

William Rushworth - Curriculum Vitae

PERSONAL INFORMATION

Department of Mathematics
Syracuse University
United States
willrushworth@posteo.net
+1 3653661337

Born 5 August 1991, United Kingdom; British citizen.

EMPLOYMENT

Syracuse University, Philip T. Church Postdoctoral Fellow, 2021-23

McMaster University, Postdoctoral Fellow, 2018-21

EDUCATION

Durham University

PhD, 2018

- Thesis: *Virtual knot homology and concordance*, supervised by Prof. Andrew Lobb.

University of Leeds

MPhys, BSc Theoretical Physics, First class, 2014

- Masters Thesis: *Integrable systems of Calogero-Moser type*, supervised by Prof. Simon Ruijsenaars.

PUBLICATIONS

Minimal crossing number implies minimal supporting genus, with Hans U. Boden. **Bull. Lond. Math. Soc.** 53, 2021. Preprint available [here](#).

On ribbon graphs and virtual links, with Scott Baldridge and Louis Kauffman. Submitted. Preprint available [here](#).

Generalized Fishburn numbers and torus knots, with Colin Bijaoui, Hans U. Boden, Beckham Myers, Robert Osburn, Aaron Tronsgard, and Shaoyang Zhou. **J. Combin. Theory Ser. A** 178, 2021. Preprint available [here](#).

Virtual Khovanov homology, expository article (peer reviewed). In the *Encyclopedia of Knot Theory*, CRC Press, 2021.

Ascent concordance, accepted for publication in **Algebr. Geom. Topol.** Preprint available [here](#).

A parity for 2-colourable links, accepted for publication in **Osaka J. Math.** Preprint available [here](#).

Additional gradings on generalisations of Khovanov homology and invariants of embedded surfaces, with Vassily Manturov, **J. Knot Theory Ramifications** 27 (9), 2018. Preprint available [here](#).

Computations of the slice genus of virtual knots, **Topology Appl.** 253, 2019. Preprint available [here](#).

Doubled Khovanov homology, **Canad. J. Math.** 70, 2018. Preprint available [here](#).

SELECTED TALKS Session: *Knots and Braids in Dimensions 3 and 3.5*, Nearly Carbon Neutral Geometric Topology conference, June 2021

Special Session: *Low-dimensional topology*, Canadian Mathematical Society Summer Meeting, June 2021

Trends in Low Dimensional Topology, virtual seminar, May 2020

~~Special Session: *Low dimensional topology*, Canadian Mathematical Society Summer Meeting, June 2020, Meeting postponed~~

~~Special Session: *Knots and Links in 3-Manifolds*, American Mathematical Society Spring Central Sectional Meeting, April 2020 Meeting cancelled~~

Topology seminar, Dartmouth College, February 2020

Special Session: *Topology*, Canadian Mathematical Society Winter Meeting, December 2019

Geometry and Topology seminar, University of Waterloo, November 2019

Special Session: *Topology*, Canadian Mathematical Society Winter Meeting, December 2018

Transpennine Topology Triangle, University of Sheffield, January 2018

Scottish Topology Seminar, University of Aberdeen, October 2017

Geometry and Topology seminar, Durham University, October 2017

Russian-Chinese Conference on Knot Theory and Related Topics, Bauman State Technical University, July 2017 (delivered remotely)

EL:ECTRIC postgraduate topology conference, University of Sheffield, June 2017

TEACHING

Student research supervision

- 2020–21 Fall Supervisor: MATH 4W03 reading course on algebraic topology for Matthew How. McMaster University.
Topics included: the fundamental group, simplicial and cellular homology, cohomology.
- 2020–21 Fall Supervisor: MATH 4W03 reading course on Khovanov homology and mutation for Karim Eltanahy. McMaster University.
- 2019–20 Summer Co-supervisor: Stewart Award recipient Matthew How (undergraduate summer research project), McMaster University.
Topics included: low-dimensional manifolds, Dehn surgery, Kirby calculus, the Casson invariant.
- 2018–19 Summer Co-supervisor: *An exploration of quantum invariants of knots and modularity*, Fields Undergraduate Summer Research Program, Fields Institute.
Topics included: the (coloured) Jones polynomial, Khovanov homology, skein algebras.

At McMaster University:

- 2020–21 Winter Instructor: MATH 3T03 Inquiry In Topology.
- 2020–21 Fall Instructor: MATH 1B03 Linear Algebra I.
- 2019–20 Winter Instructor: MATH 3T03 Inquiry In Topology. (No evaluations due to Covid19)
- 2019–20 Winter Instructor: MATH 1B03/1ZC3 Linear Algebra I / Engineering Mathematics II. (No evaluations due to Covid19)
- 2018–19 Winter Instructor: MATH 1B03/1ZC3 Linear Algebra I / Engineering Mathematics II. [Evaluations](#)
- 2018–19 Fall Instructor: MATH 2Z03 Engineering Mathematics III. [Evaluations](#)

At Durham University:

- 2016–17 Teaching Assistant: Analysis I, Linear Algebra I, Algebra II
- 2015–16 Teaching Assistant: Analysis I, Linear Algebra I, Calculus I

AWARDS

- 2012 Undergraduate Research Bursary, Institute of Physics

SERVICE & ACTIVITIES

Co-organizer of *Workshop on Link Homology and Concordance*, three-day workshop at the Fields Institute, Toronto. Supported by the Fields Institute and the National Science Foundation.

Referee for **J. Knot Theory Ramifications**, **Canad. Math. Bull.**, **Bull. Lond. Math. Soc.**, **European J. Combin.**

Part of the Association for Women in Mathematics Mentor Network.