



Probability Seminar

Aspects of large N expansions in random matrix theory

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Abstract

Expansions in powers of $1/N$ in random matrix theory can be traced back to the study of moments for the GUE via graphical methods. In this presentation, a particular $1/N$ expansion for the mean of a smooth linear statistic for the Gaussian beta ensemble will be taking as the starting point. The shape of this expansion naturally leads to the question of the asymptotic expansion of the density, globally scaled, and scaled near the edge. It also leads to the consideration of signed measures, which can be accessed via a loop equation analysis. Returning to the asymptotic expansion of the scaled density, one finds that there are "hidden" integrable structures at higher orders. Viewpoints on these in the context of differential equations satisfied by the density in the classical cases will be discussed.

Date:	March 26, 2026 (Thursday)
Time:	3:00 – 4:00 pm
Venue:	ZOOM: https://hku.zoom.us/j/ Meeting ID: 970 8754 5398 Password: 086428