

Department of Mathematics, BGU

Colloquium

On Tuesday, May 31 2016

At 14:30 – 15:30

In Math 101-

N. Christopher Phillips (University of Oregon)

will talk about

The mean dimension of a homeomorphism and the radius of comparison of its C^* -algebra

Abstract: We describe a striking conjectured relation between “dimensions” in topological dynamics and C -algebras. (No previous knowledge of C -algebras or dimension theory will be assumed.) Let X be a compact metric space, and let $h \colon X \rightarrow X$ be a minimal homeomorphism (no nontrivial invariant closed subsets). The *mean dimension* $\mathit{mdim}(h)$ of h is a dynamical invariant, which I will describe in the talk, and which was invented for purposes having nothing to do with C -algebras. One can also form a crossed product C -algebra $C^*(\mathbb{Z}, X, h)$. It is simple and unital, and there is an explicit description in terms of operators on Hilbert space, which I will give in the talk. The *radius of comparison* $\mathit{rc}(A)$ of a simple unital C -algebra A is an invariant introduced for reasons having nothing to do with dynamics; I will give the motivation for its definition in the talk (but not the definition itself). It has been conjectured, originally on very thin evidence, that the radius of comparison

of $C^*(\mathbb{Z}, X, h)$ is equal to half the mean dimension of h for any minimal homeomorphism h .

In this talk, I will give elementary introductions to mean dimension, the crossed product construction, and the ideas behind the radius of comparison. I will then describe the motivation for the conjecture and some partial results towards it.