Jan Wehr
Arizona University, Arizona, USA

What is the equation of motion of a Brownian particle?

MARCH 12, 2014  WEDNESDAY  EE01  15:40

ABSTRACT

I will outline an experiment, studying movement of colloidal particles in water. Starting from the Newton's law, I will build a differential equation describing the Brownian motion of such a particle. This equation contains a noise term, accounting for the collisions of the particle with the water molecules. Its careful analysis when the particle's mass is small, reveals a presence of an unexpected noise-induced drift, in an excellent agreement with the experiment. I will comment on related effects, occurring in a wide class of systems, including equations describing a recent noisy electrical circuit experiment. The talk will assume only familiarity with elementary physics and calculus.