1146-05-80   **Colton Magnant*** (`dr.colton.magnant@gmail.com`). *Gallai-Ramsey number for K_5.*

Given a graph H, the k-colored Gallai Ramsey number $gr_k(K_3 : H)$ is defined to be the minimum integer n such that every k-coloring of the edges of the complete graph on n vertices contains either a rainbow triangle or a monochromatic copy of H. Fox et al. [J. Fox, A. Grinshpun, and J. Pach. The Erdős-Hajnal conjecture for rainbow triangles. J. Combin. Theory Ser. B, 111:75-125, 2015.] conjectured the value of the Gallai Ramsey numbers for complete graphs. In this talk, we discuss the case $H = K_5$. Somewhat surprisingly, it turns out that the validity of the conjecture depends upon the (yet unknown) value of the Ramsey number $R(5,5)$. It is known that $43 \leq R(5,5) \leq 48$ and conjectured that $R(5,5) = 43$ [B.D. McKay and S.P. Radziszowski. Subgraph counting identities and Ramsey numbers. J. Combin. Theory Ser. B, 69:193-209, 1997]. If $44 \leq R(5,5) \leq 48$, then Fox et al.'s conjecture is true and we will discuss the proof. If, however, $R(5,5) = 43$, then Fox et al.'s conjecture is false, meaning that at least one of these two conjectures must be false. We will discuss an example to this effect. This is joint work with Ingo Schiermeyer. (Received January 08, 2019)