

# Number theory

## Low-lying zeros of quadratic Dirichlet L-functions

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In this talk we study the 1-level density of low-lying zeros of Dirichlet  $L$ -functions attached to real primitive characters of conductor at most  $X$ . We obtain an asymptotic expansion of this quantity with lower order terms in descending powers of  $\log X$ . We show that this is valid under GRH when the support of the Fourier Transform of the implied even test function  $\phi$  is contained in  $(-2, 2)$ . We also uncover a phase transition when the supremum of the support of  $\hat{\phi}$  reaches 1, where a new lower order term appears.

This is joint work with Daniel Fiorilli and Anders Södergren.