

Paolo Marimon

My research is in model theory, a branch of mathematical logic, and constraint satisfaction problems (CSPs), a topic in theoretical computer science. In model theory, I work in interactions between model theory, combinatorics, and the study of probabilistic symmetries. On CSPs, I study computational problems which are naturally represented on well-behaved infinite structures.

Personal Details

Languages Fluent: Italian, Spanish, English. Elementary (A1): German, French, Catalan
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Positions

2023-2025 **Postdoc**, Institut für Diskrete Mathematik & Geometrie. TU Wien. Vienna.
Funded by POCOCOP, ERC Synergy Grant No. 101071674.

Education

2019-2023 **PhD in Pure Mathematics**, Imperial College London.

Admin Roth Scholarship. Supervisors: Prof. David Evans, Dr. Charlotte Kestner.
Thesis: Measures and amalgamation properties in ω -categorical structures.

2018 **Summer Research Project**, University of Oxford.

(July-Sept.) Topic: The Separation of Right Angled Artin Groups (geometric group theory);
with Dr. Richard Wade. University of Oxford.

2015-2019 **Master of Mathematics and Philosophy**, University of Oxford, Worcester College.

Part A and B: First Class. Part C: First Class. (PartA&B correspond to my undergraduate studies).
Dissertation in mathematics: Categoricity for totally transcendental theories; with Prof. Ehud Hrushovski.
Thesis in philosophy: The metaontology of thin objects; with Prof. James Studd.

Articles

2024 **Invariant Keisler measures for ω -categorical structures.**

Journal of Symbolic Logic. Accepted (and published online).

2024 **On the non-measurability of ω -categorical Hrushovski constructions.**

Archive for Mathematical Logic. Accepted (and published online).

Preprints

2024 **When invariance implies exchangeability (and applications to invariant Keisler measures).**

Joint work with Samuel Braunfeld and Colin Jahel. ArXiv:2408.08370. Submitted.

2024 **Minimal operations over permutation groups.**

Joint work with Michael Pinsker. ArXiv:2410.22060. Currently preparing a computer science conference version with title "Polymorphisms and Constraint Satisfaction Problems of non-rigid structures".

Papers in preparation

2025 **Topologies on the endomorphism monoids of countable structures.**

Joint work with Javi de la Nuez Gonzales and Zaniar Ghadernezhad. In preparation.

2025 **Binary operations over permutation groups.**

Joint work with Carl-Fredrik Nyberg Brodda. In preparation.

2025 **When invariance implies exchangeability II.**

Joint work with Artem Chernikov, Samuel Braunfeld, and Colin Jahel. In preparation.

- 2025 **On diagonally canonical polymorphisms.**
Joint work with Philipp Grzywaczyk. In preparation.

Selected Talks and Posters

- Nov 2024 **Minimal operations over permutation groups.** PALS, Panglobal Algebra and Logic Seminar. University of Colorado.
- Oct 2024 **When Invariance Implies Exchangeability.** Peking University Model Theory seminar.
- Sep 2024 Poster: **When Invariance Implies Exchangeability.** Model Theory and Applications to Groups and Combinatorics. CIRM, Luminy.
- Jul 2024 **Exchangeability of Consistent Random Expansions.** Midsummer combinatorial Workshop XXIX, Prague.
- May 2024 **Minimal operations over permutation groups.** 105 Arbeitstagung Allgemeine Algebra - AAA105, Prague.
- Mar 2024 **Minimal operations over permutation groups.** Algebra seminar. Korean Institute of Advanced Studies.
- Mar 2024 **When measures don't care about structure (and when they do).** Logic seminar. Yonsei University.
- Sep 2023 **Measures in homogeneous 3-hypergraphs.** Model Theory Workshop. Wroclaw.
- Jun 2023 **Measures in ternary homogeneous structures.** SEEMOD. University of Oxford.
- Jan 2023 **Invariant Keisler measures in simple ω -categorical structures.** Logic seminar. Carnegie Mellon University.
- Nov 2022 **Universally measure zero non-forking formulas in simple omega-categorical Hrushovski constructions.** 7th French-Kazakh Colloquium in Model Theory. Institut Camille Jordan. Lyon.
- Jul-Aug 2022 Poster: **Invariant Keisler Measures in ω -categorical Hrushovski Constructions.** UNIMOD 2022. I also contributed by typing the exercises for the problem classes.
- Jun 2022 **Invariant Measures in ω -categorical Hrushovski constructions.** SEEMOD & LYMoTS meeting. University of Manchester.
- Mar 2022 **Non-measurability of omega-categorical Hrushovski constructions.** European Conference on Interdisciplinary Model Theory - ECIMT. Münster.
- Jan 2022 **Non-MS-measurability of omega-categorical Hrushovski constructions.** British Postgraduate Model Theory Conference (BPGMTC). Manchester & online.
- Dec 2021 **Non-MS-measurability of omega-categorical Hrushovski constructions.** South and East of England Model Theory Network Conference (SEEMOD). Queen Mary University of London.

Research Visits

- Mar 2024 **Two weeks visits at the Korean Institute of Advanced Studies (KIAS).** Visiting Javi de la Nuez Gonzales. Funded by the KIAS.
- Nov 2022 **One month visit to the Institut Camille Jordan (ICJ),** Université Claude Bernard, Lyon 1, France. Funded by the ICJ.

Organised Reading Groups

- 2023-2024 **CSP reading group.** Organiser. TU Wien, TU Dresden, Charles University (Prague), Leeds and Cambridge. Website with recordings: cspreadinggroup.github.io.
- 2023-2024 **Finite Structures with Few Types,** by Cherlin and Hrushovski. Organiser jointly with Aris Papadopoulos. TU Wien, Leeds, University of Notre Dame, Imperial.
- 2023 "On NSOP₂ theories" by Mutchnik. Organiser. Imperial and Institut Camille Jordan.

Teaching

- 2024-2025 **Model theory II: Stability.** TU Wien. Masters' course. Designing and teaching the course. Lecture notes and recordings available on my website.
- 2023-2025 **Supervising students** at TU Wien: bachelor thesis on "Automorphism groups and Ramsey properties of sparse graphs" by Evans, Hubička, and Nešetřil; bachelor mini-thesis on "The CSP Dichotomy, the Axiom of Choice, and Cyclic Polymorphisms" by Kátay, Tóth, and Vidnyánszky.
- 2024 **Model theory.** TU Wien. Masters' course. Problem classes and problem sheets, available on my website. Lectured twice.
- 2022 **Associate Fellowship of the Higher Education Academy.** Approved through the Imperial College London STAR Framework.
- 2019-2023 **Graduate Teaching Assistant** at Imperial College London: Introduction to University Mathematics (2020, 2022); Introduction to University Mathematics re-sit exam preparation (2021, 2023); Linear Algebra and Groups (2019-2022); Latex workshops for first year projects (2020-2022); Mathematics Pre-Arrival Course (2021-2022); Commutative Algebra (2020).
- 2020-2022 **Senior Graduate Teaching Assistant:** Analysis II (metric spaces and topology).
- 2020-2021 **Personal tutoring** in mathematics and philosophy. Grosvenor Tutors.

Organisation of meetings and conferences

- 2022 SEEMOD. Imperial College London.
- 2024 POCOCOP meeting. TU Wien.

Awards

- 2023 **Runner-up prize for the Mathematics PhD Symposium poster competition.** Imperial College London.
- 2022 **Travel Grant from the Association for Symbolic Logic (ASL)** for Unimod 2022.
- 2017 **Gibbs Prize for FHS Mathematics and Philosophy Part A.** Best performance in Mathematics for Mathematics & Philosophy Part A exams.
- 2016 **Scholarship, Worcester College.** For performance in first year exams.

Professional Development Courses

- 2019-2022 Graduate School and Department of Mathematics of Imperial College London: Teaching: Maths GTA training; Intro to Assessment and Feedback for Learning; Intro to Learning and Teaching; Performative Aspects of Teaching; Microteaching; GTA Retreat for Associate Fellowship to the Higher Education Academy. Management Skills: Time Management for your Doctorate.

Other roles

- 2018-2019 Mathematics & Philosophy representative for MURC (Mathematics Undergraduate Representation Committee) and JCMP (Joint Committee for Mathematics & Philosophy).

Other Interests

- Piano:** Recently playing: Brahms' Intermezzo Op.118 No.2. and Schumann's Arabeske. Op.18.
- Philosophy:** Early analytic philosophy (Frege, Russell, Wittgenstein, and Ramsey). Philosophy of logic, mathematics, and quantum physics. Ethics (Anscombe, Murdoch, Foote, and Midgley).
- Origami:** Advanced practitioner and creator. Interested in uses of origami for mathematics education.
- German:** Taking courses at: Goethe-Institut, London (2023), Innes Institute Vienna (2024).