

Department of Mathematics, BGU

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# BGU Probability and Ergodic Theory (PET) seminar

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*On Thursday, March ,24 2022*

*At 11:10 – 12:00*

**In 101-**

Elad Sayag (Tel-Aviv University)

will talk about

## **Entropy, ultralimits and Poisson boundaries**

Abstract: In many important actions of groups there are no invariant measures. For example: the action of a free group on its boundary and the action of any discrete infinite group on itself. The problem we will discuss in this talk is ‘On a given action, how invariant measure can be?’. Our measuring of non-invariance will be based on entropy (f-divergence). In the talk I will describe the solution of this problem for the free group acting on its boundary and on itself. For doing so we will introduce the notion of ultra-limit of G-spaces, and give a new description of the Poisson-Furstenberg boundary of  $(G,k)$  as an ultra-limit of G action on itself, with ‘Abel sum’ measures. Another application will be that amenable groups possess KL-almost-invariant measures (KL stands for the Kullback-Leibler divergence).

All relevant notions, including the notion of Poisson-Furstenberg boundary and the notion of ultra-filters will be explained during the talk.

This is a master thesis work under the supervision of Yehuda Shalom.