

*Department of Mathematics,
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Math 243 - Functional Analysis Seminar

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Asymptotics of polynomials via free probability

Abstract:

Since the seminal work of Voiculescu in the early 90s, the connection between the asymptotic behavior of random matrices and free probability has been extensively studied. More recently, in relation to the solution of the Kadison-Singer problem, Marcus, Spielman, and Srivastava discovered a deep connection between certain classical polynomial convolutions and free probability. Soon after, this connection was further understood by Marcus, who introduced the notion of finite free probability.

In this talk I will present recent results on finite free probability with applications to the asymptotic analysis of real-rooted polynomials. Our approach is based on a careful combinatorial analysis of the finite free cumulants, and allows us to study the asymptotic dynamics of the root distribution of polynomials after repeated differentiation, as well as the fluctuations of the root distributions of polynomials around their limiting measure. This is joint work with Octavio Arizmendi and Daniel Perales: arXiv:2108.08489.

Host: David Jekel

Tuesday, October 19, 2021

11:00 AM

Zoom, email djekel@ucsd.edu for details.
