



THE UNIVERSITY of
MISSISSIPPI
Department of Mathematics

AMS Graduate Student Seminar

Qinghong Zhao

Multicolor Ramsey numbers of Kipas in Gallai colorings

Thursday, February 27, 2020
2:30 p.m. Hume 321

Abstract: A Gallai coloring of a complete graph is an edge-coloring such that no triangle has all its edges colored differently. A Gallai k -coloring is a Gallai coloring that uses k colors. Given a graph H and an integer $k \geq 1$, the Gallai-Ramsey number $GR_k(H)$ is defined to be the minimum integer n such that every Gallai k -coloring of the edges of K_n contains a monochromatic copy of H . In this talk, I will present our recent results on Gallai-Ramsey numbers for some graphs with chromatic number three such as \widehat{K}_m for $m \geq 2$, where \widehat{K}_m is a kipas with $m+1$ vertices obtained from the join of K_1 and P_m , and a class of graphs with five vertices, denoted by \mathcal{H} . We first study the general lower bound of such graphs and propose a conjecture for the exact value of $GR_k(\widehat{K}_m)$. Then we give a unified proof to determine the Gallai-Ramsey numbers for many graphs in \mathcal{H} and obtain the exact value of $GR_k(\widehat{K}_4)$ for all $k \geq 1$. Our outcomes not only indicate that the conjecture on $GR_k(\widehat{K}_m)$ is true for $m = 4$, but also imply several results on $GR_k(H)$ for some $H \in \mathcal{H}$ which are proved individually in different papers.