UCMERCED UNIVERSITY OF CALIFORNIA School of Natural Sciences

APPLIED MATHEMATICS SEMINAR 291

Deterministic Methods for Stochastic Dynamics

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Date: **3/2/18**
Time: **3:00 PM**
Location: **COB1 267**

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ABSTRACT

Dynamical systems arising in engineering and science are often subject to random fluctuations. The noisy fluctuations may be Gaussian or non-Gaussian, which are modeled by Brownian motion or α-stable Levy motion, respectively. Non-Gaussianity of the noise manifests as nonlocality at a "macroscopic" level. Stochastic dynamical systems with non-Gaussian noise (modeled by α-stable Levy motion) have attracted a lot of attention recently. The non-Gaussianity index α is a significant indicator for various dynamical behaviors.

Our interest in this field has been motivated by geophysical fluid transport and mixing phenomena, and inspired by transition pathways in gene regulation networks.

The speaker will overview recent advances in non-Gaussian stochastic dynamical systems, highlighting deterministic and numerical methods, including analysis and simulation of nonlocal partial differential equations for mean exit time, escape probability, critical transition tipping time, and most probable transition pathways between metastable states.