Speaker: Trevor D. Wooley

Title: Weyl, equidistribution, and subconvex L^p-sets for $p < 2$.

Abstract: We investigate subsets $\mathcal{A}$ of the natural numbers having the property that, for some positive number $p < 2$, one has

$$\int_0^1 \Big| \sum_{n \in \mathcal{A} \cap [1,N]} e(n\alpha) \Big|^p \, \mathrm{d}\alpha \ll \big| \mathcal{A} \cap [1,N] \big|^p N^{\varepsilon - 1}.$$

Examples of such sets include (but are not restricted to) the squarefree, or more generally, the r-free numbers. We show that there are many other examples of such sets. For polynomials $\psi(x;\boldsymbol{\alpha}) = \alpha_k x^k + \ldots + \alpha_1 x$, having coefficients α_i satisfying suitable irrationality conditions, we obtain Weyl-type estimates for associated exponential sums restricted to subconvex L^p sets, and we show that the sequence $(\psi(n;\boldsymbol{\alpha}))_{n \in \mathcal{A}}$ is equidistributed modulo 1. We discuss also applications to averages of arithmetic functions.