Probabilistic Operator Algebra Seminar

Organizer: Dan-Virgil Voiculescu

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Title: *Rectangular finite free probability.*

In this talk, I will introduce a new type of polynomial convolution that serves as the foundation for building what we call rectangular finite free probability, generalizing the square finite free probability of Marcus, Spielman and Srivastava. We relate this operation to large rectangular random matrices and explain how it acts on singular values of rectangular matrices in a canonical way. Furthermore, we obtain nontrivial inequalities on roots of polynomials and build some appropriate tools, e.g. the analogue of the classical R-transforms. These developments are inspired by well-known results and concepts from probability theory. We also show that classical orthogonal polynomials such as Gegenbauer or Laguerre polynomials naturally arise through this convolution.