

FREE GROUP FACTOR PROBLEM AND POPA'S MEAN VALUE PROPERTY

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Abstract: In early 1940's Murray and von Neumann discovered a natural way to construct a von Neumann algebra from a countable, discrete group. This led to immense research activity in the subject area of Operator Algebras, and subsequent interplay with Ergodic Theory. One of the longstanding open problems in the theory of von Neumann algebras is the so called Free Group Factor Problem: whether the von Neumann algebra arising from the free group on two generators is isomorphic to the von Neumann algebra arising from the free group on infinitely many generators.

In this talk I will describe Sorin Popa's approach towards solving the free group factor problem. I will describe Popa's question regarding Mean Value property for the free group factors, and our resolution of Popa's question via noncommutative Poisson boundaries. Noncommutative Poisson boundaries for finite von Neumann algebras was developed by Jesse Peterson and the speaker in a recent joint work. If time permits, I will describe the connection between the study of noncommutative Poisson boundaries and various rigidity results, which are related to various other longstanding open problems in von Neumann algebras.

This talk is based on a recent joint work with Jesse Peterson.