Department of Mathematics, BGU

Colloquium

On *Tuesday, April ,22 2025*

At *14:30 – 15:30*

In *Math 101-*

Tamar Bar-On (BGU)

will talk about

Demushkin groups of infinite rank in Galois theory

Abstract: One of the most interesting open questions in Galois theory these days is: Which profinite groups can be realized as absolute Galois groups of fields? Restricting our focus to the one-prime case, we begin with a simpler question: which pro-p groups can be realized as maximal pro-p Galois groups of fields?

For the finitely generated case over fields that contain a primitive root of unity of order p, we have a comprehensive conjecture, known as the Elementary Type Conjecture by Ido Efrat, which claims that every finitely generated pro-p group which can be realized as a maximal pro-p Galois group of a field containing a primitive root of unity of order p, can be constructed from free pro-p groups and finitely generated Demushkin groups, using free pro-p products and a certain semi-direct product.

The main objective of the presented work is to investigate the class of infinitely-ranked pro-p groups which can be realized as maximal pro-p Galois groups. Inspired by the Elementary Type Conjecture, we start our research with 2 main directions: .1 Generalizing the definition of Demushkin groups to arbitrary rank and studying their realization as absolute/ maximal pro-p Galois groups. .2 Investigating the possible realization of a free (pro-p) product of infinitely many absolute Galois groups.

In this talk we focus mainly on the second direction. In particular, we give a necessary and sufficient condition for a restricted free product of countably many Demushkin groups of infinite countable rank, to be realized as an absolute Galois group.