

DR JOSEPH PAUL MACMANUS

Room 1.20, The Fry Building ◊ Bristol, BS8 1UG

EMPLOYMENT

- 2025 – 2028 Heilbronn Research Fellowship
University of Bristol

EDUCATION

- 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

- Upcoming Graduate Lecture Course — Taught Course Centre
Topic: Coarse Graph Theory.
Bath, Bristol, Oxford, Warwick, & Swansea Universities, and Imperial College London.
- 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.

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] Heim, P., MacManus, J., Mineh, L. (2026). Realising all countable groups as QI groups. *Submitted*.
- [2] MacManus, J. (2025). Vertex-transitive graphs with uniformly bisecting quasi-geodesics. *Submitted*.
- [3] MacManus, J. (2024). A note on quasi-transitive graphs quasi-isometric to planar (Cayley) graphs. *Preprint*.
- [4] Baligács, J., MacManus, J. (2024). The metric Menger problem. *Preprint*.
- [5] MacManus, J. (2023). Accessibility, planar graphs, and quasi-isometries. *Submitted*.

PUBLICATIONS

- [1] MacManus, J. P., Mineh, L. (2026). Tiling in some nonpositively curved groups. To appear in *Transactions of the American Mathematical Society*.
- [2] MacManus, J. P. (2025). Fat minors in finitely presented groups. *Combinatorica*, 45(4), 40.
- [3] MacManus, J. P. (2024). Deciding if a hyperbolic group splits over a given quasiconvex subgroup. *Groups, Geometry, and Dynamics* (published online first).

- [4] 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. AMS Sectional Meeting, North Dakota State University (Upcoming, April 2026) — *Monotileable groups*
3. 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. Isaac Newton Institute, Cambridge, OGG Colloquium (November 2025) — *All countable groups are full QI-groups*
2. Jagiellonian University, Theoretical Computer Science Seminar (April 2025) — *Asymptotic minors of Cayley graphs*
3. ICMAT, Madrid, Group Theory Seminar (March 2025) — *Coarse characterisations of planarity in Cayley graphs*
4. University of Bristol, Geometry and Topology Seminar (October 2024) — *Coarse characterisations of planarity in Cayley graphs*
5. University of Warwick, Geometry and Topology Seminar (February 2024) — *Groups quasi-isometric to planar graphs*
6. University of Cambridge, Junior Geometry Seminar (April 2023) — *Splitting detection, and limit set complements*
7. University of Bristol, Junior Geometry Seminar (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