Probabilistic Operator Algebra Seminar

Organizer: Dan-Virgil Voiculescu

August 23   **Joachim Kock**, University of Copenhagen

Title: *Partial monoids and decomposition spaces of noncrossing partitions in free probability*

The combinatorics of noncrossing partitions underlies some of the basic algebraic aspects of free probability. Traditionally, in the spirit of Rota, the framework for this is that of posets and lattices, as exposed in the book of Nica and Speicher. In ongoing work with Kurusch Ebrahimi-Fard, Loic Foissy and Frederic Patras, we have been exploiting other structures formed by noncrossing partitions, such as half-shuffles, operads, partial monoids and decomposition spaces. In this talk I will focus on partial monoids and decomposition spaces and explain how they relate back to lattices of noncrossing partitions via the notion of decalage from simplicial homotopy theory. In some respects these alternative structures are closer to actual practice in free probability. I will exemplify this with Speicher's multiplicative functions and the Mastnak-Nica Hopf algebra.