FLUCTUATIONS IN SMALL SYSTEMS.

Scope:

* Relaxation laws, Laplace transform, small-ε on distributions
* Diffusion: Fick's laws, PDEs, Fourier transform, Gaussian solution, boundary value problems, continuity equation, master equation
* Random walks, continuum limit, "central limit theorem"
* External force fields: Fokker-Planck equation
* Random forces: From Newton's to Langevin's equation of motion
* First passage time problems, search processes
* Anomalous diffusion: continuous time random walks, fractional Brownian motion, generalised Langevin eq, fractals, percolation
* Ergodicity, ageing
* Fluctuation-dissipation relations, Einstein relations

Literature:

* N van Kampen, Stochastic processes in physics & chemistry
* H Risken, The Fokker-Planck equation
* C Gardiner, Stochastic methods
* BD Hughes, Random walks & random environments vol I
* J Klafter & IM Sokolov, First steps in random walks
* S Chandrasekhar, Rev Mod Phys 15, 1 (1943)
* R Metzler & J Klafter, Phys Rep 339, 1 (2000)