

Joint IAS-PU Symplectic Geometry Seminar

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The Hypoelliptic Laplacian

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Date & Time: Fri, 03/22/2013 - 13:30 - 14:30

Location: Fine Hall 322

If X is a Riemannian manifold, the Laplacian is a second order elliptic operator on X . The hypoelliptic Laplacian L_b is an operator acting on the total space TX of the tangent bundle of X , that is supposed to interpolate between the elliptic Laplacian (when $b \rightarrow 0$) and the geodesic flow (when $b \rightarrow \infty$). Up to lower order terms, L_b is the weighted sum of the harmonic oscillator along the fibre TX and of the generator of the geodesic flow. One expects that, in this deformation, there are conserved spectral quantities.

In the talk, I will explain the construction of the hypoelliptic Laplacian in de Rham theory as a natural interpolation between the Hodge Laplacian and a symplectic Laplacian. In the case of locally symmetric spaces, the spectrum of the elliptic Laplacian is essentially preserved by the deformation. Finally, we will show how to use the hypoelliptic Laplacian to evaluate orbital integrals

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terms:

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