Institut für Diskrete Mathematik

Seminar für Kombinatorik und Optimierung

Friday 23rd April 14:15

Online meeting (Webex)

Sharp thresholds and applications to extremal combinatorics

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Given $p \in [0,1]$, let μ_p denote the product measure on the cube $\{0,1\}^n$. It is well known that if $\mathcal{F} \subset \{0,1\}^n$ is a monotone family then the measure $\mu_p(\mathcal{F})$ is monotonically increasing with p. The family has a sharp threshold at p if a small increase in p leads to a significant increase in $\mu_p(\mathcal{F})$.

The existence of sharp thresholds is of interest to a wide range of topics and has received considerable attention. When p is bounded away from 0 or 1 the picture is quite well understood, but the case when p is small is more challenging. In this talk I will discuss some recent results in this regime, which improve several previous bounds.

Our sharp threshold results also have significant applications in Extremal Combinatorics. Here we obtain new results on the Turán number of any bounded degree uniform hypergraph obtained as the expansion of a hypergraph of bounded uniformity. These results are asymptotically optimal and solve a number of open problems in the area.

Joint work with Peter Keevash, Noam Lifshitz and Dor Minzer.

Meeting link:

https://tugraz.webex.com/tugraz/j.php?MTID=me01f43109c693c884b459339d643d7d9

Meeting number: 121 128 5385

Password: e8pQ8ZBQN4B

Joshua Erde, Mihyun Kang