Bounding the Chromatic Number of Graphs that Do Not Contain an Induced Subdivision of the Bull

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Abstract A class $\mathcal{G}$ of graphs is *χ-bounded* if there exists a function $f : \mathbb{N} \to \mathbb{N}$ such that for all $G \in \mathcal{G}$, $\chi(G) \leq f(\omega(G))$. χ-bounded classes of graphs were introduced in 1987 by András Gyárfás as a generalization of the class of perfect graphs. Gyárfás conjectured that for any tree T, the class of graphs that do not contain T as an induced subgraph is χ-bounded. In 1997, Alex Scott proved a 'topological' version of this conjecture: for any tree T, the class of graphs that do not contain any subdivision of T as an induced subgraph is χ-bounded; he then conjectured that for every graph H, the class of graphs that do not contain any subdivision of H as an induced subgraph is χ-bounded. In this talk, we present two proofs of Scott's conjecture for the case when H is the bull (i.e. the 5-vertex graph that consists of a triangle and two pendant edges).

Joint work with Maria Chudnovsky, Alex Scott, and Nicolas Trotignon