Plenary Speakers, Titles, and Abstracts

Monday, May 30

9:15–10:05 AM

Ram Murty (Queen's University)
Introduction to Artin L-series

After defining Artin L-series, we will discuss the Chebotarev density theorem and its applications.

2:00–2:50 PM

Brian Conrey (American Institute for Mathematics)
Introduction to random matrix theory

We show how to calculate some basic statistics such as n-correlation of the eigenvalues of unitary matrices.

Tuesday, May 31

9:00–9:50 AM

Brian Conrey (American Institute for Mathematics)
The recipe

We show how to make conjectures for averages over a family of products of L-functions and ratios of products of L-functions, and indicate some applications.

2:00 PM

Ram Murty (Queen's University)
Artin's holomorphy conjecture and recent progress

Artin conjectured that each of his non-abelian L-series extends to an entire function if the associated Galois representation is nontrivial and irreducible. We will discuss the status of this conjecture and discuss briefly its relation to the Langlands program.

Wednesday, June 1

9:00–9:50 AM

Ram Murty (Queen's University)
Special values of Artin L-series

Dirichlet's class number formula has a nice conjectural generalization in the form of Stark's conjectures. These conjectures pertain to the value of Artin L-series at $s = 1$. However, the special values at other integer points also are interesting and in this context, there is a famous conjecture of Zagier. We will give a brief outline of this and display some recent results.

11:15 AM–12:05 PM

Brian Conrey (American Institute for Mathematics)
Ranks of elliptic curves

We show how to use conjectures for moments of L-functions to get insight into the frequency of rank 2 elliptic curves within a family of quadratic twists.

Thursday, June 2

9:00–9:50 AM

K. Soundararajan (Stanford University)
Distribution of values of zeta and L-functions

I will discuss the distribution of values of zeta and L-functions when restricted to the right of the critical line. Here the values are well understood by probabilistic models involving "random Euler products". This fails on the critical line, and the L-values here have a different flavor here with Selberg's theorem on log normality being a representative result.

2:00–2:50 PM

K. Soundararajan (Stanford University)
Moments of zeta and L-functions on the critical line, I

I will discuss techniques to get upper and lower bounds for moments of zeta and L-functions. The lower bounds are unconditional and the upper bounds in general rely on the Riemann Hypothesis. In several cases of low moments, one can obtain asymptotics, and I may discuss a couple of such recent cases.

Friday, June 3

9:00–9:50 AM

K. Soundararajan (Stanford University)
Moments of zeta and L-functions on the critical line, II

I will discuss techniques to get upper and lower bounds for moments of zeta and L-functions. The lower bounds are unconditional and the upper bounds in general rely on the Riemann Hypothesis. In several cases of low moments, one can obtain asymptotics, and I may discuss a couple of such recent cases.