

## ***MODEL THEORY SEMINAR***

**Guest Speaker: Yifan Jing**

**University of Illinois at Urbana-Champaign**

**Date:** Tuesday, February 4, 2020

**Time:** 10:45 AM

**Location:** 125 Hayes-Healy Hall



***Lecture Title:***

**The avoidance density of  $(k, l)$ -sum-free sets**

***Abstract***

Let  $M_{(2,1)}(N)$  be the infimum of the size of the largest sum-free subset of any set of  $N$  positive integers. An old conjecture in additive combinatorics asserts that there is a constant  $c = c(2, 1)$  and a function  $\omega(N) \rightarrow \infty$  as  $N \rightarrow \infty$ , such that  $cN + \omega(N) < M_{(2,1)}(N) < (c + \varepsilon)N$  for any  $\varepsilon > 0$ . The constant  $c(2, 1)$  is determined by Eberhard, Green, and Manners, while the existence of  $\omega(N)$  is still open. In this talk, we consider the analogue conjecture for  $(k, l)$ -sum-free sets. We determine the constant  $c(k, l)$  for every  $(k, l)$ , and prove the existence of the function  $\omega(N)$  for infinitely many  $(k, l)$ . The proof uses tools from Fourier analysis and nonstandard analysis.