

Probabilistic Operator Algebra Seminar

Organizer: Dan Virgil Voiculescu

Monday, 9:00–10:30 am, to attend via Zoom email David Jekel (daj@math.ku.dk) remote

May 18 **Felix Parraud**, Queen's University

Asymptotic expansion for transport maps between laws of multimatrix models

The so-called multimatrix models are tuples of random matrices of dimension N with joint density (with respect to the Lebesgue measure) proportional to e^{-N^2V} for some function V . More precisely, it is known that as long as V is close enough from the quadratic potential one can find a "transport map" T_N such that, given X a tuples of independent GUE random matrices, the law of $T_N(X)$ is the one of our multimatrix model. Heuristically, this implies that "up to a change of variable" , our models are the same. However, the construction of T_N , which is given by stochastic calculus, usually yields an object harder to study than our multimatrix model itself. The aim of this talk is therefore to study its asymptotic behaviour by giving an asymptotic expansion of this transport map. This also yields some corollaries such that the strong convergence of our multimatrix models. In a few words, our strategy consist in building a suitable space of differentiable functions such that solutions of stochastic differential equations can be viewed as functions of an infinite family of GUE random matrices. Besides, this space of functions is also built in a way that is compatible with the the theory of asymptotic expansion for functions evaluated in GUE matrices developped in previous papers. This talk is based on joint work arXiv:2604.03213 with David Jekel and Evangelos A. Nikitopoulos.