

Large induced trees in K_r -free graphs

Date Tuesday, October 28

Time 5 pm

Location 507 Math

Abstract: For a graph G , let $t(G)$ denote the maximum number of vertices in an induced subgraph of G that is a tree. We study the problem of bounding $t(G)$ for graphs which do not contain a complete graph K_r on r vertices. This problem was posed twenty years ago by Erdős, Saks, and Sós. Substantially improving earlier results of various researchers, we prove that every connected triangle-free graph on n vertices contains an induced tree of order \sqrt{n} . When $r \geq 4$, we also show that $t(G) \geq \frac{\log n}{4 \log r}$ for every connected K_r -free graph G of order n . Both of these bounds are tight up to small multiplicative constants, and the first one disproves a recent conjecture of Matoušek and Šámal.

This is joint work with Po-Shen Loh and Benny Sudakov.