

THE MATHEMATICS DEPARTMENT PRESENTS

A MATHEMATICS COLLOQUIUM

MONDAY, November 19, 2007

BOND HALL 217

4:00 pm

Title: An Application of Markov Processes: A Model of Biological Cell Movement

Speaker: Prittee Sahijwani, Western Washington University

Abstract: A Markov process is a random process in which the future behavior of the system depends only on the present and not on its past. Markov processes can be used to describe many physical, biological, and economic phenomena. I will first introduce the general framework for Markov processes and explain some definitions and theorems. I will then talk about the paper "From a discrete to a continuous model of biological cell movement" by Stephen Turner, Jonathan A. Sherratt, and Kevin J. Painter. This paper, which is a beautiful application of the Markov process, investigates the so-called Cellular Potts Model, a general computational framework for simulating the movement and interaction of biological cells. The authors start with the movement of a single cell moving in a one-dimensional lattice and derive the relationship between the various parameters of the Cellular Potts model and the diffusion coefficient.

Refreshments will precede the talk at 3:30pm in Bond Hall 300
courtesy of Victor Chan.