Department of Mathematics, BGU

# BGU Probability and Ergodic Theory (PET) seminar

**On** *Thursday, April 28, 2022*

**At** *11:10 – 12:00*

**In** *-101*

Chris Phillips (University of Oregon)

will talk about

## Mean dimension of an action and the radius of comparison of its C*-algebra

Abstract: For an action of a countable amenable group $G$ on a compact metric space $X$, the mean dimension $mdim(G, X)$ was introduced by Lindenstrauss and Weiss, for reasons unrelated to $C^*$-algebras. The radius of comparison $rc(A)$ of a $C^*$-algebra $A$ was introduced by Toms, for use on $C^*$-algebras having nothing to do with dynamics.

A construction called the crossed product $C^*(G, X)$ associates a $C^*$-algebra to a dynamical system. There is significant evidence for the conjecture that $rc(C^*(G, X)) = (1/2)mdim(G, X)$ when the action is free and minimal. We give the first general partial results towards the direction $rc(C^*(G, X)) \geq (1/2)mdim(G, X)$. We don't get the exact conjectured bound, but we get nontrivial results for many of the known examples of free minimal systems with $mdim(G, X) > 0$. The

proof depends, among other things, on Cech cohomology, and uses something we call the mean cohomological independence dimension. Unlike the currently known results in the other direction, it works for all choices of $G$.

The talk will include something about the crossed product construction; no previous knowledge of it will be assumed.

This is joint work with Ilan Hirshberg.