An Alternative Solution to Waring's Problem over Finite Fields

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Graph theory is an accessible yet powerful tool used to study and understand many different phenomena arising in real life. Not only does this machinery help solve real life problems, but it can also be used to tackle problems in mathematics, in particular in combinatorics, algebra and number theory.

Waring's problem is a classical problem in number theory with an extensive literature. Stated in 1770, it conjectures that for each positive integer k, there exists an integer $g(k)$ such that each positive integer is the sum of at most $g(k)$ many k-th powers of positive integers. Waring's problem, as well as its variants, have intrigued mathematicians for the last two and a half centuries. In this talk, we focus on Waring's problem over finite fields. One can apply graph theoretic methods (in particular, spectral graph theory) to obtain self-contained proofs to show that every element of the field $\mathbb{F}_q$ can be written as a sum of two k-th powers when $q > k^4$.

Monday January 30th

2:00 PM to 2:30 PM

Sequoia Hall 316