

GEORGETOWN UNIVERSITY
Department of Mathematics

COLLOQUIUM

Hypoelliptic heat kernel inequalities on nilpotent Lie groups

Speaker: Professor Tai Melcher

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Friday October 9, 2009 at 3.15pm
St. Mary's 326

Abstract: In \mathbb{R}^n the fundamental solution to the heat equation and the transition probability function of Brownian motion have the same form. Thus, Brownian motion is intimately related to heat flow in \mathbb{R}^n , which ultimately relies on the Laplacian and flat geometry of Euclidean space. In curved spaces, the dynamics of heat flow necessarily change depending on the geometry, and these changes can be characterized again in terms of a diffusion on that space. This interpretation of the heat kernel allows probabilistic methods of proof for results that may have a purely analytic interpretation. In particular, we will give a brief introduction to Malliavin calculus, and show how this probabilistic theory can be used to prove certain heat kernel inequalities for a class of second order differential operators on nilpotent Lie groups.

Refreshments will be served after the talk.