



Colloquium Series



Classification of group von Neumann Algebras

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Abstract: In the 1930s Murray and von Neumann laid out the foundations of a mathematical framework designed to handle Quantum Mechanics by describing a natural generalization of matrices on vector spaces, namely operators acting on Hilbert spaces. The classification of von Neumann algebras, the term used for certain special collections of these operators, continues to leave an impact on fields including topology, quantum field theory, quantum computing, big data, and free probability theory. In this talk, we'll motivate the basic concepts and describe some of the areas of active research. We'll close with a description of the research that I am currently undertaking including a classification program that brings together tools intertwining geometry and group theory that assists us in unraveling the structure of these mysterious objects.

Keywords: Functional Analysis, Operator Algebras, Geometric Group Theory, Analysis

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