Graph Theory meets Extremal Set Theory

In extremal set theory, one is typically given a set $S$ on $n$ elements and a collection $\mathcal{F}$ of subsets $A_1, A_2, \ldots$ of $S$ with some restrictions on those subsets (for example, each subset must have a common element with every other subset). One then typically seeks to upper bound the size of $\mathcal{F}$. A natural analogue of this setting for graphs, introduced by Holroyd and Talbot in 2002, is to take our graph $G$ to be $G = (S, E)$ and each $A_i$ to be an independent subset of $G$. In this talk, I will discuss some old and new problems and results in the area, and make a connection to Chvátal’s conjecture in extremal set theory. If time permits, I will sketch a proof of a result I obtained in joint work with Glenn Hurlbert and Vikram Kamat.