Probabilistic Operator Algebra Seminar

Organizer: Dan-Virgil Voiculescu

August 28
Romuald Lenczewski, Wroclaw University of Science and Technology

Title: *Decomposition of free cumulants*

Free cumulants are multilinear functionals defined with the use of the family of lattices of non-crossing partitions. The family of much smaller lattices of interval partitions is used to define Boolean cumulants. In order to bridge the gap between these two families of lattices and the associated cumulants we introduce and study the family of lattices of noncrossing partitions adapted to Motzkin paths and define the associated operator-valued 'Motzkin cumulants'. The corresponding Möbius inversion formula plays the role of a lattice refinement of the well-known formula expressing free cumulants in terms of Boolean cumulants. We are going to discuss this concept and its main application: the additive decomposition of free cumulants in terms of scalar-valued counterparts of Motzkin cumulants which can be viewed as 'partial free cumulants'.