September 16, 2013
KAP 414
2:00 PM – 3:00 PM

Prof. Matthew Lorig
(Princeton University)

"Pricing Variance Swaps on Time-Changed Markov Processes"

Abstract: We prove that the variance swap rate is just the price of a co-terminal European-style contract when the underlying is modeled as an exponential Markov process, time-changed by an arbitrary continuous stochastic clock, which has arbitrary correlation with the driving Markov process. The payoff function of the European contract that prices the variance swap satisfies an ordinary integro-differential equation, which depends only on the dynamics of the Markov process, not on the clock. We present examples of Markov processes whose payoff function can be computed explicitly. When the Markov process is a Lévy process, the European contract has a log-style payoff, which recovers the results Carr, Lee, and Wu (2011).

This is a joint work with Peter Carr and Roger Lee.