

Upstate New York Online Number Theory Colloquium

Time and Date: 12:00 pm EST October 26, 2020

Speaker: Chantal David

Title: Moments and non-vanishing of cubic Dirichlet L-functions at $s=1/2$

Abstract: A famous conjecture of Chowla predicts that $L(\frac{1}{2}, \chi) \neq 0$ for all Dirichlet L-functions attached to primitive characters χ . It was conjectured first in the case where χ is a quadratic character, which is the most studied case. For quadratic Dirichlet L-functions, Soundararajan proved that at least 87.5% of the quadratic Dirichlet L-functions do not vanish at $s = \frac{1}{2}$.

Under GRH, there are slightly stronger results by Ozlek and Snyder. We present in this talk the first result showing a positive proportion of cubic Dirichlet L-functions non-vanishing at $s = 1/2$ for the non-Kummer case over function fields. This can be achieved by using the recent breakthrough work on sharp upper bounds for moments of Soundararajan, Harper and Lester-Radziwill. Our results would transfer over number fields (but we would need to assume GRH in this case). The talk will be accessible to a general audience of number theorists and graduate students in number theory.

Joint work with A. Florea and M. Lalin.