Combinatorics and Probability Seminar

Universality for the minimum modulus of random trigonometric polynomials

Nick Cook (Duke)

Abstract: We consider the restriction to the unit circle of a random degree-n polynomial with iid coefficients (the Kac polynomial). For the case of Gaussian coefficients, it was recently shown by Yakir and Zeitouni that in the large-n limit the minimum modulus (suitably rescaled) follows an exponential distribution. We show this is a universal phenomenon, extending their result to arbitrary sub-Gaussian coefficients, such as Rademacher signs. Our approach relates the joint distribution of values of the polynomial at several angles to that of a random walk in high-dimensional phase space, for which we obtain a central limit theorem at fine scales. The case of discrete coefficients is particularly challenging as the distribution is then sensitive to arithmetic structure among the angles. Based on joint work with Hoi Nguyen.

Monday, March 15 at 3:00 PM in Zoom