

MATHEMATICS SEMINAR
of the
UNIVERSITY OF LUXEMBOURG
in cooperation with the
LUXEMBOURG MATHEMATICAL SOCIETY

April 2008

8 April 2008, at 3:30 pm

Room 3.04 bs

Nikita Ratanov
Universidad del Rosario, Bogota, Colombia

Jump telegraph processes and a volatility smile

Abstract

We develop a class of financial market models based on inhomogeneous telegraph processes, i.e. random motions with alternating velocities and jumps occurring when the velocities are switching. While such markets may admit an arbitrage opportunity, the model under consideration is arbitrage-free and complete if directions of jumps in stock prices are in a certain correspondence with their current velocity and interest rate behaviour. Diffusion rescaling in this model gives a natural representation of volatility. Explicit formulae for prices of standard European options are obtained, which permits to calculate directly implied volatilities with respect to various moneyness of the option.

8 April 2008, at 5 pm

Room 3.04 bs

Janusz Grabowski
Institute of Mathematics of the Polish Academy of Sciences

The Lagrange and Hamilton formalisms on Lie algebroids

Abstract

I will present a geometric approach to formalisms of Analytical Mechanics, alternative to the variational one, explaining the generation of the Euler-Lagrange and the Hamilton equations on one diagram. We recognize the structure responsible for the whole picture as the canonical symplectic structure on the cotangent bundle of the configuration space (phase space). The advantage of this approach is that it can be easily generalized to the case of Lie algebroids, i.e. to linear Poisson structures instead of the symplectic one.

29 April 2008, at ~~5 pm~~ 16:15 pm

Room 3.04 bs

Bernard Beauzamy
Professor, University of Lyon, 1979-1995
Chairman, Société de Calcul Mathématique, Paris, 1995 -

Mathematical methods for handling uncertainties

Abstract

In real life problems, many difficulties often occur: lack of data, conflicting aims, and so on, so the use of academic tools (for instance optimisation tools) is rarely possible. In this talk, we will present a "robust" approach, which takes all difficulties into account from the very beginning. We will also show that this approach requires sophisticated mathematical tools, mostly of probabilistic nature. In particular, we will present a brief description of the "Experimental Probabilistic Hypersurfac", the construction of which is based upon entropy principles (Bernard Beauzamy and Olga Zeydina).

6 May 2008, at 6:30 pm

Bâtiment de Recherche B, ground floor, seminar room

Annual meeting of the Luxembourg Mathematical Society