

Nicholas A. Scoville

Curriculum Vitae

101K Pfahler
Ursinus College
Collegeville, PA

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POSITIONS HELD

Ursinus College

Full Professor	fall 2021- present
Joseph Beardwood III Chair of Mathematics	fall 2017-present
Associate Professor	fall 2016- spring 2021
Chair of Mathematics and Computer Science	spring 2016-present
Assistant Professor	fall 2010-spring 2016

Faulkner University

Adjunct Professor	2015
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Regina Luminis Academy

Adjunct Instructor	2020-present
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EDUCATION

Dartmouth College

Ph.D., Mathematics	June 2010
Masters of Arts, Mathematics	June 2007

Western Michigan University

Masters of Science, Mathematics	June 2005
Bachelors of Science, Mathematics	August 2003

Grand Rapids Community College

Associates, Architectural Drafting	May 2001
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TEACHING EXPERIENCE

Ursinus College,

Math 400: Mathematics for Human Flourishing
Math 335: Abstract Algebra
Math 491: Algebraic Topology
Math 451: Discrete Morse Theory
Math 361: Graph Theory
CIE 100: Common Intellectual Experience
Math 421: Topology
Math 211: Multivariable calculus
Math 235: Linear Algebra
Math 10: Problem Solving
Math 322: Geometry
Math 341: Probability
Math 236W: Discrete Mathematics
Stat 141Q: Statistics I
Math 111: Calculus I
Math 112: Calculus II

Adjunct Professor, Faulkner University

Math 1312: Mathematics Spring 2015

Other teaching experience,

<i>Teaching Assistant: Dartmouth College</i>	Summer 2009
<i>Instructor: Dartmouth College</i>	2007-2009
<i>Teaching Assistant: Dartmouth College</i>	2005-2007
<i>Instructor: Western Michigan University</i>	2003-2005
<i>Undergraduate Teaching Assistant: Western Michigan University</i>	2002-2003

INDEPENDENT STUDIES

Ursinus College,

Category theory, Tony Delgado	Spring 2023
Star clusters and homotopy type, Connor Donovan	Fall 2022
Cohomology, Connor Donovan	Fall 2022
Category theory, Tony Delgado	Fall 2022
Discrete Morse theory and knots, Connor Donovan	Spring 2021
Discrete Morse theory, Elvi Sopiqoti	Spring 2020
Discrete plates and Olives, Matthew Furgele	Spring 2020
Analyzing heart data, Ben Minardi	Spring 2019
Algebraic topology, Nick Tulio	Spring 2019
Strong collapsibility and the Morse complex, Max Lin	Spring 2019
Group of strong self-homotopy equivalences, Vince Sergi, Ryan Quick	Spring 2019
Boolean functions, Ryan Quick	Fall 2018
Algebraic topology, Jason Bennett	Fall 2018
Generating Discrete Morse Functions from Point Data, Ashlyn Welch	Spring 2018
Random discrete Morse theory, Nikolai Peralta	Spring 2018
Homotopy theory, Karthik Yegnesh	Fall 2016 Spring 2017, Fall 2017, Spring 2018
Topology, Ian Rand	Spring 2017
Discrete Morse theory and Persistent homology, Yuqing Liu	Spring 2017

Random discrete Morse theory, Nikolai Peralta, Chase Babrich	Fall 2016, Spring 2017
Algebraic topology, Matan Peleg	Fall 2016, Spring 2017
Category theory, Michael Vennettilli	Spring 2015
Multiplication in discrete Morse theory, Rose Blanchard	Spring 2015
Number theoretic notions in discrete Morse theory, Ian Rand	Spring 2015
Discrete Morse theory, Tyler Helms	Fall 2014
Estimating the discrete LS category, Brian Green	Fall 2013
Homology and Cohomology, Seth Aaronson, Brian Green, Michelle Tanco	Spring 2013
Discrete LS category, Seth Aaronson	Spring 2013
Counting discrete Morse functions, Seth Aaronson	Spring 2012
Lie Groups, Brian Green	Spring 2012
Discrete Morse Theory, Mike Agiorgousis	Spring 2012
Markov Chains, Jayant Velagala	Spring 2012
Probability, Jayant Velagala	Fall 2011
Knot Theory, Will Molden	Fall 2011
Discrete Morse Theory, Seth Aaronson	Spring 2011

STUDENT POSTERS AND PRESENTATIONS

Jose Arbelo, Tony Delgado, Charley Kirk, Zach Schlamowitz “ <i>The Dope metric is SIC: A stable, informative, and computable metric on time series</i> , Mathfest, Philadelphia, Pennsylvania	August 2022
Connor Donovan “ <i>Towards the homotopy type of the Morse complex</i> , Exploring Innovation in Appalachia, (virtual), won third place in the math/physics/astronomy category,	August 2021
Connor Donovan “ <i>Towards the homotopy type of the Morse complex</i> , Mathfest, (virtual)	August 2021
Benjamin Johnson “ <i>Merge trees in discrete Morse theory</i> , Mathfest, Cincinnati, Ohio	August 2019
Yuqing Liu “ <i>Persistence equivalence of discrete Morse functions on trees</i> , Mathfest, Denver, Colorado	August 2018
Karthik Yegnesh “ <i>Families of Objects in Categories and Elementary Topoi</i> , AMS/MAA Joint Math Meetings, Atlanta, Georgia	January 2017
Karthik Yegnesh “ <i>Cosheaf theoretical constructions in networks and persistent homology</i> , 68 th annual Delaware Valley Science Fair, Oaks, Pennsylvania (won “first place” in Mathematics)	March 2016
Karthik Yegnesh “ <i>Cosheaf theoretical constructions in networks and persistent homology</i> , 59 th annual Montgomery County Science Research Competition, Collegeville, Pennsylvania (won “first place” in math category)	March 2016
Matt Belle “ <i>Arboricity</i> , AMS/MAA Joint Math Meetings, Baltimore, Maryland	January 2014
Brian Green “ <i>Estimating the discrete Lusternik–Schnirelmann category</i> , AMS/MAA Joint Math Meetings, Baltimore, Maryland	January 2014

Seth Aaronson *Lusternik–Schnirelmann category for cell complexes*,
AMS/MAA Joint Math Meetings, San Diego, California January 2013

Mike Agiorgousis, Brian Green, and Alex Onderdonk *Discrete Morse Functions and Homology*,
AMS/MAA Joint Math Meetings, San Diego, California (won “Outstanding Presentation” award) January 2013

Mike Agiorgousis, Brian Green, and Alex Onderdonk *Discrete Morse Functions and Homology*,
Undergraduate Science Research Symposium, Haverford College September 2012

Mike Agiorgousis, Brian Green, and Alex Onderdonk *Discrete Morse Functions and Homology*,
Mathfest, Madison, Wisconsin August 2012

Mike Agiorgousis, Brian Green, Alex Onderdonk, and Kim Rich *Discrete Morse Functions and Homology*,
Disappearing Boundaries Summer Research Meeting, Lebanon Valley College July 2012

Seth Aaronson and Marie Meyer, “*Graph Isomorphisms in Discrete Morse Theory*”, *AMS/MAA Joint Meetings*,
Boston, MA January 2012

PUBLICATIONS

Kevin P. Knudson, Nicholas A. Scoville, “Discrete Morse theory for open complexes,” *submitted*

Julian Brüggemann and Nicholas A. Scoville, “On cycles and merge trees,” *submitted*

Christopher J. Tralie, Zachary Schlamowitz, Jose Arbelo, Antonio I. Delgado, Charley Kirk, Nicholas A. Scoville, “The DOPE Distance is SIC: A Stable, Informative, and Computable Metric on Time Series And Ordered Merge Trees,”

Dominic Klyve and Nicholas A. Scoville, “Summation graphs and discrete Morse theory,” *submitted*

Gregory Lupton, Oleg Musin, Nicholas A. Scoville, P. Christopher Staecker, Jonathan Treviño-Marroquin, “A Second Homotopy Group for Digital Images,” *Algebr Comb* (2024). <https://doi.org/10.1007/s10801-024-01352-9>

Connor Donovan and Nicholas A. Scoville, “Star clusters in the Matching, Morse, and Generalized complex of discrete Morse functions,” *New York J. Math.*, 29 (2023) 13931412.

Nicholas A. Scoville, “The Closure Operation as the Foundation of Topology: A Mini-Primary Source Project for Topology Students,” *Convergence* (June 2023)

Gregory Lupton, John Oprea, and Nicholas A. Scoville, “The digital Hopf construction,” *Topology and its applications*, 2023, 108405, ISSN 0166-8641, <https://doi.org/10.1016/j.topol.2022.108405>.

Benjamin Johnson and Nicholas A. Scoville, “Merge trees in discrete Morse theory,” *Research in the Mathematical Sciences* 9, 49 (2022). <https://doi.org/10.1007/s40687-022-00347-x>

Gregory Lupton and Nicholas A. Scoville, “Digital Fundamental Groups and Edge Groups of Clique Complexes,” *Journal of Applied and Computational Topology*, (2022). <https://doi.org/10.1007/s41468-022-00095-5>

Desamparados Fernandez-Ternero, Enrique Macias-Virgos, David Mosquera-Lois, Nicholas A. Scoville, and Jose-Antonio Vilches, “Fundamental Theorems of Morse theory on posets,” *AIMS Mathematics* 2022, Volume 7, Issue 8: 14922-14945. doi: 10.3934/math.2022818

Gregory Lupton, John Oprea, and Nicholas A. Scoville, “Subdivision of Maps of Digital Images,” *Discrete and Computational geometry*, 67, 698742 (2022). <https://doi.org/10.1007/s00454-021-00350-z>

Nicholas A. Scoville and Matthew C. B. Zaremsky, “Higher connectivity of the Morse complex,” *Proceedings of the AMS Series B*, 9 (2022), 135149.

Connor Donovan, Maxwell Lin, and Nicholas A. Scoville, “On the homotopy and strong homotopy type of complexes of discrete Morse functions,” *Canadian Mathematical Bulletin*, 1-19, 2022, doi:10.4153/S0008439522000121

Maxwell Lin and Nicholas A. Scoville, “On the automorphism group of the Morse complex,” *Advances in Applied Mathematics*, Volume 131, October 2021, 102250

Gregory Lupton, John Oprea, and Nicholas A. Scoville, “Homotopy Theory in Digital Topology,” *Discrete and Computational geometry*, 67 (2022), no. 1, 112165, doi.org/10.1007/s00454-021-00336-x

Gregory Lupton, John Oprea, and Nicholas A. Scoville, “A Fundamental Group for Digital Images,” *Journal of Applied and Computational Topology*, 5 (2021), no. 2, 249311.

Nicholas A. Scoville, “Topology from Analysis: A Mini-Primary Source Project for Topology Students,” *Convergence* (June 2020)

Desamparados Fernandez-Ternero, Enrique Macias-Virgos, Nicholas A. Scoville, and Jose-Antonio Vilches, “Strong discrete Morse theory and simplicial LusternikSchnirelmann category: A discrete version of the Lusternik-Schnirelmann Theorem,” *Discrete and Computational Geometry*, 63 (2020), no. 3, 607623.

Ian Rand and Nicholas A. Scoville, “Discrete Morse functions, vector fields, and homological sequences on trees,” *Involve, A Journal of Mathematics* Involve, a Journal of Mathematics 13-2 (2020), 219–229. DOI 10.2140/involve.2020.13.219

Yuqing Liu and Nicholas A. Scoville, “The realization problem for discrete Morse functions on trees,” *Algebra Colloquium*, 27 : 3 (2020) 455–468 DOI: 10.1142/S1005386720000371

Nicholas A. Scoville, “The Cantor Set Before Cantor: A Mini-Primary Source Project for Analysis and Topology Students,” *Convergence* (May 2019)

Mike Agiorgousis, Brian Green, Alex Onderdonk, Nicholas A. Scoville, and Kim Rich, “Homological sequences in discrete Morse theory,” *Topology Proceedings*, 54 (2019) 283–294

Colin Adams, Allison Henrich, Kate Kearney and Nicholas A. Scoville, “Knots Related by Knotoids,” *American Mathematical Monthly* Volume 126, 2019 - Issue 6, 483–490

Nicholas A. Scoville and Karthik Yegnesh “A Persistent Homological Analysis of Network Data Flow Malfunctions,” *Journal of Complex Networks*, Issue 6, 1 December 2017, Pages 884-892

Nicholas A. Scoville, “Connecting Connectedness: A Mini-Primary Source Project for Topology Students,” *Convergence* (October 2017)

Nicholas A. Scoville and Willie Swei “On the Lusternik–Schnirelmann category of a simplicial map,” *Topology and its applications* 216 (2017), 116-128

Brian Green, Nicholas A. Scoville, and Mimi Tsuruga, “Estimating the discrete Lusternik–Schnirelmann category,” *Topological Methods in Nonlinear Analysis*, 45, No. 1 (2015), 103–116

Akshaye Dhawan, Michelle Tanco, and Nicholas A. Scoville, “A Distributed Greedy Algorithm for Constructing Connected Dominating Sets in Wireless Sensor Networks,” SENSORNETS, Lisbon, Portugal January 2014

Nicholas A. Scoville, “Metric Structures for CW Complexes,” *Topology Proceedings*, 44 (2014) 117–131

Seth Aaronson, Marie Meyer, Nicholas A. Scoville, Mitchell T. Smith, and Laura Stibich, “Graph Isomorphisms in discrete Morse theory,” *AKCE Int. J. Graphs Comb.*, 11, No. 2 (2014), 163–176

Seth Aaronson and Nicholas A. Scoville, “Lusternik–Schnirelmann category for cell complexes,” *Illinois J. of Mathematics*, 57, No. 3 (2013), 743–753

Nicholas A. Scoville, “Georg Cantor at the Dawn of Point-Set Topology,” *Loci*, (March 2012), DOI: 10.4169/loci003861

Nicholas A. Scoville, “Lusternik–Schnirelmann Category and the Connectivity of X ,” *Algebraic & Geometric Topology*, 12 (2012) 435-448

Nicholas A. Scoville, “Mapping Cone Sequences and a Generalized Notion of Cone Length,” *JP Journal of Geo. and Top.*, 11(2011), Issue 3, 209-233

Nicholas A. Scoville, “A Metric for Homotopy Types,” Ph.D. Thesis, Dartmouth College, Spring 2010

Rob Nendorf, Nicholas A. Scoville, Jeff Strom, “Categorical Sequences,” *Algebraic & Geometric Topology*, 6 (2006) 809–838

BOOKS

Discrete Morse theory, AMS/MAA Press, 2019

BOOK CHAPTERS

Nicholas A. Scoville, “Sometimes when your hopes have all been shattered,” *Living Proof: Stories of resilience along the mathematical journey*, Edited by Henrich et al., AMS/MAA Press, 2019

ARTICLES

Nicholas A. Scoville, “Course on Mathematics for Human Flourishing” *MAA FOCUS* February/March 2023

BOOK REVIEWS

Nicholas A. Scoville, “A Brief Quadrivium” by Peter Ulrickson, *The American Mathematical Monthly* Volume 131, 2024 - Issue 6

Nicholas A. Scoville, “Never a dull moment: Hassler Whitney, Mathematics Pioneer” by Keith Kendig, *The American Mathematical Monthly* Volume 126, 2019 - Issue 9

PRESENTATIONS

<i>Discrete Morse theory for open simplicial complexes</i>	July, 2024
AMS-UMI Joint Math meetings, Palermo University (invited talk)	
<i>Discrete Morse theory as an introduction to topology</i>	April, 2024
Towson University undergraduate conference, Plenary talk (invited talk)	
<i>Tools of discrete Morse theory</i>	February, 2024
Applied and Combinatorial topology workshop, Dagstuhl Germany (invited talk)	
<i>A McCord theorem for closure spaces</i>	October, 2023
Topology seminar, Notre Dame University (invited talk)	
<i>The Moore Method, Flatland, and alternate topology axioms</i>	July, 2023
Innovative Pedagogy in Geometry and Topology, Oberlin College (invited talk)	
<i>Discrete Morse theory as an introduction to topology</i>	July, 2023
Euler Circle (invited talk)	
<i>Discrete Morse theory as an introduction to topology</i>	April, 2023
University of Arizona undergraduate seminar (invited talk)	
<i>Towards a new digital homotopy theory</i>	March, 2023
Discrete homotopy workshop, American Institute of Mathematics, San Jose (invited talk)	
<i>Discrete Morse theory: three approaches</i>	October, 2022
Michael Penn math Patreon Seminar (invited talk)	
<i>Some recent results on the homotopy type of the Morse complex</i>	July, 2022

Applied Topology in Bedlewo, Bedlwo Poland (semi-plenary lecture)	
<i>The homotopy type of the Morse complex for some collections of trees</i>	June, 2022
Union College Mathematics Conference 2022, Union College	
<i>The homotopy type of the Morse complex for some collections of trees</i>	April, 2022
Virtual AMS/MAA Joint Meetings (invited talk)	
<i>Towards a new digital homotopy theory</i>	December, 2021
Virtual University of Regina seminar (invited talk)	
<i>Discrete Morse theory as an introduction to topology</i>	November, 2021
Virtual Rutgers undergraduate seminar (invited talk)	
<i>Higher connectivity of the Morse complex</i>	January, 2021
Virtual AMS/MAA Joint Meetings (invited talk)	
<i>Discrete Morse theory as an introduction to topology</i>	March, 2020
Juniata College math colloquium (invited talk)	
<i>Towards a new digital homotopy theory</i>	February, 2020
University of Albany Geometry/Topology seminar (invited talk)	
<i>Digital topology: A smooth introduction</i>	November, 2019
Westminster College, Fulton Missouri (invited talk)	
<i>Towards a new digital homotopy theory</i>	November, 2019
University of Missouri Geometry/Topology seminar (invited talk)	
<i>Strong discrete Morse theory and an application to simplicial Lusternik–Schnirelmann category</i>	November, 2019
Topological Complexity and Related topics, AMS Southeastern Sectional Meeting, University of Florida (invited talk)	
<i>On the automorphism group of the Morse complex</i>	November, 2019
General Contributed Paper Session, AMS Southeastern Sectional Meeting, University of Florida	
<i>On the automorphism group of the Morse complex</i>	September, 2019
Union College Mathematics Conference 2019, Union College	
<i>A new digital homotopy theory</i>	June, 2019
Lehigh Geometry/Topology Conference	
<i>Towards a new digital homotopy theory</i>	May, 2019
Lehigh University Algebraic Topology seminar (invited talk)	
<i>Build your own topology</i>	January, 2019
General Contributed Paper Session on Research in Topology, Joint Math Meetings, Baltimore	
<i>Digital Topology: A smooth introduction</i>	October, 2018
Western Michigan University (invited talk)	
<i>Strong discrete Morse theory</i>	July, 2018
ICART 2018, Rabat Morocco	
<i>Digital Topology: A smooth introduction</i>	March, 2018
Colloquium, Elon University (invited talk)	
S^1 and S^2 and S^3 , oh fy! A digital Hopf fibration	January, 2018

Math Colloquium, Montana State University (invited talk)	
S^1 and S^2 and S^3 , oh fy! A digital Hopf fibration	November, 2017
Colloquium, Catholic University of America (invited talk)	
Digital Topology: A smooth introduction	November, 2017
Colloquium, Bard College (invited talk)	
S^1 and S^2 and S^3 , oh fy! A digital Hopf fibration	November, 2017
Colloquium, Dartmouth College (invited talk)	
Digital Topology: A smooth introduction	October, 2017
Colloquium, Seattle University (invited talk)	
Digital Topology: A smooth introduction	October, 2017
Colloquium, Central Washington University (invited talk)	
Simplicial Lusternik–Schnirelmann category and strong discrete Morse theory	October, 2017
Topology Seminar, University of Florida (invited talk)	
S^1 and S^2 and S^3 , oh fy! A digital Hopf fibration	October, 2017
Colloquium, University of Florida Colloquium (invited talk)	
Digital Topology: A smooth introduction	September, 2017
Math Club, Cleveland State University (invited talk)	
A Persistent Homological Analysis of Network Data Flow Malfunctions	August, 2017
Applied Algebraic Topology in Sapporo, Sapporo Japan	
A Persistent Homological Analysis of Network Data Flow Malfunctions	June, 2017
Applied Topology in Bedlewo, Bedlwo Poland	
A Simplicial Lusternik–Schnirelmann Theorem (poster)	June, 2017
Topological Data Analysis: Theory and Applications, Macalester College	
Towards a new digital homotopy theory	April 2017
Colloquium, Cleveland State University (invited talk)	
Collaborative Research: Transforming Instruction in Undergraduate Mathematics via Primary Historical (TRIUMPHS)	January, 2017
MAA Invited Paper Session on Research in Improving Undergraduate Mathematical Sciences Education Program, AMS/MAA Joint Meetings, Atlanta (invited talk)	
(Strong) discrete Morse theory as an introduction to topology	September, 2016
Colloquium, Butler University (invited talk)	
Georg Cantor at the dawn of point-set topology	September, 2016
Butler University (invited talk)	
A Simplicial Lusternik–Schnirelmann Theorem (poster)	July, 2016
ATMCS 7, Torino Italy	
The Cantor Set before Cantor	January, 2016
AMS/MAA Joint Meetings, Seattle Washington	
Discrete Morse theory as an introduction to Topology	December 2015
Colloquium, University of Sevilla (invited talk)	

- Graph isomorphisms in discrete Morse theory* October, 2015
Colloquium, Lehigh University (invited talk)
- Estimating the discrete Lusternik–Schnirelmann category* February, 2015
Homology: Theoretical and Computational Aspects, Genoa, Italy
- Discrete Morse theory at the service of Number Theory* January, 2015
MAA General Contributed Paper Session on Research in Topology, AMS/MAA Joint Meetings, San Antonio
- Graph isomorphisms in discrete Morse theory* October, 2014
Colloquium, Seattle University (invited talk)
- Lusternik–Schnirelmann category, categorical sequences, and rational numbers* September, 2014
Topology seminar, University of Michigan (invited talk)
- Topology and its history- must there be a separation?* May, 2014
Pohle Colloquium, Adelphi University (invited talk)
- Lusternik–Schnirelmann category, categorical sequences, and rational numbers* February, 2014
Geometry/Topology seminar, University of Pennsylvania (invited talk)
- Topology and its history- must there be a separation?* January, 2014
PASHoM Seminar, Villanova University (invited talk)
- Graph isomorphisms via discrete Morse theory* January, 2014
AMS Special Session on Trends in Graph Theory, AMS/MAA Joint Meetings, Baltimore
- Topology and its history are connected under the classroom topology* October, 2013
Special Session on History of Mathematics and Its Use in Teaching,
AMS Southeastern Sectional meeting, University of Louisville (invited talk)
- Computing the Discrete Lusternik–Schnirelmann category of a simplicial complex* July, 2013
Applied Topology in Bedlewo, Bedlewo, Poland
- Discrete Lusternik–Schnirelmann category* October, 2012
General Contributed Paper Session, AMS Southeastern Sectional Meeting, Tulane University
- Discrete Morse theory and the homology of simplicial complexes* August, 2012
General Contributed Paper Session, Mathfest, Madison
- Fun with Pi* March, 2012
Pi Day Celebration, Ursinus College
- Lusternik–Schnirelmann Category and the Connectivity of X* January, 2012
Research in Algebra and Topology, AMS/MAA Joint Meetings, Boston
- Graph Isomorphisms in Discrete Morse Theory* November, 2011
Colloquium, Saint Joseph’s University (invited talk)
- Graph Isomorphisms in Discrete Morse Theory* October, 2011
Colloquium, Swarthmore College (invited talk)
- Graph Isomorphisms in Discrete Morse Theory* September, 2011
Colloquium, Gettysburg College (invited talk)
- Discrete Morse Functions on Graphs* August, 2011
Pure Mathematics Session, Mathfest, Lexington

<i>The Advent of Point-Set Topology</i>	January, 2011
General Topology Session, AMS/MAA Joint Meetings, New Orleans	
<i>Pick's Theorem: How to compute the area of a polygon</i>	October, 2010
ϵ -talk Seminar, Ursinus College	
<i>Rethinking the way we teach Point-Set Topology</i>	August 2010
The History of Mathematics and Its Uses in the Classroom, Mathfest, Pittsburgh	
<i>Irrational Numbers</i>	February 2010
Colloquium, St. Mary's University (invited talk)	
<i>2 Equations Attributed to Euler</i>	February 2010
Colloquium, Mount Saint Mary's College (invited talk)	
<i>What makes Topological Spaces different?</i>	January 2010
Colloquium, Ursinus College (invited talk)	
<i>A Metric for Homotopy Types</i>	January 2010
Geometry/Topology Session III, AMS/MAA Joint Meetings, San Francisco	
<i>Generalized Cone and Killing Lengths</i>	November 2008
Graduate Student Seminar, Dartmouth College	
<i>Hopf Invariants and the Reduced Diagonal</i>	April 2004
Topology Seminar, Western Michigan University	
<i>Something About the Quartic</i>	February 2004
History of Math Seminar, Western Michigan University	
<i>Diophantine Equations</i>	February 2004
Student Seminar, Western Michigan University	
<i>Beginning Invariant Theory and the Fundamental Theorem of Symmetric Polynomials</i>	January 2004
Algebra Seminar, Western Michigan University	
<i>Two Special Cases of Ganea's Conjecture</i>	December 2003
Topology Seminar, Western Michigan University	
<i>Applications of Groebner Bases and Elimination Theory</i>	November 2003
Algebra Seminar, Western Michigan University	
<i>Category-Type Invariants of Maps</i>	November 2003
Topology Seminar, Western Michigan University	
<i>Hardy, Littlewood, and Ramanujan-the REAL Triple Threat!</i>	September 2003
History of Math Seminar, Western Michigan University	

WORKSHOPS RUN

<i>Open problems in discrete Morse theory</i>	September, 2023
BIGS Young Researcher Networking: Meeting on Topology and Applications, Bonn Germany (invited workshop)	
<i>Discrete Morse theory: Breadth and depth</i>	July, 2022
Adam Mickiewicz University, Poznan Poland (invited workshop)	

<i>MAA Workshop: Teaching Undergraduate Mathematics via Primary Source Projects.</i> AMS/MAA Joint Math Meetings, Denver Colorado	January, 2020
<i>TRIUMPHS Graduate student training Workshop</i> New Mexico State University	July 19-20, 2019
<i>TRIUMPHS Training Workshop</i> University of Colorado Denver	September 13-15, 2018
<i>Teaching Undergraduate Mathematics via Primary Source Projects</i> AMS/MAA Joint Math Meetings, San Diego CA	January 2018
<i>Teaching Mathematics with Primary Historical Sources</i> MAA EPADEL sectional meeting, Kutztown PA	April 1, 2017
<i>TRIUMPHS Training Workshop</i> University of Colorado Denver	September 8-10, 2016
<i>Connecting Past to Present: An approach to teaching topology via original resources</i> HPM 2016, Montpellier France	July, 2016

HONORS AND AWARDS

AMS-Simons Research Enhancement Grants for PUI Faculty	July 2023-June 2026
Laughlin Professional Achievement Award for distinguished service to Ursinus college through significant contribution to scholarship	May 2023
Paul R. Halmos-Lester R. Ford Award for article of expository excellence published in The American Mathematical Monthly	August 2020
REU SITE: Exploration and Professional Excellence in the Mathematical Sciences NSF Grant 1851948 (April 2020- March 2023)	\$225,469
Western Michigan University Department of Mathematics Alumni Achievement Award	October 2018
Collaborative Research: RUI: Transforming Instruction in Undergraduate Mathematics via Primary History Sources NSF IUSE Grant 1524065 (Aug. 2015- Sept. 2020) PIs at Colorado State, Central Washington, NMSU, Xavier, U Colorado, Denver, U Florida	\$71,002
Best oral presentation at HTCA conference in Genoa, Italy sponsored by Gruppo Italiano Ricercatori in Pattern Recognition.	February 2015
Mellon travel grant	July 2013

Mellon travel grant May 2012

Project NExT Fellow Aug. 2010 – Aug. 2011

ADDITIONAL SKILLS

Mathematical Software: LATEX, MATLAB, Maple, BlackBoard, WeBWork, HTML, Minitab, Derive, Java.

MATHEMATICAL ACTIVITIES

MAA Dolciani Mathematical Expositions , editorial board January 2024-present

Served on PhD thesis committee for David Mosquera Lois
 “Morse Theory on Finite Spaces”
 University of Santiago de Compostela, February 2022

Served on MA math thesis committee for Marwa Mosallam
 “On cup-products of cofibers of maps between Moore spaces,
 Hopf invariant, and Lusternik–Schnirelmann category”
 Western Michigan University, July 2021

Served on virtual panel “Teaching and the Liberal Arts”
 University of Tennessee, Knoxville April 2020

Referee for several journals 2013-present

Member of NSF’s College of Reviewers for Undergraduate Education 2018-2021

Scientific Committee, ESU8, Oslo Norway July 2018

Scientific Committee, ICART 2018, Rabat Morocco July 2018

Organized Special Session “AMS Special Session on Open & Accessible Problems
 for Undergraduate Research,”
 with Allison Henrich and Michael Dorff at AMS/MAA Joint Math Meetings January 2018

Focus Magazine, editorial board November 2017-2022

Served on NSF panel review 2016, 2017, 2018

Served on MAA Basic Library List Committee	January 2017-January 2020
Organized Special Session “AMS Special Session on Open & Accessible Problems for Undergraduate Research, ” with Allison Henrich and Michael Dorff at AMS/MAA Joint Math Meetings	January 2017
Served on panel “The Research and Teaching Pendulum: January 2017 Finding a Stable Equilibrium” at AMS/MAA Joint Math Meetings	January 2017
Organized Special Session “Applied and Computational Topology, ” with Matthew Wright and Paweł Dłotko at AMS/MAA Joint Math Meetings	January 2016
Organized panel “Finding a thesis topic and advisor, ” at AMS/MAA Joint Math Meetings	January 2016
Reviewed applications for Posters on the Hill	Fall 2015
Reviewer for MathSciNet Mathematical Reviews	February 2015-present
Organized panel “Graduate school: Choosing one, getting in, staying in, ” at AMS/MAA Joint Math Meetings	January 2015
Reviewed applications for Posters on the Hill	Fall 2014
Book reviewer for online MAA book reviews	2014-Present
Faculty representative for Ursinus MAA student chapter	2014-Present
CUR Councilor in the Mathematics and Computer Sciences Division	2014-Present
Served on panel “You published your dissertation: now what?” at AMS/MAA Joint Math Meetings	January 2013
Organized panel “The on-campus interview survival guide” at AMS/MAA Joint Math Meetings	January 2013
Reviewer for mathematical publication database Zentralblatt	August 2012-present
Senior Personal, Ursinus College REU (NSF Grant No. DMS-1003972)	June 2012-August 2012

Organized Panel “Hit the Ground Running! Interview like a Pro and land the job” at AMS/MAA Joint Math Meetings	January 2012
Senior Personal, Ursinus College REU (NSF Grant No. DMS-1003972)	June 2011-August 2011
Judge for MAA Student Paper Session 3, MathFest	August 2011
Judge of research abstracts for Young Mathematicians Network Conference applicants	July 2011
Judge for MAA Student Poster Session, Joint Mathematics Meetings	January 2011
Calculus Committee, Ursinus College; Member	August 2010-present
Statistics Committee, Ursinus College; Member	August 2010-present
Organizer for Ursinus College ϵ -talks	Fall 2010-Fall 2016
Treasurer for YMN (Young Mathematicians Network)	2010-2015
Judge for MAA Student Paper Session 11, MathFest	August 2010
Reader/Reviwer for “Introduction to Homotopy Theory” by Martin Arkowitz	2007-2008
Student Seminar Organizer	2004-2005
WMU Pi Mu Epsilon Graduate Representative	2003-2005
Grader	Summer 2004, Summer 2003

ADDITIONAL ACTIVITIES

Completed Level 19 on high speed in <i>Dr Mario</i> Dr. Mario, Nintendo Entertainment System, 1990	January 2022
Tutor for Critical Point Test Prep Berwyn, PA	Fall 2020-present
Director of Religious Education Sacred Heart Parish, Royersford PA.	Fall 2019-Fall 2023
Second Grade PREP Teacher	Fall 2016-Spring 2019

Taught hour-long once weekly religious formation/catechism class to second grade students at Sacred Heart Parish, Royersford PA.

First Grade PREP Teacher Fall 2015-Spring 2016

Taught hour-long once weekly religious formation/catechism class to first grade students at Sacred Heart Parish, Royersford PA.

Fourth Grade PREP Teacher Fall 2014-Spring 2015

Taught hour-long once weekly religious formation/catechism class to fourth grade students at Sacred Heart Parish, Royersford PA.

Ursinus College Newman Society Faculty Advisor Fall 2011-present

Sixth Grade PREP Teacher Fall 2011-Spring 2014

Taught hour-long once weekly religious formation/catechism class to sixth grade students at Sacred Heart Parish, Royersford PA.

Beat *Silver Surfer* September 2011

Finished NES game *Silver Surfer* (Arcadia Systems, 1990), considered by many to be the most difficult game in NES history.

Sixth Grade Religious Education Teacher Fall 2010-Spring 2011

Taught hour-long once weekly religious formation/catechism class to sixth grade students at St. Norbert Parish, Paoli PA.

Seventh Grade Religious Education Teacher Fall 2009-Spring 2010

Taught hour-long once weekly religious formation/catechism class to seventh grade students at St. Denis Parish, Hanover NH.

Contra Speedrun Fall 2008

Defeated NES video game Contra in 11 minutes and 4 seconds without cheats or turbos, Hanover NH

Youth Group Leader at St. Denis Parish Fall 2008-Spring 2009

Gave lectures, organized activities, participated in service projects