

Probabilistic Operator Algebra Seminar

Organizer: Dan-Virgil Voiculescu

April 12 **Stefan Steinerberger**, University of Washington, Seattle

Title: *Roots of Polynomials and Free Convolution*

I will discuss the behavior of roots of derivatives of polynomials on the real line in the case where the number of differentiation steps becomes proportional to the degree. The arising limiting dynamics can be captured by a nice nonlocal evolution equation (the Hilbert transform makes an appearance) and turns out to be equivalent to free fractional convolution of the underlying density by itself. I will tell the story from the beginning, show many nice pictures, discuss some recent results by Granero-Belinchon, Kabluchko, Hoskins, Kiselev, O'Rourke, Shlyakhtenko, Tao and Tan and pose many open problems.