

ZACHARY WINKELER

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EDUCATION

Ph.D., Mathematics, *Dartmouth College*, Hanover, NH (expected) Spring 2022

- Advisor: Ina Petkova

A.M., Mathematics, *Dartmouth College*, Hanover, NH Spring 2019

B.S., Computer Science and Mathematics, *Northeastern University*, Boston, MA Spring 2017

PAPERS

Khovanov homology for links in thickened multipunctured disks

- Preprint: [arXiv:2106.03834](https://arxiv.org/abs/2106.03834)

TALKS

2022 Joint Mathematics Meetings (planned) January 2022

- *AMS Special Session on Knots, Links, 3-manifolds, ... and 4-manifolds*

Binghamton University Graduate Combinatorics, Algebra, and Topology Conference (BUGCAT) (planned) November 2021

Dartmouth Topology Seminar (planned) October 2021

Dartmouth Graduate Student Seminar (Various Topics) 2019 - 2021

PROJECTS

Computing knot/tangle invariants (with Samuel Tripp)

- Designed program in Python to compute Ina Petkova's and Vera Vértési's tangle Floer homology: <https://github.com/samueltripp/tanglefloer>
- Wrote code in Macaulay2 to compute Nate Dowlin's spectral sequence from Khovanov homology to knot Floer homology: <https://github.com/zach-winkeler/khovanov-ss>

TEACHING

Course Instructor, *Dartmouth College*, Hanover, NH Fall 2019 - Fall 2021

- Math 22, Linear Algebra with Applications (Fall 2021)
- Math 13, Calculus of Vector-valued Functions (Fall 2020)
- Math 1, Introduction to Calculus (Fall 2019)

Teaching Assistant, *Dartmouth College*, Hanover, NH Fall 2017 - Spring 2019

- Math 22, Linear Algebra with Applications (Spring 2019)
- Math 13, Multivariable Calculus (Winter 2018)
- Math 11, Accelerated Multivariable Calculus (Fall 2018)

- Math 22, Linear Algebra with Applications (Fall 2017)

Teaching Assistant, *Northeastern University*, Boston, MA

Fall 2014 - Spring 2017

- CS 2500, Fundamentals of CS I
- CS 2510, Fundamentals of CS II
- CS 3800, Theory of Computation
- CS 7805, Theory of Computation

PROGRAMS ATTENDED

2022 Joint Mathematics Meetings , <i>Seattle, WA</i>	(planned) January 2022
Binghamton University Graduate Combinatorics, Algebra, and Topology Conference (BUGCAT) , (<i>virtual</i>)	(planned) November 2021
Foam Evaluation , <i>ICERM (virtual)</i>	(planned) November 2021
Perspectives on Knot Homology , <i>BIRS (virtual)</i>	May 2021
QUANtum groups, Categorification, Knot invariants, and Soergel bimodules (QUACKS) , (<i>virtual</i>)	August 2020
Categorification Learning Seminar , (<i>virtual</i>)	Summer - Fall 2020
Interactions of Gauge Theory with Contact and Symplectic Topology in Dimensions 3 and 4 , <i>BIRS (virtual)</i>	June 2020
Nearly Carbon Neutral Geometric Topology Conference , (<i>virtual</i>)	June 2020
Perspectives on Dehn Surgery , <i>ICERM</i>	July 2019

PROFESSIONAL ACTIVITIES

Topology Reading Seminar (co-organizer) , <i>Dartmouth College</i>	2018 - 2021
Teaching Seminar , <i>Dartmouth College</i>	Summer 2019

EDUCATIONAL OUTREACH

Directed Reading Program , <i>Dartmouth College</i> , Hanover, NH	Winter 2021
<ul style="list-style-type: none"> • The Curry-Howard Isomorphism 	
GIV Summer Math Immersion , <i>University of Vermont</i> , Burlington, VT	Summer 2019 - 2021
<ul style="list-style-type: none"> • Impartial Games (Summer 2019) • Programming with Circles and Arrows (Summer 2020, virtual) • Partizan Combinatorial Games (Summer 2021, virtual) 	
Exploring Mathematics 2019 , <i>Dartmouth College</i> , Hanover, NH	Summer 2019
Rainstorm , <i>Learning Unlimited (virtual)</i>	Fall 2020 - Summer 2021
<ul style="list-style-type: none"> • How to Win at (Some) Games (Fall 2020, Spring 2021) • How to Win at (Some More) Games (Spring 2021) • If It's Knot Theory Then What Is It? (Summer 2021) • It's Sort Of Math (Summer 2021) 	

Splash/Waterfall, *Northeastern University*, Boston, MA

Spring 2014 - Spring 2017

- How to Count to Infinity (Spring 2017)
- How to Program with Circles and Arrows (Spring 2017)
- How to Add Things that Aren't Really Numbers (Fall 2016)
- How to Beat Your Friends at Tic-Tac-Toe (Fall 2015, Spring 2016)
- A Crash Course in Calculus (Spring 2014)

AWARDS

Gridley Fellowship, *Dartmouth College*, Hanover, NH

Fall 2017 - Spring 2018

Dean's List, *Northeastern University*, Boston, MA

Fall 2013 - Spring 2017