



UNIVERSITY OF ROCHESTER

Department of Mathematics Colloquium Series

ABSTRACT

In 1827, the Scottish biologist Brown described the phenomenon of chaotic movement of small particles of pollen in a liquid. It has become clear later in the 19th century that the mechanism for this movement had a purely physical nature. In 1905, Einstein explained this phenomenon, called the Brownian motion, using the molecular-kinetic theory of heat. Experimental studies confirming Einstein's results were carried out by the physicist Perrin. A related mathematical object, the so-called random walk, describes a particle making steps of random length at a discrete set of times. The economist Bachelier used random walks to study the behavior of financial markets. At present time, the (continuous) Brownian motion and its discrete counterpart, random walk, are some of the most basic objects in probability theory. Some of the important contributions to the theory of Brownian motion are due, in particular, to the mathematician Wiener.

The speaker will review the history mentioned above in greater detail. After that some of the modern developments will be presented. These include in particular random walks in higher dimensions, polymer growth problems, percolation problems in the lattice models.

The talk is addressed to an audience with interest in mathematics.

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Random Walks from Einstein to the Present

Thursday, December 7, 3:30–4:30 p.m.
Hoyt Auditorium

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