Philadelphia Area Number Theory Seminar

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The least Euler prime via a sieve approach

Abstract: Euler primes are primes of the form $p = x^2 + Dy^2$ with $D > 0$. In analogy with Linnik's theorem, we can ask if it is possible to show that $p(D)$, the least prime of this form, satisfies $p(D) \ll D^A$ for some constant $A > 0$. Indeed Fogels showed this in 1962, but it wasn't until 2016 that an explicit value for A was determined by Zaman and Thorner, who showed one can take $A = 694$. Their work follows the same outline as the traditional approach to proving Linnik's theorem, relying on log-free zero-density estimates for Hecke L-functions and a quantitative Deuring–Heilbronn phenomenon. In an ongoing work (as part of my PhD thesis) we propose an alternative approach to the problem via sieve methods that avoids the use of the above technical results on zeros of the Hecke L-functions. We hope that such simplifications may result in a better value for the exponent A.

Tuesday, September 20, 2022
3–5 PM

Bryn Mawr College
Department of Mathematics
Park Science Center **328**

Informal refreshments at 3PM – Talk at 3:30PM