1052-11-35 **Julia Wolf*** (julia.wolf@cantab.net). *Counting solutions to linear systems modulo N - an introduction to local quadratic Fourier analysis.*

Quadratic Fourier analysis was introduced by Gowers in his analytic proof of Szemeredi's theorem in 1998, and played a crucial role in Green and Tao's proof of the existence of long arithmetic progressions in the primes in 2004. We shall discuss recent formulations of quadratic Fourier-type decompositions that allow us to count the number of solutions to certain systems of linear equations in the integers modulo N. This talk covers joint work with Tim Gowers. (Received July 31, 2009)