

# The minimum number of monochromatic 4-term progressions

*Date* Tuesday, October 6

*Time* 3 pm

*Location* 303 Mudd

*Abstract:* It is not difficult to see that whenever you 2-color the elements of  $Z/pZ$ , the number of monochromatic 3-term arithmetic progressions depends only on the density of the color classes. The analogous statement for 4-term progressions is false. We shall analyse the reasons for this, and subsequently derive bounds on the minimum number of monochromatic 4-term arithmetic progressions in any 2-coloring of  $Z/pZ$ . In the process we touch upon the subject of quadratic Fourier analysis as well as a closely related question in graph theory studied by Thomason et al.: What is the minimum number of monochromatic  $K_4$ s in any 2-coloring of  $K_n$ ?