FINAL REPORT OF THE COMMITTEE FOR THE AILA-UMI FRANCO MONTAGNA PRIZE 2025

The Franco Montagna Prize 2025 Committee, composed of Annalisa Conversano, Mauro Ferrari, Mai Gehrke, Martino Lupini, and Giuseppe Metere, commenced its activities in February 2025. The Committee conducted its work through telematic tools and concluded its deliberations on May 16, 2025.

The Committee reviewed the 11 applications received. The candidates for the prize, listed in alphabetical order, are:

- 1. Vittorio CIPRIANI
- 2. Alessandro CODENOTTI
- 3. Nicola CONTUMACCIO
- 4. Anna DE MASE
- 5. Pietro FRENI
- 6. Marina IANNELLA
- 7. Gian Carlo MILANESE
- 8. Pietro SABELLI
- 9. Juan Manuel SANTIAGO SUÀREZ
- 10. Salvatore SCAMPERTI
- 11. Matteo SPADETTO

The Committee welcomed the broad participation and the excellent overall quality of the submitted doctoral theses, which span various areas of Mathematical Logic and offer insights of significant depth and originality.

The Committee by a majority of 3 out of 5, awards the Franco Montagna Prize 2025 to **Martina IANNELLA** for the thesis titled *From real-life to very strong axioms Classification problems in Descriptive Set Theory & regularity properties in Generalized Descriptive Set Theory*, defended at the University of Udine, supervised by Prof. Alberto Marcone (co-supervisor Prof. Vincenzo Dimonte).

In Part I, the candidate studies a family of embeddability relations among linear and circular orders. The thesis investigates both their combinatorial structure and descriptive set-theoretic properties, including the associated equivalence relations. In Part II, the results from Part I are applied to knot theory, establishing anticlassification results; the candidate shows that the equivalence relations on linear and circular orders provide lower bounds for the complexity of natural equivalence relations on knots and proper arcs. This Part also addresses the descriptive set theory of natural geometric classification problems and resolves an open question from 2013. Finally, in Part III, the candidate explores generalized descriptive set theory, particularly dealing with problems at singular cardinals of countable cofinality.

The candidate achieves significant results on all topics, demonstrating originality, independence, and strong technical skills.

According to the Prize regulations, the Committee mentions, by majority vote, candidates Salvatore SCAMPERTI and Juan Manuel SANTIAGO SUÀREZ.

The thesis of **Salvatore SCAMPERTI**, titled *Walking around quasi-orders on graphs, spaces, and their subsets*, defended at the Politecnico di Torino, supervised Prof. Raphaël Carroy and Prof. Luca Motto, addresses topics in descriptive set theory and combinatorics. In particular, it investigates the universality properties of the graph homomorphism relation, the classification of zero-dimensional Polish spaces via the Wadge hierarchy, and suitable generalizations. The candidate obtains solid results across the topics, showing originality, independence, and technical competence.

The thesis of **Juan Manuel SANTIAGO SUÀREZ**, titled *Infinitary logics and forcing*, defended at the Université Paris Cité, supervised by Boban Veličković and Matteo Viale, addresses topics at the intersection of forcing and infinitary logic. It offers substantial contributions to the Boolean-valued model theory of infinitary logics, obtaining appropriate generalizations of foundational notions such as compactness, completeness, interpolation, and omitting types theorems. Moreover, the developed framework is employed to derive deep results and introduce novel forcing tools for infinitary logics. The candidate engages with various relevant topics, showing originality, independence and technical skill.

May 16, 2025

The Committee

Annalisa Conversano Mauro Ferrari Mai Gehrke Martino Lupini Giuseppe Metere