Algebra Seminar

On the number of small prime power residues

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Abstract: Let $p$ be a prime number. For each positive integer $k \geq 2$, it is widely believed that the smallest prime that is a $k$th power residue modulo $p$ should be $O(p^\epsilon)$, for any $\epsilon > 0$. Elliott has proved that such a prime is at most $p^{\frac{k-1}{4} + \epsilon}$, for each $\epsilon > 0$. In this talk we will discuss the distribution of the prime $k$th power residues modulo $p$ in the range $[1,p]$, with a more emphasis on the subrange $[1,p^{\frac{k-1}{4} + \epsilon}]$, for $\epsilon > 0$.

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