

COLLOQUIUM

DEPARTMENT OF MATHEMATICS AND STATISTICS
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Arithmetic Progressions, Quadratic Residues, Overlap Diagrams, and the Density of Primes

Abstract

Let p be an odd prime. The distribution of the quadratic residues of p in the set $\{1, 2, \dots, p-1\}$ is a classical topic in number theory which began with Dirichlet's pioneering work in 1839-40, and has attracted intense interest ever since. In this talk, we will be concerned with measuring the size of the set of primes which have a sequence of quadratic residues in given arithmetic progressions. More specifically (but not exactly!), if \mathcal{A} denotes a given finite set of arithmetic progressions of positive integers such that the cardinality of \mathcal{A} is at least 2, if $s \geq 2$ is a fixed integer, and if U is the union formed from certain arithmetic progressions of length s taken from each element of \mathcal{A} , we wish to calculate the asymptotic density of the set of all primes p such that U is a set of quadratic residues of p . After making this more precise, we will describe an elegant geometric algorithm which performs that calculation.

Tuesday, October 20, 2015
3 – 4 PM
Room 135 Dodge Hall

(Refreshments at 2:30-3:00 PM in the kitchen area adjacent to 368 MSC)