Analysis Seminar

Tuesday, December 6, 2016

13:00-14:00 − Room 646 PGH

Speaker: N. Christopher Phillips (University of Oregon)

Title: An invitation to operator algebras on L^p-spaces (Lecture 2)

Abstract: The theory of C*-algebras is one of the most successful parts of functional analysis. C*-algebras are exactly the norm closed selfadjoint subalgebras of the algebras of bounded operators on Hilbert spaces, that is, spaces of the form $L^2(X, \mu)$ for a measure space $(X, \mathcal{B}, \mu)$. What does one get if one replaces $L^2(X, \mu)$ with $L^p(X, \mu)$? In the last few years, interesting examples of such algebras have been found, corresponding to known standard examples of C*-algebras. However, many of the standard parts of the theory of C*-algebras have no known analogs for operator algebras on L^p spaces. The current state of knowledge is thus that we have a collection of interesting examples but that much work is needed towards constructing a general theory to go with them.

In the first lecture, I will give a general outline of the sort of thing that is known, including overviews of some of the basic theory of C*-algebras, and what is known about counterparts of some of them in L^p-operator algebras. In the other lecture(s), I will describe the small amount of basic theory we have for L^p-operator algebras, including Lamperti's Theorem on isometries on L^p-spaces. This result is very different from what happens for $p = 2$, but it is an essential ingredient in many proofs of properties of examples which are surprisingly like their C*-algebra counterparts. Also, I will give a more detailed look at one or two of the main classes of examples, and state a number of open questions.