

Probabilistic Operator Algebra Seminar

Organizer: Dan-Virgil Voiculescu

November 7 **Priyanga Ganesan**, UC San Diego

Title: *Quantum graphs and colorings.*

Quantum graphs are an operator space generalization of classical graphs that have appeared in different branches of mathematics including operator algebras, non-commutative topology and quantum information theory. In this talk, I will introduce a quantum input - classical output non-local game that captures the coloring problem for quantum graphs. Using this framework, we show that every quantum graph has a finite quantum coloring and is four-colorable in the algebraic model. The winning strategies of the quantum-to-classical non local coloring game leads to a combinatorial characterization of quantum graph coloring. We will use this to obtain lower bounds for the chromatic numbers of quantum graphs and show generalizations of well-known classical bounds, such as the Hoffman's bound, to the quantum graph setting.