

CHAD GIUSTI

Curriculum Vitae

541-737-7427 chad.giusti@oregonstate.edu

<https://www.chadgiusti.com/>

Department of Mathematics Kidder Hall 268 Corvallis, OR 97331 USA

Research focus

Topological neuroscience; computation and coding in neural systems; development of topological, algebraic, and geometric methods for scientific applications; topology of spaces of configurations and embeddings

Academic employment

2024 –	Associate Professor
2023 – 2024	Assistant Professor
	Department of Mathematics, Oregon State University
2017 – 2022	Assistant Professor
	Department of Mathematical Sciences, University of Delaware
	Affiliations: Center for Applications of Mathematics in Medicine, Data Science Institute
2014 – 2017	Warren Postdoctoral Fellow
	Warren Center for Network and Data Science, University of Pennsylvania
2012 – 2014	Postdoctoral Researcher
	Department of Mathematics, University of Nebraska – Lincoln
2010 – 2012	Visiting Assistant Professor
	Mathematics Department, Willamette University

Terminal Degree

2010	Ph.D.	University of Oregon, Mathematics
		Advisor: Dev Sinha

Journal Articles

20. Arpa Ebrahimi, Shuxin Chi, Jun Yang, Phoebe Y. Lee, Prongbaram K. Colling, Hailey Mendenhall, **Chad Giusti**, David A. Hendrix, Leonard J. Foster, and Claudia S. Maier
SINGLE-CELL PROTEOMICS REVEALS PROTEOME REMODELING AND CELLULAR HETEROGENEITY DURING NGF-INDUCED PC12 NEURONAL DIFFERENTIATION
ACS Chemical Neuroscience, 2026
19. Vin de Silva, **Chad Giusti**, Vladimir Itskov, Michael Robinson, Radmila Sazdanovic, Nikolas Schonscheck, Melvin Vaupel, and Hee Rhang Yoon
DOWKER’S THEOREM FOR HIGHER-ORDER RELATIONS
Journal of Applied and Computational Topology, 2026
18. **Chad Giusti**, Darrick Lee, Vidit Nanda, and Harald Oberhauser
A TOPOLOGICAL APPROACH TO MAPPING SPACE SIGNATURES
Advances in Applied Mathematics, 2025
17. Hee Rhang Yoon, Gregory Henselman-Petrusek, Yiyi Yu, Robert Ghrist, Spencer Smith, and **Chad Giusti**
TRACKING THE TOPOLOGY OF NEURAL MANIFOLDS ACROSS POPULATIONS
Proceedings of the National Academy of Sciences USA, 2024
16. **Chad Giusti** and Darrick Lee
SIGNATURES, LIPSCHITZ FREE SPACES, AND PATHS OF PERSISTENCE DIAGRAMS
SIAM Journal on Applied Algebra and Geometry, 2023
15. Hee Rhang Yoon, Robert Ghrist, and **Chad Giusti**
PERSISTENT EXTENSIONS AND ANALOGOUS BARS: DATA-INDUCED RELATIONS BETWEEN PERSISTENCE BAR-CODES
Journal of Applied and Computational Topology, 2023

14. Lu Li, Connor Thompson, Gregory Henselman-Petrusek, **Chad Giusti**, and Lori Ziegelmeier
MINIMAL CYCLE REPRESENTATIVES IN PERSISTENT HOMOLOGY USING LINEAR PROGRAMMING: AN EMPIRICAL STUDY WITH USER'S GUIDE
Frontiers in Artificial Intelligence: Topology in Real-World Machine Learning and Data Analysis, 2021
13. **Chad Giusti** and Dev Sinha
MOD-TWO COHOMOLOGY RINGS OF ALTERNATING GROUPS
Crelle's Journal (Journal für die reine und angewandte Mathematik), 2021
12. Evelyn Tang, Marcelo G. Mattar, **Chad Giusti**, David M. Lydon-Staley, Sharon L. Thompson-Schill, and Danielle S. Bassett
EFFECTIVE LEARNING IS ACCOMPANIED BY HIGH-DIMENSIONAL AND EFFICIENT REPRESENTATIONS OF NEURAL ACTIVITY
Nature Neuroscience, 2019
11. Joshua Cruz, **Chad Giusti**, Vladimir Itskov, and William Kronholm
ON OPEN AND CLOSED CONVEX CODES
Discrete and Computational Geometry, 2019
10. Ann Sizemore, Elizabeth A. Karuza, **Chad Giusti**, and Danielle S. Bassett
KNOWLEDGE GAPS IN THE EARLY GROWTH OF SEMANTIC FEATURE NETWORKS
Nature Human Behaviour, 2018
9. Ann Sizemore, **Chad Giusti**, Ari E. Kahn, Jean M. Vettel, Richard F. Betzel, and Danielle S. Bassett
CLIQUES AND CAVITIES IN THE HUMAN CONNECTOME
Journal of Computational Neuroscience, 2018
8. Evelyn Tang, **Chad Giusti**, Graham L. Baum, Shi Gu, Eli Pollock, Ari E. Kahn, David R. Roalf, Tyler M. Moore, Kosha Ruparel, Ruben C. Gur, Raquel E. Gur, Theodore D. Satterthwaite, and Danielle S. Bassett
DEVELOPMENTAL INCREASES IN WHITE MATTER NETWORK CONTROLLABILITY SUPPORT A GROWING DIVERSITY OF BRAIN DYNAMICS
Nature Communications, 2017
7. **Chad Giusti**, Lia Papadopoulos, Eli T. Owens, Karen E. Daniels, and Danielle S. Bassett
TOPOLOGICAL AND GEOMETRIC MEASUREMENTS OF FORCE CHAIN STRUCTURE
Physical Review E, 2016
6. Ann Sizemore, **Chad Giusti**, and Danielle S. Bassett
CLASSIFICATION OF WEIGHTED NETWORKS THROUGH MESOSCALE HOMOLOGICAL FEATURES
Journal of Complex Networks, 2016
5. **Chad Giusti**, Robert Ghrist, and Danielle S. Bassett
TWO'S COMPANY, THREE (OR MORE) IS A SIMPLEX: ALGEBRAIC-TOPOLOGICAL TOOLS FOR UNDERSTANDING HIGHER ORDER STRUCTURE IN NEURAL DATA
Journal of Computational Neuroscience, 2016
4. Zitong Zhang, Qawi K. Telesford, **Chad Giusti**, Kelvin O. Lim, and Danielle S. Bassett
CHOOSING WAVELET METHODS, FILTERS, AND LENGTHS FOR FUNCTIONAL BRAIN NETWORK CONSTRUCTION
PLoS ONE, 2016
3. **Chad Giusti**, Eva Pastalkova, Carina Curto, and Vladimir Itskov
CLIQUE TOPOLOGY REVEALS INTRINSIC GEOMETRIC STRUCTURE IN NEURAL CORRELATIONS
Proceedings of the National Academy of Sciences USA, 2015
2. **Chad Giusti** and Vladimir Itskov
A NO-GO THEOREM FOR ONE-LAYER FEEDFORWARD NETWORKS
Neural Computation, 2014
1. **Chad Giusti**, Paolo Salvatore, and Dev Sinha
THE MOD-TWO COHOMOLOGY RINGS OF SYMMETRIC GROUPS
Journal of Topology, 2012

Funding

5. OSU Transdisciplinary Seed Funding, co-PI, July 2024–July 2026, Total Funding: \$50,000
PI: Jim Thatcher (Oregon State U.)
LEVERAGING TOPOLOGICAL DATA ANALYSIS FOR MORE EQUITABLE FLOODING RESILIENCE OUTCOMES
4. OSU CoS SciRIS Stage 1, co-PI, Feb. 2024– Feb. 2025, Total Funding: \$10,000
PI: Claudia Maier, co-PIs: Yanming Di, Xiaoli Fern, Silva Kolluri (all Oregon State U.)
DECIPHERING TRIPLE NEGATIVE BREAST CANCER CELL POPULATION HETEROGENEITY USING SINGLE CELL MASS SPECTROMETRY
3. AFOSR BAA FA9550-21-1-0266, Sole PI, Jul. 2021 – June 2025, Total Funding: \$557,034
TOPOLOGICAL IDENTIFICATION AND ANALYSIS OF CYCLIC FEATURES IN NEURAL POPULATION CODING
2. NSF DMS 1854683, Lead PI, Jul. 2019 – Dec 2022, Total Funding: \$559,902, PI Giusti: \$415,948
Collaborative PIs: Gregory Henselman-Petrusek (Princeton), Lori Ziegelmeier (Macalester)
EXACT HOMOLOGICAL ALGEBRA FOR COMPUTATIONAL TOPOLOGY (EXHACT)
1. AFRL BAA FA8750-17-S-7003, Sole PI, Aug. 2018 – Aug. 2019, Total Funding: \$84,946
CLIQUE AND INDEPENDENCE COMPLEX STRUCTURES FOR SENSOR NETWORK ANALYSIS

Recent Invited Talks

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| 2026 | Nov. | U. Tennessee at Knoxville, Mathematics Colloquium |
| | Nov. | SIAM Conference on the Mathematics of Data Science, Minisymposium on Topological and Statistical Methods for Complex Data |
| | Mar. | AMS Spring Western Section Meeting, Special Session on Algebraic Structures in Knot Theory and 3-dimensional Topology |
| 2025 | Aug. | Fields Institute Thematic Program on the Mathematics of Neuroscience, Workshop on Topological Data Analysis |
| | Aug. | AFOSR K-12 STEM Teacher Neuroscience Day |
| | Mar. | Stanford U., Brain Dynamics Lab (two talks) |
| | Jan. | U. Oregon, Institute of Neuroscience Colloquium |
| 2024 | May | U. Washington, Topology Seminar |
| | May | Pacific Northwest National Laboratory, Special Invited Seminar |
| | April | Oregon State U., College of Science AI Showcase |
| | Jan. | Pacific U., Mathematics Colloquium |
| 2023 | Nov. | U. Oregon, Geometry/Topology Seminar |
| | Oct. | Brown U., ICERM Workshop on Topology and Geometry in Neuroscience |
| | Jun. | Sorbonne U. Foundations of Computational Mathematics 2023, Computational Topology and Geometry Workshop |
| | May | Topos Institute, Colloquium |
| 2022 | Oct. | GEOTOP-A, Web Seminar series on Applications of Geometry and Topology |
| | Oct. | Pennsylvania State U., Mathematical Biology Seminar |
| | Aug. | U. Minnesota, IMA, Algebraic Topology and Topological Data Analysis: A Conference in Honor of Gunnar Carlsson |
| | Jun. | Union College Math Conference, Special Session on Applied Topology |
| | May | Brown U., ICERM Workshop on Topological and Dynamical Analysis of Brain Connectomes |
| | May | U. South Florida, Workshop on Discrete and Topological Models in Molecular Biology |
| | Apr. | Applied Algebraic Topology Research Network, Seminar (online) |
| | Jan. | Oregon State U., Mathematics Colloquium |
| | Jan. | Northeastern U., Mathematics Colloquium |
| 2021 | Sep. | U. Amsterdam, Institute for Advanced Study Lecture Series on TDA and Information Theory. |
| | Aug. | SIAM Conference on Applied Algebraic Geometry, Minisymposium on Algebraic Geometry of Biomedical Data |
| | Jul. | Computational Neuroscience 2021, Workshop on Topological Insights on Brain Structure and Function |
| | Jun. | Society of Mathematical Biology Annual Meeting, Minisymposium on Algebra, Combinatorics, and Topology in Modern Biology |

- 2020 Nov. Maynooth U., Mathematics and Statistics Colloquium Talk Series
- Apr. Oregon State U., Applied Topology Seminar
- Jan. U. North Carolina – Chapel Hill, Mathematics Colloquium
- 2019 Dec. Boston U., Mathematics Colloquium
- Nov. AMS Fall Southeastern Section Meeting, Special Session on Applied Topology: Theory and Applications
- Sep. Union College Math Conference, Special Session on Applied Topology
- Jul. International Conference on Industrial and Applied Mathematics 2019, Minisymposium on Topological Data Analysis and Deep Learning
- Jul. Equidiff 2019, Minisymposium on Topological Data Analysis of Dynamical Systems
- Apr. National Institute on Drug Abuse, Invited Special Seminar
- Mar. AMS Spring Southeastern Section Meeting, Special Session on Algebraic and Discrete Methods in Mathematical Biology
- 2018 Nov. École Polytechnique Fédérale de Lausanne, Workshop on Topology and Neuroscience
- Oct. NSF/Boston U. Workshop: Integrating Neurophotronics, Statistical Physics, and Control Theory for Advancing Neuroscience
- Jun. Norwegian Mathematical Society, Abel Symposium
- May U. Houston, Networks Seminar
- Feb. U. South Florida, Mathematics Colloquium
- 2017 Sep. SIAM Central States Section Meeting, Mini-symposium on Applications of Algebraic Topology
- Sep. AMS Fall Southeastern Section Meeting, Special Session on Mathematics of Biomolecules: Discrete, Algebraic and Topological
- Jul. Foundations of Computational Mathematics 2017, Computational Topology and Geometry Workshop

Other writing

4. Connor Progin, Carolyn Fish, **Chad Giusti**, David Retchless, Courtney Thatcher, and Jim Thatcher
LEVERAGING TOPOLOGICAL DATA ANALYSIS FOR DISASTER PREPARATION AND RESPONSE, A CARTOGRAPHIC PERSPECTIVE
Abstracts of the ICA 10, 2025
3. **Chad Giusti**
Review of NICHE HIERARCHY: STRUCTURE, ORGANIZATION AND ASSEMBLY IN NATURAL SYSTEMS
SIAM Review, 2018
2. **Chad Giusti**
UNSTABLE VASSILIEV THEORY
Unpublished 2011, arXiv:1107.4717v1 [math.AT]
1. **Chad Giusti**
PLUMBERS' KNOTS
Unpublished 2011, arXiv:0811.2215v3 [math.AT]

Software

3. *Open Applied Topology*, Comprehensive computational homological algebra and data analysis platform
<https://openappliedtopology.github.io>
2. *CliqueTop*, Matlab package for computation of clique topology of symmetric matrices
<https://github.com/nebneuron/clique-top>
1. *CalBlitz*, Fast, modular, low-memory calcium imaging ROI/trace extraction pipeline
<https://github.com/agiovann/CalBlitz>

Posters

- 2014 Feb. COSYNE 2014
- 2013 Dec. Topological Structures in Computational Biology, IMA
- Nov. Neuroscience 2013
- Oct. Modern Applications of Homology and Cohomology, IMA

Book Chapters2. **Chad Giusti** and Darrick Lee

ITERATED INTEGRALS AND POPULATION TIME SERIES ANALYSIS
in Proceedings of the Abel Symposium, 2020

1. **Chad Giusti** and Dev Sinha

FOX-NEUWIRTH CELL STRUCTURES AND THE COHOMOLOGY OF SYMMETRIC GROUPS
in Configuration Spaces: Geometry, Combinatorics and Topology, 2012

Public Talks

2016 Jun. U. Pennsylvania, Penn Network Visualization Program
2012 May Willamette U., U Think

Workshops, Conferences, and Session (co)organized

2025 Aug. Workshop: Cycle Representatives in Applied Homological Algebra, BIRS
Jul. SIAM Conference on Applied Algebraic Geometry (Organizing Committee)
2024 Jan. AMS-AIM Special Session on Applied Homological Algebra Beyond Persistence Diagrams, JMM
2023 June Workshop: Applied Homological Algebra Beyond Persistence Diagrams, AIM
Jan. AMS Special Session on Applied Topology: Theory and Implementation, JMM
2021 May Hot Topics Workshop: Topological Insights in Neuroscience, MSRI
2019 – 2022 Workshop on Topology: Identifying Order in Complex Systems
Every semester, location rotates (U. Delaware, U. Pennsylvania, Princeton U. Rutgers U.)
2018 Oct. Special Session on Applied Algebraic Topology, AMS Fall Eastern Sectional Meeting
2016 Jan. Algebraic and Topological Methods for Biological Networks, U. Pennsylvania
2015 May Featured Minisymposium Applications of Algebraic Topology to Neuroscience, SIAM DS

Research visits, workshops, and training programs

2026 Summer NITMB MathBio Ideathon Workshop, NSF-Simons National Institute for Theory and Mathematics in Biology
2026 Spring ICERM Workshop on Foundations of Computational Geometry and Topology
2025 Summer Fields Institute Thematic Program on the Mathematics of Neuroscience, Workshop on Topological Data Analysis
2023 Fall ICERM Semester Program on Math + Neuroscience: Strengthening the Interplay Between Theory and Mathematics (invited long term visitor)
2021 Spring IAS Amsterdam Workshop on High-order interactions: mixing and matching topological and information theory approaches (invited, online)
2018 Fall NSF/BU Workshop: Integrating Neurophotronics, Statistical Physics, and Control Theory for Advancing Neuroscience (invited)
2015 Summer Neurotechnologies for Analysis of Neural Dynamics, Princeton University
2014 Spring Scientific and Engineering Applications of Algebraic Topology, IMA, U. Minnesota (long term visitor)
2013 – 2014 “Development of a mathematical tool for rigorous analysis of neural activity sequences”, Janelia Research Campus, HHMI (visiting scientist)
2012 Summer Summer course in mining and modeling of neuroscience data, Redwood Center for Theoretical Neuroscience, U. California at Berkeley
2010 Summer Homotopy Theory of Moduli Spaces, WCATSS, U. Oregon
2009 Fall Homology Theories of Knots and Links, MSRI

Awards and Fellowships

2017 FOCM 2017 NSF Early Career Travel Award
2015 SIAM Network Science 2015 NSF Early Career Travel Award
2010 Project NExT Fellowship
2009 Jack and Peggy Borsting Award for Scholastic Achievement in Graduate Mathematics
2008 Johnson Fellowship

Press

2024	Feb.	MAA Focus Magazine "MEDICAL APPLICATIONS OF TOPOLOGICAL DATA ANALYSIS"
2019	Nov.	What's Happening in the Mathematical Sciences, AMS "THE SHAPE OF DATA" (section on topological neuroscience)
2016	Aug.	MIT Technology Review "HOW THE MATHEMATICS OF ALGEBRAIC TOPOLOGY IS REVOLUTIONIZING BRAIN SCIENCE"
2015	Dec.	Forbes "THERE'S A GEOMETRIC STRUCTURE HIDDEN INSIDE THE BRAINS OF RATS"
	Oct.	Neuroscience News "NEW MATH METHOD REVEALS STRUCTURE OF NEURAL ACTIVITY"

Current students and trainees

PhD	Azar Asgari TOPOLOGICAL METHODS IN PARKINSON'S DISEASE
PhD	Christopher Cericola (co-advised with N. Gibson) PERSISTENT HOMOLOGY FOR BRAIDS AND LONG KNOTS
PhD	Brandin Farris GEOMETRY OF RESOURCE-CONSUMER SYSTEMS
PhD	Cameron Fish STRUCTURE OF CYCLE REPRESENTATIVES IN PERSISTENT HOMOLOGY
PhD	Maeve Holm ITERATED INTEGRALS FOR CLASSIFYING DYNAMICS
PhD	Jonathan McCollum CYCLE MATCHING AND REPRESENTATIVE STABILITY IN DYNAMIC SYSTEMS
PhD	Connor Progin SHEAF-THEORETIC ANALYSIS OF FLOW IN INFRASTRUCTURE NETWORKS
PhD	Zejing Wang A ZIG-ZAG PERSISTENT HOMOLOGY TRANSFORM

Undergraduate research projects

(IS = Indep. Study, SS = Summer Scholars, GEMS = Groups Exp. Math. Sci, LURE = Launching Undergrad. Res. Exp.)

2026	IS	Gloria Jin ROTATION INVARIANT CODING SCHEMES FOR RING ATTRACTORS
2024	LURE	Liam Armstrong TOPOLOGICAL STRUCTURE IN STORM IMAGING OF HUMAN CARDIOVASCULAR TISSUE
2022	GEMS	Ziyang Jiang and Marydol Soto Santarriaga TRACKING CIRCULAR COORDINATES THROUGH ONE-LAYER FEED-FORWARD NETWORKS
2021	GEMS	Sunil Narayan and Giuliamaria Menara GEOMETRIC INTERPRETATION OF THE MAGNITUDE HOMOLOGY OF SQUARE POLYOMINOES
2020	IS, SS	Kaitlin Canalichio MERGE TREE ANALYSIS FOR CLASSIFICATION OF TEAR FILM VIDEOS RECIPIENT: 2021 UD MATHEMATICAL SCIENCES UNDERGRADUATE RESEARCH AWARD
	IS	Colin Horgan COMPUTATIONAL MODELS OF EEG IN TMS AND CAUSALITY ANALYSIS
	GEMS	Skylar Hudson and Auguste Gezalyan CLOSED CONVEX CODES THAT ARE NOT OPEN CONVEX CODES
2018	GEMS	Corey Holcomb and Alex Dishong TOPOLOGICAL STATISTICS FOR IMAGE ANALYSIS
	SS	Miguel Fuentes PERCEPTRON GEOMETRIES IN 2-LAYER FEED-FORWARD NETWORKS

Former students and trainees (by completion date)

2025	PhD	Chung-Ping Lai (co-advised with C. Escher) RECONSTRUCTING SIMPLICIAL HOMOLOGY FROM QUOTIENTS VIA COMPLEXES OF GROUPS currently: Postdoctoral Researcher at Bilkent University
2025	PhD	Giuliamaria Menara (Università degli Studi di Trieste) MAGNITUDE HOMOLOGY FOR DATA ANALYSIS currently Postdoctoral Fellow at Institut de Mathématiques de Jussieu - Paris Rive Gauche
2024	Postdoc	Nikolas Schonsheck TOPOLOGICAL COMPARISON OF CODING ACROSS NEURAL POPULATIONS currently: Assistant Professor of Mathematics at Wesleyan University
2023	PhD	Melinda Kleczynski (U. Delaware) TOPOLOGICAL METHODS IN ORNITHOLOGY AND ECOLOGY currently: NRC Postdoctoral Associate at National Institute of Standards and Technology
	PhD	Jerome Roehm (U. Delaware) RECONSTRUCTION OF STIMULUS SPACES FROM NEURAL ACTIVATION SEQUENCES currently: Assistant Professor of Mathematics and Data Analytics at Doane University
2022	Postdoc	Iris Yoon IDENTIFYING TOPOLOGICAL STRUCTURES IN SIMULTANEOUSLY OBSERVED SYSTEMS currently: Assistant Professor of Mathematics at Wesleyan University
	MSDS	Kaitlin Canalichio currently: Data Scientist at CAI
	MSDS	Colin Horgan currently: Senior Data Scientist at OneMain Financial
2021	Postdoc	Haibin Hang EXACT HOMOLOGICAL ALGEBRA FOR COMPUTATIONAL TOPOLOGY (ExHACT) next position Senior Data Scientist at Amazon.com
2019	MS	Alex Dishong REDUCTION TECHNIQUES FOR THE PERSISTENT HOMOLOGY TRANSFORM ON DIGITAL IMAGES
2015	MS	Ann Sizemore (U. Pennsylvania, co-advised with D. Bassett) PERSISTENT HOMOLOGY OF NETWORK MODELS AND STRUCTURAL HUMAN BRAIN NETWORKS

Seminars and working groups led

2022	Summer	RAMP Linear Algebra Workshop, U. Delaware
2020	Summer	RAMP Computational Workshop, U. Delaware
2019	Summer	RAMP Linear Algebra Workshop, U. Delaware
2018	Summer	RAMP Computational Workshop, U. Delaware Week-long prep workshops for incoming graduate students.
2015	Spring	Applied Topology in Neuroscience, U. Pennsylvania Cross-disciplinary graduate/faculty working group for identifying problems in neuroscience which are candidates for algebraic-topological solutions.
2014	Fall	Topological Methods for Complex Systems, U. Pennsylvania Graduate/faculty lecture series on topological and categorical structures for use with graphs and networks.
2013	Fall	Algebraic Topology Seminar, U. Nebraska – Lincoln Graduate lecture series on the fundamentals of computations of homotopy groups, as a companion to seminars given by M. Hopkins that semester
2013	Summer	Applied Topology, U. Nebraska – Lincoln Graduate/faculty lecture series on persistent homology.
2007	Summer	Graduate Student Summer “Pre-School”, U. Oregon Two-week course for incoming graduate students covering fundamentals of algebra, analysis and topology.

Teaching (U. Delaware 2017 – 2022, Oregon State U. 2023 – present)

2027 Spring	Metric Spaces and Topology (Math 430), AI and Mathematics (Math 599, new course, co-developed with N. Marshall)
2027 Winter	General Topology and Fundamental Groups (Math 532)
2026 Fall	Linear Algebra I (Math 341), General Topology and Fundamental Groups (Math 531), Transitions (SCI 300)
2026 Summer	Vector Calculus I (Math 254, Ecampus)
2026 Spring	Complex Variables (Math 483), Metric Spaces and Topology (Math 430)
2026 Winter	Topics in Topology: Spectral Sequences and Homotopy Theory (Math 676)
2025 Fall	Transitions (Recitation, SCI 300), Topics in Topology: Spectral Sequences and Homotopy Theory (Math 676, new course)
2025 Spring	Fundamental Concepts of Topology (Math 333), Linear Algebra I (Math 341)
2025 Winter	General Topology and Fundamental Groups (Math 532)
2024 Fall	Algebraic Topology (Math 634), Linear Algebra II (Math 342)
2024 Spring	Fundamental Concepts of Topology (Math 333), Topological Data Analysis (Math 599)
2024 Winter	Algebraic Topology (Math 635)
2023 Spring	Algebraic Topology (Math 636)
2023 Winter	Algebraic Topology (Math 635)
2022 Fall	Abstract Algebra (Math 451), Honors Linear Algebra (Math 349)
2022 Spring	Topological Data Analysis (Math 667)
2021 Spring	Mathematical Techniques in Data Science (Math 637)
2020 Fall	Vector Spaces (Math 672)
2019 Fall	Honors Linear Algebra (Math 349)
2019 Spring	Topological Data Analysis (Math 667, new course)
2018 Fall	Linear Algebra (Math 349), Vector Spaces (Math 672)
2018 Spring	Algebraic Topology (Math 829, new course)
2017 Fall	Topology and Its Applications (Math 567, new course)
2003 – 2013	38 undergraduate courses at U. Oregon, Willamette U. and U. Nebraska – Lincoln, including: Differential Geometry, Linear Algebra, Several Variable Calculus, Intro to Differential Equations, Honors Differential Equations, Discrete Math, Probability and Statistics, Calculus, Calculus for Life Sciences, Business Calculus, Elementary Functions, College Algebra, Intermediate Algebra, Contemporary Mathematics

University Service Activities (U. Delaware 2017 – 2022, Oregon State U. 2023 – present)

2025 – 2026	Mathematics, Probability/Algebra/Number Theory Tenure Track Hiring Committee (chair)
2025 – 2026	Mathematics Graduate Committee
2024 –	Mathematics Undergraduate Committee (assessment lead)
2024 – 2025	Mathematics Ad-hoc Development Committee (chair)
2023 – 2024	Mathematics Graduate Committee
2023 –	Mathematics, Geometry/Topology Seminar (Co-)Organizer
2023 – 2024	Mathematics, DEJAI Committee
2023 – 2024	Mathematics, Geometry/Topology Postdoctoral Hiring Committee (chair)
2023 – 2024	Mathematics, Applied Geometry Tenure Track Hiring Committee
2021	Mathematical Sciences, Strategic Hiring Plan Committee
2020 – 2021	Mathematical Sciences, Graduate Studies Committee
2020 – 2022	College of Arts and Sciences, Natural Sciences Portfolio Diversity/Equity/Inclusion Taskforce
2020 – 2022	Mathematical Sciences, Math Alliance Graduate Program Group
2019	Mathematical Sciences, Advisory Committee
2019 – 2020	Interdisciplinary Neuroscience PhD Program Development Committee
2018 – 2019	Mathematical Sciences, Development Committee
2017 – 2019	Data Science Foundations Cluster Search Committee
2017 – 2018	Mathematical Sciences, Undergraduate Research Coordinator
2017 – 2018	Mathematical Sciences, Undergraduate Affairs Committee

External Service Activities

2025	NSF Review Panelist
2016 – 2024	Abstract Reviewer, COSYNE (2017, 2020, 2023, 2024)
2017	Program Committee, International Conference on Mathematical Neuroscience 2017
2010 – 2018	AWM Mentor Network, Mentor

Reviewer/Referee for Academic Publications

Symposium on Computational Geometry; Journal of Applied and Computational Topology; SIAM Applied Geometry and Algebra; PLoS Computational Biology; PLoS ONE; Neural Computation; Network Neuroscience; Journal of Computational Chemistry; Journal of Computational Physics; Journal of Neuroscience Methods; Journal of the Royal Society Interface; Brain Structure and Function; Brain Topography; Cerebral Cortex; Applied Network Science; IEEE Transactions on Network Science and Engineering; Oxford University Press; CRC Press

Current Professional Memberships

Association for Women in Mathematics (AWM), National Association of Mathematicians (NAM), Society for Industrial and Applied Mathematics (SIAM), Society for Neuroscience (SfN)