

ZACHARY WINKELER

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ACADEMIC POSITIONS

Visiting Assistant Professor, *Smith College*, Northampton, MA Fall 2022 - Present

EDUCATION

Ph.D., Mathematics, *Dartmouth College*, Hanover, NH Summer 2022

- Advisor: Ina Petkova
- Thesis: Spectral sequences and Khovanov homology

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

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

PAPERS

On the invariance of the Dowlin spectral sequence (with S. Tripp)

- Preprint: [arXiv:2207.14415](https://arxiv.org/abs/2207.14415)

Khovanov homology for links in thickened multipunctured disks

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

TALKS

2022 Joint Mathematics Meetings April 2022

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

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

Dartmouth Topology Seminar October 2021

Dartmouth Graduate Student Seminar (Various Topics) 2019 - 2022

PROJECTS

Computing knot/tangle invariants (with S. 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 11, Accelerated Multivariable Calculus (Fall 2018)
- Math 13, Multivariable Calculus (Winter 2018)
- Math 22, Linear Algebra with Applications (Fall 2017)

Teaching Assistant, *Northeastern University*, Boston, MA

Fall 2014 - Spring 2017

- CS 7805, Theory of Computation (Spring 2017)
- CS 3800, Theory of Computation (Spring 2016)
- CS 2510, Fundamentals of CS II (Spring 2015)
- CS 2500, Fundamentals of CS I (Fall 2014)

PROGRAMS ATTENDED

2022 Joint Mathematics Meetings, (*virtual*) April 2022

Recent Developments in Link Homology, *SwissMAP* (*virtual*) February 2022

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

Foam Evaluation, *ICERM* (*virtual*) November 2021

Perspectives on Knot Homology, *BIRS* (*virtual*) May 2021

QUANtum groups, Categorification, Knot invariants, and Soergel bimodules (QUACKS), (*virtual*) August 2020

Categorification Learning Seminar, (*virtual*) Summer - Fall 2020

Interactions of Gauge Theory with Contact and Symplectic Topology in Dimensions 3 and 4, *BIRS* (*virtual*) June 2020, March 2022

Nearly Carbon Neutral Geometric Topology Conference, (*virtual*) June 2020

Perspectives on Dehn Surgery, *ICERM* July 2019

UCLA Topology Workshop 2018, *UCLA* January 2018

PROFESSIONAL ACTIVITIES

Topology Reading Seminar (co-organizer), *Dartmouth College* 2018 - 2021

Teaching Seminar, *Dartmouth College* Summer 2019

LaTeX Workshop (co-organizer), *Dartmouth College* Fall 2018 - Winter 2020

MENTORING

Summer Hybrid Undergraduate Research (SHUR) 2022, *Dartmouth College* Summer 2022

Directed Reading Program, *Dartmouth College* Winter 2021

- The Curry-Howard Isomorphism

EDUCATIONAL OUTREACH

Rainstorm , <i>Learning Unlimited (virtual)</i>	Fall 2020 - Winter 2022
<ul style="list-style-type: none">• If It's Knot Theory Then What Is It? (Summer 2021)• It's Sort Of Math (Summer 2021)• How to Win at (Some More) Games (Spring 2021)• How to Win at (Some) Games (Fall 2020, Spring 2021, Winter 2022)	
GIV Summer Math Immersion , <i>University of Vermont</i> , Burlington, VT	Summer 2019 - 2021
<ul style="list-style-type: none">• Partizan Combinatorial Games (Summer 2021, virtual)• Programming with Circles and Arrows (Summer 2020, virtual)• Impartial Games (Summer 2019)	
Exploring Mathematics 2019 , <i>Dartmouth College</i> , Hanover, NH	Summer 2019
Splash/Waterfall , <i>Northeastern University</i> , Boston, MA	Spring 2014 - 2017
<ul style="list-style-type: none">• 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)	
Let's Get Ready , <i>Let's Get Ready</i> , Boston, MA	Fall 2013 - Spring 2017
AWARDS	
Gridley Fellowship , <i>Dartmouth College</i> , Hanover, NH	Fall 2017 - Spring 2018
Dean's List , <i>Northeastern University</i> , Boston, MA	Fall 2013 - Spring 2017