JACOB GATES FOSTER

Department of Sociology, UCLA
264 Haines Hall, 375 Portola Plaza, Los Angeles, CA 90095
Email: foster@soc.ucla.edu
Website: http://www.sociology.ucla.edu/faculty/jacob-foster
Phone: 1-312-608-8742

POSITIONS

2023—	External Professor, Santa Fe Institute
2023—	Professor, Department of Sociology, UCLA
	Special Assistant to the Vice Chancellor for Strategic Initiatives in Data Science
	Leadership Committee, Institute for Digital Research and Education
	Fellow, California Center for Population Research
	Affiliate, Center for Social Statistics, BRITE Center, Bedari Kindness Institute
	Core Faculty, Center for Behavior, Evolution, and Culture
2020-2023	Associate Professor, Department of Sociology, UCLA
2020-2021	Infosys Member, School of Social Science, Institute for Advanced Study
2013-2020	Assistant Professor, Department of Sociology, UCLA
2013	Research Associate (Assistant Professor), Sociology, UChicago
2010-2012	Postdoctoral Scholar, Department of Sociology, University of Chicago
	supervised by James A. Evans

EDUCATION

2006-2010	PhD, Physics, University of Calgary (Complexity Science Group)
	Thesis: "On the Methodology of Complex Network Analysis,"
	supervised by Maya Paczuski and Peter Grassberger
2003-2006	DPhil Candidate, Mathematics, University of Oxford
	Transfer Thesis: "Conformal Invariance, Renormalization, and the Eternal Universe," supervised by Sir Roger Penrose
1999-2003	B.S. with distinction, magna cum laude, Physics, Duke University
	Honors Thesis: "Physics with Two Time Dimensions,"
	supervised by Berndt Mueller

RESEARCH INTERESTS

Complex systems, collective intelligence, computational social science, machine learning/AI, social theory, science & technology, cognition & culture, NLP, cultural evolution, networks, game theory, SETI

FUNDING

2022-2025	PI, "Building Diverse Intelligences through Compositionality and Mechanism Design," Templeton World Charity Foundation ($1.75 million)
2023-2025	Co-PI, "AccelNet-Design: Accelerating Research Collaboration on Artificial and Natural Intelligences (ARCANI)," National Science Foundation ($249,974)
2021-2023	Co-PI, "Extraterrestrial Intelligence and the Niche Construction of Adaptive Information," Templeton World Charity Foundation ($98,926; $30,675 to UCLA)
2018-2023	PI, "Building a Community of Practice in Diverse Intelligences," Templeton World Charity Foundation ($3.2 million)
2018-2019	PI, "Diverse Intelligences Summer Institute: Pilot," Templeton World Charity Foundation ($233,342)
2017-2018	PI, "Planning a Summer School in Diverse Intelligences," Templeton World Charity Foundation ($99,983)
2017-2019	PI, "How Stories Live: Using Big Data to Understand the Diversity Dynamics of Folktales," Transdisciplinary Seed Grant-Big Data Track, UCLA
2016-2017	Faculty Career Development Award, UCLA
2016-2017	PI, "Quantifying the Dynamics of Diversity in Culture and Technology," Transdisciplinary Seed Grant, UCLA
2013-2014	PI, "Selection and Cognitive Transformation in the Population Dynamics of Culture," California Center for Population Research (seed grant), UCLA
2013-2016	Co-PI, "Metaknowledge Research Network," John Templeton Foundation ($5.2 million)

SCHOLARSHIPS AND FELLOWSHIPS

2020	Infosys Membership, School of Social Science, Institute for Advanced Study
2020	Fellowship, Center for Advanced Study in the Behavioral Sciences (declined)
2008	iCORE Scholarship (transferred from 2007 Alberta Ingenuity Scholarship)
2007, 2008	Graduate Research Scholarship, University of Calgary
2006	Dean's Entrance and Graduate Recruitment Scholarships, University of Calgary
2003	Rhodes Scholar
2003	Fellowship to attend Vienna International Summer University
2002	Faculty Scholar, Duke University (2-3 awarded per year for academic promise)
2002	Dean's Summer Fellowship, Duke University
1999	Angier B. Duke Scholar, Duke University (full-tuition, 4 year merit scholarship)

PUBLICATIONS AND WORK UNDER REVIEW

Krenn M, Buffoni L, Coutinho B, Eppel S, **Foster JG**, Gritsevskiy A, Lee H, Lu Y, Moutinho JP, Sanjabi N, Sonthalia R, Tran NM, Valente F, Xie Y, Yu R, Kopp M (forthcoming) Predicting the future of AI with AI: High-quality link prediction in an exponential growing knowledge network. *Nature Machine Intelligence*. Online at: https://arxiv.org/pdf/2210.00881.pdf

Koch B*, Sainburg T, Geraldo Bastías P,* Jiang S*, Sun Y, **Foster JG** (forthcoming) Deep learning of potential outcomes. *Sociological Methods & Research. *Graduate student co-authors*. Online at: https://arxiv.org/abs/2110.04442

Foster JG (forthcoming) From thin to thick: Toward a politics of human-compatible AI. *Public Culture*.

Evans JA*, **Foster JG*** (forthcoming) Algorithmic abduction: Robots for alien reading. *Critical Inquiry*. *Equal Authorship*

Arseniev-Koehler A*, **Foster JG** (2022) Machine learning as a model for cultural learning: Teaching an algorithm what it means to be fat. *Sociological Methods & Research* 51(4): 1484-1539. *Winner of the Best Graduate Student Paper Award, ASA Section on Mathematical Sociology*. *Graduate student co-author.*

Perry S, Carter A, **Foster JG,** Noebel S, Smolla M (2022) What makes inventions become traditions? *Annual Review of Anthropology* 51: 419-436.

Cheng L*, **Foster JG**, Lee H (2022) A simple, interpretable method to identify surprising topic shifts in scientific fields. *Frontiers in Research Metrics and Analytics* 7:1001754. *Undergrad co-author*.

Arseniev-Koehler A*, Cochran S, Mays V, Chang KW, **Foster JG** (2022) Integrating topic modeling and word embedding to characterize violent deaths. *Proc. Natl. Acad. Sci. USA.* 119(10): e2108801119. *Graduate student co-author.*

Arseniev-Koehler A* and **Foster JG** (2022) Sociolinguistic properties of word embeddings. *The Atlas of Language Analysis in Psychology*, eds. Dehghani M, Boyd RL (Guilford Press), pp. 464-477. *Graduate student co-author.* Online at: https://osf.io/preprints/socarxiv/b8kud/

Lee H, Sonthalia R, **Foster JG** (2021) Dynamic embedding-based methods for link prediction in machine learning semantic network. *2021 IEEE International Conference on Big Data*: 5801-5808. *Winner of Special Prize "for an exciting, dynamical embedding and applications of Transformers."*

Koch B*, Denton E, Hanna A, **Foster JG** (2021) Reduced, reused and recycled: The life of a dataset in machine learning research. *NeurIPS 2021 Datasets & Benchmarks Track. Winner of NeurIPS 2021 Datasets & Benchmarks Best Paper Award. *Graduate student co-author.* Online at: https://openreview.net/forum?id=zNQBIBKJRkd

Perry S*, Carter A, Smolla M, Akçay E, Noebel S, **Foster JG***, Healy S (2021) Not by transmission alone: The role of invention in cultural evolution. *Phil. Trans. Roy. Soc. B.* 376: 20200049. *Corresponding Authors*

Arseniev-Koehler A*, **Foster JG**, Mays V, Chang KW, Cochran S (2021) Aggression, escalation, and other latent themes in legal intervention deaths of non-Hispanic Black and White men: Results from the 2003-2017 National Violent Death Reporting System. *American Journal of Public Health* 111(S2): S107-S115. *Graduate student co-author.*

Uppunda A, Cochran S, **Foster JG**, Arseniev-Koehler A, Mays V, Chang KW (2021) Adapting coreference resolution for processing violent death narratives. *NAACL (North American Chapter of the Association for Computational Linguistics) 2021*.

Gjesfjeld E, Silvestro D, Chang J, Koch B, **Foster JG**, Alfaro ME (2020) A quantitative workflow for modeling diversification in technological systems. *PLOS ONE* 15(2): e0227579.

Evans JA*, **Foster JG*** (2019) Computation and the sociological imagination. *Contexts* 18(4): 10-15. **Equal Authorship*

Foster JG, Evans JA (2019) Promiscuous inventions: Modeling cultural evolution with multiple inheritance. *Beyond the Meme*, Minnesota Studies in Philosophy of Science, Vol 22, eds. Love A, Wimsatt W (University of Minnesota Press, Minneapolis), pp. 200-236.

Foster JG (2018) Culture and computation: Steps to a Probably Approximately Correct theory of culture. *Poetics* 68: 144-154.

Foster JG, Cartmill EA (2018) Managing the multiplicity of meaning. *Co-operative Engagements in Intertwined Semiosis: Essays in Honour of Charles Goodwin,* Tartu Semiotics Library, Vol 19, ed. Favareau D (University of Tartu Press, Tartu), pp. 136-143.

Foster JG (2015) The eye of the swarm: Collective intelligence and the public intellectual. *Speaking Power to Truth: Knowledge and the Public Intellectual in a Changing World*, eds. Keren M, Hawkins R (Athabasca University Press, Edmonton), pp. 69-89.

Rzhetsky A, **Foster JG**, Foster IT, Evans JA (2015) Choosing experiments to accelerate collective discovery. *Proc. Natl. Acad. Sci. USA* 112(47): 14569-14574.

Foster JG, Rzhetsky A, Evans JA (2015) Tradition and innovation in scientists' research strategies. *American Sociological Review* 80(5): 875-908. *Winner of 2016 Star-Nelkin Paper Award, ASA Section on Science, Knowledge, and Technology.*

Shi F, **Foster JG**, Evans JA (2015) Weaving the fabric of science: Dynamic network models of science's unfolding structure. *Social Networks* 43: 73-85.

Vilhena DA, **Foster JG**, Rosvall M, West JD, Evans JA, Bergstrom CT (2014) Finding cultural holes: How structure and culture diverge in networks of scholarly communication. *Sociological Science* 1: 221-238.

Foster DV, Rorick M, Gesell T, Feeney L, **Foster JG** (2013) Dynamic landscapes: A model of context and contingency in evolution. *J. Theor. Biol.* 334: 162-172.

Foster DV, **Foster JG**, Grassberger P, Paczuski M (2011) Clustering drives assortativity and community structure in ensembles of networks. *Phys. Rev. E* 84: 066117.

Evans JA, **Foster JG** (2011) Metaknowledge. *Science* 331(6018): 721-725.

Foster DV, **Foster JG**, Paczuski M, Grassberger P (2010) Communities, clustering phase transitions, and hysteresis: Pitfalls in constructing network ensembles. *Phys. Rev. E* 81: 046115.

Foster JG, Foster DV, Grassberger P, Paczuski M (2010) Edge direction and the structure of networks. *Proc. Natl. Acad. Sci. USA* 107(24): 10815-10820.

Foster DV, **Foster JG**, Huang S, Kauffman SA (2009) A model of sequential branching in hierarchical cell fate determination. *J. Theor. Biol.* 260: 589-597.

Foster JG, Grassberger P, Paczuski M (2009) Reinforced walks in two and three dimensions. *New J. Phys.* 11: 023009. *Selected as one of the best papers in NJP for 2009.*

Foster JG, Foster DV, Grassberger P, Paczuski M (2007) Link and subgraph likelihoods in random undirected networks with fixed and partially fixed degree sequences. *Phys. Rev. E* 76: 046112.

Under Review/Revision (manuscripts available upon request):

Koch B*, Silvestro D, **Foster JG** (revise & resubmit at *American Journal of Sociology*) The evolutionary dynamics of cultural change (as told through the birth and brutal, blackened death of metal music). *Graduate student co-author.* Online at: https://osf.io/preprints/socarxiv/659bt/

Foster JG, Shi F, Evans JA (in revision for *Research Policy*) Surprise! Measuring novelty as expectation violation. Online at: https://osf.io/preprints/socarxiv/2t46f/

Song Y*, Bergstrom CT*, **Foster JG*** (in revision) Why scientists chase big problems: Individual strategy and social optimality. *Equal Authorship.* Online at: http://arxiv.org/abs/1605.05822

PEER REVIEWED ABSTRACTS

Foster JG (2012) Me to We: Cooperation, conflict, and the evolution of language. In Scott-Phillips TC, Tamariz M, Cartmill EA, Hurford JR (eds.), *The Evolution of Language: Proceedings of the 9th International Conference (EVOLANG9)*, Singapore: World Scientific.

Foster JG, Slayton M (2010) Deception, tells, and the evolution of combinatorial communication. In Smith ADM, Schouwstra M, de Boer B, Smith K (eds.), *The Evolution of Language: Proceedings of the 8th International Conference (EVOLANG8)*, Singapore: World Scientific.

BOOK REVIEWS, COMMENTARY, AND WHITE PAPERS

Foster JG (2020) Interview: Early career faculty spotlight. *ASA Methodology Section Newsletter* 08-20: 2-5.

Cartmill EA, **Foster JG**, Krakauer DC, and Sharp O* (2020) Diverse Intelligence. *InterPlanetary Transmissions: Stardust, Proceedings of the Santa Fe Institute's Second InterPlanetary Festival*, eds. Krakauer DC, McShea CL (Santa Fe Institute Press, Santa Fe). *Speakers listed alphabetically.*

Menjívar C, **Foster JG,** Brand JE, and Group of Concerned UCLA Sociologists (2020) Don't call it 'social distancing.' CNN Op-ed. Online at: https://www.cnn.com/2020/03/21/opinions/physical-distancing-menjivar-foster-brand/index.html

Chu D, Demir I, Eichensehr K, **Foster JG**, Green ML, Lerman K, Menczer F, O'Connor C, Parson E, Ruthotto L, Shai A, Sotelo J, and Venturi L* (2020) Deep fakery: an action plan. White Paper produced by workshop, Deep Fakery: Mathematical, Cryptographic, Social, and Legal Perspectives, Institute for Pure and Applied Mathematics, UCLA. *Authors listed alphabetically.* Online at: http://ipam.ucla.edu/wp-content/uploads/2020/01/Whitepaper-Deep-Fakery.pdf

Foster JG (2017) "Five Variations," commentary on *How Societies and States Count* by Rebecca Jean Emigh, Dylan Riley, and Patricia Ahmed. *Trajectories* 28, 3: 20-25.

Foster JG (2016) Review of *Terrified* by Christopher Bail. *American Journal of Sociology* 122, 6: 974-976.

Foster JG (2014) Review of *Climbing the Charts* by Gabriel Rossman. *American Journal of Sociology* 119, 4: 1205-1208.

Foster JG (2012) Review of *A Cooperative Species* by Samuel Bowles and Herbert Gintis. *American Journal of Sociology* 118, 2: 501-504.

WORK IN PROGRESS

Foster JG (invited for *Annual Review of Sociology*) Collective intelligence.

Foster JG (invited for *Social Research*) The social science of the possible.

Ford P*, **Foster JG***, Martel JF* (invited for *Daedalus*) Care for the dead: Ancestors, traditions, and the life of cultures. **Authorship order to be determined*

Foster JG*, Evans JA* (under contract, Princeton University Press) *Knowing*. **Equal Authorship*

Foster JG*, ML Green* (in prep) The arms race for truth. **Equal Authorship*

Xu J, **Foster JG**, van der Schaar M (in prep) Making the cut: The design and dynamics of up-or-out evaluation.

Bergstrom CT*, **Foster JG***, Song Y*, Tanaka M* (in prep) The information cost of publication bias. **Authorship order to be determined*

PREPRINTS

Foster JG, Müller B (2010) Physics with two time dimensions.
Online at: http://arxiv.org/abs/1001.2485

INVITED TALKS

May 2023	"Information Architectures for (Human-Compatible) Artificial Intelligence," Information Architectures as Sociotechnical Competitions (Santa Fe Institute, USA)
Apr 2023	"Deconstructing the Barrier of Meaning," AI and the Barrier of Meaning 2 (Santa Fe Institute, USA)
Mar 2023	"How Complex Wholes Become Smarter than their Parts: Science, Culture, Evolution, and Beyond," Department of Informatics (Indiana University, USA)
Nov 2022	Panelist, "Collective Intelligence," Workshop on Human Flourishing and the Futures of Intelligence (Stanford, USA)
Sep 2022	"Imagine Datatopia: From the Social Production of Collective (Un)intelligence to the Sociology of the Possible," Michigan Datatopia Colloquium (University of Michigan, USA)
Aug 2022	"Multiple Thoughts on Multiple Life," Multiple Life Workshop (Santa Fe Institute, USA)
Dec 2021	"Science and the Social Production of Collective (Un)intelligence," Science4Cast (IEEE Big Data 2021, Virtual)

Sep 2021	"Beyond Machines of Flesh and Blood: Toward New Paradigms for Human-Compatible Collective Intelligence," Collective Intelligence in Natural and Artificial Systems (Santa Fe Institute, USA)
Jun 2021	"Culture and Computation: Steps to a Probably Approximately Correct Theory of Culture," Center for Human-Compatible Artificial Intelligence Virtual Workshop (UC Berkeley, USA)
Mar 2021	"Modeling Mind: Linking Method to Theory," Worldview Lab Seminar (Duke University, USA)
Mar 2021	"Using Machine Learning to Find Hidden Patterns in Violent Deaths," After Hours Conversations (Institute for Advanced Study, USA)
Mar 2021	"Modeling Culture: Linking Theory and Method with Machine Learning & Macroevolution," Economic Sociology Seminar (MIT Sloan, USA)
Feb 2021	"Toward a Social Science of the Possible," Friends of the Institute for Advanced Study (Institute for Advanced Study, USA)
Jan 2021	"Modeling Mind: Linking Method to Theory," Berkeley Culture Conference (UC Berkeley, USA)
Dec 2020	"Computation, Evolution, Construction: Three Tools for Re-imagining the Social," School of Social Science Seminar (Institute for Advanced Study, USA)
May 2020	"The Social Production of Collective Intelligence: An Unexpected Journey," Research Revealed (UCLA, USA)
Mar 2020	"Beyond Babel? Context, Convergence, and the Prospects for Universal Communication," Future of Humanity Club (UCLA, USA)
Jan 2020	"Beyond Babel? Context, Convergence, and the Prospects for Universal Communication," Complex Systems/ICAM Symposium: Emergence in Communication & Learning (University of Michigan, USA)
Jan 2020	"Made to Know: Science as the Social Production of Knowledge (and its Limits)," Osher Lab (UCLA Department of Mathematics, USA)
Dec 2019	"Measuring Novelty by Simulating Discovery," Monthly Networks Meeting (UCLA, USA)
Sep 2019	"Made to Know: Science as the Social Production of Knowledge (and its Limits)," Metascience 2019 Symposium (Stanford University, USA)
Jun 2019	Panelist, "Diverse Intelligence," InterPlanetary Festival (Santa Fe, USA)
Mar 2019	"Made to Know: Science as the Social Production of Knowledge by a Complex Adaptive System," keynote, Retuning Cognition with a Pair of Rocks: Culture, Evolution, Technology (Univ. of Pittsburgh, Center for Philosophy of Science, USA)
Mar 2019	"Made to Know: How Complex Systems Produce Knowledge," Cognitive Forum (UCLA Department of Psychology, USA)

May 2018	"The Arms Race for Truth," joint talk with Mark Green, PULSE Conference on AI in Strategic Context: Development Paths, Impacts, and Governance (UCLA Law School, USA)
Mar 2018	"Computational Thinking: Linking Culture and Cognition in Gender, Science, and Memory," Networks & Time Workshop (Columbia University, USA)
Feb 2018	"Understanding Explanation in Artificial Intelligence: What Should We Expect?" joint talk with Mark Green, UCLAI Workshop (UCLA Law School, USA)
Nov 2017	"The Road to 42: Social Limits to Collective Understanding," Limits of Understanding Workshop (Santa Fe Institute, USA)
Oct 2017	"Culture and Computation: Steps to a Probably Approximately Correct Theory of Culture," Networks & Culture Workshop (Stanford GSB, USA)
Sep 2017	"Made to Know: Science as the Social Production of Collective Intelligence," Department of Sociology Colloquium (UC Berkeley, USA)
Jun 2017	"Made to Know: Science as the Social Production of Collective Intelligence," SFI Innovation Executive Studio (Santa Fe Institute, USA)
Apr 2017	"Made to Know: Science as the Social Production of Collective Intelligence," CQA Spring Meeting (Las Vegas, USA)
Feb 2017	"Made to Know: Science as the Social Production of Collective Intelligence," Computational Social Science & Public Policy Colloquium (UChicago, USA)
Oct 2016	"Culture and Computation: Steps to a Probably Approximately Correct Theory of Culture," Formalizing Culture Workshop (Bern, Switzerland)
Oct 2016	"Made to Know: Science as the Social Production of Collective Intelligence," Network Science IGERT Seminar (UCSB, USA)
Aug 2016	Discussant, "Big Data/Big Theory," American Sociological Association Annual Meeting (Seattle, USA)
May 2016	"Show Us What You Got: Costs (and Benefits) of Misinformation in Science," Culture Analytics (Institute for Pure and Applied Mathematics, UCLA, USA)
Apr 2016	"Made to Know: Science as the Social Production of Collective Intelligence," Institute for Mathematical Behavioral Sciences (UC-Irvine, USA)
Apr 2016	"Concerning Censuses: Five Variations," commentary on *How Societies and States Count* (UCLA, USA)
Mar 2016	"Made to Know: Science as the Social Production of Collective Intelligence," International Symposium on Science of Science (Library of Congress, DC, USA)
Jan 2016	"Made to Know: Science as the Social Production of Collective Intelligence," Department of Sociology (University of Arizona, USA)
Dec 2015	"Math + Sociology," Transforming Post-Secondary Education in Mathematics, Regional Meeting (Duke University, USA)

Nov 2015	"Made to Know: Science as the Social Production of Collective Intelligence," Wagner Conference: Decision Making at Research Frontiers (University of Nevada-Reno, USA)
Oct 2015	"The Unknown Known: Science, Social Learning, and Collective Intelligence," Quantifying Science, Conference on Complex Systems 2015 (Tempe, USA)
Jun 2015	"On the Shoulders of Giants? Science and Collective Intelligence," plenary, Collective Intelligence 2015 (Santa Clara, USA)
May 2015	"On the Shoulders of Giants? Science, Social Learning, and Collective Intelligence," The Jacob Marschak Interdisciplinary Colloquium on Mathematics in the Behavioral Sciences (UCLA, USA)
May 2015	"The Unknown Known: Science, Social Learning, and Cultural Evolution," Behavior, Evolution, and Culture Speaker Series (UCLA, USA)
Oct 2014	"Promiscuous Inventions," with James Evans, Beyond the Meme: Articulating Dynamic Structures in Cultural Evolution (University of Minnesota, USA)
May 2014	"Finding Cultural Holes," Data as Critique: New Computational Approaches to the Study of Culture (University of Chicago, USA)
Apr 2014	"How Science Thinks," Innovation and Creativity Workshop (UCLA, USA)
Feb 2014	"Science as Social Learning," CCPR Seminar (UCLA, USA)
Jan 2014	"Toward an Ecology of Scientific Knowledge: Science, Social Learning, and Cultural Evolution," Workshop on Mathematics of Social Learning (IPAM, UCLA, USA)
Oct 2013	"Cultural Enrichment," Workshop on Social Network Data: Collection and Analysis (Statistical and Applied Mathematical Sciences Institute, NC, USA)
Jul 2013	"Clusters," NSF Conference on Innovation (Wharton, UPENN, USA)
Apr 2012	"Stability and Conformity in Scientists' Research Strategies," School of Information (University of Michigan, USA)
Nov 2011	"Novelty, Metaknowledge and Models of Discovery," Center for Nonlinear and Complex Systems & Center for Theoretical and Mathematical Sciences (Duke University, USA)
Oct 2011	"The Eye of the Swarm: Collective Intelligence and the Public Intellectual," Workshop on the Transformation of Public Intellectuals and Canadian Democracy (University of Calgary, Canada)
Aug 2010	"Knowledge and Metaknowledge," inaugural Institute for Computing in Science Workshop: Integrating, Representing, and Reasoning over Human Knowledge (Snowbird, Utah, USA)
Mar 2009	"Complex Equality & Complex Systems," invited class (University of Alberta, Canada)

| Oct 2007 | "Simulation, Reality, and the Social: a Virtual Provocation," Computational Philosophies (Niels Bohr Institute, Denmark) |

TALKS

Note: I have only listed talks I have given personally. My students have given a number of talks at ASA and other venues on co-authored papers. I also list talks at events I have helped to organize.

July 2023	"Building Diverse Intelligences through Compositionality and Mechanism Design," Diverse Intelligences Summit (Templeton World Charity Foundation/UCLA)
Aug 2022	"Building Diverse Intelligences through Compositionality and Mechanism Design," Diverse Intelligences Summit (Templeton World Charity Foundation/UCLA)
Feb 2022	"Institutions, Innovation, and the Social Production of Collective (Un)intelligence," Mathematics of Collective Intelligence (Institute for Pure and Applied Mathematics, UCLA, USA)
Jun 2021	"How Complex Wholes Become Smarter than their Parts: Compositionality & Mechanism Design as Organizing Principles for Diverse Intelligences," Diverse Intelligences Summit (Templeton World Charity Foundation/UCLA)
Feb 2021	"How Stories Shape Societies: A Simple Model," contributed Lightning Talk (Social Science Foo, USA)
Mar 2020	"Theory, Imagination & Understanding: Our Common Task," Machine Learning, Theory, and Method in the Social Sciences (Institute for Advanced Study, USA)
Aug 2019	"Measuring Novelty by Simulating Discovery," with Feng "Bill" Shi and James Evans, contributed talk, American Sociological Association Annual Meeting (New York City, USA)
Aug 2017	"Why Scientists Chase Big Problems," with Carl Bergstrom and Yangbo Song, contributed talk, American Sociological Association Annual Meeting (Montréal)
Aug 2017	"Culture and Computation: Steps to a Probably Approximately Correct Theory of Culture," contributed talk, American Sociological Association Annual Meeting (Montréal, Canada)
Aug 2015	"Promiscuous Inventions," with James Evans, contributed talk, American Sociological Association Annual Meeting (Chicago, USA)
Aug 2015	"Tradition and Innovation at Scale: Studying SKAT with Big Data," with Andrey Rzhetsky and James Evans, contributed talk, SKAT 25 (Chicago, USA)
Aug 2015	"Inequality all the way down? Dynamics of attention in 20th century physics," with Pete Aceves, Chris Rea, and James Evans, contributed talk, SKAT 25 (Chicago USA)
Aug 2014	"Finding Cultural Holes," with Daril Vilhena, Martin Rosvall, Jevin West, James Evans, and Carl Bergstrom, contributed talk, American Sociological Association Annual Meeting (San Francisco, USA)
Oct 2013	"The Numbers Speak: Big Data, Utopia, and Reflexivity," contributed talk, Society for the Social Studies of Science (San Diego, USA)

Aug 2013	"Blackboxing, Conceptual Distance, and the Routines of Invention," with James Evans, contributed talk, American Sociological Association Annual Meeting (New York City, USA)
Aug 2012	"Stability and Conformity in Scientists' Research Strategies," with James Evans and Andrey Rzhetsky, contributed talk, American Sociological Association Annual Meeting (Denver, USA)
Aug 2012	"Evolutionary and Ecological Approaches to Measuring Influence and Impact," with James Evans and Andrey Rzhetsky, contributed talk, American Sociological Association Annual Meeting (Denver, USA)
Jun 2012	"Stability and Conformity in Scientists' Research Strategies," NetSci 2012 Symposium, Networks: The Science of Science & Innovation (Northwestern University, USA)
May 2012	"The Art and Science of Community Detection," Computational Social Sciences Workshop (University of Chicago, USA)
Nov 2011	"Novelty, Metaknowledge and Models of Discovery," Organizations and Markets Workshop, Booth School of Business (University of Chicago, USA)
Aug 2011	"Measuring Novelty: Models of Discovery and Invention," with James Evans and Andrey Rzhetsky, contributed talk, American Sociological Association Annual Meeting (Las Vegas, USA)
Jan 2010	"A Network Analysis Smörgåsbord," Complexity Seminar (University of Calgary, Canada)
Apr 2009	"The Meme Factor," InnoLab Seminar (University of Calgary, Canada)
Mar 2009	"What is the Future of Economics?" Complexity Seminar (University of Calgary, Canada)
Sep 2008	"On Unification in the Behavioral Sciences," InnoLab Seminar (University of Calgary, Canada)
Aug 2008	"Taking the Avatar Approximation: The Promise and Peril of High-throughput Social Science in Virtual Worlds," contributed talk, Challenges and Visions in the Social Sciences (ETH Zurich, Switzerland)
Jun 2008	"Dynamic Landscapes: A Model of Context and Contingency in Evolution," Santa Fe Institute Complex Systems Summer School (Santa Fe, USA)
Mar 2008	"Torture, Terror, and the Undead," contributed talk, Graduate Sociology Conference (University of Calgary, Canada)
May 2007	"Modeling Adaptive Radiation in Pseudomonads," with Amer Shreim, contributed talk, Fields Institute Workshop: The Mathematics of Evolution (University of Ottawa, Canada)

AWARDS

2021	Special Prize "for an exciting, dynamical embedding and applications of Transformers," Science4cast Competition, IEEE Big Data
2021	NeurIPS 2021 Datasets & Benchmarks Best Paper Award
2016	Star-Nelkin Paper Award, ASA Section on Science, Knowledge, and Technology
2016	Faculty Career Development Award, UCLA
2006	Finalist, Oxford Leadership Prize
2005	Finalist, Oxford Leadership Prize
2005	International Academy of Achievement
2003	Spot Award, Los Alamos National Laboratory, Group P-21
2003	Barbara Hernnstein-Smith Award for Outstanding Work in Literary Theory or Criticism, Duke University
2002	Phi Beta Kappa
2002	Sigma Pi Sigma (physics honor society)
1998	Recognized by Educational Testing Service and Virginia General Assembly for the most 5's on Advanced Placement exams of any junior in the world (ETS also awarded me a trip to Disney World)

ADDITIONAL RESEARCH EXPERIENCE

2003	Researcher, Quantum Cryptography Group, Los Alamos National Laboratory
2001-2002	Undergraduate Researcher, Quantum Optics Group, Duke University

TEACHING AND MENTORING EXPERIENCE

2021—	Postdoctoral Mentor, Dr. Rishi Sonthalia (Hedrick Adjunct Assistant Professor in Mathematics at UCLA)
2021-2023	Postdoctoral Mentor, Dr. Harlin Lee (Hedrick Adjunct Assistant Professor in Mathematics at UCLA); now Assistant Professor of Data Science & Society, Mathematics, and Computer Science at UNC
2020-2022	Postdoctoral Mentor, Dr. David Peterson; now Assistant Professor of Sociology at Purdue University
2016-2017	Postdoctoral Mentor, Dr. Erik Gjesfjeld, former Renfrew Fellow at the McDonald Institute for Archaeological Research, Cambridge; now Program Officer in Human Sciences at the John Templeton Foundation
2016—	Member, MA Committee (Alina Arseniev-Koehler [Chair], Sociology, 2017; Clara Hanson, Sociology, 2017; Bernie Koch [Chair], Sociology, 2018; Christina Wilmot [Co-Chair], Sociology, 2023; Leah Jacobson [Chair], Sociology, 2023), UCLA

2015-2016	Postdoctoral Mentor, Dr. Yangbo ("Darcy") Song, who held the title of Assistant Project Scientist; now Assistant Professor in the School of Management and Economics at Chinese University of Hong Kong (Shenzhen)
2014—	Instructor, SOCIOL 111 (Social Networks), SOCIOL 191V (Science as X), SOCIOL 204 (Topics in Sociological Theorizing), SOCIOL 208A (Social Network Methods) SOCIOL 19 (Diversity and Complexity), SOCIOL 19 (Frontiers of Science), SOCIOL 285 (Formal Models of Social Structures), SOCIOL 208C (Machine Learning for Social Scientists), SOCIOL 285 (Social Science of the Possible), Department of Sociology, UCLA
2013—	Member, PhD Committee (Brooks Ambrose, Sociology, 2013/defended 2019; Seth Erickson, Information Studies, 2015/defended 2018; Kevin Shih, Sociology, 2015/ defended 2020; Kartik Ahuja, Electrical Engineering, 2015-2019; Frank van der Wouden, Geography, 2016/defended 2018; Jane Carlen, Statistics, 2016/defended 2018; Emily Yen, Sociology, 2016/defended 2019; Andrew Herman, Sociology, 2017/ defended 2022; Yotala Oszkay, Sociology, 2017/defended 2022; Kotrina Kajokaite, Anthropology, 2018/defended 2019; Bart Blackburn, Statistics, 2018/defended 2020; Reem Mehdoui, Anthropology, 2018; Chris Esposito, Geography, 2019/ defended 2021; Alina Arseniev-Koehler [Chair], Sociology, 2019/defended 2022; Ian Peacock, Sociology, 2019; Clara Hanson, Sociology, 2019/defended 2022; Melissa Haller, Geography, 2020/defended 2022; Bernard Koch [Chair], Sociology, 2020; Pablo Geraldo Bastías [Co-Chair], Sociology, 2021/defended 2023; Grace Li, Mathematics, 2022; Viraj Sawant, Institute of Environment & Sustainability, 2022), UCLA
2013	Co-instructor, SOCI 40183 (Do Ideas Evolve?), University of Chicago, Center for Disciplinary Innovation/CHSS/Department of Sociology
2009	Mentor for Undergrad Research Project, University of Calgary/Duke University
2005-2006	Tutor, Applied Mathematics, University of Oxford, Balliol College
2004-2006	Teaching Assistant, Further Quantum Theory, Quantum Field Theory, University of Oxford, Mathematical Institute
2000, 2002	Teaching Assistant, Mathematics & Chemistry, Woodberry Forest School

SUMMER SCHOOLS, INSTITUTES, AND WORKSHOPS

2023	Core Faculty, Intelligence & Representation: Models of the world in natural and artificial systems, August 13-25, Complexity-GAINS International Summer School, Isaac Newton Institute, University of Cambridge
2023	Director, Diverse Intelligences Summer Institute, June 25-July 15, St Andrews
2023	Invited Participant, AI and the Barrier of Meaning, April 24-26, Santa Fe Institute
2023	Invited Participant, Social Science of Caregiving, January 12-14, Center for Advanced Study in the Behavioral Sciences at Stanford University
2022	Director, Diverse Intelligences Summer Institute, July 24-August 12, St Andrews

2022	Invited Participant, Social Science of Caregiving (Virtual), April 8, Center for Advanced Study in the Behavioral Sciences at Stanford University
2022	Lead organizer, Mathematics of Collective Intelligence, Institute for Pure and Applied Mathematics, UCLA
2021	Invited Participant, Social Science of Caregiving (Virtual), July 9, Center for Advanced Study in the Behavioral Sciences at Stanford University
2021	Director, Diverse Intelligences Summer Institute (Virtual), June 27-July 24, The Internet
2021	Invited Participant, Social Science Foo (Virtual), Feb 19-21, The Internet
2020	Director, Diverse Intelligences Summer Institute (Virtual), June 29-July 25, The Internet
2020	Invited Participant, Center for Human-Compatible Artificial Intelligence, Virtual Workshop, UC Berkeley
2020	Co-organizer, Machine Learning, Theory, and Method in the Social Sciences, Institute for Advanced Study, Princeton, NJ
2020	Complex Systems/Institute for Complex Adaptive Matter Symposium: Emergence in Communication & Learning, University of Michigan (invited)
2019	Co-organizer, Deep Fakery: Mathematical, Cryptographic, Social, and Legal Perspectives, Institute for Pure and Applied Mathematics, UCLA
2019	Co-organizer, Social and Ethical Challenges in Machine Learning, Institute for Advanced Study, Princeton, NJ
2019	Core Participant, Machine Learning for Physics and the Physics of Learning, Long Program, Institute for Pure and Applied Mathematics, UCLA
2019	Bootcamp, BRITE Center (**B**ridging **R**esearch **I**nnovation, **T**raining and **E**ducation for Minority Health Disparities Solutions), UCLA (invited)
2019	Metascience 2019 Symposium (invited)
2019	Director, Diverse Intelligences Summer Institute, June 30-July 20, St Andrews
2019	Keck Institute for Space Studies: Data-Driven Approaches to Searches for the Technosignatures of Advanced Civilizations (invited)
2019	University of Pittsburgh, Center for Philosophy of Science: Retuning Cognition with a Pair of Rocks: Culture, Evolution, Technology (invited)
2018	Bootcamp, BRITE Center (**B**ridging **R**esearch **I**nnovation, **T**raining and **E**ducation for Minority Health Disparities Solutions), UCLA (invited)
2018	Director, Diverse Intelligences Summer Institute, July 29-August 11, St Andrews
2018	PULSE Conference on AI in Strategic Context: Development Paths, Impacts, and Governance, UCLA (invited)

2018	MIT Libraries: Summit on Grand Challenges in Information Science and Scholarly Communications Research—Scholarly Discovery (invited)
2017	Santa Fe Institute: Limits of Understanding (invited)
2017	Santa Fe Institute: Action Symposium on Artificial Intelligence (invited)
2017	Stanford Graduate School of Business: Networks & Culture (invited)
2017	Linköping University: Mapping the Future of Analytical Sociology (invited)
2016	Co-organizer, SoCal Network Economics and Game Theory Symposium, November 4-5, UCLA
2016	University of Bern: Formalizing Culture (invited)
2016	Co-organizer, The Deception of Self and Others, May 27, Institute for Society and Genetics, UCLA
2016	Instructor, Metaknowledge: Mapping, Measuring, and Modeling Science, Culture Analytics Tutorials, Institute for Pure and Applied Mathematics, UCLA
2016	Instructor, Introduction to Machine Learning for Social Scientists, Arizona Methods Workshop, University of Arizona
2014	Co-organizer and panelist, Mathematics of Politics, Institute for Pure and Applied Mathematics, UCLA
2014	University of Chicago: Data as Critique: New Computational Approaches to the Study of Culture (invited)
2014	Institute for Pure and Applied Mathematics, UCLA: Mathematics of Social Learning (invited)
2013	Statistical and Applied Mathematical Sciences Institute: Workshop on Social Network Data: Collection and Analysis (invited)
2013	Wharton, UPENN: NSF Workshop on Innovation (invited)
2013	Oxford Internet Institute: Workshop on Big Data and the Social Sciences (invited)
2012	Co-organizer, Networks: The Science of Science and Innovation, NetSci 2012 Symposium
2012	Institute for Computing in Science Workshop: Big Data and Long Tails (invited)
2011	Institute for Computing in Science Workshop: Accelerating Discovery, Human Computer Symbiosis 50 Years On (invited)
2010	Institute for Computing in Science Workshop: Integrating, Representing, and Reasoning over Human Knowledge (invited)
2008	Complex Systems Summer School, Santa Fe Institute
2005	String Theory Summer School, Perimeter Institute
2003	Vienna International Summer University: Cosmological and Biological Evolution

ACADEMIC SERVICE AND CITIZENSHIP

Ad hoc reviewer: Science, Nature, Proceedings of the National Academy of Sciences (USA), American Journal of Sociology, American Sociological Review, Sociological Methods & Research, Socius, Sociological Science, Research Policy, Topics in Cognitive Science, EPJ Data Science, Social Science and Medicine, Evolang, Computer Supported Cooperative Work, Academy of Management, PLoS ONE, PLoS Computational Biology, Journal of Physics A: Mathematical and Theoretical, New Journal of Physics, Physical Review E

Since Appointment at UCLA:

Professional Service:

2022-2026	Lead organizer, Mathematics of Intelligences, Institute for Pure and Applied Mathematics, UCLA (scheduled for Fall 2024, with two annual reunions)
2022	Lead organizer, Mathematics of Collective Intelligence, Institute for Pure and Applied Mathematics, UCLA
2020	Expert reviewer for grant submitted to Templeton World Charity Foundation
2020	Expert reviewer for NSF AccelNet (panel)
2020	Co-organizer, Machine Learning, Theory, and Method in the Social Sciences, Institute for Advanced Study, Princeton, NJ
2019	Co-organizer of workshop, Deep Fakery: Mathematical, Cryptographic, Social, and Legal Perspectives, Institute for Pure and Applied Mathematics, UCLA
2019	Co-organizer, Social and Ethical Challenges in Machine Learning, Institute for Advanced Study, Princeton, NJ
2019-2021	Editorial Board, Sociological Methodology
2019-2021	Consulting editor, American Journal of Sociology
2018—	Director, Diverse Intelligences Summer Institute
2018	Expert reviewer for grant submitted to Templeton World Charity Foundation
2018	Expert reviewer for NSF in Sociology
2018	Member, James S. Coleman Distinguished Career Achievement Award Committee, Section on Mathematical Sociology (ASA)
2018, 2019	Expert reviewer for "Emergences," Scientific Council of the City of Paris
2017	Expert reviewer for NSF in Sociology and Science, Technology, and Society
2017	Member, Hacker-Mullins Award Committee, Section on Science, Knowledge, and Technology (ASA)
2016, 2017	Champion, Templeton World Charity Foundation
2016	Expert reviewer for concept paper at National Institute on Drug Abuse
2015	Member, Mathematical Sociology Outstanding Article Award Committee (ASA)

| 2014 | Expert reviewer for grant submitted to John Templeton Foundation |

University Service:

2020—	Advisory Board, Social Sciences Center for Education, Research & Technology, UCLA
2020—	Leadership Committee, Institute for Digital Research and Education, UCLA
2019—	Special Assistant to the Vice Chancellor for Strategic Initiatives in Data Science
2017-2020	Committee on Big Data, Division of Social Sciences, UCLA
2016	Co-organizer, SoCal Network Economics and Game Theory Symposium, UCLA
2016	Member (at request of Academic Senate), June 1 Incident Task Force, UCLA
2016	Co-organizer of workshop, The Deception of Self and Others, Institute for Society and Genetics, UCLA
2016	Member, UCLA Delegation to "Narratives of Change," California Institution for Women
2014	Organized Arthur Frank's visit to UCLA as 2014 Canadian Scholar in Residence
2014	Co-organizer of workshop and panelist, Mathematics of Politics, Institute for Pure and Applied Mathematics, UCLA
2013-2020	Executive Committee, Institute for Digital Research and Education, UCLA

Departmental Service:

2023-2024	Executive Committee, Department of Sociology, UCLA
2022-2023	Executive Committee, Department of Sociology, UCLA
2022-2023	Colloquium Committee, Department of Sociology, UCLA
2021-2022	Executive Committee, Department of Sociology, UCLA
2020-2021	On sabbatical
2019-2020	Executive Committee, Department of Sociology, UCLA
2018-2019	Executive Committee, Department of Sociology, UCLA
2018-2019	Faculty Search Committee, Department of Sociology, UCLA
2017-2018	Executive Committee, Department of Sociology, UCLA
2016—	Faculty Sponsor, Computational Sociology Working Group
2016-2017	Undergraduate Education Committee, Department of Sociology, UCLA
2016	Presentation, "Made to Know: Science as the Social Production of Collective Intelligence," UCLA Department of Sociology Board of Visitors
2015	Faculty Search Committee, Department of Sociology, UCLA
2014-2015	Graduate Admissions Committee, Department of Sociology, UCLA

2014	Public lecture, "The Ecology of Ideas: How is Knowledge Made?" UCLA Department of Sociology Development event, Calabasas, CA
2013-2014	Graduate Committee, Department of Sociology, UCLA

Before Appointment at UCLA

2013—	Editorial Board, Computational Social Sciences Series, Springer
2012-2013	Founding co-organizer, Computational Social Sciences Workshop, University of Chicago
2012	Co-organizer, Networks: The Science of Science and Innovation, NetSci 2012 Symposium
2011—	Member, American Sociological Association (Mathematical Sociology; Methodology; Sociology of Culture; Science, Knowledge & Technology; Theory)
2008-2009	President, Physics Graduate Liaison Committee, University of Calgary
2008	Graduate Student Representative, Visioning Retreat, Department of Physics & Astronomy, University of Calgary
2007	Interdepartmental working group on "The Physics of Life," University of Calgary
2006-2009	Physics Graduate Liaison Committee, University of Calgary
2006-2008	Colloquium committee, Department of Physics & Astronomy, UCalgary
2003-2004	Research, supervision of final editing for Prof. Sir Roger Penrose's The Road to Reality: A Complete Guide to the Laws of the Universe (Random House, 2004).

COMMUNICATION SKILLS

Completed course in January 2005 on public communication of science, University of Oxford

Writer for Oxonian Review of Books

"Everybody Loves Einstein," a review of Einstein's Miraculous Year, ed. John Stachel

"Brave Old World," a review of World as Laboratory by Rebecca Lemov

"Warming Up to Al Gore," a review of An Inconvenient Truth by Al Gore

"Love Among the Ruins," a review of In the Shadow of the Bomb by S.S. Schweber

Writer for The American (now defunct)

"The Man Who Made Our World," a review of Einstein: His Life and Universe by Walter Isaacson