Probabilistic Operator Algebra Seminar

Organizer: Dan-Virgil Voiculescu

July 12   **Aldo Garcia Guinto**, Michigan State University

Title: *Schreier's Formula for some Free Probability Invariants*

Let $G \overset{\alpha}{\curvearrowright} (M, \tau)$ be a trace-preserving action of a finite group G on a tracial von Neumann algebra. Suppose that $A \subset M$ is a finitely generated unital $*$-subalgebra which is globally invariant under α. We give a formula relating the von Neumann dimension of the space of derivations on A valued on its coarse bimodule to the von Neumann dimension of the space of derivations on $A \rtimes_\alpha^{\mathrm{alg}} G$ valued on its coarse bimodule, which is reminiscent of Schreier's formula for finite index subgroups of free groups. This formula induces a formula for $\dim \mathrm{Der}_c(A, \tau)$ (defined by Shlyakhtenko) and under the assumption that G is abelian we obtain the formula for Δ (defined by Connes and Shlyakhtenko). These quantities and the free entropy dimension quantities agree on a large class of examples, and so by combining these results with known inequalities, one can expand the family of examples for which the quantities agree.