

January 13th, 2017
KAP 414
2:00 P.M. – 3:00 P.M.

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**“Lévy Processes, Phase-Type Distributions
and Martingales”**

Abstract: Lévy processes are defined as processes with stationary independent increments. In finance, they generalize the Black-Scholes model by accommodating jumps and non-Gaussian marginals, and some popular examples there are variance Gamma, CGMY and NIG processes.

We survey here how to explicitly compute a number of relevant quantities by restricting to the dense class of compound Poisson processes with phase-type jumps in both directions and an added Brownian component (phase-type distributions are certain generalizations of the exponential distribution). The solutions are in terms of roots to polynomials, and the basic equations are derived by purely probabilistic arguments using martingale optional stopping, and the method also applies to regime switching.

The approach is illustrated via a worked-out numerical example dealing with equity default swaps.