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**An introduction to II<sub>1</sub> factors**

Lecture 1: Definition of finite von Neumann algebras, weak and strong operator topologies, bicommutant theorem. Trace, GNS construction. Examples: group von Neumann algebra, group measure space construction. Equivalence relations and their von Neumann algebra, orbit equivalence.

Lecture 2: Hilbert (bi)modules/ completely positive maps. Examples from group theory. Weak containment of bimodules. Basic construction and Popa's intertwining techniques.

Lecture 3: Characterization of amenability for finite von Neumann algebras. Relative property (T) for groups and von Neumann algebras. Applications to rigidity.

Lecture 4: Subfactors. Definition of Jones' index. Iterated basic construction. Connes' fusion tensor products. Principal graphs of a subfactor.