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Integral equations, the spectral theorem and an introduction to noncommutative geometry



10:30 – 11:30

Hilbert's theory of integral equations, now over one hundred years old, is a famously successful marriage of matrix algebra and analysis. One way to view Alain Connes' much newer noncommutative geometry is to see it as an evolution of the theory of integral equations that incorporates geometric ideas into Hilbert's work. I shall try to develop this perspective in my lecture. I will focus on one construction of Connes, which relates integral equations to Weyl's asymptotic law, the Atiyah–Singer index theorem, and more.

スーパーグローバルコース 数学特別講演会

2019年6月20日

京都大学理学研究科3号館127大会議室

K-theory of group C^ -algebras and applications*

13:00 – 14:00

A rapid development of K-theory of group C^* -algebras started about 40 years ago. To a large extent this was related with applications to topology of smooth manifolds (the Novikov conjecture on higher signatures) and to representation theory of semisimple Lie groups (and discrete discrete series in particular). But the topic of K-theory for group C^* -algebras is very attractive also by its deep relations with index theory of elliptic operators. There are several unsolved, very challenging conjectures in this theory, such as the Baum–Connes conjecture and the Kadison–Kaplansky conjecture. I will try to give a survey of the current status of this theory, without going into deep technical details. The talk will be accessible to graduate students. (Some knowledge of Hilbert space theory will be required.)



Gennadi Kasparov
Vanderbilt University



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