

*Department of Mathematics,
University of California San Diego*

Math 295 - Mathematics Colloquium

Prof. Chuan Xue

Ohio State University

Multiscale Problems in Cell Biology

Abstract:

Complex biological systems involve multiple space and time scales. To get an integrated understanding of these systems involves multiscale modeling, computation and analysis. In this talk, I will discuss two such examples in cell biology and illustrate how to use multiscale methods to explain experimental data. The first example is on chemotaxis of bacterial populations. I will present recent progress on embedding information of single cell dynamics into models of cell population dynamics. I will clarify the scope of validity of the well-known Keller-Segel chemotaxis equation and discuss alternative models when it breaks down. The second example is on the axonal cytoskeleton dynamics in health and disease. I will present a stochastic multiscale model that gave the first mechanistic explanation for the cytoskeleton segregation phenomena observed in many neurodegenerative diseases.

Host: Bo Li

Tuesday, January 15, 2019

4:00 PM

AP&M 6402
