Mathematics, Statistics, and Computer Science   **@ UIC**

Combinatorics and Probability Seminar

A Topological Turán Problem

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Abstract: The classical Turán problem asks: given a graph H, how many edges can an n-vertex graph have while containing no isomorphic copy of H? By viewing (k+1)-uniform hypergraphs as k-dimensional simplicial complexes, we can ask a topological version of this, (first posed by Nati Linial): given a k-dimensional simplicial complex S, how many facets can an n-vertex k-dimensional simplicial complex have while containing no homeomorphic copy of S? Until recently, little was known for k > 2. In this talk, we give an answer for general k. Our proof uses the simple but powerful probabilistic technique of dependent random choice and the combinatorial notion of a trace-bounded hypergraph. Joint work with Jason Long and Bhargav Narayanan.

Monday, March 29 at 3:00 PM in Zoom