

1116-05-1520 **W Timothy Gowers***, Centre for Mathematical Sciences, Wilberforce Road, Cambridge, CB3
0WB, United Kingdom. *Fourier analysis on general finite groups.*

The first two lectures in this series will be about Fourier analysis and generalizations that apply to scalar-valued functions on finite Abelian groups. This one will be about how it can be generalized in two further directions: to non-Abelian groups and to matrix-valued functions. An obvious example of a matrix-valued function on a group is a representation, and indeed basic representation theory plays a central part in these generalizations. I shall give examples of how non-Abelian Fourier analysis can be used to solve interesting problems at the intersection of combinatorics and group theory. I shall also mention connections between some of these problems and the notion of quasirandom graphs from the first lecture. (Received September 20, 2015)