Abstracts of the talks

Hansjörg Albrecher (University of Lausanne)
Some Results on Dividends, Ruin and Bankruptcy

In the classical insurance risk model, the company is ruined as soon as the surplus is negative. In this talk we distinguish between ruin (negative surplus) and bankruptcy (going out of business), where the probability of bankruptcy is in general a function of the level of negative surplus. Under certain model assumptions we discuss implications for the discounted penalty function as well as for expected discounted dividends until bankruptcy under a barrier strategy, when dividends can only be paid with certain probabilities at each point in time. As a by-product, a certain type of computational bridge between continuous- and discrete-time insurance risk models is investigated.

Søren Asmussen (University of Aarhus)
Markov Bridges, Bisection and Variance Reduction

A Markov bridge (a, b, T) is a segment T of length of a Markov process X conditioned to start in a and end in b. Motivated by numerous applications, simulation of such bridges has been recently studied extensively. A main case are diffusions, but also Lévy bridges have been considered. This case deals with a Markov jump process on a finite state space, which has numerous applications in genetics. An infinite resolution algorithm is presented based on the idea of bisection and in addition of state values to involve also information on the number of jumps. The main justification for the algorithm is its potential for variance reduction presented via numerical examples. Joint work with Asger Hobolth, Aarhus.

Jean Jacod (Paris VI)
The Quadratic Variation of an Itô Semimartingale without Brownian Part

This is joint work with Viktor Todorov. In the context of high frequency data, one of the main objects of interest is the quadratic variation. When the underlying process is an Itô semimartingale one knows the rate of convergence of the "approximated" quadratic variation when it is computed on the basis of a regular sampling with a mesh going to 0. This rate is the square root of the number of observations.

If the process has no Brownian part, the above limit vanishes, meaning

that the rate is not appropriate. We show that, under some (unfortunately rather strong) assumptions, there is a faster rate, and we describe the corresponding limiting process.

Peter Jagers (Chalmers University Gothenburg)
Extinction

Extinction, of families, nations, cultures, species and populations in general is a fundamental and frequent occurrence in Nature as well as human life. Branching processes were indeed created to study it. We look back at the history of this, and say some words about the time and path to extinction. However, extinction can occur for many reasons besides those of the demographic stochasticity that provide the raison d´ être of branching processes: through competition, catastrophes, and the intriguing phenomenon of evolutionary suicide. The latter is illustrated through a simple but illuminating toy model.

Anders Tolver Jensen (University of Copenhagen)
Martingales, Partial Eigenfunctions and Ruin

Within the past decade Martin Jacobsen has demonstrated how martingales obtained from partial eigenfunctions for the generator of a Markov process may be used to study the distribution of exit times. The main contribution has been to show how the technique allows to compute Laplace transforms of exit times when exit may occur after a jump. In this talk we study the distribution of exit times for a generalized Ornstein-Uhlenbeck process with Markov-modulated parameters. The solution involves matrix-valued hypergeometric functions. Apart from offering a unified formulation of the solution to a number of recently published results the work also covers some new and interesting examples. This includes piecewise exponential Markov processes with two-sided jumps arriving according to a phase-type distribution, and processes with linear or exponential paths depending on the regime of a finite state Markov chain. This is joint work with Jacob Stordal Christiansen.

Uwe Küchler (Humboldt University Berlin)
On Tempered Stable Lévy Processes

The talk is based on joint work with Stefan Tappe (Zürich). Tempered stable processes constitute a family of Lévy processes which allow for various

explicit calculations. This class includes several well-known Lévy processes such as the Variance Gamma-, Bilateral Gamma- and CGMY-processes. It is a six parameter family with exponentially damped Lévy measure of a stable process.

In the talk analytical and statistical properties of these processes as well as applications to mathematical finance are presented.

Torgny Lindvall (University of Gothenburg)
The Bernstein Polynomials: An Anniversary

One hundred yeays ago, it was observed by Bernstein that a famous approximation theorem due to Weierstrass may be easily deduced from the law of large numbers in its simplest form. However, the probabilistic content is not often mentioned in textbooks on approximation theory, despite the title of Bernstein's paper of 1912. The purpose of this talk is to show how many results on these polynomials can be proved by natural manipulations and moment estimates of certain random variables.

The talk is certainly accessible to all students.

Holger Lennart Rootzén (Chalmers University Gothenburg)
Discrete Hedging and Approximation of Stochastic Integrals