Rainbow connection and forbidden subgraphs

Ingo Schiermeyer

(joint work with Přemek Holub and Zdeněk Ryjáček)

A connected edge-colored graph G is rainbow-connected if any two distinct vertices of G are connected by a path whose edges have pairwise distinct colors; the rainbow connection number $rc(G)$ of G is the minimum number of colors such that G is rainbow-connected. We consider families $\mathcal{F}$ of connected graphs for which there is a constant $k_{\mathcal{F}}$ such that, for every connected $\mathcal{F}$-free graph G, $rc(G) \leq diam(G) + k_{\mathcal{F}}$, where $diam(G)$ is the diameter of G. In this talk, we give a complete answer for $|\mathcal{F}| \in \{1, 2\}$.