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**PAUL PÉRINGUEY**, University of British Columbia

*Sign correlation between error terms of counting functions of primes in arithmetic progressions modulo 11*

In this talk we will investigate the sign of the normalized error term for the primes in arithmetic progression, i.e the quantity  $E^\psi(x; q, a) = \frac{\varphi(q)\psi(x; q, a) - x}{\sqrt{x}}$ , where  $\psi(x; q, a) = \sum_{\substack{n \leq x \\ n \equiv a \pmod{q}}} \Lambda(n)$  and  $\Lambda$  denotes the Von Mangoldt function.

More precisely, we study, under the Generalized Riemann Hypothesis and the Linear Independence Hypothesis, the logarithmic density of integers  $x$  for which  $E^\psi(x; q, a)$  and  $E^\psi(x; q, b)$  are of the same sign, for  $(ab, q) = 1$ .

Furthermore we will provide numerical values for these densities when  $q = 11$ .

This is a joint work with Kübra Benli and Greg Martin.