

Abstract

Oberwolfach Workshop:

Analytic Number Theory

Dates:

3 - 9 November 2019 (Code: 1945)

Organizers:

Jörg Brüdern, Göttingen
Kaisa Matomäki, Turku
Robert C. Vaughan, State College
Trevor D. Wooley, Bristol

The focus of the meeting is on the recent progress in a number of central areas of the subject. One of these is Maynard's innovation via Selberg's sieve to produce bounded gaps between primes and answer questions about k -tuples of primes, very large gaps between primes and related questions.

Another concerns the recent work on the Vinogradov mean value theorem by Wooley, and the injection of ideas from harmonic analysis by Bourgain, Demeter and Guth leading to the best possible version of the theorem. The meeting will explore the very close relationship between the two methods and the progress that is being made when the diophantine system is no longer translation and dilation invariant and the many applications of the new methods.

The meeting will examine the consequences of the recent work of Matomäki and Radziwił giving deep insights into multiplicative functions and which has led to some unexpected and surprising conclusions.

It will also reflect the substantial recent activity by Bhargava, de la Bretche, Browning, Heath-Brown and Salberger in applying analytic methods to making statistical counts of what are, in principal, algebraic or geometric objects, such as number fields, ranks of elliptic curves, the density of rational points on varieties, including various forms of the Manin-Peyre conjectures.

It is planned to examine the close relationship between methods which have developed in recent years in additive combinatorics and their cousins descended from the classical Hardy-Littlewood-Ramanujan method.

Other aspects of the subject that are methodologically close to the above will also be covered.