Department of Mathematics, BGU

# Colloquium

**On** *Tuesday, January ,16 2024*

**At** *14:30 – 15:30*

**In** *Math 101-*

Or Shalom (IAS, Princeton)

will talk about

## Structure theorems for the Host–Kra characteristic factors and inverse theorems for the Gowers unfiormity norms

Abstract: The Gowers unfiormity k-norm on a finite abelian group measures the averages of complex functions on such groups over k-dimensional arithmetic cubes. The inverse question about these norms asks fi a large norm implies correlation with a function of an algebraic origin. The analogue of the Gowers uniformity norms for measure-preserving abelian actions are the Host-Kra-Gowers seminorms, which are intimately connected to the Host-Kra-Ziegler factors of such systems. The corresponding inverse question, in the dynamical setting, asks for a description of such factors in terms of systems of an algebraic origin. In this talk, we survey recent results about the inverse question in the dynamical and combinatorial settings, and in particular how an answer in the former setting can imply one in the latter. This talk is based on joint works with Asgar Jamneshan and Terence Tao. This talk is aimed at a general audience. In particular, no prior knowledge in ergodic theory or additive combinatorics is required.