Philadelphia Area Number Theory Seminar

Djordje Milićević
Bryn Mawr College

Distribution of Kloosterman paths to high prime power moduli

Abstract: Kloosterman sums are an important and ubiquitous class of complete exponential sums exhibiting square-root cancellation. Polygonal paths traced by their normalized incomplete sums give a fascinating insight into their chaotic formation.

In this friendly talk emphasizing pictures and underlying ideas, we will present our recent joint work with Zhang on the asymptotic distribution of Kloosterman paths to an increasingly high power p^n of a fixed odd prime p, a pure depth-aspect analogue of theorems of Kowalski–Sawin and Ricotta–Royer–Shparlinski. We find that this collection of Kloosterman paths naturally splits into finitely many disjoint ensembles, each of which converges in law as $n \to \infty$ to a distinct complex valued random continuous function. As the key arithmetic input we prove that complete sums of products of arbitrarily many Kloosterman sums to high prime power moduli exhibit either power savings or power alignment in shifts of arguments.

Thursday, March 31, 2022
3:25 – 4:45 PM

Swarthmore College
Department of Mathematics and Statistics
Science Center **149**
Informal refreshments at 3:10PM