

Rosario Mennuni

Postdoctoral researcher

✉ R.Mennuni@posteo.net
🌐 <http://poisson.phc.dm.unipi.it/~mennuni/>
ORCID [0000-0003-2282-680X](https://orcid.org/0000-0003-2282-680X)
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Professional Experience

- 2024–present **Postdoctoral researcher**, *Università degli Studi di Milano*
- 2021–2024 **Postdoctoral researcher**, *Università di Pisa*
- 2020–2021 **Postdoctoral researcher**, *Westfälische Wilhelms-Universität Münster*

Education

- 2016–2020 **PhD in Mathematics**, *University of Leeds*
Supervisors H. Dugald Macpherson and Vincenzo Mantova
Thesis Invariant types in model theory (<https://etheses.whiterose.ac.uk/26807/>)
- 2013–2016 **Laurea Magistrale in Matematica (M.S.)**, *Università di Pisa*, 110/110 cum laude
Advisor Alessandro Berarducci
Thesis Definable groups, NIP theories, and the Ellis Group Conjecture
- 2009–2013 **Laurea Triennale in Matematica (B.S.)**, *Università di Pisa*, 109/110
Advisor Alessandro Berarducci
Thesis Il Teorema di Keisler-Shelah

Research Interests

Model theory, neostability theory, ordered structures, type spaces, positive logic, mathematical logic

Publications and preprints

- The Amalgamation Property for automorphisms of ordered abelian groups*, with Jan Dobrowolski, *Transactions of the American Mathematical Society*, 377 (2024), 7037–7079, doi: 10.1090/tran/9217.
- The domination monoid in henselian valued fields*, with Martin Hils, *Pacific Journal of Mathematics*, 328(2), 287–323 (2024). doi: 10.2140/pjm.2024.328.287
- Vector spaces with a union of independent subspaces*, with Alessandro Berarducci and Marcello Mamino, *Archive for Mathematical Logic*, 63, 499–507 (2024). doi: 10.1007/s00153-024-00906-9
- Self-divisible ultrafilters and congruences in $\beta\mathbb{Z}$* , with Mauro Di Nasso, Lorenzo Luperi Baglini, Moreno Pierobon and Mariacarla Ragosta, *Journal of Symbolic Logic*. doi: 10.1017/jsl.2023.51
- Some definable types that cannot be amalgamated*, with Martin Hils, *Mathematical Logic Quarterly*, 69, 46–49 (2023). doi: 10.1002/malq.202200046
- On double-membership graphs of models of Anti-Foundation*, with Bea Adam-Day and John Howe, *Bulletin of Symbolic Logic*, 29(1), 128–144 (2023). doi: 10.1017/bsl.2022.37
- The domination monoid in o-minimal theories*, *Journal of Mathematical Logic*, Vol. 22, No. 01, 2150030 (2022). doi: 10.1142/S0219061321500306
- Weakly binary expansions of dense meet-trees*, *Mathematical Logic Quarterly*, 68:32–47 (2022). doi: 10.1002/malq.202000045
- Invariant Types in Model Theory* (Thesis abstract), *Bulletin of Symbolic Logic*, 26(3–4), 296–297 (2020). doi: 10.1017/bsl.2020.25
- Product of invariant types modulo domination-equivalence*, *Archive for Mathematical Logic*, 59, 1–29 (2020). doi: 10.1007/s00153-019-00676-9
- Model-theoretic dividing lines via posets*, with Darío García, arxiv.org/abs/2209.00571

Editorial Activity

- 2023–present **Reviewer**, *The Journal of Symbolic Logic*

2020–present **Reviewer**, *Archive for Mathematical Logic*

Reviews

- 2024 **zbMATH review**, *Z. Ghadernezhad, J. de la Nuez González*, Group topologies on automorphism groups of homogeneous structures, <https://zbmath.org/7807758>
- 2024 **mathscinet review**, *S. Shelah*, Canonical universal locally finite groups, <https://mathscinet.ams.org/mathscinet/article?mr=4575363>
- 2023 **zbMATH review**, *V. Guingona*, On VC-density in VC-minimal theories, <https://zbmath.org/7598586>
- 2023 **zbMATH review**, *G. Metcalfe, L. Reggio*, Model completions for universal classes of algebras: necessary and sufficient conditions, <https://zbmath.org/7657286>
- 2023 **zbMATH review**, *A. Berenstein, E. Vassiliev*, Definable groups in dense pairs of geometric structures, <https://zbmath.org/7541616>

Mentoring and supervision

- 2023 **Supervisor**, of Alessandro Sferlazza (Master Student at Scuola Normale Superiore (Pisa) for his 4th year *colloquio*)
- 2021 **Mentor**, of Simone Ramello (Master Student at the Università di Torino) during his 5 month Erasmus+ traineeship at WWU Münster

Outreach

- 2023 **Responsabile di laboratorio**, *Infinito, infinito più uno, e cose parecchio più grandi*, XIX settimana matematica (outreach event aimed at senior high-school students), Università di Pisa

Scholarships, Awards and Grants

- 2024 Progetto di ricerca GNSAGA: Model Theory and applications to Algebra and Combinatorics (travel grant, 1 year, €3k). Participant
- 2019 London Mathematical Society Postgraduate Research Conference Grant (Scheme 8), towards the organisation of the British Postgraduate Model Theory Conference 2020 (£2k). Cofunded by the School of Mathematics of the University of Leeds (£4k), guaranteed by the British Logic Colloquium (£750). Principal investigator
- 2019 ASL Travel Grant Award to attend “Logic Colloquium 2019”, Prague
- 2018 ASL Travel Grant Award to attend “From Permutation Groups to Model Theory: a Workshop Inspired by the Interests of Dugald Macpherson, on the Occasion of His 60th Birthday”, Edinburgh
- 2017 ASL Travel Grant Award to attend “Set-Theoretic and Topological Methods in Model Theory”, Tezpur
- 2017 ASL Travel Grant Award to attend “Model Theory and Applications”, Mons
- 2017 Premio Tesi 3+2 AILA 2017: Award for one of the best master theses in logic in Italy
- 2016–2020 Leeds Anniversary Research Scholarship

Research Projects

- 2024–present Model Theory and applications to Algebra and Combinatorics, GNSAGA (participant)
- 2023–present PRIN 2022: “Models, sets and classifications” Prot. 2022TECZJA, MUR (participant)
- 2021–2023 PRIN 2017: “Mathematical Logic: models, sets, computability” Prot. 2017NWTM8RPRIN, MIUR (postdoc)
- 2020–2021 GeoMod, ANR-DFG (postdoc)

Conference Talks and Posters

- Generic automorphisms of valued fields (Leeds, Oct '24, invited)
- O-minimality, domination, and preorders (Udine, Sep '24, contributed)
- Generic automorphisms of valued fields (Udine, Sep '24, contributed)
- Positive model theory and automorphisms of ordered structures (Manchester, Jun '24, invited)
- Ultrafilters, congruences, and profinite groups (Pisa, Jun '24, invited)
- O-minimality, domination, and preorders (Freiburg, Nov '23, invited)
- The Amalgamation Property for automorphisms of ordered abelian groups (Pisa, Sep '23, contributed)

- Some definable types in the wild (Leeds, May '23, invited)
- Automorphisms of ordered abelian groups, the Amalgamation Property, and dependent positive theories (Leeds, Jan '23, contributed)
- The domination monoid in henselian valued fields (Colmar, Sep '21, invited)
- Viewpoints on Stability and Forking (mini-course) (Short Model Theory Huddle 2, Jun '21, invited)
- Product of Invariant Types Modulo Domination-Equivalence (Oxford, Sep '19, contributed)
- Product of Invariant Types Modulo Domination-Equivalence (Prague, Aug '19, contributed)
- Domination and Products in Unstable Theories (Leeds, Jan '19, invited)
- Product of Invariant Types Modulo Domination-Equivalence (Manchester, Jan '19, contributed)
- Notions of Domination Between Invariant Types (Tezpur, Sep '17, contributed)
- Product of Invariant Types Modulo Domination-Equivalence (Edinburgh, Sep '18, poster)

Seminar Talks, invited

- Positive model theory and automorphisms of ordered structures (Pisa, Scuola Normale Superiore, Logic seminar)
- Positive logic and automorphisms of ordered abelian groups and valued fields (Napoli, Logic seminar)
- Some definable types in the wild (Münster, Oberseminar Modelltheorie und Gruppen)
- Some definable types in the wild (Lyon, Séminaire Logique Mathématique)
- Ultrafilters, congruences and profinite groups (Freiburg, Oberseminar Logik)
- Automorphisms of ordered abelian groups and dependent positive theories (Bonn, Oberseminar Logik)
- Model theory of ordered abelian groups (Torino, Logic working group)
- Automorphisms of ordered abelian groups and positive logic (Manchester, Logic seminar)
- Automorphisms of ordered abelian groups and positive logic (Caserta, Logic seminar)
- The domination monoid in henselian valued fields (University of East Anglia, Pure mathematics seminar)
- The domination monoid (Konstanz, TDE seminar)
- The domination monoid (Caserta, Logic seminar)
- The domination monoid (Bogotá, Seminario Flotante de Lógica Matemática)
- Product of Invariant Types Modulo Domination-Equivalence (Torino)
- Double-Membership Graphs of Models of Anti-Foundation (Manchester, Logic Seminar)
- Product of Invariant Types Modulo Domination-Equivalence (Imperial College London, Logic Seminar)

Seminar Talks, contributed

- Ordered groups, valued fields, and generic automorphisms (Milano, Seminario di Logica, Algebra e Categorie)
- Teoria dei modelli della doppia appartenenza (Pisa, Seminario di Logica)
- Automorfismi di gruppi abeliani ordinati e logica positiva (Pisa, Seminario di Logica)
- Model theory of double-membership (Münster, Oberseminar Modelltheorie, Geometrie und Gruppentheorie)
- The domination monoid (Münster, Oberseminar Modelltheorie, Geometrie und Gruppentheorie)
- The domination monoid in o-minimal theories (Leeds, online Logic Seminar)
- Domination-equivalence in o-minimal theories (Leeds, Postgraduate Logic Seminar)
- Double-Membership Graphs of Models of Anti-Foundation (Leeds, Models and Sets Seminar)
- The Weird, The Bad, and The Ugly (Leeds, Pure Postgraduate Seminar)
- Morley's Theorem on the Number of Countable Models, (Leeds, Models and Sets Seminar)
- Types, Products and Domination (Leeds, Postgraduate Logic Seminar)
- Domination and Products of Invariant Types: a Counterexample (Leeds, Model Theory Seminar)
- An Infinitesimal Glimpse of Non-Standard Analysis (Leeds, Pure Postgraduate Seminar)
- Notions of Domination Between Invariant Types (Leeds, Model Theory Seminar)
- First-order Quantifiers and Where to Eliminate Them (Leeds, Pure Postgraduate Seminar)
- Externally Definable Sets: An Introduction and An Application (Leeds, Model Theory Seminar)

- Keisler Measures (Leeds, Postgraduate Model Theory and Set Theory Seminar)
- Independent families and RK-incomparable ultrafilters (Pisa)
- Easton forcing (Pisa)

Organisational Duties

- 2022–2024 Organiser of the Logic Seminar, Pisa
- 2024 Local organiser of Ramsey Theory in Logic, Combinatorics and Complexity (RaTLoCC IV), Pisa
- 2023 Organiser of Logical Methods in Ramsey Theory and Related Topics, Pisa
- 2022 Local Organiser of Ultramath 2022, Pisa
- 2020 Organiser of the BPGMT Conference 2020, Leeds
- 2017 Organiser of the BPGMT Conference 2017, Leeds
- 2016–2019 Organiser of the postgraduate logic seminar, Leeds

Research visits

- Oct '24 Leeds, collaboration with Pablo Andújar Guerrero
- Oct '23 Münster, collaboration with Martin Hils
- Oct '23 Lyon, collaboration with Frank Wagner
- May '23 Leeds, collaboration with Pablo Andújar Guerrero and Pantelis Eleftheriou
- May '22 Manchester, collaboration with Jan Dobrowolski

Conferences and Workshops

- Oct 24 MAC 30 - Model theory, Algebra & Combinatorics, Leeds
- Oct 24 Model Theory and Applications to Groups and Combinatorics, Luminy
- Sep '24 XXVIII Incontro di Logica AILA, Udine
- Sep '24 Meeting of the PRIN “Models, sets, and classifications”, Udine
- Jun '24 75th British Mathematical Colloquium, Manchester
- Jun '24 Ramsey Theory in Logic, Combinatorics and Complexity (RaTLoCC IV), Pisa
- Feb '24 BIRS workshop on exponential fields, Banff
- Nov '23 2023 Geomod Conference, Freiburg
- Sep '23 XXII Congresso dell'Unione Matematica Italiana, Pisa
- Jul '23 Logical Methods in Ramsey Theory and Related Topics, Pisa
- May '23 Impromptu Leeds–McMaster model theory days, Leeds
- Jan '23 British Postgraduate Model Theory Conference, Leeds
- Dec '22 Model Theory Conference in celebration of Ludomir Newelski's 60th birthday, Będlewo
- Nov '22 A tale of modules and models, a celebration in honour of Carlo Toffalori on his retirement, Firenze
- Jun '22 Model theory and applications, Cetraro
- Jun '22 Ultramath 2022, Pisa
- Sep '21 AGRUME meeting, Colmar
- Jun '21 Short Model Theory Huddle 2, online
- Apr '21 British Postgraduate Model Theory Conference, online
- May '20 Short Model Theory Huddle, online
- Feb '20 Fifth Workshop on Generalised Baire Spaces, Bristol
- Jan '20 British Postgraduate Model Theory Conference, Leeds
- Sep '19 British Logic Colloquium 2019, Oxford
- Aug '19 Logic Colloquium 2019, Prague
- Jun '19 Applications of the Model Theory of Fields with Operators, Manchester
- Jan '19 Workshop on NIP and Groups, Leeds
- Jan '19 British Postgraduate Model Theory Conference, Manchester
- Sep '18 From Permutation Groups to Model Theory: a Workshop Inspired by the Interests of Dugald Macpherson, on the Occasion of His 60th Birthday, Edinburgh

Aug '18 Model-theoretic Methods in Number Theory and Algebraic Differential Equations, Manchester
 Apr '18 Workshop on model theory of finite and pseudofinite structures, Leeds
 Mar '18 Model Theory and Applications, Paris
 Mar '18 Model Theory of Valued fields, Paris
 Feb '18 Model Theory and Combinatorics, Paris
 Jan '18 British Postgraduate Model Theory Conference, Oxford
 Sep '17 Set-Theoretic and Topological Methods in Model Theory, Tezpur
 Jul '17 Model Theory, Będlewo
 Jun '17 Model Theory in Wrocław 2017, Wrocław
 Jan '17 British Postgraduate Model Theory Conference, Leeds
 Jan '17 Model Theory and Applications, Mons
 Jun '16 International Conference on Model Theory, Notre Dame
 Aug '15 PhD-AILA 2015, Gargnano
 Aug '15 Logic Colloquium 2015, Helsinki
 May '15 COMFORT, Convegno in onore di Marco Forti, Dipartimento di Matematica, Pisa
 Apr '14 XXV incontro dell'Associazione Italiana di Logica e sue Applicazioni, Pisa
 Jan '13 Ultra-Combinatorics, Pisa

Summer/Winter Schools and Research Periods

Jan–Apr '18 Model Theory, Combinatorics and Valued Fields Trimester, Institut Henri Poincaré, Paris
 Jan '18 Research School Model Theory, Combinatorics and Valued Fields, Luminy
 Aug '17 Scuola Estiva di Logica 2017, Gargnano
 Jul '16 Summer School in Tame Geometry, Konstanz
 Jun '16 Thematic Programme on Model Theory, Graduate Summer School, Notre Dame
 Aug '15 Scuola Estiva di Logica 2015, Gargnano
 Jul '15 Scandinavian Logic Society Summer School in Logic 2015, Helsinki

Teaching

Spring '24 Elementi di Teoria degli Insiemi, with Mauro Di Nasso, exercise sessions, Università di Pisa
 Spring '24 Logica Matematica, with Marcello Mamino, part 2/4, Università di Pisa
 Spring '22 Model Theory, postgraduate course, Università di Pisa
 Autumn '19 Computer Workshops (≈ 70 students) for Mathematics 1/Number Systems, University of Leeds
 Autumn '19 Tutorials (≈ 10 students) for MATH1010 Mathematics 1, University of Leeds
 Spring '19 Tutorials (≈ 10 students) for MATH1026 Sets, Sequences and Series, University of Leeds
 Autumn '18 Computer Workshops (≈ 70 students) for Mathematics 1/Number Systems, University of Leeds
 Autumn '18 Tutorials (≈ 10 students) for MATH1025 Number Systems, University of Leeds
 Autumn '17 Computer Workshops (≈ 70 students) for Mathematics 1/Number Systems, University of Leeds
 Autumn '17 Tutorials (≈ 10 students) for MATH1025 Number Systems, University of Leeds
 Spring '17 Tutorials (≈ 10 students) for MATH1026 Sets, Sequences and Series, University of Leeds
 Autumn '16 Computer Workshops (≈ 70 students) for Mathematics 1/Number Systems, University of Leeds
 Autumn '16 Tutorials (≈ 10 students) for MATH1025 Number Systems, University of Leeds

Teaching Training

2024 Attended *Insegnare a insegnare, corso avanzato* (Advanced course on university-level teaching), Università di Pisa
 2024 Attended *Insegnare a insegnare, corso base* (Basic course on university-level teaching), Università di Pisa

Professional Memberships

2021–present Member of Unione Matematica Italiana (UMI)

- 2021–present Member of Associazione Italiana di Logica e Sue Applicazioni (AILA)
- 2020–present Member of Istituto Nazionale di Alta Matematica (INdAM), GNSAGA group
- 2016–2020 Student member of the Association for Symbolic Logic (ASL)

Languages

- Native Italian, Sanferdinandese (Apulian dialect)
- Fluent English
- Basic French, German