

Patrick Naylor

Curriculum Vitae

University of Waterloo
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🌐 <https://www.patricknaylor.org>

Research Interests:

Low dimensional and geometric topology: in particular, questions about 3- and 4-manifolds, knotted surfaces, and trisections of 4-manifolds.

Education

- 2016–Present **PhD, Pure Mathematics**, *University of Waterloo*
Advised by Doug Park.
- 2015–2016 **MMath, Pure Mathematics**, *University of Waterloo*
- 2011–2015 **BSc Honours, Pure Mathematics**, *University of Manitoba*

Research Visits

- Fall 2019 **Visiting Student**, *Max Planck Institute for Mathematics*
- Fall 2018 **Visiting Student**, *University of Georgia*

Papers and Preprints

8. N. Castro, P. Naylor, **Low complexity relative trisections**. In preparation.
7. M. Miller, P. Naylor, **Trisections of non-orientable 4-manifolds**. arXiv:2010.07433. Submitted.
6. G. Islambouli, P. Naylor, **Multisections of 4-manifolds**, arXiv:2010.03057. Submitted.
5. P. Naylor, H. Schwartz, **Gluck twisting roll-spun knots**, arXiv:2009.05703. Submitted.
4. P. Naylor, **Trisection diagrams and twists of 4-manifolds**, arXiv:1906.01495. Submitted.
3. R. Craigen, C. Desmarais, T. Eaton, P. Naylor, **Negacyclic Weighing Matrices**. Submitted.
2. A. Beyaz, P. Naylor, S. Onaran, D. Park, **From automorphisms of Riemann surfaces to smooth 4-manifolds**, *Math. Res. Lett.* 27(3), 629-645, 2020.
1. A. Clay, C. Desmarais, P. Naylor, **Testing bi-orderability of knot groups**, *Canad. Math. Bull.* 59(3), 472-482, 2016.

Awards and Honours

Academic

- 2021 **Ontario Graduate Scholarship**, *University of Waterloo*
- 2017-2020 **NSERC Alexander Graham Bell CGS-D Scholarship**, *University of Waterloo*
- 2016-2020 **President's Graduate Scholarship**, *University of Waterloo*
- 2018 **NSERC CGS-D MSFSS Scholarship**, *University of Waterloo*
- 2018 **David Johnston International Experience Award**, *University of Waterloo*
- 2016 **NSERC CGS-M Scholarship**, *University of Waterloo*

- 2015 **Special Graduate Scholarship**, *University of Waterloo*
- 2013; 2014 **Agnes Stewart Hart Award in Mathematics**, *University of Manitoba*
- 2013 **Faculty of Science Undergraduate Research Award**, *University of Manitoba*
- 2013 **Track & Field/Cross Country Athletic Award**, *University of Manitoba*
- 2012; 2013 **President's Scholarship**, *University of Manitoba*
- 2011 **Canadian Association of Physicists Award**
For high performance on the CAP national physics contest.

Talks

Invited Talks

- Nov 2020 MIT Topology Seminar (online)
- Oct 2020 AMS Special Session on Knotted Surfaces and Concordances (online)
- Sep 2019 Workshop on 4-manifolds (lightning talk), Max Planck Institute for Mathematics
- Jun 2019 CMS Summer Meeting Topology Session, University of Regina
- May 2019 Quantum Gravity Seminar, Perimeter Institute for Theoretical Physics
- Mar 2019 Joint Pure Math and C&O Graduate Student Colloquium, University of Waterloo
- Mar 2018 Geometry and Topology Seminar, McMaster University
- Sep 2017 Pure Math Graduate Student Colloquium, University of Waterloo

Selected Seminar Talks

- 2018-Present GT GAPS Seminar (online)
- 2019-Present Geometry Working Seminar, University of Waterloo
 - 2020 TQFT and Frobenius Algebras Learning Seminar, University of Waterloo
 - 2018 Topology Student Seminar, University of Georgia
- 2017–2018 Topology and Geometry Learning Seminar, University of Waterloo
- 2016–2018 Algebraic Geometry Learning Seminar, University of Waterloo
- 2015–2016 Ring Theory Learning Seminar, University of Waterloo

Conferences Attended

- Oct 2020 AMS Special Session on Knotted Surfaces and Concordances (online)
- Jun 2020 Virtual Summer Trisectors Workshop (online)
- Jun 2020 Nearly Carbon Neutral Geometric Topology Conference (online)
- Nov 2019 Unifying 4-dimensional Knot Theory, Banff International Research Station
- Sep 2019 Workshop on 4-manifolds, Max Planck Institute for Mathematics
- Jul 2019 Four manifolds: Confluence of High and Low Dimensions, The Fields Institute
- Jun 2019 Canadian Mathematical Society Summer Meeting, University of Regina
- Apr 2019 Spring Trisectors Meeting, University of Georgia
- Dec 2018 Virginia Topology Conference, University of Virginia
- Dec 2018 Canadian Mathematical Society Winter Meeting, Vancouver
- Jun 2018 Topology Students Workshop, Georgia Institute of Technology

- Mar 2018 1st Canadian Geometry and Topology Seminar, The Fields Institute
Dec 2017 Canadian Mathematical Society Winter Meeting, University of Waterloo
Dec 2016 Canadian Mathematical Society Winter Meeting, Niagara Falls

Teaching

- Spring 2020 **Instructor**, *University of Waterloo*
Math 235: Linear Algebra 2 for Honours Math (Online)
- 2015–Present **Teaching Assistant**, *Department of Pure Mathematics, University of Waterloo*
TA for a wide variety of undergraduate, graduate, and online math courses.
- 2013–2015 **Teaching Assistant**, *Department of Mathematics/Statistics, University of Manitoba*
TA for introductory mathematics and statistics courses.

Service and Extracurricular

- 2020–Present **Math Circles Presenter**, *CEMC, University of Waterloo*
Ran math enrichment workshops for high school students, organized by the *Center for Education in Math and Computing* (CEMC) at the University of Waterloo.
- 2020–Present **CEMC Contest Committee**, *CEMC, University of Waterloo*
Committee to generate contest problems for national high school math contests.
- 2020–Present **CEMC Problem of the Month Committee**, *CEMC, University of Waterloo*
Committee to generate difficult “problems of the month” for enthusiastic high school students across Canada.
- 2016–Present **Math Contest Marker**, *CEMC, University of Waterloo*
Marker for national high school math contests run by the University of Waterloo.
- 2020 **Camp Euclid Mentor**, *Euclid Lab*
Mentor for an online mathematical research enrichment program for high school students, organized by David Gay (University of Georgia).
- 2013–2015 **Undergraduate Research Assistant**, *Department of Mathematics, University of Manitoba*
with Adam Clay in 2014 and 2015, with Andriy Prymak in 2014, and with Robert Craigen in 2013.
- 2012–2014 **CIS Academic All Canadian**, *University of Manitoba*
Maintaining an 80% average while competing on the varsity track team.
- 2009–2011 **National Triathlon Age Group Medalist**, *Kelowna, British Columbia*
Silver medalist (2009), and gold medalist (2010, 2011) in the U19 division.

Interests

Playing piano, track and field, cycling, being a master chef for departmental BBQs.