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NEW RESULTS ON THE ERDŐS-HAJNAL CONJECTURE

MARTHE BONAMY

Université Montpellier 2, France

A random graph on n vertices has a.a.s. no clique or stable set of order significantly greater than $\log n$ (Erdős 1963). Let \mathcal{C} be a non-trivial graph class closed under induced subgraphs. The Erdős-Hajnal (E-H for short) conjecture states that any such \mathcal{C} behaves quite differently from random graphs: the graphs in \mathcal{C} have a polynomial-size clique or stable set.

So far, only very little is known about the conjecture, even for simple graph classes. Indeed, for every interesting graph G on at most 5 vertices, we know that the class of graphs without induced G satisfies the E-H conjecture... except if G is a cycle or a path on 5 vertices. In an effort to approach these two cases, Bousquet, Lagoutte and Thomassé proved that the E-H conjecture is true for the class of graphs without long paths or long anti-paths, and we prove it for the class of graphs without long cycles or long anti-cycles. This is joint work with Nicolas Bousquet and Stéphan Thomassé.