

Department of Mathematics, BGU

Colloquium

On *Tuesday, April 12, 2022*

At *14:30 – 15:30*

In *Math -101*

CHRIS PHILLIPS (UNIVERSITY OF OREGON)

will talk about

Relations between dynamics and C^* -algebras: Mean dimension and radius of comparison

ABSTRACT: This is joint work with Ilan Hirshberg.

For an action of an amenable group G on a compact metric space X , the mean dimension $\text{mdim}(G, X)$ was introduced by Lindenstrauss and Weiss. It is designed so that the mean dimension of the shift on $([0, 1]^d)^G$ is d . Its motivation was unrelated to C^* -algebras.

The radius of comparison $\text{rc}(A)$ of a C^* -algebra A was introduced by Toms to distinguish counterexamples in the Elliott classification program. The algebras he used have nothing to do with dynamics.

A construction called the crossed product $C^*(G, X)$ associates a C^* -algebra to a dynamical system. *Despite the apparent lack of connection between these concepts, there is significant evidence for the conjecture that $\text{rc}(C^*(G, X)) = (1/2)\text{mdim}(G, X)$ when the action is free and minimal.* We will explain the concepts

above; no previous knowledge of mean dimension, C -algebras, or radius of comparison will be assumed. Then we describe some of the evidence. In particular, we give the first general partial results towards the direction $rc(C^*(G, X)) \geq (1/2) \text{mdim}(G, X)$. We don't get the exact conjectured bound, but we get nontrivial results for many of the known examples of free minimal systems with $\text{mdim}(G, X) > 0$.