

## Aaron Clauset

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RESEARCH INTERESTS	Network science — methods, data, theories, applications Epistemology — data science, statistical inference, machine learning, complex systems Science of science — social and epistemic inequalities, prestige economy, faculty Computational biology — oncology, genomics, networks, macroevolution	
EDUCATION	Ph.D. Computer Science, <i>University of New Mexico</i> (with distinction) B.S. Physics, <i>Haverford College</i> (with honors and concentration in Computer Science)	2002 – 2006 1997 – 2001
ACADEMIC POSITIONS	Professor, Computer Science Dept., <i>University of Colorado, Boulder</i> Core Faculty, BioFrontiers Institute, <i>University of Colorado, Boulder</i> External Faculty, <i>Santa Fe Institute</i> Affiliated Faculty, Ecology & Evo. Biology Dept., <i>University of Colorado, Boulder</i> Affiliated Faculty, Applied Mathematics Dept., <i>University of Colorado, Boulder</i> Affiliated Faculty, Information Dept., <i>University of Colorado, Boulder</i> Associate Professor, Computer Science Dept., <i>University of Colorado, Boulder</i> Assistant Professor, Computer Science Dept., <i>University of Colorado, Boulder</i> Omidyar Fellow, <i>Santa Fe Institute</i>	2022 – present 2010 – present 2012 – present 2011 – present 2012 – present 2015 – present 2018 – 2022 2010 – 2018 2006 – 2010
EDITORIAL POSITIONS	Deputy Editor, <i>Science Advances</i> , AAAS Associate Editor, <i>Science Advances</i> , AAAS Associate Editor, <i>Journal of Complex Networks</i> , Oxford University Press	2017 – present 2014 – 2017 2012 – 2017
HONORS & AWARDS (SELECTED)	Fellow, Network Science Society Paper of the Year, International Society for Scientometrics and Informetrics (ISSI) Provost Faculty Achievement Award, <i>U. Colorado, Boulder</i> Erdős-Rényi Prize in Network Science Top 20 Teachers, College of Engineering, <i>U. Colorado, Boulder</i> NSF CAREER Award Kavli Fellow Santa Fe Institute Public Lecturer (YouTube recording) Graduation Speaker, <i>U. New Mexico</i> , School of Engineering Convocation Outstanding Graduate Student Award, <i>U. New Mexico</i> , School of Engineering	2023 2021 2019 2016 2016 2015 2014 2010 2006 2006
RESEARCH PROFILES	Google Scholar <a href="https://scholar.google.com/citations?user=e7VI_HcAAAAJ">scholar.google.com/citations?user=e7VI_HcAAAAJ</a> ORCID <a href="https://orcid.org/0000-0002-3529-8746">orcid.org/0000-0002-3529-8746</a>	
	* indicates an undergraduate coauthor; ° indicates equal contribution	
MANUSCRIPTS UNDER REVIEW	W. Li, H. Zheng, X. Zhang, and <b>A. Clauset</b> , “Women’s research in STEM has greater impact on public policy.” Submitted (2025).  S. Zhang, N. LaBerge, Q. McElhiney, D. B. Larremore, and <b>A. Clauset</b> , “Editorial and peer review dynamics at elite general science journals.” Submitted (2025).	

K. Barnes, M. Ellis-Einhorn\*, C. Chavez-Ruelas, N. Hasan\*, M. Fanous\*, B. D. Sullivan, S. Friedler, **A. Clauset**, “Edge interventions can mitigate demographic and prestige disparities in the Computer Science coauthorship network.” Submitted (2025). (Preprint at [arxiv:2506.04435](https://arxiv.org/abs/2506.04435))

K. Spoon, J. Mendy\*, M. Martinez\*, M. Galesic, D. B. Larremore, **A. Clauset**, L. A. Rivera, “Reasons for gendered U.S. faculty departures across disciplines and institutions.” Submitted (2025). (Preprint at [osf.io/preprints/socarxiv/g6xwk](https://osf.io/preprints/socarxiv/g6xwk))

**A. Clauset**, B. F. Walter, L.-E. Cederman, and K. S. Gleditch, “Escalation dynamics and the severity of wars.” Submitted (2025). (Preprint at [arxiv:2503.03945](https://arxiv.org/abs/2503.03945))

B. Singh, L. Van Kleunen, and **A. Clauset**, “Meta-learning optimizes predictions of missing links in real-world networks.” Submitted (2025). (Preprint at [arxiv:2508.09069](https://arxiv.org/abs/2508.09069))

L. Van Kleunen, L. E. Dee, K. L. Wootton, F. Massol, and **A. Clauset**, “Predicting missing links in food webs using stacked models and species traits.” Submitted (2024). (Preprint at [biorxiv.org/content/10.1101/2024.11.22.624890v1](https://biorxiv.org/content/10.1101/2024.11.22.624890v1))

X. Zheng, M. Chowdhury, B. Mirpochoev, **A. Clauset**, R. M. Layer, F. J. Sedlazeck, “STIX: Long-reads based accurate structural variation annotation at population scale.” Submitted (2024). (Preprint at [biorxiv.org/content/10.1101/2024.09.30.615931v1](https://biorxiv.org/content/10.1101/2024.09.30.615931v1))

D. R. Windham, C. J. Wendt, A. Crane, M. J. Warr, F. Shi, S. Friedler, B. D. Sullivan, and **A. Clauset**, “Fast algorithms to improve fair information access in networks.” Submitted (2024). (Preprint at [arxiv:2409.03127](https://arxiv.org/abs/2409.03127))

S. Zhang, N. LaBerge, S. F. Way, D. B. Larremore, and **A. Clauset**, “Scientific productivity as a random walk.” Submitted (2023). (Preprint at [arxiv:2309.04414](https://arxiv.org/abs/2309.04414))

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W. Li, H. Zheng, J. E. Brand, and **A. Clauset**, “Gender and racial diversity socialization in science.” *Nature Computational Science* **5**, 481–491 (2025).

D. Van Egdom, M. M. Piszczek, C. Spitzmueller, P. Lindner, **A. Clauset**, “Supporting academic parents: The effects of dependent care policies on research productivity trends.” *Journal of Business and Psychology* **40**, 731–752 (2025).

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Z. P. Neal, Z. Almquist, J. Bagrow, **A. Clauset**, J. Diesner, E. Lazega, J. Lovato, J. Moody, T. P. Peixoto, Z. Steinert-Threlkeld, and A. S. Teixeira, “Recommendations for sharing network data and materials.” *Network Science* **12**(4), 404–417 (2024). [Commendation Award 2025, Society for Improving Psychological Science]

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on real-world networks under non-uniform missing edge patterns.” *PLOS ONE* **19**(7), e0306883 (2024). (Preprint at [arxiv:2401.15140](https://arxiv.org/abs/2401.15140))

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S. F. Way, A. C. Morgan, **A. Clauset**<sup>o</sup>, and D. B. Larremore<sup>o</sup>, “The misleading narrative of the canonical faculty productivity trajectory.” *Proc. Natl. Acad. Sci. USA* **114**(44), E9216–E9223 (2017). (Preprint at [arxiv:1612.08228](https://arxiv.org/abs/1612.08228)) [Also accepted at ICWSM 2017, social science track (non-archival)]

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A. Ghasemian, P. Zhang, **A. Clauset**, C. Moore, and L. Peel, “Detectability thresholds and optimal

algorithms for community structure in dynamic networks.” *Physical Review X* **6**, 031005 (2016). (Preprint at [arxiv:1506.06179](#))

M. E. J. Newman and **A. Clauset**, “Structure and inference in annotated networks.” *Nature Communications* **7**, 11863 (2016). (Preprint at [arxiv:1507.04001](#))  
[Included by *Nat. Comms.* in a special collection of papers on “Network structure and dynamics”]

S. F. Way, D. B. Larremore, and **A. Clauset**, “Gender, productivity, and prestige in computer science faculty hiring networks.” *Proc. 25th International Conference on World Wide Web (WWW)*, 1169–1179 (2016). (Preprint at [arxiv:1602.00795](#))

L. Peel and **A. Clauset**, “Predicting sports scoring dynamics with restoration and anti-persistence.” *Proc. 2015 IEEE International Conference on Data Mining (ICDM)*, 339–348 (2015). (Preprint at [arxiv:1504.05872](#))

D. B. Larremore, S. A. Sundararaman, W. Liu, W. R. Proto, **A. Clauset**, D. E. Loy, S. Speede, P. M. Sharp, B. H. Hahn, J. C. Rayner, and C. O. Buckee, “Ape origins of human malaria virulence genes.” *Nature Communications* **6**, 8368 (2015).

A. Z. Jacobs, S. F. Way, J. Ugander and **A. Clauset**, “Assembling thefacebook: Using heterogeneity to understand online social network assembly.” *Proc. ACM Web Science Conference (WebSci 2015)*, article 18 (Preprint at [arxiv:1503.06772](#))

**A. Clauset**, M. Kogan and S. Redner, “Safe leads and lead changes in competitive team sports.” *Physical Review E* **91**, 062815 (2015). (Preprint at [arxiv:1503.03509](#))  
[Chosen as an “Editors’ Suggestion”]

**A. Clauset**, S. Arbesman and D. B. Larremore, “Systematic inequality and hierarchy in faculty hiring networks.” *Science Advances* **1**(1), e1400005 (2015). [One of “Top Ten” *Science Advances* articles of 2015.] [One of the top 100 articles of 2015, by [almetrics.com](#).]

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A. Scharpf, G. Schneider, A. Nöh and **A. Clauset**, “Forecasting of the risk of extreme massacres in Syria.” *European Review of International Studies* **1**(2), 50–68 (2014).

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A. Z. Jacobs and **A. Clauset**, “A unified view of generative models for networks: models, methods, opportunities, and challenges.” *NIPS Workshop on Networks: From Graphs to Rich Data* (2014). (Preprint at [arxiv:1411.4070](#))

L. Peel and **A. Clauset**, “Change-point detection in temporal networks using hierarchical random graphs.” *KDD Workshop on Outlier Detection & Description under Data Diversity* (2014).

S. Merritt and **A. Clauset**, “Social network dynamics in a massive online game: Network turnover, non-densification, and team engagement in Halo Reach.” *Eleventh Workshop on Mining and Learning with Graphs (MLG)* (2013). (Preprint at [arxiv:1306.4363](#))

C. Aicher\*, A. Z. Jacobs and **A. Clauset**, “Adapting the stochastic block model to edge-weighted networks.” *ICML Workshop on Structured Learning* (2013). (Preprint at [arxiv:1305.5782](#))

N. Eagle, **A. Clauset** and J. Quinn, “Location segmentation, inference and prediction for anticipatory computing.” *Proc. AAAI Spring Symposium*, 20–25 (2009).

**A. Clauset** and N. Eagle. “Persistence and periodicity in a dynamic proximity network.” *DIMACS Workshop on Computational Methods for Dynamic Interaction Networks* (Piscataway), 2007. (Preprint at [arxiv:1211.7343](#)).

**A. Clauset**, C. Moore and M. E. J. Newman, “Structural inference of hierarchies in networks.” *Proc. Workshop on Statistical Network Analysis, 23rd International Conference on Machine Learning* (ICML ’06). E. M. Airoldi et al., Eds., *Lecture Notes in Computer Science* **4503**, 1–13 (2007). (Preprint at [arxiv:physics/0610051](#))

#### BOOK CHAPTERS

**A. Clauset**, “On the frequency and severity of interstate wars.” In Nils Petter Gleditsch (Ed.), *Lewis F. Richardson — His Intellectual Legacy and Influence in the Social Sciences*, Springer Pioneer Series (2020). (Preprint at [arxiv:1901.05086](#))

K. S. Gleditsch and **A. Clauset**, “Trends in Conflict.” In A. Gheciu and W. C. Wohlforth (Eds.), *The Oxford Handbook of International Security* (pp 227–244) Oxford University Press (2018).

#### ESSAYS AND PERSPECTIVES

K. Spoon and **A. Clauset**, “Gendered devaluation and retention among U.S. faculty.” *CSWEP News* 2, 7–10 (2024).

F. Karimi and **A. Clauset**, “Abolish ageism in early-career research awards.” *Nature* **620**, 492 (2023). [doi:10.1038/d41586-023-02567-9](#)

A.C. Morgan and **A. Clauset**, “Nearly a quarter of tenure-track faculty have a parent with a PhD.” *Nature Human Behavior* (2022). [doi:10.1038/s41562-022-01426-3](#)

K. Hodges, M. McNutt, **A. Clauset**, J. Jackson, G. Machlis, and S. Naeem, “The fine art of scientific advocacy: A tribute to Tom Lovejoy.” *Science Advances* **8**(2), abn9704 (2022).

**A. Clauset**, K. Behbakht, B. G. Bitler, “Decoding the dynamic tumor microenvironment.” *Science*



*Advances* **7**(23), eabi5904 (2021). doi:10.1126/sciadv.abi5904

**A. Clauset**, D. B. Larremore and R. Sinatra, “Data-driven predictions in the science of science.” *Science* **355**, 477–480 (2017). [Invited] doi:10.1126/science.aal4217

R. T. Gill, A. L. Halweg-Edwards, S. F. Way and **A. Clauset**, “Synthesis aided design: The biological design-build-test engineering paradigm?” *Biotechnology and Bioengineering* **113**(1), 7–10 (2016).

PREPRINTS  
AND OTHER  
PUBLICATIONS

E. Gartzke, M. Spagat, P. Diehl, M. Sarkees, W. Thompson, J. R. Oneal, M. Mousseau, D. Copeland, J. M. Owen, J. Snyder, N. M. Ripsman, M. Cohen, **A. Clauset**, J. Mueller, Z. Maoz, and A. Gat, “Is the decline of war a delusion? An exchange between researchers following the publication of Azar Gat’s article on the subject.” *Journal of Strategic Studies* (2025).

N. J. Cordaro, A. J. Kavran, M. Smallegan, M. Palacio, N. Lammer, T. S. Brant, V. DuMont, N. Doherty Garcia, S. Miller, T. Jourabchi, S. L. Sawyer, and **A. Clauset**, “Optimizing polymerase chain reaction (PCR) using machine learning.” Preprint, biorxiv:10.1101/2021.08.12.455589 (2021).

N. Connor and **A. Clauset**, “Predicting the outcomes of policy diffusion from U.S. states to federal law.” Preprint, arxiv:1810.08988 (2018).

J. I. Perotti, C. J. Tessone, **A. Clauset** and G. Caldarelli, “Thermodynamics of the minimum description length on community detection.” Preprint, arxiv:1806.07005 (2018).

K. Ikehara and **A. Clauset**, “Characterizing the structural diversity of complex networks across domains.” Preprint, arxiv:1710.11304 (2017).

R. C. Tillquist, L. Shoemaker, K. B. Knight, and **A. Clauset**, “The evolution of primate body size: Left-skewness, maximum size, and Copes rule.” Preprint, doi:10.1101/092866 (2016).

L. Fortunato and **A. Clauset**, “Revisiting the effect of red on competition in humans.” Preprint, doi:10.1101/086710 (2016).

A. Z. Jacobs, J. A. Dunne, C. Moore, and **A. Clauset**, “Untangling the roles of parasites in food webs with generative network models.” Preprint, arxiv:1505.04741 (2015).

C. R. Shalizi, A. Z. Jacobs\*, K. L. Klinkner and **A. Clauset**, “Adapting to non-stationarity with growing expert ensembles.” Preprint, arxiv:1103.0949 (2011).

**A. Clauset**, M. Young and K. S. Gleditsch, “A novel explanation of the power-law form of the frequency of severe terrorist events: Reply to Saperstein.” *Peace Economics, Peace Science and Public Policy* **16**(1), Article 12 (2010).

**A. Clauset**, “Story-telling, statistics, and other grave scientific insults.” *Nature Soapbox Science Blog* (posted 27 October 2010). go.nature.com/3mYkXfq

**A. Clauset**, “A theoretician ponders what physics has to offer ecology.” *Nature* **465**, 139 (2010).

N. Eagle, **A. Clauset**, A. Pentland and D. Lazer, “Multi-dimensional edge inference: Response to comment by Dr. Adams.” *Proc. Natl. Acad. Sci. USA* **107**(9), E31 (2010).

**A. Clauset** and C. Moore, “How do networks become navigable?” Preprint, arxiv:cond-mat/0309415 (2003).

POPULAR PRESS	D. B. Larremore, A. C. Morgan and <b>A. Clauset</b> , “More inclusive scholarship begins with active experimentation.” <i>The Chronicle of Higher Education</i> , published online 1 November (2017).		
	D. B. Larremore and <b>A. Clauset</b> , “Why predicting the future is more than just horseplay.” <i>The Christian Science Monitor</i> , published online 24 April (2017).		
	J. Warner and <b>A. Clauset</b> , “The Academy’s dirty secret.” <i>Slate</i> , published online 23 February (2015).		
	J. Warner and <b>A. Clauset</b> , “What same-sex marriage means for the future of recreational weed.” <i>Pacific Standard</i> , published online 24 October (2014).		
BOOK ENDORSEMENTS	M. Coscia, <i>The Atlas for the Aspiring Network Scientist</i> . (2nd ed.) (2024). → “ <i>The Atlas</i> is an essential resource for scientists in every field who want to understand their networks better.”		
	B. F. Braumoeller, <i>Only the Dead: The Persistence of War in the Modern Age</i> . Oxford University Press (2019). → “ <i>Only the Dead</i> demolishes the myth that war is in decline, and constructs a compelling explanation for the true drivers of war in the past, and likely in the future.”		
PATENTS	A. C. Morgan, S. F. Way, and <b>A. Clauset</b> , “System and methods for crawling web pages and parsing relevant information stored in web pages.” U.S. Patent Application 20200293581, Number 62/593,804 (2020).		
INDUSTRY CONSULTING	Scientific & Technical Consultant, <i>Respond Software Inc.</i> , Mountain View CA		2017
	Scientific & Technical Consultant, <i>FullContact Inc.</i> , Denver CO		2015 – 2017
	Scientific & Technical Consultant, <i>Institute for Defense Analysis</i> , Alexandria VA		2010 – 2014
	Corporate Advisory Board, <i>33across LLC</i> , New York NY		2008 – 2012
	Scientific & Technical Consultant, <i>33across LLC</i> , New York NY		2007 – 2012
	Strategy & Management Consultant, <i>FischerJordan LLC</i> , New York NY		2005
GRANTS (PI OR CO-PI)	“Training the Next Generation: Advancing Genetics and AI in Interdisciplinary PhD Education.” <b>co-PI</b> , with Tom Cech (PI; Colorado), Kristin Powell (co-PI; Colorado) John Templeton Foundation, \$3,160,877		2026 – 2029
	“Mapping the Development of K-12 STEM Education Research Over Time.” <b>co-PI</b> , with Alison F Resnick (PI; Colorado), Caitlin Farrell (co-PI; Colorado), Maria Pacheco (co-PI; Colorado) NSF DRL, \$749,775		2025 – 2028
	“Using advanced computational analysis to predict ovarian cancer outcomes.” <b>PI</b> , with Benjamin Bitler (PI; Anschutz) University of Colorado, AB Nexus seed grant program, \$124,105		2024 – 2025
	“The impact of socioeconomic heterogeneity on science and innovation.” <b>PI</b> , with Daniel E. Acuña (co-PI; Colorado) and Daniel B. Larremore (co-PI; Colorado) NSF SBE, \$400,000		2024 – 2027
	“Assessing bias and idiosyncrasies in elite scientific peer review.” <b>PI</b> , with Daniel B. Larremore (co-PI; Colorado) NSF SBE, \$501,890		2022 – 2026
	“Mining thousands of genomes to classify somatic and pathogenic structural variants.” <b>co-I</b> , with Ryan Layer (PI) and Fritz Sedlazeck (co-I; Baylor)		

NIH R01, \$3,176,940	2022 – 2027
“NRT: Integrated Data Science (Int dS): Teams for Advancing Bioscience Discovery.”	
<b>co-PI</b> , with Tom Cech (PI; Colorado), Robin Dowell (co-PI; Colorado), Eric Vance (co-PI; Colorado) and Manuel Lladser (co-PI; Colorado)	
NSF DGE, \$3,000,000	2020 – 2025
“A machine learning approach to chemotherapy-induced remodeling of the tumor microenvironment.”	
<b>co-PI</b> , with Benjamin Bitler (PI; Anschutz)	
Ovarian Cancer Research Alliance (OCRA), \$895,275	2022 – 2025
“Evaluating and Maximizing Fairness in Information Flow on Networks.”	
<b>PI</b> , with Suresh Venkatasubramanian (PI; Utah), Carlos E. Scheidegger (PI; Arizona), Sorelle Friedler (PI; Haverford), and Blair Sullivan (PI; Utah)	
NSF CISE, \$1,173,487	2020 – 2024
“A New Synthesis for the Science of Science.”	
<b>PI</b>	
NSF SBE, SMA Conference, \$40,418	2020 – 2022
“Ovarian cancer ascites: A glimpse of therapeutic response and recurrence.”	
<b>co-PI</b> , with Benjamin Bitler (PI; Anschutz), Kian Behbakht (co-PI; Anschutz), Raj Kumar (co-PI; Anschutz), Jennifer Richer (co-PI; Anschutz), Jill Slansky (co-PI; Anschutz), Matthew Sikora (co-PI; Anschutz), Kim Jordan (co-PI; Anschutz)	
Comprehensive Cancer Center Developmental Therapeutics Program Multi-PI Grant, University of Colorado Denver, \$100,000	2020
“Mapping the structure and dynamics of the scientific ecosystem.”	
<b>PI</b> , with Daniel B. Larremore (PI; Colorado), Mirta Galesic (co-PI; Santa Fe), and Jennifer Dunne (co-PI; Santa Fe)	
DoD and AFOSR, MINERVA, \$2,568,889	2019 – 2023
“Leveraging machine learning to improve biological protocol accuracy.”	
<b>PI</b> , with Sara Sawyer (co-PI; Colorado)	
University of Colorado, Research & Innovation Seed Grant, \$50,000	2018 – 2020
“Academic hiring networks and scientific productivity across disciplines.”	
<b>PI</b> , with Daniel B. Larremore (PI; Santa Fe) and Mirta Galesic (co-PI; Santa Fe)	
NSF SBE, \$550,000	2016 – 2020
“CAREER: Hierarchical probabilistic models for networks with rich data in scientific domains.”	
<b>PI</b>	
NSF CISE, \$550,000	2015 – 2020
“Extracting diagnostic signals from human microbiome data.”	
<b>PI</b> , with Ken Krauter (co-PI; Colorado) and Matt McQueen (co-PI; Colorado)	
University of Colorado, Butcher Seed Grant Award, \$70,000	2014 – 2016
“High-throughput ecosystem analysis and design.”	
<b>co-PI</b> , with Rob Knight (PI; Colorado), Ryan Gill (co-PI; Colorado), Noah Fierer (co-PI; Colorado), Manuel Lladser (co-PI; Colorado) and Robin Dowell (co-PI; Colorado)	
Keck Foundation, \$1,000,000	2013 – 2014

	<p>“An alignment-free network approach to analyzing highly recombinant malaria parasite antigens.”  <b>PI</b>, with Caroline Buckee (PI; Harvard)  NIH/NIGMS, R21, \$286,485</p>	2013 – 2016
	<p>“EAGER: Understanding technological change from the map of capabilities.”  <b>co-PI</b>, with Hyejin Youn (PI; Santa Fe Institute)  NSF SBE, \$152,500</p>	2013 – 2017
	<p>“Statistical inference for detecting structures and anomalies in networks.”  <b>PI</b>, with Cris Moore (PI; Santa Fe Institute) and Mark Newman (PI; Michigan)  DARPA and AFOSR, GRAPHS, \$2,924,396</p>	2012 – 2015
	<p>“Measuring the structure of research university networks.”  <b>PI</b>  Kauffman Foundation, \$53,000</p>	2012 – 2013
	<p>“Statistical inference and machine learning for complex networks.”  <b>co-PI</b>, with Cris Moore (PI; Santa Fe Institute) and Mark Newman (PI; Michigan)  McDonnell Foundation, \$417,576</p>	2008 – 2012
GIFTS	Facebook Inc.	2015
(UNRESTRICTED)	Microsoft Inc.	2014
INVITED TALKS (RECENT)	<ul style="list-style-type: none"> <li>• Invited Speaker, American Institute of Mathematics, Pasadena CA, 8–12 December 2025</li> <li>• Distinguished Speaker, Institute for Data Systems and Society, MIT, Boston MA, 4 November 2025</li> <li>• Invited Speaker, Editors Briefing, American Association for the Advancement of Science (AAAS), 22 October 2025</li> <li>• Colloquium Speaker, IceLab, Umea University, Umea Sweden, 7 October 2025</li> <li>• Colloquium, Department of Mathematics &amp; Computer Science, Colorado College, Colorado Springs CO, 12 September 2025</li> <li>• Invited Speaker, GraphGeeks Seminar Series, virtual, 28 August 2025</li> <li>• Keynote Speaker, Society for Chaos Theory in Psychology and Life Sciences (SCTPLS) Conference, Colorado Springs CO, 1 August 2025</li> <li>• Keynote Speaker, Oxford Summer School in Economic Networks, Oxford UK, 23–27 June 2025</li> <li>• Seminar, Institute of Agriculture and Natural Resources, University of Nebraska, Lincoln NE, 24 April 2025</li> <li>• Seminar, Department of Cognitive &amp; Information Sciences, University of California, Merced CA, 24 February 2025</li> <li>• Colloquium, Integrative Physiology Department, University of Colorado, Boulder CO, 28 October 2024</li> <li>• 171 other invited talks, since 2004</li> </ul>	
ADVISING	<p><b>Postdoctoral Fellows</b></p> <ul style="list-style-type: none"> <li>• Dr. Lucy Van Kleunen 2024 – 2025</li> <li>• Dr. Katherine Wootton 2021 – 2022</li> <li>• Dr. Eun Lee 2020 – 2022</li> <li>• Dr. Samuel F. Way 2017 – 2019</li> <li>• Dr. Andrea Berardi 2015 – 2016</li> <li>• Dr. Daniel B. Larremore 2012 – 2015</li> <li>• Dr. Leto Peel 2013 – 2015</li> </ul> <p><b>Doctoral Students</b> (all at Colorado)</p>	

- Kate Barnes 2024 – present  
Computer Science; co-advised with D. B. Larremore
- Carolina Chávez Ruelas 2023 – present  
Computer Science; co-advised with D. Acuña
- Vivian Li 2024 – present  
Computer Science and IQBiology; co-advised with L. Dee
- Katherine Spoon (PhD Computer Science, co-advised with D. B. Larremore) 2025  
Dissertation: *Quantifying Systemic Inequities in the Training and Retention of Professors*
- Ian Van Buskirk (PhD Computer Science, co-advised with D. B. Larremore) 2024  
Dissertation: *Datasets and Software for Estimating Consensus in Social Systems*
- Nicholas LaBerge (PhD Computer Science, co-advised with D. B. Larremore) 2024  
Dissertation: *Gender inequalities and peer review disparities in the academic workforce*
- Shimian (Sam) Zhang (PhD Applied Mathematics) 2024  
Dissertation: *Statistical models of scientific careers and decision-making*
- Lucy Van Kleunen (PhD Computer Science, co-advised with L. Dee) 2024  
Dissertation: *Interpretable prediction and decision-making under uncertainty using biological networks*
- Andrew J. Kavran (PhD Biochemistry, and IQ Biology, co-advised with N. Ahn) 2021  
Dissertation: *Intermittent drug treatment of BRAF<sup>V600E</sup> melanoma cells delays resistance by adaptive resensitization to drug rechallenge*
- Allison C. Morgan (PhD Computer Science) 2021  
Dissertation: *Quantifying structural inequalities in the academic workforce*
- Anna Broido (PhD Applied Mathematics, and IQ Biology) 2019  
Dissertation: *Characterizing the tails of degree distributions in real-world networks*
- Amir Ghasemian (PhD Computer Science) 2018  
Dissertation: *Limits of model selection, link prediction, and community detection*
- Nora Connor (PhD Computer Science, and IQ Biology) 2018  
Dissertation: *Using data science to find interpretable answers for problems in ecology and political science*
- Abigail Z. Jacobs (PhD Computer Science) 2017  
Dissertation: *Comparative, population-level analysis of social networks in organizations*
- Samuel F. Way (PhD Computer Science, and IQ Biology) 2017  
Dissertation: *Systematic inequalities in the composition and productivity of Computer Science faculty*
- Lauren G. Shoemaker (PhD Ecology & Evolutionary Biology, and IQ Biology, co-advised with B. Melbourne) 2017  
Dissertation: *Stabilizing and equalizing mechanisms alter community coexistence and macroevolutionary diversity patterns*
- Sears Merritt (PhD Computer Science) 2013  
Dissertation: *Dynamics and structure in competitive social systems*

#### Masters Students (all at Colorado)

- Bisman Singh (MS Applied Mathematics) 2024  
Thesis: *Predicting algorithm performance for missing link prediction in real-world networks*
- Dennis Windham (MS Computer Science) 2024  
Thesis: *Refining the Framework for Closing Gaps in Information Access in Networks.*
- Behzod Mirpochoev (MS Computer Science) 2024  
Thesis: *A Bayesian tool for estimating allele frequencies via Hardy-Weinberg equilibrium for structural variants*
- Caroline J. Wendt (MS Computer Science) 2023
- Upasana Dutta (MS Computer Science) 2022  
Thesis: *Sampling random graphs with specified degree sequences*
- Trevor DiMartino (MS Computer Science) 2017  
Thesis: *Ratchet mechanisms in macroevolutionary processes*

- Kansuke Ikehara (MS Computer Science) 2017  
Thesis: *Structure of complex networks across domains*
- Christopher Aicher (BS/MS Applied Mathematics) 2014  
Thesis: *The weighted stochastic block model*
- Pooneh Mortazavi (MS, Computer Science) 2013  
Thesis: *Genome optimization and evolution modeling using genetic algorithm and GA-TRMR*
- Yogesh Virkar (MS, Computer Science) 2012  
Thesis: *Power-law distributions and binned empirical data*

#### Undergraduate Students

- Behzod Mirpochoev (BS Computer Science, Colorado) 2022 – 2023  
Thesis: *Classification of genomic structural variants*
- Skylar Martin (BS Computer Science, Colorado) 2020 – 2021  
Thesis: *PhageOne: Inferring the grammar of bacteriophage genomes*
- Nicholas Cordaro (BS Biochemistry, Colorado) 2019 – 2020
- Christoph Uhl (BS Computer Science, Colorado) 2018 – 2020
- Alexander Ray (BS Computer Science, Colorado) 2017 – 2019  
Thesis: *Scaling laws in empirical networks*
- McKenzie Weller (BS Computer Science, Colorado) 2016 – 2019
- Tetsumichi Umada (BS Computer Science, Colorado) 2016 – 2018
- Ellen Tucker (BS Mathematics, Colorado) 2015 – 2016
- Matthias Sainz (BS Computer Science, Colorado) 2014 – 2016
- Dominic Tonozzi (BS Computer Science, Colorado) 2014 – 2015
- Christopher Aicher (BS/MS Applied Mathematics, Colorado) 2011 – 2014
- Kenneth Sheedlo (BS Comp. Sci., Colorado; Discovery Learning Apprentice) 2011 – 2012
- Andrew Zizzi (BS Aerospace, Colorado; Discovery Learning Apprentice) 2011 – 2012
- Kristen Hargett (BS Applied Math., Colorado) 2011
- Zachary Newman (BS Math., Colorado; McNair Scholar & UROP) Summer 2011
- Abigail Jacobs (BS Math., Northwestern; REU) Summer 2010
- Amy Wesolowski (BS Math., C.o. Atlantic; REU) Summer 2010
- Benjamin Good (BS Physics, Swarthmore; REU) 2008 – 2010

#### High School Students

- Preston Dunton (Legacy High School, CO) Fall 2017
- Arnab Purkayastha (Fairview High School, CO) Spring 2014
- Andrew Mauboussin (Darien High School, CT) Summer 2009

#### TEACHING

##### University Courses (\* indicates a new course)

- Biological Networks\* (undergraduate) Fall 2019, 2024, Spring 2020 – 2024  
Colorado, CSCI 3352
- Network Analysis and Modeling\* (graduate) Fall 2013, 2014, 2016, 2017, 2021, 2022  
Colorado, CSCI 5352 Spring 2025
- Algorithms (undergraduate) Spring 2014, 2017, 2018  
Colorado, CSCI 3104
- History and Future of Computing\* (undergraduate) Spring 2015, 2016  
Colorado, CSCI 4380
- Design and Analysis of Algorithms (graduate) Spring 2011 – 2013  
Colorado, CSCI 5454
- Inference, Models and Simulation for Complex Systems\* (graduate) Fall 2010, 2011  
Colorado, CSCI 7000
- Topics in Interdisciplinary Research\* (graduate) Fall 2019 – 2022, 2024, Spring 2022 – 2025  
Colorado, CSCI 7000 (co-taught with D. Larremore)

#### Summer School Courses

- Oxford Summer School in Economic Networks, Oxford UK 2025
- Santa Fe Institute, Complex Systems Summer School (CSSS) 2007 – 2023  
Santa Fe NM, 2007, 2008, 2013, 2014, 2016 – 2019, 2022, 2023;  
Beijing China, 2008, 2009; Ajitgarh India 2015
- Science of Science Summer School (S4), Syracuse U. 2022
- Philosophy & Political Economy Graduate Summer Workshop, Chapman U. 2021
- Santa Fe Institute, Complexity Interactive 2021
- Summer Institute in Computational Social Science (SICSS), Boulder CO 2018
- Santa Fe Institute, Short Course on Exploring Complexity 2011 – 2016  
Albuquerque NM, 2011; Washington DC, 2012; Stanford CA, 2012; Austin TX, 2013; Santa Fe NM, 2015; Santa Fe NM, 2016

#### REFEREE WORK

- **Applied Math and Statistics:** Annals of Applied Statistics, EPJ Data Science, SIAM ICDM Workshop on Analysis of Dynamic Networks (2009), SIAM Workshop on Network Science (2013, 2017, 2018, 2020, 2022), Statistical Analysis and Data Mining
- **Biology:** Bioinformatics, BMC Bioinformatics, eLife, Evolutionary Biology, Global Ecology and Biogeography, IET Systems Biology, Journal of Animal Ecology, Journal of Theoretical Biology, Marine Ecology Progress Series, Methods in Ecology and Evolution, PLOS Biology, PLOS Computational Biology, Trends in Ecology & Evolution
- **Computer Science:** AAI (2014), Communications of the ACM (CACM), Computer Science Reviews (CSR), Foundations and Trends in Machine Learning, IEEE GLOBECOM (2010), Proceedings of the IEEE, IEEE International Conference on Robotics and Automation (2006), ICWSM (2014–2017), Journal of the ACM (JACM), ACM Journal of Experimental Algorithmics (JEA), KDD (2025), Journal of Statistical Analysis and Data Mining, Machine Learning, ACM Trans. on Knowledge Discovery from Data (TKDD), IEEE Trans. on Knowledge and Data Engineering (TKDE), MLG (2016–2018, 2020), IEEE Trans. on Network Science and Engineering (TNSE), ACM Trans. on the Web (TWEB), RANDOM (2007), SIMPLEX (2010), SODA (2006, 2007), SDM Workshop on Analysis of Dynamic Networks (2009), NIPS Workshop on Analyzing Graphs (2008), Workshop on Experimental Algorithms (2006), ACM SIGKDD Workshop on Social Network Mining and Analysis (2008, 2009), WSDM (2010), WWW (2010–2018)
- **General:** Nature, Nature Communications, Nature Methods, PLOS ONE, PNAS, PNAS Nexus, Science, Science Advances
- **Physics:** European Physical Journal B, Europhysics Letters, Journal of Statistical Mechanics, New Journal of Physics, Physica A, Physical Review E, Physical Review Letters
- **Political Science:** American Journal of Political Science, American Political Science Review, British Journal of Political Science, Defense & Peace Economics, Journal of Conflict Resolution, Journal of Peace Research
- **Others:** Advances in Complex Systems, American Sociological Review, Computational Linguistics, Hydrology Earth System Sciences, Journal of Chemical Information and Modeling, Journal of Complex Networks, Journal of Quantitative Criminology, Networks and Spatial Economics, Social Policy & Administration, The Social Science Journal
- **Funding Agencies:** U.S. National Science Foundation (NSF), U.S. Department of Energy (DOE), U.S. Army Research Office (ARO), ETH Zürich Research Commission, European Research Council (ERC), Computing Research Association (CRA) Computing Innovation Fellows (CIFellows 2020, 2021)

#### PROFESSIONAL SERVICE

##### National

- Member, Computing Research Association (CRA) Survey Committee 2024 – 2025
- Member, Committee on *Pathways to Doctoral Degrees in Computing* CSTB, National Academies of Science, Engineering, and Medicine (NASEM) 2023 – 2025

##### Workshops (Organizer or co-organizer)

- *A New Synthesis for the Science of Science*

- Santa Fe Institute, Santa Fe NM (5–6 May) 2022  
 With D. B. Larremore (Colorado) and M. Galesic (Santa Fe)
- *Fairness in Networks*  
 Internat. Conf. on Knowledge Discovery and Data Mining (KDD) (14–18 September) 2021  
 With S. Friedler (Haverford), C. Scheidegger (Arizona), and S. Venkatasubramanian (Brown)
  - *Statistical Inference for Network Models*  
 NetSci 2020, Satellite Workshop, Rome Italy (20 September) 2020  
 With D. B. Larremore (Colorado), B. K. Fosdick (Colo. State), T. Eliassi-Rad (Northeastern),  
 and T. P. Peixoto (Cent. Eur. U.)
  - *Statistical Inference for Network Models*  
 NetSci 2019, Satellite Workshop, Burlington VT (27 May) 2019  
 With D. B. Larremore (Colorado), B. K. Fosdick (Colo. State), and T. Eliassi-Rad (Northeastern)
  - *Statistical Inference for Network Models*  
 NetSci 2018, Satellite Workshop, Paris France (11 June) 2018  
 With D. B. Larremore (Colorado), B. K. Fosdick (Colo. State), and T. Eliassi-Rad (Northeastern)
  - *Statistical Inference for Network Models*  
 NetSci 2017, Satellite Workshop, Indianapolis IN (19 June) 2017  
 With D. B. Larremore (Santa Fe), B. K. Fosdick (Colo. State), and T. Broderick (MIT)
  - *Violent Radicalization in Western Democracies*  
 Santa Fe Institute, Santa Fe NM (1–4 March) 2017  
 With M. Galesic (Santa Fe), M. Dumas (Santa Fe), and D. Pines (UC Davis)
  - *Statistical Inference for Network Models*  
 NetSci 2016, Satellite Workshop, Seoul Korea (30 May) 2016  
 With D. B. Larremore (Santa Fe), B. Fosdick (Colo. State), and A. Z. Jacobs (Colorado)
  - *Inference on Networks: Algorithms, Phase Transitions, New Models and New Data*  
 Santa Fe Institute, Santa Fe NM (14–18 December) 2015  
 With C. Moore (SFI) and M.E.J. Newman (Michigan)
  - *Networks in the Social and Information Sciences*  
 NIPS 2015, Montreal Canada (12 December) 2015  
 With E. Airoldi (Harvard), D. Choi (CMU), J. Ugander (Microsoft), and P. Toulis (Harvard)
  - *Statistical Inference for Network Models*  
 NetSci 2015, Satellite Workshop, Zaragoza Spain (1 June) 2015  
 With D. B. Larremore (Harvard), L. Peel (Colorado), and A. Z. Jacobs (Colorado)
  - *Networks: From Graphs to Rich Data*  
 NIPS 2014, Montreal Canada (13 December) 2014  
 With E. Airoldi (Harvard), D. Choi (CMU), J. Ugander (Microsoft), and L. Peel (Colorado)
  - *Mathematics Research Community Workshop on Network Science*  
 Snowbird UT (24–30 June) 2014  
 With M. A. Porter (Oxford) and D. Kempe (Southern Cal.)
  - *Statistical Inference for Network Models*  
 NetSci 2014, Satellite Workshop, Berkeley CA (2 June) 2014  
 With D. B. Larremore (Harvard), L. Peel (Colorado), and A. Z. Jacobs (Colorado)
  - *Frontiers of Network Analysis: Methods, Models, and Applications*  
 NIPS 2013, Lake Tahoe NV (9 December) 2013  
 With E. Airoldi (Harvard), D. Choi (CMU), K. El-Arini (Facebook), and J. Leskovec (Stanford)
  - *Structure, Statistical Inference, and Dynamics in Networks: From Graphs to Rich Data*  
 Santa Fe Institute, Santa Fe NM (6–9 May) 2013  
 With C. Moore (SFI) and M.E.J. Newman (Michigan)
  - *The Mathematics of Terrorism*  
 Santa Fe Institute, Santa Fe NM (31 Aug.–2 Sept) 2009  
 With B. Tivnan (MITRE)
  - *Statistical Inference for Complex Networks*  
 Santa Fe Institute, Santa Fe NM (3–5 December) 2008  
 With C. Moore (New Mexico, SFI)



- *Navigability and Complex Networks*  
Santa Fe Institute, Santa Fe NM (4–6 August) 2008  
With D. Krioukov (UCSD) and kc claffy (UCSD)
- *Is There a Physics of Society?*  
Santa Fe Institute, Santa Fe NM (10–12 January) 2008  
With M. Girvan (Maryland)

#### Conferences (Organizer or co-organizer)

- 2<sup>nd</sup> *Computer Science at UNM Student Research Conference*, Conference Chair,  
Albuquerque NM, (3 March) 2006
- 1<sup>st</sup> *Computer Science at UNM Student Research Conference*, Conference Chair,  
Albuquerque NM, (4 March) 2005

#### Program Committees

- *International Conference on Knowledge Discovery and Data Mining* (KDD) 2025
- *International Conference on Computational Social Science* (IC2S2) 2016 – 2018, 2023 – 2025
- *Atlanta Conference on Science and Innovation Policy* (ATLC) 2023
- *International Conference on Network Science* (NetSci, main cycle) 2015 – 2018, 2020
- *World Wide Web Conference* (WWW) 2010 – 2018
- *SIAM Workshop on Network Science* (NS) 2013, 2017, 2018, 2020, 2022
- (PC co-chair) *International Conference on Computational Social Science* (IC2S2) 2017
- (Senior PC) *International Conference on Network Science* (NetSci, main cycle) 2017
- (Senior PC) *World Wide Web Conference* (WWW) 2017
- *International Conference on Network Science* (NetSci-X) 2015 – 2017
- *International Workshop on Mining and Learning With Graphs* (MLG) 2016 – 2018, 2020
- *International AAAI Conference on Web and Social Media* (ICWSM) 2014 – 2017
- (Senior PC) *International Conference on Computational Social Science* (IC2S2) 2016
- *AAAI Conference on Artificial Intelligence* (AAAI) 2014
- *International Conference on Complex Networks* (CompleNet) 2009, 2010
- *Workshop on Simplifying Complex Networks for Practitioners* (SIMPLEX) 2010
- *ACM International Conference on Web Search and Data Mining* (WSDM) 2010
- *Workshop on Social Network Mining and Analysis* (at ACM SIGKDD) 2008, 2009
- *Workshop on Analysis of Dynamic Networks* (at SIAM ICDM) 2009
- *Workshop on Analyzing Graphs: Theory and Applications* (at NIPS) 2008
- *International Workshop on Experimental Algorithms* 2006

#### Advisory Boards

- University Advisory Board, *Industry of Ideas*, Social Science Research Council 2024 – 2025

#### Institutional Committees & Service

- Colorado, BioFrontiers Institute, Council 2010 – present
- Colorado, Member, School of Computing Task Force 2024 – present
- Colorado, Computational Biology Minor (CBIO), Curriculum Committee 2018 – present
- Colorado, BioFrontiers Institute, Computing Committee 2015 – present
- Colorado, Interdisciplinary Quant. Biology (IQBio) Curriculum Committee 2017 – present
- Colorado, Advisory Group, Clarivate Partnership in Research Intelligence 2024 – present
- Colorado, Computational Biology Minor (CBIO), Director (founding) 2018 – 2025
- Colorado, College of Engineering & Applied Science (CEAS) 2023 – 2025  
First Level Review Committee, Member
- Colorado, BioFrontiers Institute, Personnel Committee 2025
- Colorado, Computer Science, Executive Committee 2021 – 2024
- Colorado, BioFrontiers Outstanding Contribution Award Review Committee 2023 – 2024
- Colorado, Computer Science, Strategic Planning Committee, Co-chair 2023
- Colorado, College of Engineering & Applied Science (CEAS) 2022 – 2023

- Multi-Disciplinary Faculty Search Committee, Chair
- Colorado, Computer Science, CRA CERP point-of-contact 2016 – 2022
- Colorado, Computer Science, Teaching Circles, Director (founding) 2019 – 2022
- Colorado, Provost's Faculty Achievement Award Committee 2020 – 2021
- Colorado, BioFrontiers Faculty Search Committee, Co-chair 2016 – 2017
- Colorado, Computer Science, Faculty Search Committee 2012 – 2016
- Colorado, BioFrontiers Faculty Search Committee, Co-chair 2014 – 2015
- Colorado, Computer Science, Executive Committee 2013 – 2015
- Colorado, Computer Science, Graduate Committee 2010 – 2012
- Colorado, Interdisciplinary Quant. Biology (IQBio) Mentoring Committee 2011 – 2012
- Santa Fe Institute, Colloquium Committee 2007 – 2009

### Professional Society Leadership Positions

- Co-founder and Administrator, Zachary Karate Club CLUB Prize in Network Science  
networkkarate.tumblr.com 2013 – present
- Erdős-Rényi Prize selection committee, Network Science Society 2020
- President, UNM Computer Science Grad. Student Assoc. (CSGSA) 2004, 2005
- Vice President, UNM Computer Science Grad. Student Assoc. (CSGSA) 2003, 2004

### Professional Society Memberships

- American Association for the Advancement of Science (AAAS)
- International Society for Scientometrics and Informetrics (ISSI)
- Complex Systems Society (CSS)
- Network Science Society
- Sigma Xi (Full Member)

### SYNERGISTIC ACTIVITIES

- Founder and project lead for *Colorado Index of Complex Networks* (ICON) 2016 – present  
– icon.colorado.edu  
– public index of >5407 publicly accessible network science data sets
- Science blogger at *Structure+Strangeness* 2005 – present  
– aaronclauset.github.io, 9 entries 2017 – present  
– structureandstrangeness.com (defunct), 366 entries and >500,000 page hits 2005 – 2016
- Science microblogger on Bluesky @aaronclauset.bsky.social 2023 – present  
– 5926 followers
- Science microblogger on Mastodon @aaronclauset@fediscience.org 2022 – 2025  
– 1100+ followers / 132 posts
- Science microblogger on X/Twitter @aaronclauset 2012 – 2024  
– 11,201 followers / 3022 tweets  
– proud to be blocked by Steven Pinker since at least 2021
- Popular science writing 2014 – 2017  
*Pacific Standard, Slate, Christian Science Monitor, and Chronicle of Higher Education*
- Wikipedia contributor (various science and mathematics articles) 2006 – present
- Stackexchange contributor (various CS and mathematics questions) 2011 – present
- Public release of scientific data sets (open source; typically GPL or CC) 2007 – present  
– Fairness in networks data corpus (Python; with D. Windham) 2024  
– LinkPrediction network corpus (with A. Ghasemian, H. Hosseinmardi) 2019  
– Parental leave policies, U.S. & Canada (with A.C. Morgan, S.F. Way, D.B. Larremore) 2018  
– CommunityFitNet network corpus (with A. Ghasemian, H. Hosseinmardi) 2018  
– Degree sequences for 927 complex networks (with A.D. Broido) 2018  
– Faculty hiring networks for computer science, business, and history 2015  
– NFL 2009 network (with C. Aicher) 2014  
– Terrorist event sizes worldwide 2013  
– Body masses of all extant whale species 2013  
– Various binned quantities with heavy-tailed distributions (with Y. Virkar) 2012

– 9/11 hijackers association network	2008
– Various quantities with heavy-tailed distributions (with M.E.J. Newman)	2007
• Public release of working algorithms (open source; typically GPL or CC)	2004 – present
– Fairness in networks algorithms (Python; with D. Windham)	2024
– Configuration model sampler (Python; with U. Dutta)	2022
– Stacked topological model for link prediction in networks (Python; with A. Ghasemian)	2019
– Scale-free network toolkit (Python; with A.D. Broido)	2018
– neoSBM for metadata community detection (Python; with L. Peel)	2017
– Block entropy statistical test (BESTest) for networks (Matlab; with D.B. Larremore)	2017
– Minimum violation ranking sampling code (Matlab)	2015
– Bipartite stochastic block model package (Matlab; with D.B. Larremore)	2014
– Network change-point detection package (C++ and Python; with L. Peel)	2014
– Weighted stochastic block model package (Matlab; with C. Aicher)	2014
– Power-law distributions with bins toolkit (Matlab; with Y. Virkar)	2012
– Rare event forecasting tool kit (Matlab)	2012
– Terrorist organization simulation code (Matlab)	2011
– Modularity landscape mapping software package (Python; with B.H. Good)	2010
– Hierarchical random graph and missing-link prediction software package (C++)	2008
– Species mass macroevolution simulation code (Matlab)	2008
– Power-law distributions tool kit (Matlab and R; with C.R. Shalizi)	2007
– Local-modularity network clustering algorithm (C++)	2005
– Fast-modularity network clustering algorithm (C++)	2004