The hypoelliptic Laplacian

Jean-Michel Bismut

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The hypoelliptic Laplacian is a second order hypoelliptic operator acting on the total space of the cotangent bundle or of the tangent bundle of a compact manifold X. It depends on a parameter $b > 0$, and is supposed to interpolate between the standard Laplacian and the generator of the geodesic flow. It is produced in the formalism of Hodge theory, and so it acts on spaces of differential forms.

The purpose of the lecture will be to describe the construction of the hypoelliptic Laplacian, in de Rham theory, and also for Dirac operators.

Applications to Ray-Singer and Quillen metrics will be outlined.