

JOSEPH PAUL MACMANUS

N0.27, The Andrew Wiles Building \diamond Oxford, OX2 6GG

EMPLOYMENT

2025 – 2028 Research Fellowship
University of Bristol

EDUCATION

Exp. 2025 DPhil in Mathematics
St Anne's College, University of Oxford
Thesis: *Splittings, Tiles, and Planarity*, with Panagiotis Papazoglou

2021 MSc in Mathematics and Foundations of Computer Science
Balliol College, University of Oxford
with Distinction

2020 BSc in Mathematics and Computer Science
University of Bristol
with First Class Honours

2017 Ysgol Aberconwy Sixth Form

2017 Coleg Llandrillo

SCHOLARSHIPS, GRANTS, AND PRIZES

2023 – 2025 Graduate Development Scholarship — St Anne's College, Oxford

2021 – 2025 HDP Scholarship — Heilbronn Institute for Mathematical Research

2020 Postgraduate Grant — The James Pantyfedwen Foundation

2020 Graphcore Prize — University of Bristol

2019 Top Student in 2nd Year Maths and Comp Sci. — University of Bristol

2019 Undergraduate Summer Research Bursary — University of Bristol

TEACHING EXPERIENCE

2023 – 2025 Tutor — University of Oxford

Subjects taught:

- M1 Linear Algebra I, II,
- M1 Groups and Group actions,
- M2 Analysis I, II, III,
- M4 Geometry (Revisions),
- A2.1 Metric Spaces,
- A3 Rings and Modules (Revisions),
- A5 Topology,
- ASO Group Theory,
- C2.4 Infinite Groups,
- C3.2 Geometric Group Theory (Consultation sessions).

Merton, The Queen's, & St Anne's Colleges, and Intercollegiate.

2021 – 2023 Teaching Assistant — University of Oxford

Subjects taught:

- B3.5 Topology & Groups,
- C3.2 Geometric Group Theory,
- B1.2 Set Theory;
- M4 Geometry,
- A3 Rings and Modules,
- A5 Topology.

The Queen's College, and Intercollegiate.

2019 – 2020 Teaching Assistant — University of Bristol

Subjects taught:

- Algorithms,
- Data Structures & Algorithms,
- Combinatorics.

2018 – 2025 Private Tutor — Metatutor; Tutorful; Blue Education

OUTREACH TEACHING

2024 Fibonacci Programme — Balliol College, Oxford

Topics:

- Symmetry Groups,
- Theory of Computation,
- MAT Workshop,
- Eigenvalues and Linear Algebra,
- Hamming Codes.

2023 Monday Maths — Balliol College, Oxford

2021 UNIQ Summer School — University of Oxford

STUDENT SUPERVISION

2025 Arya Saranathan - Undergraduate Summer Research Project

Co-supervised with Davide Spriano

PREPRINTS

- [1] MacManus, J. (2024). A note on quasi-transitive graphs quasi-isometric to planar (Cayley) graphs. *Preprint*.
- [2] Baligács, J., MacManus, J. (2024). The metric Menger problem. *Preprint*.
- [3] MacManus, J., Mineh, L. (2024). Tiling in some nonpositively curved groups. *Submitted*.
- [4] MacManus, J. (2023). Accessibility, planar graphs, and quasi-isometries. *Submitted*.

PUBLICATIONS

- [1] MacManus, J. (2024). Fat minors in finitely presented groups. To appear in *Combinatorica*.
- [2] MacManus, J. (2024). Deciding if a hyperbolic group splits over a given quasiconvex subgroup. To appear in *Groups, Geometry, and Dynamics*.

- [3] Alexandru, C. -M., Bridgett-Tomkinson, E., Linden, N., MacManus, J., Montanaro, A., & Morris, H. (2020). Quantum speedups of some general-purpose numerical optimisation algorithms. *Quantum Science and Technology*, 5(4), 045014.

INVITED CONFERENCE TALKS

1. Workshop on the Coarse Geometry of Groups and Spaces, ICMS, Edinburgh (Upcoming, July 2027) — *TBC*
2. World of Geometric Group Theory IV, Online (September 2024) — *Coarsely characterising planarity in Cayley graphs*

CONTRIBUTED CONFERENCE TALKS

1. *Tilings in groups* — ITMAIA, University of Exeter (February 2024).
2. *Characterising surface groups* — ECSTASy, University of Southampton (August 2023).
3. *Understanding limit sets via finite automata* — PGTC, Heriot-Watt University (July 2023).

EXTERNAL SEMINAR TALKS

1. Theoretical Computer Science Seminar, Jagiellonian University (April 2025) — *Asymptotic minors of Cayley graphs*
2. Group Theory Seminar, ICMAT (March 2025) — *Coarse characterisations of planarity in Cayley graphs*
3. Geometry and Topology Seminar, University of Bristol (October 2024) — *Coarse characterisations of planarity in Cayley graphs*
4. Geometry and Topology Seminar, University of Warwick (February 2024) — *Groups quasi-isometric to planar graphs*
5. Junior Geometry Seminar, University of Cambridge (April 2023) — *Splitting detection, and limit set complements*
6. Junior Geometry Seminar, University of Bristol (February 2023) — *Will it split? Recognising edge groups in hyperbolic groups*

OTHER ACTIVITIES

Ongoing Reviewer:

Journals:

- Journal of Combinatorial Theory, Series B,
- Electronic Journal of Combinatorics.

2022 – 2024 Admissions Interviewer — University of Oxford

Colleges:

- St Anne's College,
- St Edmund Hall.

2022 – 2023 Seminar Organiser — University of Oxford

Junior Topology and Group Theory

2021 Maths Admissions Test (MAT) Marker — University of Oxford