

The University of Chicago

Department of Statistics

Seminar

Anna Amirdjanova

Departments of Statistics, University of Michigan

“Stochastic Equations of Motion for Incompressible Viscous Flows”

Monday, December 2, 2002 at 4:00 PM
133 Eckhart Hall, 5734 S. University Avenue

ABSTRACT

Experimental results suggest that the nature of certain hydrodynamical phenomena calls for their statistical or stochastic formulation. The main focus of our discussion will be on a 2-dimensional stochastic vorticity equation for an incompressible homogeneous viscous fluid. We consider a signed measure valued stochastic partial differential equation for a vorticity process based on the Skorohod-Ito evolution of a system of N interacting randomly moving point vortices. This approach provides an interesting alternative to the Navier-Stokes models (in their velocity formulation) perturbed by external random forces. We then pose nonlinear filtering problems associated with noisy vorticity profiles and derive corresponding stochastic differential equations for the optimal filter.