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*The Lang-Trotter Conjecture for Frobenius fields*

Let  $E$  be an elliptic curve defined over  $\mathbb{Q}$ . For each prime  $p$  of good reduction for  $E$ , consider the quadratic extension  $K(p)$  obtained by adjoining to  $\mathbb{Q}$  the roots of the  $p$ -th Frobenius polynomial. In 1976, S. Lang and H. Trotter predicted a precise asymptotic formula for the number of primes  $p$  up to  $X$  for which  $K(p)$  is equal to a fixed imaginary quadratic field. In this talk, I will discuss recent joint work with A.C. Cojocaru and H. Iwaniec, in which we prove that the Lang-Trotter Conjecture holds "on average" over families of elliptic curves.