Colloquium

On Erdos-Ko-Rado-type theorems

Peter Frankl
The Hungarian Academy of Sciences

Abstract: The lecture is going to focus on extremal set theory. The general problem is concerned with the maximum possible size of a subset of the power set of a finite set X of n elements subject to some conditions. The simplest result is probably the following.

Proposition 0. If F is a subset of 2^X, such that any two sets in F have non-empty intersection then $|F| \leq 2^(n-1)$.

One way to achieve equality is by taking all subsets containing a fixed element.

Erds-Ko-Rado Theorem. If F is a collection of k-element subsets of X such that any two sets in F have non-empty intersection and $2k < n$, then $|F| \leq \binom{n-1}{k-1}$ with equality holding only if all subsets in F contain a fixed element. We are going to discuss various generalizations and extensions of this result, some of which are still unsolved.

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Mathematics and Computer Science
Emory University