Probabilistic Operator Algebra Seminar

Organizer: Dan Virgil Voiculescu

Monday, 9:00–10:30 am, to attend via Zoom email David Jekel (djekel@uottawa.ca) remot

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Dec 7 **David Jekel**, University of Ottawa

On counterexamples to the unification of χ and χ^*

Open AI recently generated the first examples with $-\infty < \chi < \chi^*$. I will contextualize and give a detailed proof of similar example, and more explicitly show the separation between free Fisher information and the large-n limit of classical Fisher information. The upper bound on free Fisher information comes from a cumulant-bound for Fisher information that draws on higher-order conjugate variable/Stein kernel techniques from classical and free settings. The lower bound on classical Fisher information comes from volume bounds on the space of matrices admitting a noticeable block structure with respect to some projections reminiscent of the volume arguments in Voiculescu's paper on absence of Cartan algebras and many subsequent works. I will derive the upper bound using a sup-formula and showing the relationship with my study of model theory and Wasserstein distance in the context of random matrices.