

Sam Shepherd

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EDUCATION

- 2017-2021 Current DPhil student in Mathematics, Balliol College, **University of Oxford**
Supervisor: Professor Martin Bridson
- 2016-2017 MMath Mathematics, Trinity College, **University of Cambridge**
Awarded a distinction. Part III Essay, 'Culler-Vogtmann Outer Space'.
- 2013-2016 BA Mathematics, Trinity College, **University of Cambridge**
First class in every year.

RESEARCH INTERESTS

Geometric Group Theory and Topology; including CAT(0) cube complexes and specialness, Leighton's graph covering theorem and generalisations, and quasi-isometric rigidity.

PUBLICATIONS

- *Quasi-isometric rigidity for graphs of virtually free groups with two-ended edge groups* (joint with Daniel J. Woodhouse), [arXiv:2007.10034](https://arxiv.org/abs/2007.10034), 2020
- *Leighton's Theorem: extensions, limitations, and quasitrees* (joint with Martin R. Bridson), [arXiv:2009.04305](https://arxiv.org/abs/2009.04305), 2020
- *Two generalisations of Leighton's theorem* (with an appendix by Giles Gardam and Daniel J. Woodhouse), [arXiv:1908.00830](https://arxiv.org/abs/1908.00830), 2019
- *Agol's theorem on hyperbolic cubulations*, [arXiv:1905.06199](https://arxiv.org/abs/1905.06199), 2019, Rocky Mountain J. Math., to appear

TEACHING

Oxford Maths Department problem classes: tutor for Part C Infinite Groups 2020, and teaching assistant for Part C Geometric Group Theory 2019 and 2020, Part C Infinite Groups 2019, Part B Topology and Groups 2018, Part B Geometry of Surfaces 2017. Small group tutorial teaching at Queen's College for algebra, 2020.

INVITED TALKS

- [Münster Geometric Group Theory Seminar](#), Münster, November 2020
- [McGill Geometric Group Theory Seminar](#), McGill University, September 2020
- [Geometry and Topology Seminar](#), CUNY, September 2020
- [Topology and Geometric Group Theory Seminar](#), Ohio State University, August 2020
- [Geometry Graduate Colloquium](#), ETH Zurich, February 2020
- [Graduate Geometry Seminar](#), Bristol, February 2020
- [Reading group on cube complexes](#), Cambridge, June 2019

- *Graduate Geometry Seminar*, Cambridge, February 2019
- *Graduate Topology and Group Theory Seminar* (five talks), Oxford, 2018-2020

CONFERENCE PARTICIPATION

- *Geometric group theory without boundaries*, online, July 2020
- *Topology students workshop*, online, July 2020
- *Virtual geometric group theory*, online, CIRM, June 2020
- *Young geometric group theory IX*, Saint-Jacut-de-la-mer, February 2020
- *Interactions between geometry, dynamics and group theory*, Bristol, January 2020
- *Geometry and analysis*, Oxford, September 2019
- *Young geometric group theory VIII*, Bilbao, July 2019
- *Aspects of non-positive and negative curvature in group theory*, CIRM, June 2019
- *Non-positive curvature*, IMPAN, Warsaw, May 2019
- *Graphs, surfaces, and cube complexes*, Warwick, July 2018
- *Outer space and outer automorphism groups*, Warwick, April 2018
- *Geometry of Teichmüller space and mapping class groups*, Warwick, April 2018
- *Young geometric group theory VII*, Les Diablerets, March 2018

SERVICE AND INCLUSION ACTIVITIES

- Oxford Maths Festival volunteer (public outreach), 2018-2020
- Organiser of Junior Topology and Group Theory Seminar, Oxford, 2018-19
- UNIQ+ buddy, Oxford research internship for widening access, 2019
- Scribed for blind students in Oxford entrance interviews and assessments, 2017
- IntoUniversity volunteer (widening access), Walworth, summer 2017
- Cambridge Maths Fair volunteer (public outreach), 2017
- Cambridge shadowing scheme mentor, 2014

EARLY RESEARCH EXPERIENCE

JUNE-AUGUST 2016	Summer Research Student at Sainsbury Laboratory, Cambridge <i>Cambridge Maths Dept PMP Scheme</i> Worked on a bioinformatics project with Dr Daphne Ezer; statistically analysed G-boxes in plant DNA (using R programming). Gave two talks and a poster presentation at the end of the project.
JULY-AUGUST 2015	Summer Research Student at Imperial College, London <i>Imperial College London UROP programme</i> Worked on a project in probability theory with Dr Aleksandar Mijatović; based on the Markov Chain Central Limit Theorem.