North British Functional Analysis Seminar, 13 – 14 March 2015

Abstracts

Aline Bonami (Orleans)
Factorization of holomorphic functions and L^p estimates for Hankel operators

We will start from Blaschke Factorization in the unit disc and the upper half plane. This factorization has many applications, among which the theorem of Nehari related to symbols of Hankel operators that are bounded in the Hardy spaces H^p for $p > 1$. For $p = 1$ one needs a new kind of Blaschke factorization, which we will describe. Factorization is also available for Bergman spaces in the unit disc. But when dealing with the unit ball of $\mathbb{C}^n$ with $n > 1$, counter-examples of Rosay prove that factorization is no more possible. It may be replaced by weak factorization of the Hardy space H^1 in the generalization of of the theorem of Nehari. Weak factorization of Hardy spaces H^p, is not known for the unit ball when $p > 1$ and the bidisc for $p > 3/2$. We will conclude with the weak factorization of Bergman spaces that has been recently obtained by Pau and Zhao.

Uffe Haagerup (Odense)
Talk 1: *Approximation properties for groups and von Neumann algebras*

In the talk I will first give an introduction to weak amenability (M. Cowling and U.H. 1989) and to the weaker approximation property AP (J. Kraus and U.H. 1994) for locally compact groups. Moreover I will discuss the relation of these properties to properties of the group von Neumann algebras for lattices in the groups considered. The main part of the talk will be about two recent joint works with Tim de Laat, where we prove that every simple connected Lie group of real rank greater or equal to 2 does not have the AP. More generally we have now shown (with Tim de Laat and Soren Knudby) that a connected Lie group has the AP if and only if all the simple Lie algebras occurring in the Levi decomposition of the Lie algebra of G have real rank at most 1.

Talk 2: *The Thompson groups F, T, V and their C*- and von Neumann algebras*

In the talk I will give an introduction to the three Thompson groups F, T and V, and discuss some recent results: It is a long standing open problem whether the Thompson group F is amenable. Paul Jolissaint has shown that F is inner amenable and that its von Neumann algebra L(F) has property Gamma. In a recent joint work with Kristian Knudsen Olesen, we prove that T and V are not inner amenable and L(T) and L(V) does not have property Gamma. We also prove that if the reduced C*-algebra $C^*_r(T)$ of T is simple, then F is non-amenable. Moreover in collaboration with Maria Ramirez-Solano and Soren Haagerup we use extensive numerical computations to test the amenability problem for F by estimating the norms of certain elements of $C^*_r(F)$. Numerical computations alone cannot detect whether or not F is amenable, but the results we have obtained suggest that the most likely outcome is that F is non-amenable.