Physics 223c Problem Set 2. (due 4/17)

Problem 1 (60)

In class we derived the Fokker-Planck equation governing the instantaneous probability distribution in velocity space, $P(v;t)$, for a Brownian particle (in 1D). Can you generalize the argument to derive the equation governing the instantaneous probability distribution in *phase space* (r, v) where r is the position: $P(r, v; t)$?

Problem 2 (40)

Derive the waiting-time distribution for a 2d order Poisson process: $A \to B \to C$ with transition probabilities per unit time being γ_A and γ_B. (Waiting time here is the time it takes for A to "transform" into C.) What happens when the two rates are equal? What happens when one of the rates is much faster than the other?