Non-commutative topology and the Connes-Kasparov conjecture

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L02 Carson Hall, 4:00 pm

(Tea 3:30 pm Math Lounge)

Abstract

In this lecture we first introduce the notion of C^*-algebras as non-commutative "analogues" of topological spaces. We then introduce K-theory of C^*-algebras as a cohomology theory on these non-commutative spaces. The main examples we want to discuss are the C^*-algebras associated to locally compact groups, which are strongly connected to the representation theory of these groups. For a connected group G, there was a general conjecture due to Connes and Kasparov which relates the K-theory of the (reduced) group algebra of G to the representation ring of the maximal compact subgroup of G. We will discuss the history of this conjecture and then give some ideas towards the recent general proof of the conjecture due to J. Chabert, R. Nest and myself.

The talk should be accessible to the general faculty and to those graduate students who have some background in functional analysis.

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