Combinatorics Seminar

A proof of a conjecture of Erdős et al. about subgraphs of minimum degree k

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Abstract: Erdős, Faudree, Rousseau and Schelp observed the following fact for every fixed integer $k \geq 2$: Every graph on $n \geq k-1$ vertices with at least $(k-1)(n-k+2)+(k-2)(k-3)/2$ edges contains a subgraph with minimum degree at least k. However, there are examples in which the whole graph is the only such subgraph. Erdos et al. conjectured that having just one more edge implies the existence of a subgraph on at most $(1-\epsilon_k)n$ vertices with minimum degree at least k, where $\epsilon_k > 0$ depends only on k.
In this talk, we will sketch a proof of this conjecture. The proof relies on ideas from a paper of Mousset, Noever and *Škorić*. We will discuss these ideas and how they can be extended to give a proof of the full conjecture.

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