Prof. Xin Guo
(UC Berkeley)

"Dynamics of Order Positions in a Limit Order Book (LOB)"

Abstract: One of the most rapidly growing research areas in financial mathematics is centered around modeling LOB dynamics and/or minimizing the inventory/execution risk with consideration of microstructure of LOB. A critical yet missing piece of the puzzle, is the dynamics of an order position in a LOB.

In this talk, we will present some of our recent progress regarding the limiting behavior of the dynamics of order positions in a LOB. As a corollary, we will present some explicit expressions for various quantities of interests, including the distribution of a particular limit order being executed by a given time, its expected value and variance.

Our analysis builds on techniques and results from classical probability theory: the functional central limit theorems of Glynn and Ward (1988) and Bullinski and Shashkin (2007), the convergence of stochastic processes by Kurtz and Protter (1991), and the sample path large deviation principle of Dembo and Zajic (1998).