

General Mathematics Seminar  
of the  
University of Luxembourg  
in cooperation with the  
Luxembourg Mathematical Society

June, 2011

Tuesday, June 07, 2011, at 15:30

Campus Kirchberg, Room B02

Frederi G. Viens  
( Purdue University, West Lafayette, USA )

**Malliavin calculus for expectation, density, and tail estimates, with applications**

Abstract:

I. Nourdin and G. Peccati introduced the functional  $X \mapsto G := \langle DX, DMX \rangle$  where  $D$  is the Malliavin derivative, and  $M$  is pseudo-inverse of the generator of the Ornstein-Uhlenbeck semigroup. A detailed analysis of  $G$  yields a number of comparison estimates with the normal distribution and other benchmark laws. Applications to stochastic PDEs and polymer models are also outlined. This covers work with the above two authors, plus H. Airault, R. Eden, P. Malliavin, D. Nualart, and Ll. Quer.

General Mathematics Seminar  
of the  
University of Luxembourg  
in cooperation with the  
Luxembourg Mathematical Society

**June, 2011**

**Tuesday, June 07, 2011, at 17:00**

**Campus Kirchberg, Room B02**

Samy Tindel  
( Institut Elie Cartan – Nancy, France )

**On Malliavin derivatives for rough differential equations**

Abstract:

Integrability properties for linear differential equations driven by general Gaussian processes (in particular fractional Brownian motion with Hurst parameter smaller than  $\frac{1}{2}$ ) are still an important open problem in rough paths analysis. This kind of equation governs for instance Malliavin derivatives, but also differentials of flows or convergence rates for numerical schemes. After recalling this general problem, we shall give some nontrivial examples of equations for which Malliavin derivatives are integrable and Gaussian bounds for the density are available, in the case of rough equations driven by fractional Brownian motion. If time allows it, we shall then give a general strategy in order to bound accurately the Malliavin derivative.