CENTRO DE MATEMÁTICA
UNIVERSIDADE DO PORTO

Algebra, Combinatorics and Number Theory Seminar

Date. Monday, July 07, 2025 - 10am Porto - FC1 007 (and online) [1]

Speaker. Martino Garonzi - Università degli Studi di Ferrara

Title. On profinite groups with many elements with large nilpotentizer and generalizations

Abstract. Let F be a family of finite groups closed under taking subgroups, quotients and finite direct products. Given an element g of a profinite group G, the F-izer of g in G is the set of elements x in G such that $\langle g, x\rangle$ is a pro-F-group. Let $F(G)$ be the set of elements g of G such that the F-izer of g in G has positive Haar measure. In order to understand the set $F(G)$ and its influence on the structure of G, it is crucial to understand whether it is closed in G, whether it is a subgroup of G and whether it admits a purely group-theoretical characterization. The group G is called F-positive if $F(G) = G$. Detomi, Lucchini, Morigi and Shumyatsky proved that if F is the class of finite solvable groups, then F-positivity is equivalent to being virtually prosolvable, and if F is the class of finite nilpotent groups, then F-positivity is equivalent to being finite by pronilpotent. In this talk, we discuss generalizations of these results by relaxing the assumption that $F(G) = G$. Among other things, we prove that if $F(G)$ has positive Haar measure then G is virtually pro-F when F is the class of finite solvable groups or finite p-groups (for a fixed prime p). We also prove that if an element g of G has nilpotentizer of positive Haar measure, then g has finite order modulo the Fitting subgroup of G. This is a joint work with Andrea Lucchini and Nowras Otmen.

arXiv link: `https://arxiv.org/abs/2505.16589`

There will be a coffee break after the seminar.

[1] `https://fc-up-pt.zoom.us/j/85243807260`

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