.
- ◆ Fluctuation-dissipation theorem.
- ◆ Markovian processes
- ◆ Fokker-Planck equation
- ◆ Linear response theory

◆ Special Topics (depending on the student's interest)

- ◆ Kubo formula for electrical conductivity and susceptibility.
- ◆ Conductance in mesoscopic systems.
- ◆ Applications to biophysics

Bibliography

- ◆ R. K. Pathria, Statistical Mechanics (2nd Ed, 1996, Butterworth-Heinemann)
- ◆ R. Zwanzig, Nonequilibrium statistical mechanics (Oxford, 2001)
- ◆ R. Kubo, M. Toda, and N. Hashitsume, Statistical Physics II: Nonequilibrium Statistical Mechanics (Springer-Verlag, Berlin 1985)
- ◆ Donald A. McQuarrie, Statistical Mechanics
- ◆ F. Reif, Fundamentals of Statistical and Thermal Physics (McGraw-Hill, 1965)
- ◆ W. T. Coffey, Yu P. Kalmykov and J. T. Waldron, "The Langevin equation", (World Scientific, 1998)
- ◆ P. A. Mello, N. Kumar, Quantum Transport in Mesoscopic Systems (Oxford, 2004).
- ◆ Various scientific papers