

Probabilistic Operator Algebra Seminar

Organizer: Dan-Virgil Voiculescu

October 10 **Vern Paulsen**, University of Waterloo

Title: *Positive Maps and Entanglement in Real Hilbert Spaces.*

Partially motivated by recent research in quantum physics, we take a closer look at the similarities and differences between the study of positive maps, separability and entanglement in the real and complex case. In the complex case, positive maps are often used to detect entanglement. However, it is possible for real matrices to be entangled as operators on a real Hilbert space and separable when regarded as acting on a complex space. These two distinct theories of entanglement in the real case lead to two different theories of entanglement breaking maps in the real case. Finally, we see what these differences have to say about real versions of the PPT-squared conjecture.