

Ramsey numbers of large trees

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In 1974, Stefan Burr conjectured that the Ramsey number of a tree T , denoted by $R(T)$, depends on the relation between the bipartition classes of T . More precise, for a tree T with partition classes of sizes t_1 and t_2 such that $t_1 \geq t_2$, Burr conjectured that

$$R(T) = \max\{t_1 + 2t_2, 2t_1\} - 1,$$

which arises from canonical constructions in Ramsey theory. Soon after, this conjecture was disproved, as shown by the "double-star" which has Ramsey number slightly larger than what Burr anticipated. On the positive side, Haxell, Łuczak and Tingley proved in 2002 that Burr's conjecture is almost correct for trees with small (but linear) maximum degree, giving some hope that Burr's conjecture might be true for trees of small maximum degree. In this talk, I will present a solution of this problem, showing that Burr's conjecture is indeed true for trees with small maximum degree (linear in the size of the tree), determining the exact Ramsey number for this class of trees. This is joint work with Richard Montgomery and Jun Yan.

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