Department of Mathematics, BGU

Operator Algebras and Operator Theory

On *Monday, January ,22 2024*

At *14:00 − 15:00*

In *201*

Yair Glasner (BGU)

will talk about

Non-commutative factors for an irrational rotation of the circle

Abstract: In a joint work with Tattwamasi Amrutam and Eli Glasner, we study intermediate C^*-algebras of the form $C_r^*(\Gamma) < \mathcal{A} < C(X) \rtimes \Gamma$, where $\Gamma \curvearrowright X$ is a given minimal action of a countable discrete group Γ on a compact space X. Every Γ-factor of the given topological dynamical system $X \to Y$ gives rise to an intermediate algebra of the form $\mathcal{A} = C(Y) \rtimes \Gamma$, and by analogy we may think of more general factors as representing ''non-abelian'' factors. Let us call the dynamical system "reflecting'' fi the only intermediate algebras come from dynamical factors.

We show that another source of intermediate algebras comes from ideals in $C_r^*(\Gamma)$. In particular, we show that fi Γ is not C^*-simple, X admits a Γ-invariant

probability measure, and the cardinality of X is at least 3, then the system is not reflecting.

In the talk, I will focus on the example highlighted in the title. In this case, we obtain a complete description of all intermediate algebras in terms of some combinatorial data described in terms of ideals in $C_r^*(\mathbb{Z})$. In particular there are uncountably many intermediate algebras, as compared to only countably many dynamical factors. I will show how our description can often be used in order to obtain structural information about the algebras, such as simplicity, the existence of a center, and a closed formula for the algebra generated by two given ones.