

Probabilistic Operator Algebra Seminar

Organizer: Dan-Virgil Voiculescu

February 20 **Adam Skalski**, Institute of Math. Polish Academy of Sciences

Title: *Factoriality of q -Araki-Woods von Neumann algebras via conjugate variables.*

q -Araki-Woods von Neumann algebras were introduced in 2003 by Fumio Hiai who combined two deformations of (the Gaussian picture of) the free group factors, namely q -Gaussian von Neumann algebras of Marek Bożejko, Burkhard Kummerer and Roland Speicher on one hand and free Araki-Woods factors of Dima Shlyakhtenko on the other hand. From the very beginning it was expected that these von Neumann algebras are factors as soon as they are noncommutative (so when the “initial dimension” is greater than 1), and over the years this was established in most cases by a combination of efforts of several authors. In this talk we will outline the history of the problem and show how a combination of abstract results on type III conjugate variables due to Brent Nelson and an extension of a recent construction of such variables in the tracial, q -Gaussian case, due to Akihiro Miyagawa and Roland Speicher, allows us to solve the factoriality question in full generality. We will also discuss other (known and unknown) properties of q -Araki-Woods von Neumann algebras. Based on joint work with Manish Kumar and Mateusz Wasilewski.