

## The hypergraph Turán problem

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A central problem of extremal combinatorics is to determine the Turán number of a given  $r$ -uniform hypergraph  $\mathcal{F}$ , i.e. the maximum number of edges in an  $r$ -uniform hypergraph on  $n$  vertices that does not contain a copy of  $\mathcal{F}$ . Since the problem was introduced over sixty years ago, it has only been solved for relatively few hypergraphs  $\mathcal{F}$ . Many of these results were found very recently by means of the stability method, which has brought new life to research in a challenging area. However, this method only has the potential to solve the problem when the extremal configuration is unique, so in other cases we need new techniques.

In this talk we will discuss some methods for Turán problems due to various authors, that incorporate some algebraic ideas. In particular we will present two new results: one gives bounds for the Turán numbers of projective geometries, and another gives a general bound for the Turán number of a hypergraph in terms of the number of edges that it contains.