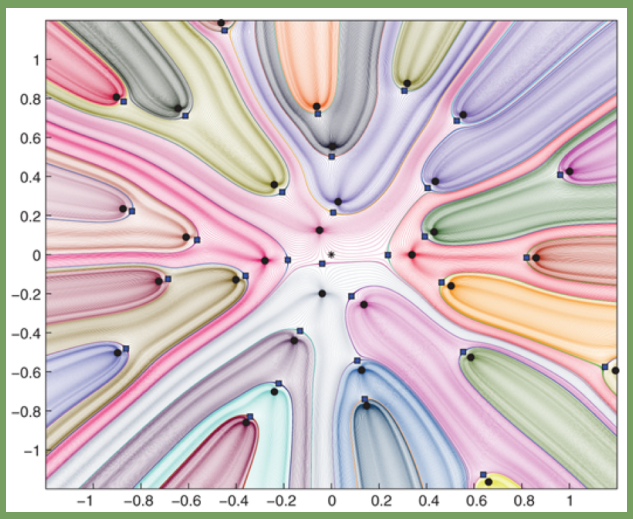
UCCS Department of Mathematics

Math Colloquium Series

BORIS HANIN

MASSACHUSETTS INSTITUTE OF TECHNOLOGY



DATE:
APRIL 20, 2017

TIME:
12:30PM-1:30PM
(REFRESHMENTS AT 12:15PM)

LOCATION:
OSBORNE
#A327

Pairing between zeros and critical points of random polynomials

Abstract: Consider a polynomial p_N(z) in one complex variable. The Gauss-Lucas Theorem says that the critical points of p_N lie inside the convex hull of its zeros. But how are critical points actually distributed inside the convex hull if p_N is chosen at random? The purpose of this talk is to explain that in fact each critical point of p_N typically comes paired with a single zero. The distance between a critical point and its paired zero is on the order of N^{-1}, which is much smaller than the typical N^{-1/2} spacing between order of N independently selected points on the sphere. In the first part of my talk, I will give a heuristic interpretation for this pairing by relating zeros and critical points to electrostatics on the Riemann sphere. In the second part, I explain what rigorous theorems are now available and state a few open problems.

For More Information please contact the UCCS Math Department at
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