

Discrete Mathematics Seminar

Illinois State University

2:00–2:50 pm, October 17@ STV 121

Speaker: Lina Li, University of Illinois at Urbana-Champaign

An overview of Erdős-Rothschild problems and their rainbow variants

In 1974, Erdős and Rothchild conjectured that the complete bipartite graph has the maximum number of two-edge-colorings without monochromatic triangles over all n -vertex graphs. Since then, this new class of colored extremal problems has been extensively studied by many researchers on various discrete structures, such as graphs, hypergraphs, boolean lattices and sets. In this talk, I would like to give an overview of some past results on this topic. The second half of this talk is to investigate the rainbow variants of the Erdős-Rothschild problem. Our first main result, confirming conjectures of Benevides, Hoppen and Sampaio, and Hoppen, Lefmann, and Odermann, completes the characterization of the extremal graphs for the edge-colorings without rainbow triangles. We also studied a similar question on sum-free sets, in which we describe the extremal configurations for the colorings of integers without rainbow sums.

