

Department of Mathematics, BGU

Colloquium

On Tuesday, April 14 2015

At 14:30 – 15:30

In Math 101-

Boaz Tsaban (Bar Ilan University)

will talk about

Algebra, selections, and additive Ramsey theory

Abstract: Improving upon theorems of Hilbert, Schur, and others, and establishing a longstanding conjecture, Hindman proved that, for each finite coloring of the natural numbers, there is an infinite set such that all finite sums of elements from the set have the same color. Galvin and Glazer used the algebraic and topological structure of the set of ultrafilters (to be defined in the lecture) to provide a very clear and elegant proof of Hindman's Theorem. This soon became the leading method for establishing coloring theorems in arithmetic and related fields.

We will survey the Galvin-Glazer method and proof, and indicate a surprising recent discovery, that Hindman's theorem is a special (in a sense, degenerate) case of a theorem about open covers of topological spaces with a property introduced by Karl Menger. The proof uses, in addition to extensions of the Galvin-Glazer theory, infinite games and selection principles.

The talk will be aimed at a general mathematical audience. In particular, we do not assume familiarity with any of the concepts mentioned above. The price is that we will not provide proof details; these are too subtle and laborious for a colloquium talk. The emphasis will be on the introduction to this beautiful connection.