Academic Positions

**Associate Professor**, Dartmouth College, Hanover, NH 2022–present

**Assistant Professor**, Dartmouth College, Hanover, NH 2016–2022

**Term Lecturer**, Barnard College, Columbia University, New York, NY 2015–2016

**G.C. Evans Instructor**, Rice University, Houston, TX 2012–2015

**Program Associate**, Mathematical Sciences Research Institute Berkeley, CA Spring 2010

Education

**Ph.D., Mathematics**, Columbia University, New York, NY 2006–2012
Advisor: Peter Ozsváth
Thesis: *Bordered Heegaard Floer homology, Satellites, and Decategorification*

**B.A., Mathematics and Computer Science**, Amherst College, Amherst, MA 2002–2006
Advisor: Ruth Haas, Smith College
Thesis: *Nonisomorphic Graph Colorings*

**Semester Abroad**, Budapest Semesters in Mathematics, Budapest, Hungary Fall 2004

Research Interests

Knot theory and low-dimensional topology, Heegaard Floer homology.

Long-Term Visits

**Visitor**, CIRGET, UQAM Montreal, Canada Summer 2019

**Invited Participant**: program on “Quantum Knot Invariants and Supersymmetric Gauge Theories” Kavli Institute for Theoretical Physics Santa Barbara, CA Fall 2018

**Program Associate**, Mathematical Sciences Research Institute Berkeley, CA Spring 2010

Publications and Preprints

**A Legendrian knot atlas for knots of arc index 10**, with N. Schwartz
arXiv version: arXiv:2307.112120.

**Spectral GRID invariants and Lagrangian cobordisms**, with M. Jubeir, N. Schwartz, Z. Winkeler, C.-M. M. Wong
arXiv version: arXiv:2303.16130.

**Bordered Floer homology with integral coefficients for manifolds with torus boundary**, with D. Knowles
Under review at Journal of Symplectic Geometry. arXiv version: arXiv:2104.15120.
A friendly introduction to the bordered contact invariant, with A. Alishahi, J. Licata, and V. Vértesi
The Open Book Series, Vol.5, No.1, 1–30, 2022. arXiv version: arXiv:2104.07616.

Bordered Floer homology and contact structures, with A. Alishahi, V. Földvári, K. Hendricks, J. Licata, and V. Vértesi
Forum of Mathematics, Sigma. 2023;11:e30. arXiv version: arXiv:2011.08672.

Twisted Mazur pattern satellite knots and bordered Floer theory, with B. Wong
Michigan Math. J. Advance Publication 1–50, 2021. arXiv version: arXiv:2005.12795.

An absolute $\mathbb{Z}/2$ grading on bordered Heegaard Floer homology.
New York Journal of Mathematics, Vol.28, 90–116, 2022. arXiv version: arXiv:1401.2670.

Khovanov homology and causality in spacetimes, with V. Chernov and G. Martin
Journal of Mathematical Physics, Vol.61, no.2. arXiv version: arXiv:2001.07274.

Skein relations in tangle Floer homology, with M. Wong
Quantum Topology, Vol.11, no.1, 119–225, 2020. arXiv version: arXiv:1611.04065.

Quantum $gl(1|1)$ and tangle Floer homology, with A. Ellis and V. Vértesi
Advances in Mathematics, Vol. 350, 130–189, 2019. arXiv version: arXiv:1510.03483.

The decategorification of bordered Heegaard Floer homology.
Journal of Symplectic Geometry, Vol. 16, no.1, 227–277, 2018. arXiv version: arXiv:1212.4529.

An introduction to combinatorial tangle Floer homology, with V. Vértesi
Proceedings of the Gökova Geometry-Topology Conference 2015, 168–186, Gökova Geometry/Topology Conference (GGT), 2016. arXiv version: arXiv:1604.08430.

A self-pairing theorem for tangle Floer homology, with V. Vértesi
Algebraic & Geometric Topology, Vol.16, no.4, 2127–2141, 2016. arXiv version: arXiv:1503.06374.

Combinatorial tangle Floer homology, with V. Vértesi
Geometry & Topology, Vol.20, no.6, 3219–3332, 2016. arXiv version: arXiv:1410.2161.

Cables of thin knots and bordered Heegaard Floer homology.
Quantum Topology, Vol.4, no.4, 377–409, 2013. arXiv version: arXiv:0911.2679.

Grants and Awards

NSF CAREER Award DMS-2145090 2022–2027
Jacobs Family Fellowship 2022–2023
Burke Research Initiation Award 2016–2022
NSF Grant DMS-1711100 2017–2020
Simons Collaboration Grant (declined) 2017
AMS Simons Travel Grant 2014–2016
John Woodruff Simpson Fellowship 2010–2011
John Woodruff Simpson Fellowship 2008–2009
John Woodruff Simpson Fellowship 2007–2008
Robert H. Breusch Prize for Outstanding Senior Thesis, Amherst College 2005–2006
Amherst College Walker Prize 2003–2004
Amherst College Walker Prize 2002–2003

Invited Colloquia and Conference Talks

Cornell Topology Festival
Third Annual Meeting of Young Bulgarian Mathematicians, Sofia, Bulgaria July 2023
Mathematics Days in Sofia, Sofia, Bulgaria July 2023
Moab Topology Conference (2 plenary lectures) May 2023
The Low Dimensional Workshop, Budapest, Hungary March 2023
Nearly Carbon Neutral Geometric Topology Conference, Plenary Lecture September 2022
Georgia Topology Conference, Athens, GA May 2022
Williams College Class of 1960s Lecture April 2022
Recent Developments in Link Homology, SRS, Les Diablerets, Switzerland February 2022
CMS Summer Meeting, SS on Low Dimensional Topology, Ottawa, ON, Canada June 2021
Workshop on “Perspectives on Knot Homology”, BIRS, Canada May 2021
CMS Winter Meeting, SS on Topology, Toronto, ON, Canada December 2019
AMS Sectional Meeting, SS on Invariants of Knots, Links, and Low-dimensional Manifolds October 2019
Perspectives on bordered Heegaard Floer theory, CIRGET, Montreal, Canada May 2018
TQFT and Categorification, IESC, France April 2018
Women In Mathematics In New England, Smith College (plenary talk) September 2017
Hamilton Geometry and Topology Workshop, Trinity College Dublin August 2016
Graduate Student Topology and Geometry Conference April 2016
AMS Sectional Meeting, SS on Low-dimensional Topology and Geometry March 2016
Gökova Geometry/Topology Conference May 2015
AMS Joint Mathematics Meetings, SS on Knot Theory January 2015
AMS Sectional Meeting, SS on Interactions between Knots and Manifolds October 2014
Workshop on “Combinatorial Link Homology Theories, Braids, and Contact Geometry”, ICERM, Providence, RI August 2014
Medgar Evers College (CUNY) Math Club/Colloquium March 2014
TCU Math Colloquium November 2013
SHSU Math Colloquium October 2013
Workshop on “Interactions of gauge theory with contact and symplectic topology in dimensions 3 and 4”, BIRS, Canada March 2013
AMS Sectional Meeting, SS on Algebraic and Combinatorial Structures in Knot Theory March 2012
AMS Sectional Meeting, SS on Low Dimensional Topology and Contact and Symplectic Geometry March 2011
AMS Joint Mathematics Meetings, SS on Knot Theory January 2011
MSRI Connections for Women Workshop January 2010
Knots in Washington XXIX, George Washington University December 2009

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| Seminar Talks |
|---------------|
| UGA Topology Seminar | March 2022 |
| Boston College Geometry/Topology/Dynamics Seminar | February 2022 |
| Syracuse University Geometry and Topology Seminar | February 2022 |
| Berkeley String-Math Seminar | December 2021 |
| University of Alabama Algebra/Topology Seminar | January 2021 |
| Georgia Tech Geometry Topology Seminar | October 2020 |
| MIT Geometry and Topology Seminar | March 2020 |
| Duke Geometry/Topology Seminar | November 2018 |
| Dartmouth Topology Seminar | November 2018 |
| Dartmouth Topology Seminar | April 2018 |
| Geometry and Topology Seminar, UMass Amherst | March 2018 |
| Wesleyan Topology Seminar | March 2018 |
| UQAM-CIRGET Geometry and Topology Seminar | March 2018 |
| LSU Topology Seminar | March 2018 |
| Topology Seminar, Dartmouth College | September 2017 |
| University of Miami Geometry and Physics Seminar | April 2017 |
| Columbia Symplectic Geometry, Gauge Theory, and Categorification Seminar | February 2017 |
| Dartmouth Geometry and Topology Seminar (3 lectures) | October 2016 |
| Brandeis Geometry and Topology Seminar | September 2016 |
| MIT Geometry and Topology Seminar | April 2016 |
| CUNY Representation Theory Seminar | March 2016 |
| Boston College Geometry/Topology Seminar | October 2015 |
| UQAM - CIRGET Geometry and Topology Seminar | June 2015 |
| Rice University Topology Seminar | February 2015 |
| Rice University VIGRE Topology Seminar | February 2015 |
| University of Virginia Geometry Seminar | January 2015 |
| Georgia Tech Geometry and Topology Seminar | January 2015 |
| Joint Los Angeles Topology Seminar | November 2014 |
| Princeton Topology Seminar | September 2014 |
| Rice University VIGRE Topology Seminar | September 2014 |
| Rice University VIGRE Topology Seminar | April 2014 |
| LSU Topology Seminar | November 2013 |
| LSU Topology Working Seminar | November 2013 |
| Rice University VIGRE Topology Seminar | December 2012 |
| Rice University Topology Seminar | November 2012 |
| Columbia Geometric Topology Seminar | April 2012 |
| Berkeley Topology Seminar | April 2012 |
| Brandeis Topology Seminar | December 2011 |
| UQAM - CIRGET Geometry and Topology Seminar | December 2011 |
| Smith College Undergraduate Seminar | November 2010 |
| Amherst College Math Seminar | April 2009 |
| Columbia Undergraduate Math Seminar | March 2009 |
| Columbia Graduate Student Topology Seminar | Spring 2009, 2011 |
| HCSSiM | July 2005 |
Teaching Experience

**Dartmouth College**, Hanover, NH

- Topics in Topology (Differential Topology)  
  Winters 2020–2024
- Accelerated Multivariable Calculus  
  Fall 2023
- The Shape of Space  
  Fall 2023
- Calculus in One and Several Variables  
  Fall 2017, 2020, 2021; Winter 2023
- Knot Theory  
  Winter 2018, Winter 2022
- Current problems in Topology (Contact Topology)  
  Fall 2019
- Algebra  
  Fall 2019
- Current problems in Topology (Heegaard Floer Homology)  
  Winter 2019
- Linear Algebra  
  Winter 2019
- Multivariable Calculus  
  Fall 2016, Fall 2018
- Differential Equations  
  Winter 2017

**Mathland**, Hanover, NH  
2024–present

**Columbia University**, New York, NY

- Calculus II  
  Spring 2016
- Calculus I  
  Fall 2015

**Rice University**, Houston, TX

- Advanced Topics in Topology  
  Spring 2015
- Geometry  
  Spring 2014
- Multivariable Calculus  
  Spring 2014
- Topics in Heegaard Floer Homology  
  Fall 2013
- Elements of Knot Theory  
  Spring 2013
- Single Variable Calculus II  
  Fall 2012, 2014

**Columbia University**, New York, NY

- Linear Algebra  
  Summer 2010
- Calculus II  
  Spring 2009
- Research Experience for Undergraduates (REU) – TA  
  Summer 2008, 2009, 2011
- Differential Geometry – TA  
  Spring 2012
- Undergraduate Topology – TA  
  Fall 2009, 2011
- Knot Theory – TA  
  Fall 2008
- Calculus III – TA  
  Summer 2008
- Analysis and Optimization – TA  
  Summer 2008
- Algebraic Topology I (graduate) – TA  
  Fall 2007, 2010
- Algebraic Topology II (graduate) – TA  
  Spring 2008, 2011

**Science Honors Program**, Columbia University, New York, NY (Instructor)

- Graph Theory (Authored course material)  
  Fall 2007, Spring 2008

**Hampshire College Summer Studies in Mathematics**, Amherst, MA (Junior Staff)

- Workshop in Number Theory, Graph Theory, Abstract Algebra, etc.  
  Summer 2005
- Topology Mini Course (Authored course material)  
  Summer 2005
Advising

**PhD Thesis Advisor**
Samuel Tripp (2022 Ph.D.)
- currently Assistant Teaching Professor at WPI.
Zachary Winkeler (2022 Ph.D.)
- currently Visiting Assistant Professor at Smith College.
Douglas Knowles (2021 Ph.D.)
- currently Math Instructor at The Learning Strategies Center, Cornell.

**Postdoctoral mentor**
C.-M. Michael Wong, 2020–2022
- currently Assistant Professor at University of Ottawa.
Samantha Allen, 2018–2021
- currently Assistant Professor at Duquesne University.
Nate Dowlin (NSF), 2018–2019
- currently Lecturer at Stanford University.

**Undergraduate Mentor**
Eli Kimche (Summer 2023, Fall 2023)
Mitchell Jubeir (Summer 2022, research co-advised with M. Wong)
Liam Knight (Summer 2022, research co-advised with M. Wong)
Noah Schwartz (Summer 2022, research co-advised with M. Wong; 2022-2023 senior thesis)
Thomas Fenaroli (Winter 2022)
Athina Avrantini (Summer 2021, research co-advised with M. Wong)
Bibek Panthi (Summer 2021, research co-advised with M. Wong)
Boxian Wang (Summer 2021, research co-advised with M. Wong)
Jacob Swenberg (Spring and Summer 2020, research co-advised with S. Allen and V. Chernov)

**Dartmouth Dissertation Defense Committees**
Ryan Maguire, 2024
Kathy Lin, 2024
Zachary Winkeler (chair), 2022
Samuel Tripp (chair), 2022
Douglas Knowles (chair), 2021
Chris Coscia, 2020

**Dartmouth Advancement Exam Committees**
Lily McBeath, 2024
Matthew Ellison, 2022
Kathy Lin, 2021
Zachary Winkeler, 2019
Samuel Tripp, 2019
Douglas Knowles, 2018
Service and Synergistic Activities

**Referee**

*Experimental Mathematics · Michigan Mathematical Journal · Proceedings of the LMS · Glasgow Mathematical Journal · Journal of Symplectic Geometry · Advances in Mathematics · Geometry & Topology · Journal of Topology · Selecta Mathematica · Quantum Topology · Algebraic & Geometric Topology · Pacific Journal of Math*

**Seminars and Conferences**

ICERM Project Leader: Women in Symplectic and Contact July 2019

Geometry and Topology workshop

Organizer of Dartmouth Topology Seminar 2017–present

Co-organizer of Columbia University Symplectic Geometry, Gauge Theory, and Categorification Seminar 2015–2016

Co-organizer of Rice University Putnam Seminar 2014–2015

Co-organizer of Rice University Topology Seminar 2014–2015

Co-organizer of Rice University Teaching Seminar 2013–2014

Co-organizer of Special session on Low-Dimensional Topology March 2013

AWM Research Symposium 2013, Santa Clara, CA

Colloquium Committee, Rice University Math Colloquium 2012–2013

**Undergraduate Outreach**

Co-instructor at SHUR: A computational approach to Legendrian knots, Dartmouth College, Hanover, NH 2022

Co-instructor at SHUR: A graphical calculator for Legendrian knots, Dartmouth College, Hanover, NH 2021

Co-creator of SHUR (Summer Hybrid Undergraduate Research), Dartmouth College, Hanover, NH 2021

Speaker at the E.E. Just Science Forum, Dartmouth College, Hanover, NH 2018

Speaker at Undergraduate Math Seminar, Columbia University, New York, NY 2009, 2016

Perspectives in Mathematics co-organizer, Columbia University, New York, NY Fall 2015

Speaker at Medgar Evers College Math Club, New York, NY 2014

Smith College Undergraduate Seminar (talk and discussion), Northampton, MA 2010

Speaker at Amherst College Math Seminar (talk and discussion), Amherst, MA 2009

REU Teaching Assistant, Columbia University, New York, NY 2008–2011

**K-12 Outreach**

Mathland, Hanover, NH (director, founder, and faculty) 2024 – present

Co-organizer of Sonia Kovalevsky Day, Dartmouth College 2023

Co-organizer of Sonia Kovalevsky Day, Dartmouth College 2022

STEM Pathways speaker, Hanover High School, Hanover, NH 2019

Plenary speaker, Sonia Kovalevsky Day, Dartmouth College 2017

Math Circle talk: *Graph Theory*, Houston, TX 2015

Women in Mathematics video: *The Pythagorean Theorem*, available at http://www.girlsangle.org/page/filmpages/Pythagorean_theorem.html 2009
Interview for Girls’ Angle Bulletin, available at 2009
http://www.girlsangle.org/page/bulletin-archive/GABv03n01.pdf

Instructor for Science Honors Program, Columbia University, New York, NY 2007–2008

HCSSiM talk: Ina plays with matches 2005

Junior Staff at Hampshire College Summer Studies in Mathematics, Amherst, MA 2005

Service: Dartmouth College

Open Education Initiative Committee 2019–2020

Judge for Association for Women in Mathematics (AWM) 2018, 2020

Upper Valley Essay Contest

Dartmouth Association of Magicians Advisor 2017–present

Departmental Committee Member

- Graduate Admissions Committee (Chair) 2022–present
- Preliminary Exam Ad-hoc Committee 2020–2021
- TA training Fall 2019
- Graduate Admissions Committee 2018–2019, 2020–2021, 2021–2022
- Colloquium Director Fall 2018, 2019–2021
- Teaching Evaluations Committee Fall 2017–Spring 2018, Fall 2019, Winter–Spring 2020
- Prize Committee Fall 2016–Spring 2018
- Undergraduate Program Committee UPC Fall 2016–Spring 2017
- Recruitment committee (x2)

Other

Panelist at Moab Topology Conference Career Panel May 2023
Panelist at WiSCon Career-Oriented Panel about Funding Opportunities, July 2019

Postdoc/TT Job Applications and Tips

Speaker at Amherst College Graduate School Event April 2017
(discussion with undergraduates about grad school in mathematics)

Tribeca Film Festival Panelist for The Man Who Knew Infinity April 2016

Served on NSF Review Panel (x3)

Reviewer for Simons Collaboration Grants