1090-60-265 **Rohini Kumar*** (rkumar@math.wayne.edu), **Jin Feng** and **Jean-Pierre Fouque**. *Large deviations in multi-time scale stochastic systems.*

Using the theory of viscosity solutions of partial differential equations, we prove large deviation results for multi-time scale stochastic systems. The talk consists of two parts. In the first part, we look at large deviations in two time scale stochastic systems where the fast and slow processes are diffusions given by coupled SDEs. This problem was motivated from finance when pricing options close to maturity under the assumption of fast mean-reverting stochastic volatility. This was joint work with Jean-Pierre Fouque and Jin Feng. In the second part of the talk, we extend the method developed in the first part, to the case where the fast process is a jump-diffusion process. Due to the jumps in the fast process, the viscosity solutions involved in this case are solutions to partial integro-differential equations. (Received March 03, 2013)