

## PMATH 940: Analytic Methods on Diophantine Problems

This course will focus on the basic principles of the circle method. We will start with Waring's problem about representations of positive integers as sums of fixed powers. Then we will study Vinogradov's mean value theorem about a system of sums of powers. We will also explore connections between Vinogradov's mean value theorem and Bourgain's discrete restriction conjecture in harmonic analysis. If time permits, we will consider extensions of these problems to the multidimensional setting and the function field.

Students are expected to have a background in Calculus roughly at the level of MATH 237; in particular, we assume familiarity with integration by parts and limits.