University of Mississippi

Combinatorics Seminar

Some Extremal Problems of Graphs and Hypergraphs

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ABSTRACT

Denote by $ex(n, H)$ the classical Turán number, i.e., the maximum number of edges among all H-free graphs with n vertices. Given $p \geq 0$ and a graph G whose degree sequence is $d_1, d_2, \ldots, d_n$, let $e_p(G) = \sum_{i=1}^{n} d_i^p$. Caro and Yuster introduced a Turán-type problem for $e_p(G)$: given $p \geq 0$, how large can $e_p(G)$ be if G has no subgraph of a particular type. Denote by $ex_p(n, H)$ the maximum value of $e_p(G)$ taken over all graphs with n vertices that do not contain H as a subgraph. The k-uniform hypergraph Turán Number of a family $\mathcal{F}$ of k-uniform hypergraphs is defined as follows: $ex_k(n, \mathcal{F}) = \max\{e(H) : |V(H)| = n, \forall G \in \mathcal{F}, G \nsubseteq H\}$. In this talk, we will present some results on $ex_p(n, H)$ and $ex_k(n, \mathcal{F})$, for some special H and $\mathcal{F}$.