

Higson Nigel / The Pennsylvania State University

June 29, 2023 10:30~12:00

Hypoelliptic equations and noncommutative geometry, I.

An introduction to Bismut's hypoelliptic Laplacian

June 30, 2023 10:30~12:00

Hypoelliptic equations and noncommutative geometry, II.

C*-algebras and hypoellipticity

Venue: To be announced to participants only

Abstract:

In linear partial differential equations, hypoellipticity is the condition that if $Df=g$, with g smooth, then f is necessarily smooth too. The best-known hypoelliptic equations are the elliptic equations, which are characterized by an isotropy property that can be readily checked point-by-point. More general point-by-point sufficiency criteria for hypoellipticity have been studied, most famously by Lars Hörmander in the 1960's. Quite recently these criteria have been used to formulate and prove noteworthy new geometric theorems, including extensions of the Atiyah-Singer index theorem. I shall give a survey of some of these developments, in which, perhaps unexpectedly, noncommutative C*-algebras and noncommutative geometry play an important role. Of special interest to a broad audience might be the example of Jean-Michel Bismut's hypoelliptic Laplacian, which is a remarkable family of operators interpolating between the Laplace operator on a Riemannian manifold and the geodesic flow on its tangent bundle.



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申込みを行って下さい。 URL : <https://forms.gle/HL591zmrewdwy3kb8>

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