The asymptotics of $r(4,t)$

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Abstract

For integers $s,t \geq 2$, the Ramsey number $r(s,t)$ denotes the minimum n such that every n-vertex graph contains a clique of order s or an independent set of order t. We prove that

$$r(4,t) = \Omega\Big(\frac{t^3}{\log^4 t}\Big) \qquad \text{as } t \to \infty$$

which determines $r(4,t)$ up to a factor of order $\log^2 t$, and solves a conjecture of Erdős.

This is a joint work with Sam Mattheus (Accepted in the Annals of Mathematics).