TOM HURD, McMaster University
First passage problems for jump diffusions arising in finance

Many aspects of pricing and hedging in option theory and credit risk boil down to problems of computing the first passage distribution of underlying stochastic processes. Techniques are well developed in the case of diffusion models, and connect with deep results of probability theory. For various reasons, first passage problems become more difficult, yet still very interesting, when the underlying processes have jumps. In this talk I will survey some areas of financial mathematics where first passage problems arise, and show various mathematical techniques for dealing with them. In the end, I will introduce an apparently new method applicable in a very useful class of models involving time changed Brownian motions.