# Combinatorics Seminar

## *Independent Sets in H-free Hypergraphs*

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**Abstract:** It is a fundamental question in Ramsey theory to determine the smallest possible independence number of an H-free hypergraph on n vertices. In the case of graphs, the problem was famously solved for H=K3 by Kim and for H=K4 (up to a logarithmic factor) by Mattheus-Verstraete in 2023. Even C4 and K5 remain wide open. We study the problem for 3-uniform hypergraphs and conjecture a full classification: the minimum independence number is poly(n) if and only if H is contained in the iterated blowup of the single-edge hypergraph. We prove this conjecture for all H with at most two tightly connected components. Based on joint work with Conlon, Fox, Gunby, Mubayi, Suk, Verstraete, and Yu.

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Mathematics
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