

Carina Curto · Curriculum Vitae

Department of Mathematics
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CV last updated: June 5, 2023

- Research** · Theoretical and mathematical neuroscience
Interests · Applied algebra, geometry, topology, and dynamical systems
· Neural networks and neural codes: theory, modeling, and data analysis

Education & Employment

Academic Positions	Brown University (forthcoming) Professor of Applied Mathematics and Brain Science Division of Applied Mathematics and the Carney Institute for Brain Science	Providence, RI July 2024–
	The Pennsylvania State University (PSU) Professor of Mathematics (2019–) co-Associate Head for Graduate Studies (2018–2021) Associate Professor of Mathematics (2014–2019) Member of the Center for Neural Engineering & the Institute for Neuroscience	State College, PA Aug 2014–present
	University of Nebraska-Lincoln (UNL) Assistant Professor of Mathematics	Lincoln, NE Aug 2009–Aug 2014
	Courant Institute, New York University (NYU) Courant Instructor (Mathematics)	New York, NY Sep 2008–Aug 2009
	Rutgers, The State University of New Jersey Center for Molecular and Behavioral Neuroscience Postdoctoral Associate in the lab of Kenneth D. Harris (Neuroscience)	Newark, NJ May 2005–Aug 2008
Education	Duke University Ph.D. in Mathematics (Algebraic Geometry & String Theory) Advisor: David R. Morrison	Durham, NC Aug 2000–May 2005
	Harvard University A.B. in Physics (Cum Laude)	Cambridge, MA Sep 1996–Jun 2000
	Iowa City West High School Valedictorian (4.0 GPA)	Iowa City, IA Aug 1992–Jun 1996
Additional Education	MBL Neuroinformatics Course, Woods Hole, MA	Aug 2006
	IAS Prospects in Theoretical Physics (String Theory), Princeton, NJ	Jun 2002
	IAS Women’s Program in Symplectic Geometry, Princeton, NJ	May 2002
	IAS Park City Math Institute, Park City, Utah	Jul 2001
	– <i>Supersymmetry, Quantum Field Theory & Enumerative Geometry</i>	
	IAS Women’s Program in Mathematical Physics, Princeton, NJ	May 2001
	Budapest Semesters in Mathematics, Hungary	Spring 1999
	University of Iowa Summer French Program in Lyon, France	Summer 1996
University of Iowa coursework (as a high school student, 15 courses) – <i>Completed courses in Mathematics (3), Physics (5), French Literature (3), Italian (2), Economics, and Computer Science</i>	1993-1996	

Grants & Awards

Research Funding	Simons Fellow in Mathematics (sabbatical award from the Simons Foundation)	2021–22
	NIH R01 NS120581 (PI for Penn State side; \$776,142)	2020–24
	CRCNS US-French Research Proposal: Neuronal circuit dynamics in zebrafish larvae: mechanisms, modulation, and mathematical modeling of network topology and attractor dynamics – with <i>Germán Sumbre</i> (PI on French side; 450,900 Euros), <i>Ecole Normale Supérieure, Paris</i>	
	NSF DMS-1951165 (PI for Penn State side; \$149,926)	2020–23
	Collaborative Research: Emergent sequences in inhibition-dominated recurrent networks – with <i>Katherine Morrison</i> (PI on UNC side; \$163,211), <i>U. of Northern Colorado</i>	
	NIH R01 EB022862 (lead PI; \$1,134,009; BRAIN Initiative theory grant)	2016–21
	– <i>Emergent dynamics from network connectivity: a minimal model</i>	
	NSF DMS-1516881 (single PI; \$150,000)	2015–19
	– <i>Theory of threshold-linear networks and combinatorial neural codes</i>	
	NSF DMS-1225666/DMS-1537228 (single PI; \$164,999; transferred from UNL to PSU)	2012–16
	– <i>Memory encoding in spatially structured networks: dynamics, discrete geometry & topology</i>	
	Sub-award from NIH R01-EY010542-19 (\$33,000)	2014–15
	– <i>Regulation of photoreceptor neurotransmission</i> (PI: <i>Wallace Thoreson, UNMC</i>)	
	Janelia Visitor Program (co-PI with E. Pastalkova & V. Itskov; \$61,976)	2013–15
	– <i>Development of a mathematical tool for rigorous analysis of neural activity sequences</i>	
	Alfred P. Sloan Research Fellowship (\$50,000)	2011–15
	Career Enhancement Fellowship for Junior Faculty (\$31,500)	2012–13
– <i>Woodrow Wilson National Fellowship Foundation & Andrew W. Mellon Foundation</i>		
Nebraska EPSCoR First Award (\$20,000)	2012–13	
NSF DMS-0920845 (single PI; \$109,635)	2009–13	
– <i>Stimulus representation and spontaneous activity in recurrent networks</i>		
Other Awards	Faculty Scholar Medal in the Physical Sciences	2020
	– <i>Penn State university-wide research award (\$5,000)</i>	
	Statistical and Applied Mathematical Sciences Institute (SAMSI)	2016
	– <i>year-long program: Challenges in Computational Neuroscience</i>	
	– <i>fully funded long-term visitor (3 months)</i>	
	– <i>taught a graduate course in Mathematical Neuroscience for Duke, UNC, & NC State students</i>	
	Institute for Mathematics and its Applications (IMA), long-term visitor	2014
	– <i>year-long program: Scientific and Engineering Applications of Algebraic Topology</i>	
	– <i>fully funded long-term visitor (2.5 months)</i>	
	AMS Travel Award (Mathematical Congress of the Americas in Guanajuato)	2013
	Named a UNL “Academic Star”	2012
	UNL Visiting Scholars Grant (to support visitors)	2010, 2012
	NSF S-STEM-1060322 (co-PI; \$599,996; education grant)	2011–16
	UNL Research Council Interdisciplinary Grant (co-PI; \$5,000)	2010
	NSF VIGRE Graduate Fellowship	2004–05
	NSF Graduate Research Fellowship	2000–04
	Duke Endowment Fellowship, Duke University	2001–04
James B. Duke Fellowship, Duke University	2000–03	
University Scholars Program Fellowship, Duke University	2000–01	
Mellon Mays Undergraduate Fellowship, Harvard University	1997–2000	
American Physical Society Scholarship	1996–98	
Detur Prize, Harvard University	1997	
Varsity Letter Winner, Harvard Women’s Tennis	1996–97	

Publications

In Progress	· J. Londono Alvarez, K. Morrison, C. Curto . Sequential control of dynamic attractors in a model of quadruped locomotion. <i>In preparation</i> .
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- C. Lienkaemper, J. Londono Alvarez, H. Rocio Santa Cruz, **C. Curto**. Underlying rank in the presence of monotone nonlinearities. *In preparation*.
- A. Veliz-Cuba, V. Itskov[†], **C. Curto**[†] ([†]*equal last authors*). Sequences of neural activity in randomly-connected networks with Hebbian plasticity yield robust bump attractor dynamics. *In preparation*.

**Preprints/
Submitted**

- 38. **C. Curto**, C. Langdon, K. Morrison. Combinatorial geometry of threshold-linear networks. *Preprint available at arXiv.org*.
- 37. **C. Curto**, J. Geneson, K. Morrison. Stable fixed points of combinatorial threshold-linear networks. *Preprint available at arXiv.org*.
- 36. **C. Curto**, C. Langdon, K. Morrison. Robust motifs of threshold-linear networks. In revision for Neural Computation. *Preprint available at arXiv.org*.
- 35. K. Morrison, A. Degeratu, V. Itskov, **C. Curto**. Diversity of emergent dynamics in competitive threshold-linear networks. *Preprint available at arXiv.org*.
- 34. **C. Curto**, R. Vera. The Leray dimension of a convex code. Submitted with minor revisions to Journal of Algebra and its Applications. *Preprint available at arXiv.org*.

**Published/
Accepted**

- 33. **C. Curto**, K. Morrison. Graph rules for recurrent neural network dynamics. **Notices of the AMS**, April 2023. *Extended version*: <https://arxiv.org/abs/2301.12638>.
- 32. C. Parmelee, S. Moore, K. Morrison[†], **C. Curto**[†]. Core motifs predict dynamic attractors in combinatorial threshold-linear networks. ([†]*equal last authors*) **PLoS ONE**, 17(3): e0264456, 2022.
- 31. C. Parmelee, J. Londono Alvarez, **C. Curto**[†], K. Morrison[†]. Sequential attractors in combinatorial threshold-linear networks. ([†]*equal last authors*) **SIAM J. of Applied Dynamical Systems**, Vol. 21, No. 2, pp. 1597-1630, 2022.
- 30. D. Egas Santander, S. Ebli, A. Patania, N. Sanderson, F. Burtscher, K. Morrison[†], **C. Curto**[†]. Nerve theorems for fixed points of neural networks. E. Gasparovic et al. (eds.): **Research in Computational Topology 2**, Association for Women in Mathematics Series 30, 2022. ([†]*equal last authors*)
- 29. L. Brown, **C. Curto**. Periodic codes and sound localization in barn owls. **Involve**, a Journal of Mathematics, vol 15, no. 1, pp. 1-37, 2022.
- 28. **C. Curto**, J. Paik, I. Rivin. Betti curves of rank one symmetric matrices. F. Nielsen and F. Barbaresco (Eds.): **Geometric Science of Information**, 5th International Conference, GSI 2021, Paris, France, July 21–23, 2021, Proceedings, LNCS 12829, pp. 645–655, 2021.
- 27. **C. Curto**, N. Youngs. Neural ring homomorphisms and maps between neural codes. Baas N., Carlsson G., Quick G., Szymik M., Thaulé M. (eds) **Topological Data Analysis, Abel Symposia**, vol 15. Springer, Cham., 2020. *Preprint available at arXiv.org*.
- 26. **C. Curto**, K. Morrison. Relating network connectivity to dynamics: opportunities and challenges for theoretical neuroscience. **Current Opinion in Neurobiology**, Vol 58, pp. 11-20, 2019.
- 25. **C. Curto**, E. Gross, J. Jeffries, K. Morrison, Z. Rosen, A. Shiu, N. Youngs. Algebraic signatures of convex and non-convex codes. **Journal of Pure and Applied Algebra**, 2019.
- 24. **C. Curto**, J. Geneson, K. Morrison. Fixed points of competitive threshold-linear networks. **Neural Computation**, Vol 31, pp. 94-155, 2019.
- 23. K. Morrison, **C. Curto**. Predicting neural network dynamics via graphical analysis. *Book chapter in Algebraic and Combinatorial Computational Biology*. R. Robeva, M. Macaulay (Eds), 2018.
- 22. **C. Curto**, A. Veliz-Cuba, N. Youngs. Analysis of combinatorial neural codes: an algebraic approach. *Book chapter in Algebraic and Combinatorial Computational Biology*. R. Robeva, M. Macaulay (Eds), 2018.

21. **C. Curto**, V. Itskov. Combinatorial neural codes. *Book chapter in Handbook of Discrete and Combinatorial Mathematics*, Second Edition, edited by Kenneth H. Rosen, CRC Press, 2018.
20. **C. Curto**, E. Gross, J. Jeffries, K. Morrison, M. Omar, Z. Rosen, A. Shiu, N. Youngs. What makes a neural code convex? **SIAM J. Appl. Algebra and Geometry**, vol. 1, pp. 222-238, 2017.
19. **C. Curto**. What can topology tells us about the neural code? **Bulletin of the AMS**, vol. 54, no. 1, pp. 63-78, 2017. – Also translated to Chinese for *Mathematical Advances in Translation*.
18. **C. Curto**, K. Morrison. Pattern completion in symmetric threshold-linear networks. **Neural Computation**, Vol 28, pp. 2825-2852, 2016.
17. W.B. Thoreson, M.J. Van Hook, C. Parmelee, **C. Curto**. Modeling and measurement of vesicle pools at the cone ribbon synapse: changes in release probability are solely responsible for voltage-dependent changes in release. **Synapse**, 70:1-14, 2016.
16. C. Giusti, E. Pastalkova, **C. Curto**[†], V. Itskov[†] ([†]*equal last authors*). Clique topology reveals intrinsic geometric structure in neural correlations. **PNAS**, vol. 112, no. 44, pp. 13455-13460, 2015.
15. M.J. Van Hook, C. Parmelee, M. Chen, K.M. Cork, **C. Curto**, W.B. Thoreson. Calmodulin enhances ribbon replenishment and shapes filtering of synaptic transmission by cone photoreceptors. **Journal of General Physiology**, 144:357-378, 2014.
14. **C. Curto**, A. Degeratu, V. Itskov. Encoding binary neural codes in networks of threshold-linear neurons. **Neural Computation**, Vol 25, pp. 2858-2903, 2013.
13. **C. Curto**, V. Itskov, A. Veliz-Cuba, N. Youngs. The neural ring: an algebraic tool for analyzing the intrinsic structure of neural codes. **Bulletin of Mathematical Biology**, Volume 75, Issue 9, pp. 1571-1611, 2013.
12. **C. Curto**, V. Itskov, K. Morrison, Z. Roth, J.L. Walker. Combinatorial neural codes from a mathematical coding theory perspective. **Neural Computation**, Vol 25(7), pp. 1891-1925, 2013.
11. **C. Curto**, D.R. Morrison. Threefold flops via matrix factorization. **Journal of Algebraic Geometry**, Vol 22(4), pp. 599-627, 2013.
10. **C. Curto**, A. Degeratu, V. Itskov. Flexible memory networks. **Bulletin of Mathematical Biology**, Vol. 74(3), pp. 590-614, 2012.
9. V. Itskov*, **C. Curto***, E. Pastalkova, G. Buzsaki (**equal contribution*). Cell assembly sequences arising from spike threshold adaptation keep track of time in the hippocampus. **Journal of Neuroscience**, Vol. 31(8), pp. 2828-2834, 2011.
8. K.D. Harris, P. Bartho, P. Chadderton, **C. Curto**, J. de la Rocha, L. Hollender, V. Itskov, A. Luczak, S. Marguet, A. Renart, S. Sakata. How do neurons work together? Lessons from auditory cortex. **Hearing Research**, Vol. 271(1-2), pp. 37-53, 2011.
7. P. Bartho, **C. Curto**, A. Luczak, S. Marguet, K.D. Harris. Population coding of tone stimuli in auditory cortex: dynamic rate vector analysis. **European Journal of Neuroscience**, Vol. 30(9), pp. 1767-1778, 2009.
6. **C. Curto**, S. Sakata, S. Marguet, V. Itskov, K.D. Harris. A simple model of cortical dynamics explains variability and state dependence of sensory responses in urethane-anesthetized auditory cortex. **Journal of Neuroscience**, Vol. 29(34):10600-10612, 2009.
5. **C. Curto***, V. Itskov* (**equal contribution*). Cell groups reveal structure of stimulus space. **PLoS Computational Biology**, Vol. 4(10): e1000205, 2008.
4. V. Itskov, **C. Curto**, K.D. Harris. Valuations for spike train prediction. **Neural Computation**, Vol. 20(3), pp. 644-667, 2008.
3. **C. Curto**. Matrix model superpotentials and ADE singularities. **Advances in Theoretical and Mathematical Physics**, Vol. 12 (2), pp. 357-409, 2008.

2. C. A. Kletzing, J. D. Scudder, E. E. Dors, and C. Curto. The auroral source region: plasma properties of the high altitude plasma sheet. **Journal of Geophysical Research**, 108(A10), 1360, 2003.

1. C. Curto, S. J. Gates, V. G. J. Rodgers, Superspace geometrical realization of the N-extended super Virasoro algebra and its dual. **Physics Letters B** 480, pp. 337-347, 2000.

Ph.D. Thesis 0. C. Curto. Matrix Model Superpotentials and Calabi-Yau Spaces: an ADE Classification. Duke University Ph.D. Thesis, 2005. (arxiv.org/math.AG/0505111)
This work resulted in two publications: #3 and #11 above.

Talks & Presentations

Invited Talks	IPAM Workshop: Mathematical Approaches for Connectome Analysis (MAC2024), UCLA	Feb 2024
	Applied Topology Seminar, AATRN (online)	Aug 2023
	SIAM Conference on Applied Algebraic Geometry, Eindhoven, The Netherlands (plenary)	Jul —
	Warsaw School of Ideas in Neuroscience, Poland (3-hour minicourse + public talk)	Jul —
	Deep Code Meeting: Topological structure of the hippocampal code, Instituto Cajal, Madrid	Jun —
	Foundations of Computational Mathematics Conf. (FoCM 2023), Paris (plenary)	Jun —
	Congreso Antonio Monteiro, Universidad Nacional del Sur, Bahia Blanca, Argentina (online)	Jun —
	– <i>Workshop: Mathematical aspects of brain computation</i>	
	Center for Theoretical Neuroscience Seminar, Columbia U.	May —
	Center for Mind, Brain, Computation and Technology Seminar, Stanford U.	May —
	AMS Weekly Seminar, Dept. of Applied Math and Statistics, Johns Hopkins U.	Mar —
	COSYNE Annual Conference, Montreal	Mar —
	<i>Workshop: Dynamic geometrical transformations: Language of flexible brain computations</i>	
	13th Americas Conf. on Diff. Eqs. and Nonlinear Analysis, Sao Carlos, Brazil (plenary)	Jan —
	8th Mexican Workshop in Applied Geometry and Topology (online)	Nov 2022
	Toponets 22, CCS satellite workshop, Mallorca, Spain (hybrid)	Oct —
	Symposium on the Mathematics of Neuroscience, Crete, Greece (hybrid)	Sep —
	Bernstein Conference 2022, Berlin (plenary)	Sep —
	Applied, Combinatorial & Toric Topology Conf., Inst. for Math. Sciences, Singapore (online)	Jul —
	NEURO2022 Advances in Computational Neuroscience Symposium, Okinawa, Japan (hybrid)	Jul —
	Frontiers in Applied and Computational Mathematics (FACM-2022), NJIT (plenary)	May —
	Mathematics Colloquium, Tulane University (online)	Apr —
	Mathematics Colloquium, Rice University	Apr —
	GEOTOP-A: Applications of Geometry and Topology Seminar (online)	Apr —
	Computation & Theory (C&T) Seminar, Janelia Research Campus	Mar —
	Applied Mathematics Colloquium, Brown University	Mar —
	Center for Computational Brain Science Seminar, Brown University (online)	Mar —
	Joint seminar of the Dept. of Cognitive Sciences and Dept. of Biology, ENS, Paris	Feb —
	Mathematics Colloquium, University of Warwick, UK (online)	Feb —
	Workshop: Mathematical modeling and statistical analysis in neuroscience, IHP, Paris	Feb —
	– <i>part of semester program: Mathematical modeling of organization in living matter</i>	
	Center for the Physics of Biological Function, CUNY Graduate Center, NYC	Jan —
	– <i>Symposium: Dimensionality and dynamics in networks of neurons</i>	
	***** in-person talks resume *****	*****
	BIRS Workshop: Dynamical Principles of Biological and Artificial Neural Networks (online)	Jan —
	Mathematics, Artificial Intelligence and Neuroscience (MAIN) meeting, Stockholm (online)	Dec 2021
	– <i>at Institute of Technology, KTH, Royal Institute of Technology (hybrid conference)</i>	
	Topology Seminar, Northeastern University (online)	Dec —
	Centre for Topological Data Analysis seminar series, U. of Oxford (online)	Dec —
	Mathematics Colloquium, University at Albany – SUNY (online)	Nov —
	Mathematics Colloquium, West Virginia University (online)	Nov —
	BIRS-CMO Workshop: Geometry & Learning from Data (online)	Oct —
	BRAIN 9th Annual Neuroscience Virtual Conference (distinguished speaker) (online)	Aug —
	Networks 2021 satellite workshop: Dynamics and Motifs (DynaMo) (online)	Jul —
	World Wide Theoretical Neuroscience Seminar (WWTNS) (online)	Jun —

Symposium on Autonomous Computing and Memory Materials (online)	May —
54th Spring Topology and Dynamical Systems Conf., Murray State Univ. (online) (plenary)	May —
Mathematics Colloquium, City College of New York (CCNY) (online)	Apr —
Dynamical systems seminar, Boston University (online)	Apr —
Institute of Neuroinformatics Seminar, U. of Zurich and ETH Zurich (online)	Apr —
Bernstein Center for Computational Neuroscience, Munich, LMU (online)	Apr —
Mathematical Biology Seminar, U. of Minnesota (online)	Apr —
Mathematics Colloquium, Vanderbilt University (online)	Mar —
Center for Theoretical Neuroscience, Columbia University (online)	Jan —
Mathematics Colloquium, University of Oregon (online)	Jan —
Neurotheory seminar series on World Wide Neuro, The Neurotheory Forum (online)	Nov 2020
Physics and Astronomy Seminar, James Madison University (online)	Nov —
Mathematics Colloquium, University of Iowa (online)	Nov —
***** era of online talks begins *****	*****
(Cancelled) 2020 Summer Conf. on Topology and its Applications, Youngstown State U. (plenary)	Jul —
(Cancelled) Arrangements in Fribourg, Summer School and Workshop, Fribourg, Switzerland	Jun —
– <i>Minicourse on Arrangements and Neural Codes, giving 2 one-hour lectures</i>	
(Cancelled) Frontiers in Applied and Computational Mathematics (FACM), NJIT (plenary)	May —
(Cancelled) Discrete and Topological Methods in Molecular Biology, U. of South Florida	May —
(Cancelled) Physics Undergraduate Symposium, James Madison University (keynote)	Apr —
(Cancelled) 54th Spring Topology and Dynamical Systems Conf., Murray State Univ. (plenary)	Mar —
(Cancelled) Mathematics Colloquium, University of Iowa	Mar —
***** Covid-19 lockdowns and cancellations begin *****	*****
Theoretical Biology Seminar, Institute of Advanced Study, Princeton	Mar —
Workshop: Geometry and Neuroscience, Fields Institute, Toronto	Feb —
– <i>Minicourse on topology and neuroscience, giving a series of 4 one-hour lectures</i>	
Workshop: Physics of neural circuits and network dynamics, Simons Center, Stonybrook	Jan —
Widely Applied Mathematics Seminar, Harvard	Nov 2019
ACMS Colloquium, Notre Dame	Oct —
Computational Neuroscience Seminar, University of Chicago	Oct —
Swartz Seminar, Center for Theoretical/Computational Neuroscience, NYU	Oct —
Physics Colloquium, Penn State	Sep —
ESI Systems Neuroscience Conference, Max Planck Institute for Brain Research, Frankfurt	Sep —
Workshop on Advanced Methods in Theoretical Neuroscience, Göttingen, Germany	Jul —
– <i>Structure and disorder: from random connections to functional circuits</i>	
Minisymposium on Neural Codes, SIAM AG Conference, Bern, Switzerland	Jul —
Women in Computational Topology workshop, Australian National University, Canberra	Jul —
International Conf. on Mathematical Neuroscience (ICMNS), Copenhagen, Denmark (plenary)	Jun —
Gatsby Center for Theoretical Neuroscience, University College London	Jun —
Minisymposium on Networks, SIAM Applied Dynamical Systems Meeting, Snowbird, Utah	May —
Department of Mathematics Colloquium, U. of Washington	May —
Swartz Foundation Seminar Series, Center for Computational Neuroscience, U. of Washington	May —
Max Planck Institute for Mathematics in the Sciences, Leipzig	Apr —
Max Planck/HHMI Connectomics Meeting at Harnack-House, Berlin	Apr —
BRAIN Initiative Investigator's Meeting, Washington D.C.	Apr —
AMS Invited Address, Spring Southeastern Sectional Meeting, Auburn University (plenary)	Mar —
Department of Mathematics Colloquium, Penn State	Feb —
Theoretical and Computational Neuroscience (TCN) Conference, Houston, TX (plenary)	Feb —
NeuroNex Workshop sponsored by the Gulf Coast TCN Consortium, Houston, TX	Jan —
AMS-AWM Special Session on Applied Topology, Joint Math Meetings, Baltimore, MD	Jan —
Department of Mathematics Seminar, UC San Diego	Dec 2018
Computational Neuroscience Lunch Talk, UC San Diego	Dec —
Neurosciences Graduate Program Seminar Series, UC San Diego	Dec —
Workshop on Topology and Neuroscience, EPFL, Lausanne, Switzerland (3 talks, keynote)	Nov —
– <i>One of two keynote speakers giving a series of 3 one-hour lectures</i>	
ICERM workshop: Nonlinear algebra in applications, Brown University	Nov —
Center for Theoretical Neuroscience, Columbia University	Nov —
Topology and Neuroscience Symposium, University of Pennsylvania (keynote)	Oct —
MASS Colloquium, Penn State	Oct —
AMS Fall Eastern Sectional Meeting, University of Delaware	Sep —

Applied Math Seminar, Rutgers University, New Brunswick	Sep —
Abel Symposium: Topological Data Analysis, Geiranger, Norway (unable to attend, travel issue)	Jun —
Analysis and Interpretation of Connectomes, Janelia Research Campus (HHMI), Ashburn, VA	May —
Applied Topology & Geometry Seminar, Brown University	Apr —
Joshua Lederberg - John von Neumann Symposium on Quantitative Biology, IAS, Princeton	Apr —
CeSMUR: Central States Mathematics Undergraduate Conf., U. of Nebraska-Lincoln (keynote)	Apr —
Complex Systems in Neuroscience: Bridging Theory and Experiment, U. of Pittsburgh	Mar —
COSYNE Annual Conference, Denver, CO (invited plenary, audience of 500+)	Mar —
Geometry Seminar, Penn State	Nov 2017
AMS Sectional Meeting, Orlando, FL	Sep —
International Conf. on Applied Algebraic Topology, Hokkaido U., Sapporo, Japan (plenary)	Aug —
SIAM AG Conference, Atlanta, GA	Aug —
Mathematical Congress of the Americas, Montreal	Jul —
BIRS Workshop: Topological Methods in Brain Network Analysis, Banff, Canada	May —
AIM Seminar, Northeastern University	Apr —
Student Colloquium Series, Bucknell University	Mar —
Center for Neural Engineering Seminar, Penn State	Feb —
Third school for topological data analysis, CINVESTAV, Mexico City	Jan —
– <i>Lectures for a 3-day mini course on topology and neuroscience</i>	
BRAIN Initiative Investigator’s Meeting, Bethesda, MD	Dec 2016
Mathematical Biosciences Institute (MBI), Ohio State University	Oct —
– <i>Dynamical Systems and Data Analysis in Neuroscience: Bridging the Gap</i>	
EPFL Life Sciences Seminar Series, Lausanne, Switzerland	Sep —
MONA2 Conference on Modelling Neural Activity, Waikoloa, Hawaii	Jun —
SIAM Conference on Discrete Mathematics, Atlanta, GA	Jun —
International Conf. on Mathematical Neuroscience (ICMNS), Juan-les-Pins, France (plenary)	Jun —
Penn Symposium on Mathematical & Comp. Biology, U. of Pennsylvania	May —
Midwest Math Biology Conference, University of Wisconsin-La Crosse (plenary)	May —
TGDA @ OSU Conference, Ohio State University	May —
Differential Equations Seminar, North Carolina State University	Apr —
SAMSI Workshop: Mathematics of Neural Networks and Neural Codes, Durham, NC	Mar —
AMS Spring SE Sectional Meeting, Athens, GA	Mar —
AMS Current Events Bulletin, 2016 Joint Math Meetings, Seattle, WA	Jan —
Penn State, Center for Neural Engineering Seminar	Nov 2015
Biology and Mathematics in the Bay Area (BaMBA), San Jose, CA	Oct —
MSRI Theory of Neural Computation Workshop, Berkeley, CA	Oct —
SIAM Conference on Applied Algebraic Geometry, Daejeon, South Korea	Aug —
– <i>Special Session: Algebraic structures arising in systems biology</i>	
DARPA Dynamics, Geometry and Big Data Sets Workshop, Arlington, VA	May —
Duke University, Mathematical Biology Colloquium	Apr —
Penn State, Dynamics Working Seminar	Mar —
Department of Mathematics Colloquium, University of South Florida, Tampa	Mar —
AMS Sectional Meeting, Georgetown University	Mar —
Ohio State, Topology Geometry and Data Analysis Seminar	Feb —
MASS Colloquium, Penn State	Oct 2014
Temple University, Mathematics Colloquium	Feb —
Georgia Tech, Mathematics Seminar	Feb —
Penn State University, Mathematics Colloquium	Jan —
University of Oregon, Math/Biology Seminar	Jan —
University of Toronto, Mathematics Colloquium	Jan —
Northeastern University, Applied & Interdisciplinary Mathematics Seminar	Jan —
Institute of Mathematics for Applications (IMA), U. Minnesota	Dec 2013
– <i>Workshop: Topological Structures in Computational Biology</i>	
UC Davis, Applied Mathematics REU Seminar	Aug —
Mathematical Congress of the Americas, Guanajuato, Mexico	Aug —
– <i>Special Session: Applied Combinatorics</i>	
SIAM Conference on Applied Algebraic Geometry, Colorado State U.	Aug —
– <i>Minisymposium: Applications to the Life and Physical Sciences</i>	
Frontiers in Applied and Computational Mathematics Conference, NJIT	Jun —
Baylor College of Medicine, NRI Colloquium, Houston, TX	May —
University of Houston, Networks Seminar (Math Dept)	May —

	Sam Houston State University, Mathematics Colloquium	May —
	AMS Regional Meeting, Iowa State University	Apr —
	– <i>Special Session: Discrete Methods and Models in Mathematical Biology</i>	
	Brown University, Pattern Theory Seminar (Applied Math)	Apr —
	Woodrow Wilson Fellowship Fall Retreat, Princeton, NJ	Oct 2012
	Mathematical Biosciences Institute (MBI), Ohio State	Oct —
	– <i>Workshop: Mathematical Challenges in Neural Network Dynamics</i>	
	AIMS Conf. on Dynamical Systems, DEs, & Applications, Orlando, FL	Jul —
	– <i>Special Session: Stochastic Networks with Applications to Neuroscience</i>	
	SIAM Conference on Discrete Mathematics, Halifax, Nova Scotia	Jun —
	– <i>Minisymposium: Discrete Mathematical Biology</i>	
	Mathematical Neuroscience Meeting, Edinburgh, UK (plenary)	Mar —
	COSYNE Annual Meeting, Salt Lake City, UT (workshop talk)	Feb —
	University of Iowa, Physics Colloquium	Dec 2011
	CIRM (Luminy), Marseille, France	Oct —
	– <i>Workshop: Spatio-temporal evolution equations and neural fields</i>	
	AMS Regional Meeting, Lincoln, NE	Oct —
	University of Nebraska - Omaha, Neuroscience Colloquium	Apr —
	Kavli Institute for Systems Neuroscience, Trondheim, Norway	Jan —
	– <i>Seminar for the Moser group</i>	
	Center of Mathematics for Applications (CMA), U. of Oslo, Norway	Jan —
	– <i>Workshop: Algebraic geometry in the sciences</i>	
	AIMS Conference on Dynamical Systems, etc., Dresden, Germany	May 2010
	– <i>Special Session: Dynamical networks and their applications in neuroscience</i>	
	AMCS Colloquium, University of Iowa	Mar —
	Mathematical Biosciences Institute (MBI), Ohio State	Nov 2009
	– <i>Workshop: Mathematical Developments Arising from Biology</i>	
	Rensselaer Polytechnic Institute, Mathematics Seminar	Jun —
	Institute of Advanced Study (IAS), Princeton, NJ	Apr —
	– <i>Workshop on Topology: Identifying Order in Complex Systems</i>	
	University of Utah, Mathematical Biology Seminar	Mar —
	COSYNE Annual Meeting, Salt Lake City, UT (workshop talk)	Mar —
	UC Berkeley, Mathematical & Computational Biology Seminar	Feb —
	Temple University, Mathematics Colloquium	Feb —
	Notre Dame, Mathematics Colloquium	Feb —
	Michigan State University, Mathematics Colloquium	Jan —
	Ohio State University, Mathematics Seminar	Jan —
	University of Nebraska-Lincoln, Mathematics Colloquium	Jan —
	North Carolina State University, Mathematics Colloquium	Jan —
	Georgia Tech, Math Biology Seminar	Jan —
	New York University, Courant Instructor Day	Sep 2008
	Center for Theoretical Neuroscience, Columbia University	Apr —
	NJIT Mathematical Biology Seminar	Apr —
	IBM Computational Biology Research Group, New York	Feb —
	New York University, Mostly Biomathematics Seminar	Feb —
	Rutgers University, Mathematical Biology Seminar, New Brunswick	Dec 2007
	New York University, Mostly Biomathematics Seminar	Nov —
	Applications of Analysis to Mathematical Biology, Duke University	May —
	CNS Annual Meeting, Madison, WI (workshop talk)	Jul 2005
	Theoretical Physics Session, NSBP/NSHP Joint Meeting	Feb —
	University of Iowa, Particle Physics Seminar	Dec 2004
	University of Wisconsin, Madison, Topology Seminar	Dec —
Other	Institute for Mathematics and its Applications (IMA), U. of Minnesota	Spring 2014
Research	– <i>Invited participant for: “Topological Systems: Communication, Sensing, and Actuation,”</i>	
Invitations	and <i>“Topology and Geometry of Networks and Discrete Metric Spaces.”</i>	
	Physical and Mathematical Principles of Brain Structure and Function	May 2013
	– <i>Invited participant. Sponsored by NSF & the Kavli Foundation. Arlington, VA.</i>	
	– <i>The workshop’s purpose was to brainstorm ideas for President Obama’s BRAIN Initiative.</i>	

Selected Posters**BRAIN Initiative Investigator’s Meeting, Washington, DC**

An invitation-only meeting for PIs on NIH or NSF grants funded by the BRAIN initiative.

- *Dynamically relevant motifs in inhibition-dominated neural networks* Apr 2019
- *Predicting emergent sequences from network connectivity* Apr 2018
- *Emergent dynamics from network connectivity: a minimal model* Dec 2016

Note: in addition to presenting posters, we were also selected for 20-minute talks each time.

I gave the talk in 2016 and 2019, while my co-I Katherine Morrison gave the talk in 2018.

COSYNE (Computational and Systems Neuroscience) Annual Meeting

Salt Lake City, UT. Abstract selection for posters is peer-reviewed and competitive.

(*indicates a student or postdoc presenter)

- *Pattern generation in simple inhibition-dominated networks* Feb 2016
- *Calcium-dependence of vesicle replenishment at photoreceptor synapses** Feb 2014
- *Associative memory encoding in bump attractor networks* Mar 2013
- *The neural ring: an algebraic tool for analyzing neural codes** Mar —
- *Perturbative memory encoding in recurrent networks* Feb 2012
- *Recurrent vs. feedforward networks: differences in neural code topology* Feb —
- *Sequences and the emergence of bump attractor networks** Feb —
- *Combinatorial neural codes from a math coding theory perspective** Feb —
- *Optimal architectures for fast-learning, flexible networks* Feb 2010
- *Stimulus space topology vs. network topography in the ring model* Feb 2009
- *Control of single neuron activity by sensory stimuli and global network dynamics in auditory cortex* Feb —
- *State-dependence of sensory-evoked responses in neocortex* Feb 2007

SfN (Society for Neuroscience) Annual Meeting

Washington, D.C. (2005, 2008, 2017); Atlanta, GA (2006); San Diego, CA (2007, 2010, 2013).

- *Predicting emergent sequences from network connectivity* Nov 2017
- *Associative memory encoding in bump attractor networks* Nov 2013
- *Pairwise correlation graphs of hippocampal population activity have highly non-random, low-dimensional clique topology* Nov —
- *Flexible networks for memory-encoding* Nov 2010
- *Long-lasting, temporally reliable cell sequences via threshold-adaptation in the hippocampus* Nov —
- *Control of single neuron activity by sensory stimuli and global network dynamics in auditory cortex* Nov 2008
- *State-dependence of sensory-evoked responses in neocortex* Nov 2007
- *Dynamics of activated and inactivated states in neocortex* Oct 2006
- *Laminar organization of sensory-evoked activity in neocortex* Nov 2005

Teaching**Teaching Experience****Courses taught @ PSU**

- Math 535: Linear Algebra (graduate qual course) Fall 2022
- Math 311W: Discrete Mathematics Fall 2015, Fall 2019
- Math 435: Basic Abstract Algebra Fall 2017
- Math 441: Linear Algebra (3 sections) Fall 2016, Fall 2020
- Math 597B: Mathematical Neuroscience (graduate course) Fall 2015, Spring 2021
- Math 405: Advanced Calculus for Engineers and Scientists I (2 sections) Fall 2014

Courses taught @ UNL

- Math 107: Analytic Geometry & Calculus II Fall 2013
- Math 450: Combinatorics Fall 2013
- Math 310: Introduction to Proofs Using Algebra Spring 2012
- Math 496/896: Mathematical Neuroscience Spring 2011
- Math 221: Differential Equations (2 times) Spring 2010, Fall 2010

Math 314: Linear Algebra (3 times)	Fall 2009, Spring 2011
Courant Instructor (lecturer), New York University	2008-2009
Math V122: Calculus II (Fall 2008), Review sessions for Calculus I courses (Spring 2009).	
Unofficial Lecturer , CMBN, Rutgers University	2005-2006
Linear Algebra for Neuroscientists	
– <i>Designed and taught a weekly 2-hour seminar course for graduate students and postdoctoral researchers in neuroscience. Topics included SVD, PCA, MDA and Fourier analysis.</i>	
Graduate Student Instructor (lecturer), Duke University	2002-2003
Math 32: Calculus II (Fall 2002), Math 103: Multivariable Calculus (Spring 2003).	
Course Assistant (recitation, office hours, grading), Harvard University	1997-1998
Math 1b: Calculus II (Fall 1997), Math 21a: Vector Calculus (Spring 1998), and Math 21b: Linear Algebra (Fall 1998).	

Research Mentoring & Conference Organizing

Conference Organizer & Group Leader	ICERM Math + Neuroscience: Strengthening the Interplay Between Theory and Mathematics	Fall 2023
	– <i>lead organizer for a semester-long program at ICERM, Brown University</i>	
	MSRI Hot Topics Workshop: Topological Insights in Neuroscience	May 2021
	– <i>co-organizers: Kathryn Hess, Ran Levi, and Chad Giusti</i>	
	SIAM AG 2021 Program Committee	2020-21
	AMS Spring Eastern Sectional Meeting at Brown University (moved online)	Mar 2021
	– <i>Special Session: Applied Combinatorics, co-organized with Carly Klivans and Pedro Felzenszwalb</i>	
	Women in Computational Topology Workshop, Australian National University, Canberra	Jul 2019
	– <i>Research Group Leader for 7 junior participants</i>	
	AMS Spring Southeastern Sectional Meeting, Auburn University	Mar 2019
	– <i>Special Session: Algebraic and Discrete Methods in Mathematical Biology</i>	
	Mathematical Congress of the Americas, Montreal, Canada	Jul 2017
	– <i>Special Session: Applied and Computational Algebra and Geometry</i>	
	MBI Workshop: Topological, Geometric, and Statistical Techniques in Biological Data Analysis	Sep 2016
	XXI Coloquio Latinoamericano del Algebra, Buenos Aires, Argentina	Jul 2016
	– <i>Special Session: Computational Algebra and Applications of Algebra</i>	
	MONA2 Conference on Modelling Neural Activity, Waikoloa, Hawaii	Jun 2016
	SAMSI year-long program in Computational Neuroscience, organizing committee	Aug 2015–May 2016
	– <i>Working Group Leader (with Brent Doiron and Chris Hillar)</i>	
	– <i>organizer for Opening Workshop</i>	Aug 2015
	– <i>organizer for Workshop: Mathematics of Neural Networks and Neural Codes</i>	Mar 2016
	AMS Math Research Community: Algebraic and Geometric Methods in Applied Discrete Mathematics	
	– <i>Research Group Leader for 8 junior participants</i>	2014–16
	– <i>I was one of 5 faculty organizers supervising 40 participants during the week-long workshop at Snowbird (UT) in June 2014.</i>	
Seminars (organizer)	Theoretical Biology Seminar & Math Biology Colloquium (PSU)	Aug 2014–
	Applied Algebra and Network Theory Seminar (PSU)	2014–2015
	Math Biology Seminar (UNL)	2010–2011
	Math/Neuro “Lab” meetings (with Vladimir Itskov)	2010–present
Students & Mentoring	<i>Postdocs (8), PhD students (6), and their subsequent jobs:</i>	
	Zelong Li · Ph.D. student (PSU, 2022–)	
	Nicole Sanderson · postdoc (PSU, 2021–)	
	Safaan Sadiq · Ph.D. student (PSU, 2021–)	
	Juliana Londono Alvarez · Ph.D. student (PSU, 2019–)	
	Caitlin Lienkaemper · Ph.D. student (PSU, 2017–22) · recipient of NSF Graduate Research Fellowship (2018)	
	· postdoc at Boston University, Center for Systems Neuroscience Fellowship (2022–)	

Chris Langdon · postdoc (PSU, 2017–19) · postdoc at Cold Spring Harbor Laboratory (Schwarz fellowship)
 · postdoc at Princeton U.
Jesse Geneson · postdoc (PSU, 2017–18) · postdoc at Iowa State, assistant prof. at San Jose State University
Ramon Vera · postdoc (PSU, 2015–16) · postdoc at Institute for Mathematics, UNAM, Mexico
Katie Morrison · postdoc, 2015 (PSU) · associate prof. at University of Northern Colorado
Zvi Rosen · postdoc, 2015 (PSU) · postdoc at U. Penn · assistant prof. at Florida Atlantic University
Caitlyn Parmelee · Ph.D. student, 2013–2016 (UNL) · associate prof. at Keene State College (with tenure)
Chad Giusti · postdoc, 2012–2014 (UNL) · postdoc at U. Penn · assistant prof. at U. Delaware
 · assistant prof. at Oregon State (2023–)
Nora Youngs · Ph.D. student, 2011–2014 (UNL) · postdoc at Harvey Mudd
 · associate prof. at Colby College (with tenure)
Alan Veliz-Cuba · postdoc, 2010–2013 (UNL) · postdoc at U. Houston, associate prof. at University of Dayton

Undergraduates:

Carlos (Joaquin) Castaneda · undergraduate from UNAM, Mexico, visited PSU in Fall 2022
 Joseph Lent · undergraduate, 2020–21, completed an undergraduate thesis in May 2021
 Jingze Li · undergraduate, 2019
 David Falk · undergraduate, 2017–18, completed an undergraduate thesis in July 2018
 Quanqi Hu · undergraduate, 2017–18
 Shanglun Li · undergraduate, 2017–18
 Elena Cadenas · undergraduate, 2017–18
 Margaret Carly · undergraduate, 2016–17
 Karen Haar · undergraduate, 2017
 Haixing Yin · undergraduate, 2016–17
 Johan Moreira · undergraduate, 2016–17
 Aubrey Thompson · undergraduate, 2012–2014 · Ph.D. student at U. Pittsburgh/Carnegie Mellon

Other students and postdocs mentored:

Joshua Paik · Ph.D. student at Penn State, 2020–22
 Hannah Rocio Santa Cruz · Ph.D. student at Penn State, 2019–
 Sumita Garai · Ph.D. student at Penn State, summer 2020
 Stephen White · Ph.D. student at Penn State, 2019–20
 Lindsey Brown · undergrad at Duke, Ph.D. student at Harvard, 2016–21
 Steven Collazos · Ph.D. student at U. Minnesota, 2017
 Alex Kunin · Ph.D. student, 2013–2019 · postdoc at U. Houston · assistant prof. at Creighton U.
 Zachary Roth · Ph.D. student, 2012–2015
 Camila Tulyaganova · M.A. student, 2013–2014
 William Kronholm · visiting faculty for IMMERSE program at UNL, June–July 2013
 Keler Marku · undergrad, 2010–2013
 Ashley Sullivan · M.A. student, 2010–2012

Ph.D. Committees	Dissertation committee for Erik Hermansen (NTNU, Trondheim, Norway, advisor: Benjamin Dunn)	2023
	Dissertation committee for Connor Olson (PSU Mathematics, advisor: Tim Reluga)	2022–
	Dissertation committee for Berenice Anaya (PSU Psychology, advisor: Koraly Perez-Edgar)	2021–22
	Dissertation committee for Aayush Khare (PSU Physics, advisor: Dezhe Jin)	2021–
	Dissertation committee for Kyle Bojanek (U. Chicago Neuroscience, advisor: Stephanie Palmer)	2021–
	Dissertation committee for Hannah Rocio Santa Cruz (PSU Mathematics, advisor: Vladimir Itskov)	2021–
	Dissertation committee for Juliana Londono Alvarez (PSU Mathematics, advisor: Carina Curto)	2020–
	Dissertation committee for Caitlin Lienkaemper (PSU Mathematics, advisor: Carina Curto)	2019–
	Dissertation committee for Min-Chun Wu (PSU Mathematics, advisor: Vladimir Itskov)	2018–21
	Dissertation committee for TaeKen Kim (PSU Engineering, advisor: Steven Schiff)	2019–20
	Dissertation committee for Parul Maheshwari (PSU Physics, advisor: Reka Albert)	2017–20
	Dissertation committee for Anirban Das (PSU Mathematics, advisor: Manfred Denker)	2018–19
	Dissertation committee for Fatemeh Bahari (PSU Neural Engr., advisor: Bruce Gluckman)	2017–19
	Dissertation committee for Yevhen Tupikov (PSU Physics, advisor: Dezhe Jin)	2016–19
Dissertation committee for Alex Kunin (PSU Mathematics, advisor: Vladimir Itskov)	2015–19	
Dissertation committee for Xiao Gan (PSU Physics, advisor: Reka Albert)	2015–19	

	Dissertation committee for Nithin Varma (PSU Comp. Sci., advisor: Sofya Raskhodnikova)	2016–17
	Dissertation committee for Om Thakkar (PSU Comp. Sci., advisor: Adam Smith)	2016–17
	Dissertation committee for Meiram Murzabulatov (PSU Comp. Sci., advisor: S. Raskhodnikova)	2015–17
	Dissertation committee for Mike Skocik (PSU Physics, advisor: Bradley Wyble)	2015–16
	Dissertation committee for Jacob Turner (PSU Mathematics, advisor: Jason Morton)	2015
	Supervisory committee for Zachary Roth (UNL; advisor: Vladimir Itskov)	2013–15
	Supervisory committee for Caitlyn Parmelee (UNL; as advisor)	2013–16
	Supervisory committee for Nora Youngs (UNL; as advisor)	2011–14
	Supervisory committee for Sara Reynolds (UNL; as a reader)	2011–14
Other	Honor’s thesis committee for Colleen Boucher	2022
Dissertation	– (Hobart and William Smith Colleges, advisor: Joseph Rusinko)	
Committees	Master’s thesis committee for Hengameh Taraz (Lesley University, Boston)	2022
	Master’s thesis committee for Joseph Schuessler (PSU EECS, advisor: David Miller)	2021

Service & Miscellanea

PSU Service	Search committee for department head (internal/external search)	2022–23
	Promotion and Tenure committee	2022–25
	Honors advisor	2022-23
	Qualifying exams committee	2022–24
	Faculty Scholar Medal committee	2021, 2023
	Search committee for the new Dean of the Eberly College of Science	Spring 2020
	Co-Head of Graduate Studies for admissions and recruiting	2018–21
	Personnel committee (ex-officio, as co-head of Graduate Studies)	2018–21
	Search committee for department head (internal search)	Spring 2018
	Policy committee (elected)	2017–20
	Research support committee	2016–19
	Personnel committee	2016–17
	GTA oversight committee	2016–17
	Colloquium and distinguished lecture committee	2016–17
	CORED appointed member (co-chair of academic team)	2017–18
	CORED affiliate member	2015–17
UNL Service	Search committee for the new Dean of the College of Arts & Sciences	2013-2014
	Search committee: departmental postdoctoral positions	2011-2012
	Search committee: math department chair (internal search)	Spring 2011
	Search committee: faculty position in Math Education	2010–2011
	Search committee: faculty position in Interdisciplinary Neurophysiology	Fall 2009
External Service	AMS Committee on Human Rights of Mathematicians	2022–25
	Tenure reviews (7 cases)	2018–
	Full professor reviews (3 cases)	2020–
	Editorial Board of Physical Review Research	2021–
	Editorial Board of Mathematical Neuroscience and Applications	2021–
	Associate Editor of SIAGA (a SIAM journal)	2017–
	AMS Eastern Section Program Committee	Feb 2020–Jan 2022
	NIH review panelist (8 times)	2009–
	NSF review panelist (6 times)	2009–
	NSF external reviewer (5 times)	2009–
	NSERC external reviewer (Canadian version of NSF)	2015
	ATMCS Scientific Committee	2019–20
	BFAL Program Committee	2018
	ICMNS Program Committee (2 times)	2017–18
	COSYNE Program Committee	2016–17
	Reviewer for the annual COSYNE conference	2013

	Reviewer for <i>Nature</i> , <i>PNAS</i> , <i>Neural Computation</i> , <i>PLoS Computational Biology</i> , <i>PLoS ONE</i> , <i>eLife</i> , <i>Cell</i> , <i>Physica D</i> , <i>Journal of Mathematical Neuroscience</i> , <i>Journal of Neuroscience</i> , <i>Neuroscience</i> , <i>Journal of Computational Neuroscience</i> , <i>Journal of Algebraic Statistics</i> , <i>Network Neuroscience</i> , <i>Advances in Applied Mathematics</i> , <i>SIREV</i>	2009–
	Mellon Mays Graduate Initiatives Math and Science Mtg., New York, NY – <i>SSRC workshop to develop ideas for promoting minorities in math and science</i>	Sep 2009
Outreach	GEM Seminars at Mt. Nittany Middle School, State College, PA (2 times) Nebraska Conference for Undergraduate Women in Mathematics (NCUWM) – <i>Member of the conference committee</i> (2013-2014) – <i>Panel moderator: “Random bits of advice” banquet panel</i> (2010, 2012 & 2013) All Girls All Math (summer camp for high school girls at UNL) – <i>Panel moderator</i> (2012, 2013), <i>panelist</i> (2011), & <i>minicourse in Neuroscience</i> (2010)	May 2017, Mar 2018 2010-2014 2010-2013
Languages	English (native), Spanish (native), French (fluent), Russian (basic). Matlab (native), Maple (basic).	
Publicity	My Favorite Theorem podcast (episode 51, recorded June 2019) – <i>with Evelyn Lamb and Kevin Knudson</i> Quanta Magazine interview: Her Key to Modeling Brains: Ignore the Right Details – <i>interview about my research in Quanta’s Q&A series</i> Simons Foundation article: Simple Networks Generate Complex Dynamics – <i>article on my research, following my talk at Cosyne 2018</i> Simons Foundation article: Cross-Pollination at Cosyne 2018 – <i>article featuring select “buzz-worthy” talks at Cosyne 2018</i> AMS Notices: Women’s History Month issue – <i>I was one of 27 contemporary female mathematicians featured in the main article</i> Forbes article: There’s a Geometric Structure Hidden Inside the Brains of Rats – <i>describes the main results of my 2015 PNAS paper</i>	Feb 2020 June 2018 May 2018 Apr 2018 Mar 2018 Dec 2015