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*

Papers ─────────────────────────────

Peer Reviewed

14. Jurgen 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 (forthcoming)*.

13. Heather Z. Brooks, **PSC** and Mason A. Porter (2024). Emergence of Polarization in a Sigmoidal Bounded-Confidence Model of Opinion Dynamics. *SIAM Journal on Applications of Dynamical Systems (forthcoming)*.

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.

Other Writings

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

2. **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

Edge-Correlated Growing Hypergraphs

2024	Conference on Network Science (NetSci)

Connection, Computation, and Complex Systems in Undergraduate Education

2024	Conference on Network Science (NetSci)

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

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

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

Recognitions and Grants

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."

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

Fulbright Scholarship *2012-2013*
US-NORWAY FULBRIGHT FOUNDATION *Oslo, Norway*

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 0441: *Network Science* (planned)

Fall 2024 CSCI 0200: *Mathematical Foundations of Computing* (x2) (planned)

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

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

Southern California Applied Mathematics Symposium (SoCAMS) *2022*
HARVEY MUDD COLLEGE *Claremont, CA*

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)