PhD
THESIS DEFENSE

ON DEHN’S DECISION PROBLEMS IN GENERALIZED THOMPSON’S GROUPS

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PLACE:
- Sala de Grados, Módulo 8, Facultad de Ciencias de la UAM (max. 21 people)
- Online - Jitsi: meet.jit.si/TesisDoctoralArocaLobatoJulio
Abstract

Introduced by Richard Thompson in 1965, Thompson’s classical groups $F$, $T$ and $V$ are important examples of finitely presented subgroups of the group of homeomorphisms of the Cantor set. Historically, $T$ and $V$ were the first examples of infinite, finitely presented simple groups. The main focus of this thesis is a family of generalizations of Thompson’s groups, called symmetric Thompson’s groups, originally introduced by Hughes in the context of Finite Similarity Structure (FSS) groups. They are subgroups of the homeomorphism group of the Cantor set, but now the “local action” is governed by a fixed subgroup of an appropriate symmetric group.

Our first result is a solution of the conjugacy problem for symmetric Thompson’s groups. More concretely, we generalize a construction of Belk-Matucci in order to interpret conjugacy in these groups in terms of certain topological objects called strand diagrams. As a consequence, we are able to conclude that a large class of symmetric Thompson’s groups are pairwise non-isomorphic. Next, in a joint work with C. Bleak (St. Andrews), we give conditions that guarantee the existence of an embedding between pairs of symmetric Thompson’s groups, extending results of Higman and Birget. Moving away from symmetric Thompson’s groups, in collaboration with M. Cumplido (UCM) we introduce a new family of groups that generalize the so-called braided Thompson’s groups of Brin and Dehornoy. Roughly speaking, the difference between our groups and those of Brin and Dehornoy is that we allow for infinite, but recursive, braiding. We show that, as is the case with braided Thompson’s groups, every infinitely braided Thompson’s group is finitely generated.

Thompson’s groups are also strongly related to mapping class groups of infinite-type surfaces, through the so-called asymptotic mapping class groups, which have been extensively studied by Sergiescu, Funar and Kapoudjian mainly. Our final result is a rigidity result for a simplicial complex defined in terms of simple closed curves on a surface; more concretely, we prove that its automorphism group is the extended mapping class group, extending a result of Margalit to the infinite-type setting.