

Shades of Perfection

János Pach⁽¹⁾

⁽¹⁾ Rényi Institute, Budapest & IST Austria

In the early period of development of graph theory, perfect graphs played a central role. They motivated a lot of research in optimization, graph coloring, theory of algorithms, and in hypergraph theory. However, most graphs are not perfect. Inspired by pioneering work of Asplund and Grunbaum, at a conference in Pokrzywna (Poland), Gyárfás initiated the systematic study of "nearly perfect" graphs. These are infinite classes of graphs with the property that their chromatic numbers are bounded by a function f of their clique numbers. How far these graphs are from being perfect, depends on the growth rate of f . It has turned out that many "natural", geometrically defined classes of graphs are nearly perfect, but there are also interesting exceptions. The problem is related to the celebrated Erdős-Hajnal conjecture, one of the most challenging open problems in Ramsey theory.