Discrete Mathematics Seminar

Illinois State University

2:00–2:50 pm, April 8

Speaker: Zhiyu Wang, Georgia Institute of Technology

Saturation problems in Ramsey theory, ordered sets and geometry

A graph G is F-saturated if G is F-free and $G + e$ is not F-free for any edge not in G. The saturation number of F is the minimum number of edges in an n-vertex F-saturated graph. We consider analogues of this problem in other settings. In particular we prove saturation versions of some Ramsey-type theorems on graphs and Dilworth-type theorems on posets. We also consider semisaturation problems, wherein we only require that any extension of the combinatorial structure creates new copies of the forbidden configuration. In this setting, we prove a semisaturation version of the Erdős-Szekeres theorem on convex k-gons, as well as multiple semisaturation theorems for sequences and posets. Joint work with Gábor Damásdi, Balázs Keszegh, David Malec, Casey Tompkins, and Oscar Zamora.