



## Mathematics and CS Seminar

# Fractional $R$ -diagonal convolution, truncated single ring matrices, and dynamics of complex polynomial roots.

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Host: Laszlo Erdős

Recently, a (growing) number of papers have described a surprising connection between differential operators applied to (deterministic or random) polynomials and sums of random matrices. These results have been primarily focused polynomials with real roots where the related random matrices are Hermitian. After briefly discussing the history and success of this approach to real rooted polynomials we will consider the extension to polynomials with complex roots. Many nice properties are lost when considering complex roots, and hence non-Hermitian matrices, so we will specifically focus on random polynomials with independent coefficients and single ring matrices. We will discuss how free probability theory can connect sums of these single ring matrices to derivatives of these polynomials. With this connection in hand we will consider questions of stability and central limit behavior of the roots under differentiation. Based on joint work with Sean O'Rourke and David Renfrew.

**Tuesday, October 10, 2023 03:15pm - 04:15pm**

Heinzel Seminar Room (I21.EG.101), Office Building West, ISTA



This invitation is valid as a ticket for the ISTA Shuttle from and to Heiligenstadt Station.

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