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.
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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 (July-Sept.) **Summer Research Project**, University of Oxford.
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.
Parts A & B: First Class. Part C: First Class. (Parts A & 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

2025 **Binary symmetries of tractable non-rigid structures**.
Joint work with Michael Pinsker. Fortieth Annual ACM/IEEE Symposium on Logic in Computer Science (LICS). Accepted. This is a conference version of "Minimal operations over permutation groups".

2025 **On the non-measurability of ω-categorical Hrushovski constructions**.
Archive for Mathematical Logic. Volume 64, pages 351–386.

2024 **Invariant Keisler measures for ω-categorical structures**.
Journal of Symbolic Logic. Accepted (and published online).

Preprints

2024 **Minimal operations over permutation groups**.
Joint work with Michael Pinsker. ArXiv:2410.22060. The conference version of this paper, "Binary symmetries of tractable non-rigid structures" is accepted to LICS 2025.

2024 **When invariance implies exchangeability (and applications to invariant Keisler measures)**.
Joint work with Samuel Braunfeld and Colin Jahel. ArXiv:2408.08370. Submitted.

Papers in preparation

2025 **Topologies on the endomorphism monoids of countable structures**.
Joint work with J 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 visit 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.

Organisation of meetings and conferences

2022 SEEMOD. Imperial College London.

2024   POCOCOP meeting. TU Wien. Room, hotel, and restaurant bookings. Event schedule.

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.

2023-2025   **Finite Structures with Few Types**, by Cherlin and Hrushovski. Jointly with Aris Papadopoulos. TU Wien, U. Leeds, U. Notre Dame, Imperial, U. Maryland, U. Torino.

2023   "On NSOP$_2$ 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. 16 lectures+problem classes. 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; visiting student (from ISEER Bhopal) bachelor project on Hall's universal group.

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.

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 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.