SEMINARI DI MATEMATICA

Giovedì 18 ottobre 2018
Scuola Normale Superiore
Pisa
Sala Conferenze, Collegio Puteano
si terranno i seguenti seminari:

14:30 **Paolo Buttà** (Università di Roma "La Sapienza"),
"On the large deviations of interface motions in statistical mechanics models"

Abstract:
In this talk, I consider the sharp interface limit of the action functional associated to either the Glauber dynamics for Ising systems with Kac potentials or the Glauber+Kawasaki process. The corresponding limit functionals provide, in the sense of large deviations theory, the probability of deviations from the mean curvature flow. I discuss, in the case of smooth interfaces, the derivation of these functionals, for which explicit formulae of the mobility and transport coefficients are given. This is joint work with L. Bertini and A. Pisante.

15:20 **Michela Ottobre** (Heriot-Watt University, Edimburgh)**,**
"Beyond the Hoermander condition"

Abstract:
The study of diffusion processes of elliptic and hypoelliptic type has by now produced a fully-fledged theory, involving several branches of mathematics: stochastic analysis, analysis of differential operators, (sub-)Riemannian geometry and control theory, just to mention the main players. One of the key steps in the development of such a theory has been the seminal paper of Hoermander and a large body of work has been dedicated for over 40 years to the study of diffusion processes under the Hoermander Condition (HC), which is a sufficient condition for hypoellipticity. We propose to study processes that do not, in general, satisfy the HC. In place of the HC, we wish to enforce a weaker condition, the so-called UFG condition, introduced by Kusuoka and Strook with probabilistic motivations, and, independently, by Sussman, Hermann and Lobry, this time in the field of control theory. In particular, Kusuoka and Strook showed that it is still possible to build a solid PDE theory for diffusion semigroups even in absence of the Hoermander condition. We will present new results on the geometry and long time behaviour of diffusion semigroups that do not satisfy the Hoermander condition. Our interest in UFG diffusions stems from the observation that they constitute a large class of SDEs which exhibit multiple invariant measures and such that it is possible to determine in a systematic way the basin of attraction of each equilibrium state. This is a joint work with P. Dobson (Maxwell Institute), T. Cass and D. Crisan (Imperial College).

16:10 **Boguslaw Zegarlinski** (Imperial College London)**,**
"Hypoelliptic diffusion in noncommutative setup"

Abstract:
I will review results and problems concerning hypoelliptic diffusion and coercive (Poincare and Log-Sobolev) inequalities.