The Hypergraph Turán Problem

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007 Kemeny Hall, 4:00 pm

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Abstract

A central problem of extremal combinatorics is to determine the Turán number of a given r-uniform hypergraph F, i.e. the maximum number of edges in an r-uniform hypergraph on n vertices that does not contain a copy of F. Since the problem was introduced over sixty years ago, it has only been solved for relatively few hypergraphs 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 the history of Turán problems for graphs and hypergraphs, the methods that have been successfully used by various authors, and challenges for future research in the area.

This talk should be accessible to graduate students.