Philip S. Chodrow

Assistant Professor of Computer Science
Middlebury College

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Experience _____

Assistant Professor of Computer Science   *2022 – present*
MIDDLEBURY COLLEGE   *Middlebury, VT*

Hedrick Visiting Assistant Adjunct Professor of Mathematics   *2020 – 2022*
UNIVERSITY OF CALIFORNIA, LOS ANGELES   *Los Angeles, CA*

Education _____

PhD in Operations Research   *2015-2020*
MASSACHUSETTS INSTITUTE OF TECHNOLOGY   *Cambridge, MA*

BA in Mathematics and Philosophy   *2008-2012*
SWARTHMORE COLLEGE   *Swarthmore, PA*

Grants, Fellowships and Funding _____

RUI: Network Evolution with Unobserved Mechanisms ($287,522)   *2024-2027*
NATIONAL SCIENCE FOUNDATION (NSF)   *Middlebury, VT*

Graduate Research Fellowship ($138,000)   *2017-2020*
NATIONAL SCIENCE FOUNDATION (NSF)   *Cambridge, MA*

Fulbright Research Award (~$28,000)   *2012-2013*
US-NORWAY FULBRIGHT FOUNDATION   *Oslo, Norway*

Papers _____

Peer Reviewed

14. Heather Z. Brooks, **PSC** and Mason A. Porter (2024): Emergence of Polarization in a Sigmoidal Bounded-Confidence Model of Opinion Dynamics. *SIAM Journal on Applied Dynamical Systems* 23, 1442–1470.

13. Jürgen Kritschgau, Daniel Kaiser, Oliver Alvarado Rodriguez, Ilya Amburg, Jessalyn Bolkema, Thomas Grubb, Fangfei Lan, Sepideh Maleki, **PSC** and Bill Kay (2024): Community Detection in Hypergraphs via Mutual Information Maximization. *Scientific Reports* 14, 6933–6934.

12. Quindel Jones, Andrés R. Vindas-Meléndez, Ariana Mendible, Manuchehr Aminian, Heather Z. Brooks, Nathan Alexander, Carrie Diaz Eaton and **PSC** (2023): Data Science and Social Justice in the Mathematics Community. *Notices of the American Mathematical Society* 70, 1–2.

11. **PSC**, Nicole Eikmeier and Jamie L. Haddock (2023): Nonbacktracking Spectral Clustering of Nonuniform Hypergraphs. *SIAM Journal on Mathematics of Data Science* 5, 251–279.

10. Mary Angelique G. Demetillo, Colin Harkins, Brian C. McDonald, **PSC**, Kang Sun and Sally E. Pusede (2021): Space-based Observational Constraints on NO2 Air Pollution Inequality from Diesel Traffic in Major US Cities. *Geophysical Research Letters* 48, e2021GL094333.

9. **PSC**, Nate Veldt and Austin R. Benson (2021): Generative Hypergraph Clustering: From Blockmodels to Modularity. *Science Advances* 7, eabh1303.

8. Mari Kawakatsu, **PSC**, Nicole Eikmeier and Daniel B. Larremore (2021): Emergence of Hierarchy in Networked Endorsement Dynamics. *Proceedings of the National Academy of Sciences* 118, e2015188118. (three equal first authors)

7. **PSC** (2020): Configuration Models of Random Hypergraphs. *Journal of Complex Networks* 8, cnaa18.

6. **PSC** (2020): Moments of Uniform Random Multigraphs with Fixed Degree Sequences. *SIAM Journal on Mathematics of Data Science* 2, 1034–1065.

5. **PSC** and Peter J. Mucha (2020): Local Symmetry and Global Structure in Adaptive Voter Models. *SIAM Journal on Applied Mathematics* 80, 620–638.

4. **PSC** and Andrew Mellor (2020): Annotated Hypergraphs: Models and Applications. *Applied Network Science* 5, 9–10.

3. **PSC** (2017): Structure and Information in Spatial Segregation. *Proceedings of the National Academy of Sciences* 114, 11591–11596.

2. **PSC**, Zeyad Al-Awwad, Shan Jiang and Marta C. González (2016): Demand and Congestion in Multiplex Transportation Networks. *PloS ONE* 11, e161738.

1. **PSC**, Cole Franks and Brian Lins (2013): Upper and Lower Bounds for the Iterates of Order-Preserving Homogeneous Maps on Cones. *Linear Algebra and its Applications* 439, 999–1005.

Working Papers

4. **PSC**, Heather Z. Brooks, Harlin Lee, Anna Haensch, Juan G. Restrepo and Mason A. Porter: Dynamics of Female Gender Representation in Academic Mathematics. *In progress.*

3. Yifei Luo*, Nicholas W. Landry and **PSC**: Efficient Sampling of Configuration-Model Hypergraphs. *In progress.* (*Undergraduate mentee)

2. Xie He, **PSC** and Peter J. Mucha: Edge-Correlated Growing Hypergraphs. *In progress.*

1. William Thompson, Moyi Tian, Thomas Gebhart, Linh Huynh, Alexander Wiedemann, Vicki Modisette, **PSC** and Heather Z. Brooks: Inferring Interaction Kernels from Stochastic Opinion Dynamics on Networks. *In progress.*

Other Writings

2. **PSC**, Manuchehr Aminian, Carlos Paniagua and Jude Higdon (2021): Persons Charged with Violations of 21 U.S.C. §846: Poverty, Unemployment, Education, and Sentences.

1. **PSC**, Mari Kawakatsu, Nicole Eikmeier and Daniel B. Larremore (2021): Networks, Dynamics, and Prestige: How Hierarchies Emerge from Individual Choices. *SIAM News Blog.*

Invited Talks

Dynamics of Gender Representation in Professional Mathematics

2024   Tufts University Applied Mathematics Seminar

Connection, Computation, and Complex Systems in Undergraduate Education

2024   Conference on Network Science (NetSci)

Edge-Correlated Growing Hypergraphs

2024   BRAINS Seminar: Bridging AI, Networks and Hypergraphs

Challenges and Opportunities in Hypergraph Network Data Science

2023   Vermont-KIAS Workshop on Group Interactions in Network Science

2023   Joint Math Meetings: Special Session on Hypergraph Data Science

Feedback Loops from Ranking in Networks

2023   Smith College Mathematics Seminar

2021   REU on Kaczmarz Methods for Large-Scale Data Analysis, Claremont Colleges

2021   UCLA Undergraduate Mathematics Student Association

Eigenvector Methods for Clustering Nonuniform Hypergraphs

2024   Toronto Metropolitan University Network Science Seminar

2023   University of Vermont Joint Lab Seminar

2022   Oxford University Networks Seminar

2022   Swarthmore College Mathematics Seminar

2021   Canadian Mathematical Society Winter Meeting

2021   UCLA Undergraduate Mathematics Student Association

2021   Claremont Center for the Mathematical Sciences

Generative Hypergraph Clustering: Scalable Hueristics and Sparse Thresholds

2023   University of Edinburgh Informatics Seminar

2023   University of Glasgow Computer Science Seminar

2022   Middlebury College Computer Science Seminar

2022   Colgate University Computer Science Seminar

2022   Wesleyan University Computer Science Seminar

2021   Grinnell College Computer Science Seminar

2021   Conference on Network Science (NetSci): Satellite on Higher-Order Models in Network Science

2021   Association for the Advancement of Artificial Intelligence (AAAI): Workshop on Graphs and Complex Structures for Learning and Reasoning

Random Graphs for Data Science

2020   UCLA Network Science Seminar

2020   MIT ORC Student Seminar

2019   Northeastern University Network Science Seminar

Public Talks: Data Science and AI

2023   Middlebury DLINQ Summer Workshop

2023   Middlebury TEDx

2023   Middlebury Faculty At Home

Other Professional Events

Invited Panels

2022   Panel on Academic Job Interviews
Pomona REU

2022   Data Science and the Social Sciences
UCLA Data Science Union

2021   Early-Career Research Panel
Northeastern Regional Conference on Complex Systems

2021   Perspectives on Graphs and Complex Structures for Learning and Reasoning
AAAI

Workshop Participation

2023   Data Science and Social Justice: Networks, Policy, and Education
ICERM

2023   AMS Mathemematics Research Community: Mathematics of Complex Social Systems

2022   Data Science and Social Justice: Networks, Policy, and Education
ICERM

2022   AMS Mathemematics Research Community: Models and Methods for Sparse (Hyper)Network Science

Honors and Awards

Liggett Instructor Distinguished Faculty Teaching Award   *2022*
DEPARTMENT OF MATHEMATICS, UCLA   *Los Angeles, CA*

"Recognizing excellence in contribution to the instructional mission of the Department."

Ivy Award   *2012*
SWARTHMORE COLLEGE   *Swarthmore, PA*

"Recognizing the man of the graduating class who is outstanding in leadership, scholarship, and contributions to the Swarthmore College community."

Travel and Conference Awards

2022   SIAM Travel Award, *SIAM Conference on Mathematics of Data Science*

2021   SIAM Travel Award, *SIAM Conference on Applications of Dynamical Systems*

2020   Best Poster Award, *Northeastern Regional Conference on Complex Systems*

Teaching

Middlebury College

Spring 2025	CSCI 0451: *Machine Learning* (planned)
	CSCI 0442: *Network Science* (planned)
Winter 2025	CSCI 0702: *Senior Thesis*
Fall 2024	CSCI 0200: *Mathematical Foundations of Computing* (x2)

	CSCI 0702: *Senior Thesis*
	CSCI 0500: *Advanced Study*
Spring 2024	CSCI 0451: *Machine Learning*
	CSCI 0702: *Senior Thesis*
Winter 2024	CSCI 0702: *Senior Thesis*
Fall 2023	CSCI 0200: *Mathematical Foundations of Computing* (x2)
Spring 2023	CSCI 0451: *Machine Learning* (x2)
Fall 2022	CSCI 0145: *Introduction to Computing* (x2)

University of California, Los Angeles

Spring 2022	MATH 168: *Introduction to Networks*
Winter 2022	PIC 16B: *Python Programming with Applications II*
Fall 2021	PIC 16B: *Python Programming with Applications II*
	PIC 16A: *Python Programming with Applications I*
Spring 2021	PIC 16B: *Python Programming with Applications II*
	PIC 16A: *Python Programming with Applications I*
Winter 2021	PIC 16A: *Python Programming with Applications I*
Fall 2020	PIC 16A: *Python Programming with Applications I*

Professional Development

2024 – present	Cultural Competency in Computing (3C) Fellowship
2023	Middlebury College Engaged Listening Project
2021	MAA Project NeXT
2020	UCLA CEILS Introduction to Evidence-Based Pedagogy

Professional Service

Journal Reviews

SIAM Review	*SIAM J. Math. Data Sci.*	*SIAM J. Appl. Dyn. Sys.*
SIAM J. Matrix Analysis	*Nature Communications*	*Science Advances*
Proc. Nat. Acad. Sci. (PNAS)	*J. Applied and Computational Topology*	*Physical Review Letters*
Physical Review X	*Physical Review E*	*IEEE Trans. Network Sci. and Eng.*
Nature Human Behavior	*Social Network Analysis and Mining*	*Networks and Spatial Economics*
Chaos	*Int'l J. Geo. Info. Sys.*	*PLoS One*

Events Co-Organized

Minisymposium on Tensor Methods in Network Science	*2022*

SIAM Conference on Mathematics of Data Science | San Diego, CA
Southern California Applied Mathematics Symposium (SoCAMS) | *2022*
Harvey Mudd College | *Claremont, CA*

MAA Project NExT Workshop on Projects Across the Mathematics Curriculum | *2022*
Joint Math Meetings | *Online*

Workshop on Graphs and Complex Structures for Learning and Reasoning | *2022*
Association for the Advancement of Artificial Intelligence (AAAI) | *Vancouver, CA*

Professional Societies

Society for Industrial and Applied Mathematics (SIAM)   Mathematical Association of America (MAA)

Association for Women in Mathematics (AWM)   National Association of Mathematicians (NAM)