WMI

East Midlands Stochastic Analysis Seminar

Friday 15 October 2010

Organisers: Zdzislaw Brzezniak (York), David Elworthy (Warwick),
Xue-Mei Li (Warwick) and Huaizhong Zhao (Loughborough)

Programme:

13:30   **In S0.09: H.Weber** (Warwick) *Rough Burgers-Like Equations with Multiplicative Noise*

ABSTRACT: In this talk we discuss the concept of solutions to one-dimensional Burgers like equations of the type $du = \Delta u + g(u)\, \partial_x u + \theta(u)\, dW(t)$ where dW denotes space time white noise. Due to the roughness of the noise classical solution concepts are not well defined in this situation. We define weak solutions using rough integration theory to define the spatial integral against a test function. The solution one obtains in this way are subject to a choice similar to the choice between Itô and Stratonovich integration for SDE. We obtain global existence and uniqueness for our solution once this choice is made. Furthermore, we argue that a particular choice is natural as the solution one obtains is the limit of smoother approximations. This is a joint work with Martin Hairer.

14:40   **In S0.09: N. Ikeda** *Eulerian Polynomials, Bernoulli Polynomials and Levy's Stochastic Area Formula*

ABSTRACT: I will show representations in term of Wiener space of Eulerian polynomial, Eulerian polynomials of type Bn in the sense of A.M.Cohen (Munster J. Nath.,1(2008), and Bernoulli polynomials. Proof of these are based on a generalization of Levy's stochastic area formula (Proc. 2nd Berkeley Symp. Math. Statist. Probab. ,1951 Univ. Press of Calfornia Univ.)

15:40   Tea Break in the Mathematics Institute Common Room

16:00   **In B3.02 (Colloquium): J-M Bismut** (Paris) *The Hypoelliptic Laplacian*

ABSTRACT: If X is a compact Riemannian manifold, the hypoelliptic Laplacian is a natural second order operator acting on the total space of the cotangent bundle, which is supposed to interpolate in the proper sense between the ordinary Laplacian of X and the generator of the geodesic flow. It is essentially the weighted sum of the harmonic oscillator of the fibres and of the generator of the geodesic flow. The hypoelliptic Laplacian is a Laplacian in the sense of Hodge theory. Its construction is obtained via an exotic deformation of classical Hodge theory, in de Rham or Dolbeault cohomology. The underlying stochastic process is a deformation of classical Brownian motion to a Langevin process. For locally symmetric spaces, the spectrum of the ordinary Laplacian is essentially preserved through the hypoelliptic deformation. One can exploit this fact to give an explicit evaluation of semisimple orbital integrals along lines which are formally similar to the proof of the Atiyah-Singer index theorem.

17:00   Wine and Cheese in the Mathematics Institute Common Room

We shall leave for lunch at EAT (Arts Centre) from the Mathematics Institute Common Room at 12.10, and in the evening will go out to eat at Kayal Restaurant in Leamington Spa (places limited: register with David Elworthy). All are welcome and there is some limited support for travel etc for graduate students especially. For more details or accommodation arrangements please contact David Elworthy and/or mrc@maths.warwick.ac.uk.

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For further information please see:
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