

# APPLIED MATHEMATICS COLLOQUIUM

## Spatial Stochastic Simulation of Polarization in Yeast Mating

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Abstract:

In microscopic systems formed by living cells, the small numbers of some reactant molecules can result in dynamical behavior that is discrete and stochastic rather than continuous and deterministic. Spatio-temporal gradients and patterns play an important role in many of these systems. In this lecture, we report on recent progress in the development of computational methods and software for spatial stochastic simulation. Then we describe a spatial stochastic model of polarisome formation in mating yeast. The new model is built on simple mechanistic components, but is able to achieve a highly polarized phenotype with a relatively shallow input gradient, and to track movement in the gradient. The spatial stochastic simulations are able to reproduce experimental observations to an extent that is not possible with deterministic simulation.

**Monday May 16<sup>th</sup>, 2011**

**4:30 PM**

**Building 2, Room 105**

*Refreshments are available in Building 2, Room 290  
(Math Common Room) between 3:30 – 4:30 PM*

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