Department of Mathematics, BGU

Combinatorics Seminar

On *Tuesday, January ,1 2019*

At *10:45 – 11:45*

In *101-*

Chaya Keller (Technion)

will talk about

Improved lower and upper bounds on the Hadwiger-Debrunner numbers

Abstract: A family of sets F is said to satisfy the (p,q)-property fi among any p sets in F, some q have a non-empty intersection. Hadwiger and Debrunner (1957) conjectured that for any p < q < d there exists a constant c = c_d(p,q), such that any family of compact convex sets in R^d that satisfies the (p,q)-property, can be pierced by at most c points. Helly's Theorem is equivalent to the fact that c_d(p,p)=1 (p < d).

In a celebrated result from ,1992 Alon and Kleitman proved the conjecture. However, obtaining sharp bounds on the minimal such c_d(p,q), called 'the Hadwiger-Debrunner numbers', is still a major open problem in combinatorial geometry.

In this talk we present improved upper and lower bounds on the Hadwiger-Debrunner numbers, the latter using the hypergraph container method. Based on joint works with Shakhar Smorodinsky and Gabor Tardos.