

WABASH EXTRAMURAL MODERN ANALYSIS SEMINAR

April 23

2:00pm

at

Wabash College
Crawfordsville, IN

*Times given are Eastern Daylight Time,
which is currently local time for Central Indiana.*

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| 2:00-2:30 | <i>Conversation</i> |
| 2:30-3:30 | On Some Structural Rigidity Results of Group von Neumann Algebras
<i>KRISHNENDU KHAN, University of Iowa</i> |
| 3:30-4:00 | <i>Refreshments and Conversation</i> |
| 4:00-5:00 | The Hochschild Cohomology of Uniform Roe Algebras
<i>MATTHEW LORENTZ, Michigan State University</i> |
| 5:00—... | <i>Farewells</i> |

The purpose of Wabash Seminar talks is to present surveys of interest to all analysts, including graduate students and scholars working in areas far from the speaker's specialty.

Come and meet your fellow analysts, learn what's going on, and spread the word.

Next Meeting: TBD

For further information contact

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On Some Structural Rigidity Results of Group von Neumann Algebras

KRISHNENDU KHAN

In this talk I will present examples of property (T) type II_1 factors with trivial fundamental group, thus, providing progress towards the well-known open questions of Connes'94 and Popa'06. We will show that the semidirect product feature is an algebraic feature that survive passage to group von Neumann algebras for a class of inductive limit of property (T) groups arising from geometric group theory. Using Popa's deformation/rigidity in conjunction with group theoretic methods we proved that the acting group can be completely recoverable from the von Neumann algebra as well as the limit action of the acting group. In addition, the fundamental group of the group von Neumann algebras associated to these limit groups are trivial, which contrasts the McDuff case. This is based on an initial joint work with I. Chifan, S. Das and C. Houdayer and a subsequent joint work with S. Das.

The Hochschild Cohomology of Uniform Roe Algebras

MATTHEW LORENTZ

In this talk we show a necessary and sufficient condition for the vanishing of the Hochschild cohomology of a uniform Roe algebra. Specifically, the n -dimensional continuous Hochschild cohomology vanishes if and only if every norm continuous n -linear map from the uniform Roe algebra to itself is equivalent to a weakly continuous n -linear map.

Motivated by the needs of mathematical physics and the study of one-parameter automorphism groups, it is interesting to study whether all derivations are inner (i.e. given by the commutator bracket) for a particular C^* -algebra. In the 1970s, a complete solution to this problem was obtained in the separable case via the work of several authors. For non-separable C^* -algebras the picture is murkier. Recently Rufus Willett and I gave a new class of examples that only have inner derivations: uniform Roe algebras, which are separable only in the trivial finite dimensional case. Uniform Roe algebras were originally introduced for index-theoretic purposes but are now studied for their own sake as a bridge between C^* -algebra theory and coarse geometry, as well as having interesting applications to single operator theory. We will briefly explain how the uniform Roe algebra only having inner derivations is equivalent to the first Hochschild cohomology vanishing. Using this as motivation, we will discuss the Hochschild cohomology in higher dimensions.