

# MARK NEWMAN

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Department of Physics and Center for the Study of Complex Systems

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## EDUCATION

1988            B.A., physics, University of Oxford  
1991            Ph.D., physics, University of Oxford

## EMPLOYMENT

1991–1994        Postdoctoral fellow, Department of Physics, Cornell University  
1994–1996        Research Associate, Cornell Theory Center, Cornell University  
1996–1998        Postdoctoral fellow, Santa Fe Institute  
1998–2002        Research Professor, Santa Fe Institute  
2002–2005        Assistant Professor, Department of Physics, University of Michigan  
2005–2007        Associate Professor, Department of Physics, University of Michigan  
2007–present     Full Professor, Department of Physics, University of Michigan  
2008–2015        Paul Dirac Collegiate Professor of Physics, University of Michigan  
2015–present     Anatol Rapoport Distinguished University Professor of Physics, University of Michigan

## VISITING POSITIONS

2000            Visiting Professor, Center for Applied Mathematics, Cornell University  
2002–present     External Faculty member, Santa Fe Institute  
2006            Visiting Professor, McCormick School of Engineering, Northwestern University  
2008–2009        Visiting Professor, Santa Fe Institute  
2016            Visiting Professor, Rudolf Peierls Centre for Theoretical Physics, University of Oxford  
2016            Visiting Professor, Isaac Newton Institute for Mathematical Sciences, University of Cambridge

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## RECENT FUNDED RESEARCH

2020–2023        National Science Foundation, \$329,712: Structure and function in large-scale complex networks  
2017–2020        National Science Foundation, \$294,514: Broad-scale modeling of complex networks  
2014–2017        National Science Foundation, \$265,000: Large-scale structure in complex networks  
2012–2016        Defense Advanced Research Projects Agency, \$2.9 million: Statistical inference for detecting structures and anomalies in networks

2011–2014	National Science Foundation, \$320,000: Large-scale structure in complex networks
2009–2011	James S. McDonnell Foundation, \$417,576: Statistical inference and machine learning for complex networks
2008–2011	National Science Foundation, \$150,000: The structure and dynamics of social networks and other networked systems
2004–2007	National Science Foundation, \$268,421: The structure and dynamics of social networks and other networked systems
2002–2008	James S. McDonnell Foundation, \$408,000: Networks and contagion among computers and people
2001–2004	National Science Foundation, \$144,236: The structure and dynamics of social networks and other networked systems

#### AWARDS AND HONORS

2021	Network Science Society Euler Award 2021
2018	Fellow of the Network Science Society
2016	John S. Guggenheim Fellowship
2016	Simons Fellow in Theoretical Physics
2014	ISI Lagrange Prize 2014
2014	Fellow of the American Association for the Advancement of Science
2014	Top 1% Highest Cited Physicists in the world, Thomson-Reuters Science Citation Index
2013	Senior Fellow, Michigan Society of Fellows
2012	Excellence in Education Award, University of Michigan
2011	Faculty Recognition Award, University of Michigan
2010	Ulam Distinguished Lecturer, Santa Fe Institute
2008	Gold Prize of the Geographic Association for <i>The Atlas of the Real World</i>
2007	Fellow of the American Physical Society
2004	Robert D. and Janet E. Neary Research Award, University of Michigan
2003	Harold C. Earley Faculty Research Award, University of Michigan
1992	NATO Fellow
1991	Lindemann Trust Fellow

#### HONORARY LECTURESHIPS

2018	Myhill Lectures in Mathematics, University of Buffalo
2016	The Gentry Lectures, Wake Forest University
2016	Turing Lecture, Alan Turing Institute, London
2015	Sandia Distinguished Lecture, Sandia National Laboratory, Albuquerque
2013	Badger Lecture in Network Medicine, Harvard University
2013	Distinguished Lecture on Scientific Computing, Simon Fraser University
2011	Hitachi Distinguished Lecture, University of Oklahoma
2011	Ockham Lecture, Oxford University
2010	Ulam Lectures, Santa Fe Institute
2009	Distinguished Lecture on Network Science, Pennsylvania State University
2008	NICO Distinguished Lecture, Northwestern University
2008	NSF ADVANCE Distinguished Lecture, Kansas State University
2007	John Wiley Jones Distinguished Lecture in Science, Rochester Institute of Technology

## CURRENT AND FORMER STUDENTS AND POSTDOCS

	<b>Degree/Position</b>	<b>Date(s)</b>	<b>Current position</b>
Michelle Girvan	Ph.D.	2003	Professor, University of Maryland
Petter Holme	Postdoc	2005–2006	Professor, Tokyo Institute of Technology, Japan
Michael Gastner	Ph.D.	2005	Assistant Professor, Yale-NUS College, Singapore
Juyong Park	Ph.D.	2006	Associate Professor, KAIST, South Korea
Elizabeth Leicht	Ph.D.	2008	Research division, Facebook Corporation
Gourab Ghoshal	Ph.D.	2009	Associate Professor, University of Rochester
Bethany Percha	M.P.H.	2010	Assistant Prof., Mount Sinai School of Medicine
Brian Karrer	Ph.D.	2011	Research division, Facebook Corporation
Brian Ball	Ph.D.	2014	Dotomi Inc.
Travis Martin	Ph.D.	2016	Google Inc.
Xiao Zhang	Ph.D.	2017	Amazon A9 Inc.
Maria Riolo	Postdoc	2015–2018	Postdoctoral Fellow, Santa Fe Institute
George Cantwell	Ph.D.	2020	Postdoctoral Fellow, Santa Fe Institute
Jean-Gabriel Young	Postdoc	2017–2020	Assistant Professor, U. of Vermont
Alec Kirkley	Ph.D. candidate	2017–	

## SERVICE AND ADMINISTRATION

2021–2022	Faculty Search Committee (chair), Michigan Physics
2020–2021	Graduate admissions committee, Michigan Physics
2020–2021	Curriculum Committee, Michigan Physics
2019–2020	Faculty Search Committee (chair), Michigan Complex Systems
2019–2020	Curriculum Committee, Michigan Physics
2019	Distinguished University Professorship committee, University of Michigan
2019	Promotion Evaluations Committee, Office of the Provost, University of Michigan
2018–2019	Graduate admissions committee, Michigan Physics
2017–2018	Faculty search committee (chair), Michigan Complex Systems
2017–2018	Distinguished University Professorship committee, University of Michigan
2016–2017	Graduate awards committee, Michigan Physics
2015–2016	Faculty search committee, Michigan Complex Systems
2015	Promotion Evaluations Committee, Office of the Provost, University of Michigan
2014–2015	Faculty search committee, Michigan Complex Systems
2014–2015	Graduate admissions committee, Michigan Physics
2014	Faculty Recognition Awards committee, University of Michigan
2013–2014	Faculty search committee, Michigan Complex Systems
2013–2014	Colloquium organizer, Michigan Physics
2013	International Conference on Network Science (NetSci 2013), program committee
2013	Faculty Recognition Awards committee, University of Michigan
2013	European Physical Society Outstanding Referee
2013	Faculty Grievance Board, University of Michigan
2012	Faculty Recognition Awards committee, University of Michigan
2012–2013	Faculty search committee, Michigan Complex Systems
2012–2013	Faculty search committee, Michigan Physics
2012–2013	Third Century Initiative steering committee, University of Michigan
2011	Santa Fe Institute Complex Systems Summer School, co-organizer

2011–2014	Northwestern University NSF program on complex networks, advisory board
2010–2011	SIAM Mathematics Awareness Month, organizing committee
2010–2011	Long-range planning committee, Michigan Physics
2010–2011	IT committee, Michigan Physics
2010–present	International Faculty Advisor, University of Michigan
2009–2014	Santa Fe Institute Science Board
2009–2010	Editorial committee, Michigan Physics
2008–present	Guest editor, <i>Proceedings of the National Academy of Sciences</i>
2008–2009	Graduate qualifying exam committee, Michigan Physics
2008	American Physical Society Outstanding Referee
2008	NSF panel on Foundations for Complex Systems Research in the Physical Sciences
2007–2008	Departmental Executive Committee, Michigan Physics
2007–2008	Faculty search committee, Michigan Physics
2007–2008	Graduate qualifying exam committee, Michigan Physics
2007–present	International Advisory Board, CABDyN Complexity Center, University of Oxford
2005–2006	Faculty search committee (chair), Michigan Physics
2005–2006	Faculty search committee (chair), Michigan Complex Systems
2005–2006	Graduate qualifying exam committee, Michigan Physics
2005–2006	Undergraduate concerns committee, Michigan Physics
2005–2006	Computing committee, Michigan Physics
2004–2005	Graduate qualifying exam committee, Michigan Physics
2003–2004	Graduate qualifying exam committee, Michigan Physics
2002–2003	Condensed matter seminar organizer, Michigan Physics
	Regular tenure and promotion panels

**Refereeing:** American Physical Society Outstanding Referee 2008, European Physical Society Distinguished Referee 2013

Referee for *Nature*, *Nature Physics*, *Science*, *Proceedings of the National Academy*, *Physical Review Letters*, *Physical Review B*, *Physical Review E*, *Physical Review X*, *Proceedings of the Royal Society*, *Journal of the Royal Society Interface*, *Journal of Statistical Physics*, *Journal of Statistical Mechanics*, *Physica A*, *Physica D*, *Europhysics Letters*, *European Physical Journal B*, *Journal of Physics A*, *Physics Letters A*, *International Journal of Modern Physics C*, *American Journal of Physics*, *Journal of Complex Networks*, *Advances in Complex Systems*, *Complexity*, *PLOS Computational Biology*, *Scientific Reports*, *PLOS One*, *Journal of Theoretical Biology*, *Chaos*, *Physics Reports*, *Reviews of Modern Physics*, *Social Networks*.

## TEACHING

Course	Title	Institution	Year
Physics 406	Statistical and Thermal Physics	University of Michigan	2002
Physics 406	Statistical and Thermal Physics	University of Michigan	2003
Complex Systems 535	Network Science	University of Michigan	2004
Physics 406	Statistical and Thermal Physics	University of Michigan	2004
Complex Systems 535	Network Science	University of Michigan	2005
Complex Systems 511	Theory of Complex Systems	University of Michigan	2006
Physics 406	Statistical and Thermal Physics	University of Michigan	2007

Complex Systems 511 Physics 390	Theory of Complex Systems Introduction to Modern Physics	University of Michigan	2007
Complex Systems 535 Physics 390	Network Science Introduction to Modern Physics	University of Michigan	2008
Complex Systems 535 Physics 411	Network Science Computational Physics	University of Michigan	2009
Complex Systems 535 Physics 411	Network Science Computational Physics	University of Michigan	2010
Complex Systems 535 Physics 411	Network Science Computational Physics	University of Michigan	2011
Complex Systems 535 Physics 411	Network Science Computational Physics	University of Michigan	2011
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Complex Systems 535 Physics 411	Network Science Computational Physics	University of Michigan	2012
Complex Systems 535 Physics 411	Network Science Computational Physics	University of Michigan	2013
Complex Systems 535 Physics 411	Network Science Computational Physics	University of Michigan	2013
Complex Systems 535 Physics 390	Network Science Introduction to Modern Physics	University of Michigan	2014
Complex Systems 535 Physics 411	Network Science Computational Physics	University of Michigan	2015
Complex Systems 535 Physics 411	Network Science Computational Physics	University of Michigan	2015
Complex Systems 535 Physics 411	Network Science Computational Physics	University of Michigan	2017
Complex Systems 535 Physics 411	Network Science Computational Physics	University of Michigan	2017
Complex Systems 535 Physics 411	Network Science Computational Physics	University of Michigan	2018
Complex Systems 535 Physics 411	Network Science Computational Physics	University of Michigan	2018
Complex Systems 535 Physics 288	Network Science Physics of Music	University of Michigan	2019
Complex Systems 535 Physics 288	Network Science Physics of Music	University of Michigan	2019
Complex Systems 535 Physics 288	Network Science Physics of Music	University of Michigan	2020
Complex Systems 535 Physics 288	Network Science Physics of Music	University of Michigan	2020
Complex Systems 535 Physics 288	Network Science Physics of Music	University of Michigan	2021

Also: Santa Fe Institute Complex Systems Summer School, Santa Fe, New Mexico, Summer 1996, 1998, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2011, 2012, and 2015 as well as occasional other schools.

#### THESIS COMMITTEES

Name	Department	Role	Graduation date
Jaeil Kim	Physics	Member	Winter 2002
Christopher Warren	Physics	Member	Summer 2003
Brett Pearson	Physics	Member	Winter 2004
Michael Gastner	Physics	Chair	Fall 2005
Han Peters	Mathematics	Cognate	Summer 2005
Sudin Bhattacharya	Mechanical Engineering	Member	Summer 2006
Juyong Park	Physics	Chair	Summer 2006
Dongxiao Zhu	Bioinformatics	Member	Summer 2006
Gunes Erkan	Computer Science	Cognate	Summer 2007
Daimian Wang	Physics	Member	Winter 2007
Elizabeth Leicht	Physics	Chair	Summer 2008
Althea Moorhead	Physics	Member	Summer 2008
Sarah Feldt	Physics	Member	Summer 2009
Gourab Ghoshal	Physics	Chair	Fall 2009
Kevin Haworth	Applied Physics	Member	Winter 2009
Jong-Hoon Kim	Epidemiology	Member	Fall 2009

Eva-Marie Proszkow	Physics	Member	Summer 2009
Casey Schneider-Mizell	Physics	Member	Summer 2010
Jane Wang	Applied Physics	Member	Fall 2010
David Adams	Physics	Member	Winter 2011
Eytan Bakshy	School of Information	Cognate	Fall 2011
Shanna Shaked	Applied Physics	Member	Winter 2011
Justin Gillespie	Naval Architecture	Cognate	Winter 2012
Brian Karrer	Physics	Chair	Winter 2012
Kevin Xu	Electrical Engineering	Cognate	Summer 2012
Li Zhang	Physics	Member	Fall 2012
Yunpeng Zhao	Statistics	Cognate	Summer 2012
Navid Dianati	Physics	Member	Winter 2013
Yen Ting Lin	Physics	Member	Summer 2013
Brian Ball	Physics	Chair	Summer 2014
Morgan Parker	Naval Architecture	Cognate	Summer 2014
Maria Riolo	Applied Mathematics	Member	Fall 2014
Adam Sypniewski	Physics	Member	Winter 2014
Daniel Wilcox	Physics	Member	Winter 2015
Pablo Damasceno	Chemical Engineering	Cognate	Summer 2015
Jieshi Fang	Civil Engineering	Cognate	Summer 2015
Travis Martin	Computer Science	Co-chair	Summer 2016
Yuan Zhang	Statistics	Cognate	Summer 2016
Andrew Elliot	Mathematics (Oxford)	External examiner	Winter 2017
Xiao Zhang	Physics	Chair	Summer 2017
Christopher Henry	Epidemiology	Cognate	Summer 2017
Meryl Spencer	Physics	Member	Summer 2018
Leyou Zhang	Physics	Member	Winter 2019
Fang-Yi Yu	Computer Science	Cognate	Spring 2019
Yike Liu	Physics	Member	Spring 2019
Ojan Khatib-Damavandi	Physics	Member	Summer 2019
Harry Richmond	Mathematics	Cognate	Summer 2020
George Cantwell	Physics	Chair	Summer 2020
Andrei Klishin	Physics	Member	Summer 2020

#### PRESS COVERAGE

New York Times, 15 August 2018; The Economist, 18 August 2018; BBC Radio 5, 10 August 2018; Los Angeles Times, 10 August 2018; The Guardian, 9 August 2018; The Times of London, 9 August 2018; The Independent, 9 August 2018; Washington Post, 8 August 2018; New Scientist, 8 August 2018; Boston Globe, 8 August 2018; Washington Post, November 1, 2016; BBC News online, October 21, 2013; Science News, November 7, 2012; Times Higher Education, June 2, 2011; and many others, including Science, Nature, The Lancet, National Public Radio, Chicago Tribune, CNN Television News, Discovery Channel, Atlantic Monthly, Vanity Fair magazine, Esquire magazine, Daily Telegraph, Der Spiegel magazine, ABC News online, Salon.com, and Die Zeit.

## PUBLICATIONS

Citation record (July 9, 2021):

	Total citations	Cites per year (since 2016)	h-index
Web of Science	92,599	7,859	78
Google Scholar	224,998	18,789	112

## BOOKS

1. Mark Newman, *Networks*, 2nd edition, Oxford University Press, Oxford (2018).
2. Mark Newman, *Computational Physics*, Createspace Independent Publishing (2012).
3. Daniel Dorling, Mark Newman, and Anna Barford, *The Atlas of the Real World*, Thames & Hudson, London (2008).
4. M. E. J. Newman, A.-L. Barabási, and D. J. Watts, *The Structure and Dynamics of Networks*. Princeton University Press, Princeton (2006).
5. M. E. J. Newman and G. T. Barkema, *Monte Carlo Methods in Statistical Physics*. Oxford University Press, Oxford (1999).
6. J. J. Binney, N. J. Dowrick, A. J. Fisher, and M. E. J. Newman, *The Theory of Critical Phenomena*. Oxford University Press, Oxford (1992).

## PAPERS IN REFEREED JOURNALS

1. G. T. Cantwell, A. Kirkley, and M. E. J. Newman, The friendship paradox in real and model networks. *Journal of Complex Networks* **9**, cnab011 (2021).
2. J.-G. Young, F. S. Valdovinos, and M. E. J. Newman, Reconstruction of plant-pollinator networks from observational data. *Nature Communications* **12**, 3911 (2021).
3. A. Kirkley, G. T. Cantwell, and M. E. J. Newman, Belief propagation for networks with loops. *Science Advances* **7**, eabf1211 (2021).
4. J.-G. Young, G. T. Cantwell, and M. E. J. Newman, Bayesian inference of network structure from unreliable data. *Journal of Complex Networks* **8**, cnaa046 (2021).
5. M. E. J. Newman, G. T. Cantwell, and J.-G. Young, Improved mutual information measure for clustering, classification, and community detection. *Phys. Rev. E* **101**, 042304 (2020).
6. M. A. Riolo and M. E. J. Newman, Consistency of community structure in complex networks. *Phys. Rev. E* **101**, 052306 (2020).
7. M. Newman and C. R. Ferrario, Improved demand curve for food or drug consumption in behavioral experiments. *Psychopharmacology* **237**, 943–955 (2020).
8. G. T. Cantwell and M. E. J. Newman, Message passing on networks with loops. *Proc. Natl. Acad. Sci. USA* **116**, 23398–23403 (2019).
9. M. E. J. Newman, Spectra of networks containing short loops. *Phys. Rev. E* **100**, 012314 (2019).
10. M. E. J. Newman, X. Zhang, and R. R. Nadakuditi, Spectra of random networks with arbitrary degrees. *Phys. Rev. E* **99**, 042309 (2019).

11. G. T. Cantwell and M. E. J. Newman, Mixing patterns and individual differences in networks. *Phys. Rev. E* **99**, 042306 (2019).
12. E. E. Bruch and M. E. J. Newman, Structure of online dating markets in US cities. *Sociological Science* **6**, 219–234 (2019).
13. A. Kirkley, G. T. Cantwell, and M. E. J. Newman, Balance in signed networks. *Phys. Rev. E* **99**, 012320 (2019).
14. M. E. J. Newman, Estimating network structure from unreliable measurements. *Phys. Rev. E* **98**, 062321 (2018).
15. E. E. Bruch and M. E. J. Newman, Aspirational pursuit of mates in online dating markets. *Science Advances* **4**, eaap9815 (2018).
16. M. E. J. Newman, Network structure from rich but noisy data. *Nature Physics* **14**, 542–545 (2018).
17. X. Zhang, C. Moore, and M. E. J. Newman, Random graph models for dynamic networks. *Eur. Phys. J. B* **90**, 200 (2017).
18. M. A. Riolo, G. T. Cantwell, G. Reinert, and M. E. J. Newman, Efficient method for estimating the number of communities in a network. *Phys. Rev. E* **96**, 032310 (2017).
19. M. E. J. Newman, Equivalence between modularity optimization and maximum likelihood methods for community detection. *Phys. Rev. E* **94**, 052315 (2016).
20. M. E. J. Newman and G. Reinert, Estimating the number of communities in a network. *Phys. Rev. Lett.* **117**, 078301 (2016).
21. M. E. J. Newman and A. Clauset, Structure and inference in annotated networks. *Nature Communications* **7**, 11863 (2016).
22. T. Martin, B. Ball, and M. E. J. Newman, Structural inference for uncertain networks. *Phys. Rev. E* **93**, 012306 (2016).
23. P. Zhang, C. Moore, and M. E. J. Newman, Community detection in networks with unequal groups. *Phys. Rev. E* **93**, 012303 (2016).
24. X. Zhang and M. E. J. Newman, Multiway spectral community detection in networks. *Phys. Rev. E* **92**, 052808 (2015).
25. M. E. J. Newman and T. P. Peixoto, Generalized communities in networks. *Phys. Rev. Lett.* **115**, 088701 (2015).
26. X. Zhang, T. Martin, and M. E. J. Newman, Identification of core-periphery structure in networks. *Phys. Rev. E* **91**, 032803 (2015).
27. M. E. J. Newman and T. Martin, Equitable random graphs. *Phys. Rev. E* **90**, 052824 (2014).
28. B. Karrer, M. E. J. Newman, and L. Zdeborová, Percolation on sparse networks. *Phys. Rev. Lett.* **113**, 208702 (2014).
29. T. Martin, X. Zhang, and M. E. J. Newman, Localization and centrality in networks. *Phys. Rev. E* **90**, 052808 (2014).
30. X. Zhang, R. R. Nadakuditi, and M. E. J. Newman, Spectra of random graphs with community structure and arbitrary degrees. *Phys. Rev. E* **89**, 042816 (2014).
31. M. A. Riolo and M. E. J. Newman, First-principles multiway spectral partitioning of graphs. *Journal of Complex Networks* **2**, 121–140 (2014).
32. M. E. J. Newman, Prediction of highly cited papers. *EPL* **105**, 28002 (2014).
33. M. E. J. Newman, Spectral methods for network community detection and graph partitioning. *Phys. Rev. E* **88**, 042822 (2013).



34. M. E. J. Newman and C. R. Ferrario, Interacting epidemics and coinfection on contact networks. *PLOS One* **8**, e71321 (2013).
35. M. E. J. Newman, Community detection and graph partitioning. *Europhys. Lett.* **103**, 28003 (2013).
36. T. Martin, B. Ball, B. Karrer, and M. E. J. Newman, Coauthorship and citation patterns in the Physical Review. *Phys. Rev. E* **88**, 012814 (2013).
37. B. Ball and M. E. J. Newman, Friendship networks and social status. *Network Science* **1**, 16–30 (2013).
38. R. R. Nadakuditi and M. E. J. Newman, Spectra of random graphs with arbitrary expected degrees. *Phys. Rev. E* **87**, 012803 (2013).
39. R. R. Nadakuditi and M. E. J. Newman, Graph spectra and the detectability of community structure in networks. *Phys. Rev. Lett.* **108**, 188701 (2012).
40. M. E. J. Newman, Communities, modules and large-scale structure in networks. *Nature Physics* **8**, 25–31 (2012).
41. B. Ball, B. Karrer, and M. E. J. Newman, An efficient and principled method for detecting communities in networks. *Phys. Rev. E* **84**, 036103 (2011).
42. B. Karrer and M. E. J. Newman, Competing epidemics on complex networks. *Phys. Rev. E* **84**, 036106 (2011).
43. B. Percha, M. E. J. Newman, and B. Foxman, Transmission probabilities and durations of immunity for three pathogenic group B Streptococcus serotypes. *Infection, Genetics, and Evolution* **11**, 1407–1412 (2011).
44. M. E. J. Newman, Complex systems. *Am. J. Phys.* **79**, 800–810 (2011).
45. B. Karrer and M. E. J. Newman, Stochastic blockmodels and community structure in networks. *Phys. Rev. E* **83**, 016107 (2011).
46. B. Karrer and M. E. J. Newman, Random graphs containing arbitrary distributions of subgraphs. *Phys. Rev. E* **82**, 066118 (2010).
47. R. Guimerà, D. B. Stouffer, M. Sales-Pardo, E. A. Leicht, M. E. J. Newman, and L. A. N. Amaral, Origin of compartmentalization in food webs. *Ecology* **91**, 2941–2951 (2010).
48. B. Karrer and M. E. J. Newman, A message passing approach for general epidemic models. *Phys. Rev. E* **82**, 016101 (2010).
49. A. Clauset, C. R. Shalizi, and M. E. J. Newman, Power-law distributions in empirical data. *SIAM Review* **51**, 661–703 (2009).
50. M. E. J. Newman, Random graphs with clustering. *Phys. Rev. Lett.* **103**, 058701 (2009).
51. B. Karrer and M. E. J. Newman, Random graph models for directed acyclic networks. *Phys. Rev. E* **80**, 046110 (2009).
52. G. Ghoshal, V. Zlatic, G. Caldarelli, and M. E. J. Newman, Random hypergraphs and their applications. *Phys. Rev. E* **79**, 066118 (2009).
53. M. E. J. Newman, The first-mover advantage in scientific publication. *EPL* **86**, 68001 (2009).
54. B. Karrer and M. E. J. Newman, Random acyclic networks. *Phys. Rev. Lett.* **102**, 128701 (2009).
55. A. Clauset, C. Moore, and M. E. J. Newman, Hierarchical structure and the prediction of missing links in networks. *Nature* **453**, 98–101 (2008).
56. M. Newman, The physics of networks. *Physics Today*, November 2008, pp. 33–38.
57. B. Karrer, E. Levina, and M. E. J. Newman, Robustness of community structure in networks. *Phys. Rev. E* **77**, 046119 (2008).

58. M. E. J. Newman and G. Ghoshal, Bicomponents and the robustness of networks to failure. *Phys. Rev. Lett.* **100**, 138701 (2008).
59. E. A. Leicht and M. E. J. Newman, Community structure in directed networks. *Phys. Rev. Lett.* **100**, 118703 (2008).
60. M. E. J. Newman, Component sizes in networks with arbitrary degree distributions. *Phys. Rev. E* **76**, 045101 (2007).
61. M. A. Porter, P. J. Mucha, M. E. J. Newman, and A. J. Friend, Community structure in the United States House of Representatives. *Physica A* **386**, 414–438 (2007).
62. E. A. Leicht, G. Clarkson, K. Shedden, and M. E. J. Newman, Large-scale structure of time evolving citation networks. *Eur. Phys. J. B* **59**, 75–83 (2007).
63. G. Ghoshal and M. E. J. Newman, Growing distributed networks with arbitrary degree distributions. *Eur. Phys. J. B* **58**, 175–184 (2007).
64. M. E. J. Newman and E. A. Leicht, Mixture models and exploratory analysis in networks. *Proc. Natl. Acad. Sci. USA* **104**, 9564–9569 (2007).
65. P. Holme and M. E. J. Newman, Nonequilibrium phase transition in the coevolution of networks and opinions. *Phys. Rev. E* **74**, 056108 (2006).
66. C. Moore, G. Ghoshal, and M. E. J. Newman, Exact solutions for models of evolving networks with addition and deletion of nodes. *Phys. Rev. E* **74**, 036121 (2006).
67. M. E. J. Newman, Finding community structure in networks using the eigenvectors of matrices. *Phys. Rev. E* **74**, 036104 (2006).
68. M. T. Gastner and M. E. J. Newman, Optimal design of spatial distribution networks. *Phys. Rev. E* **74**, 016117 (2006).
69. M. E. J. Newman, Modularity and community structure in networks. *Proc. Natl. Acad. Sci. USA* **103**, 8577–8582 (2006).
70. L. Ancel Meyers, M. E. J. Newman, and B. Pourbohloul, Predicting epidemics on directed contact networks. *J. Theor. Bio.* **240**, 400–418 (2006).
71. M. T. Gastner and M. E. J. Newman, The spatial structure of networks. *Eur. Phys. J. B* **49**, 247–252 (2006).
72. B. Foxman, M. Newman, B. Percha, K. K. Holmes, and S. O. Aral, Measures of sexual partnerships: Lengths, gaps, overlaps and sexually transmitted infection. *Sexually Transmitted Diseases* **33**, 209–214 (2006).
73. E. A. Leicht, P. Holme, and M. E. J. Newman, Vertex similarity in networks. *Phys. Rev. E* **73**, 026120 (2006).
74. M. T. Gastner and M. E. J. Newman, Shape and efficiency in spatial distribution networks. *J. Stat. Mech.* **2006**, P01015 (2006).
75. D. Dorling, A. Barford, and M. Newman, Worldmapper: The world as you’ve never seen it before. *IEEE Transactions on Visualization and Computer Graphics* **12**, 757–764 (2006).
76. M. E. J. Newman, Threshold effects for two pathogens spreading on a network. *Phys. Rev. Lett.* **95**, 108701 (2005).
77. J. Park and M. E. J. Newman, A network-based ranking system for American college football. *J. Stat. Mech.* **2005**, P10014 (2005).
78. J. Park and M. E. J. Newman, Solution for the properties of a clustered network. *Phys. Rev. E* **72**, 026136 (2005).

79. M. E. J. Newman, Power laws, Pareto distributions and Zipf's law. *Contemporary Physics* **46**, 323–351 (2005).
80. M. A. Porter, P. J. Mucha, M. E. J. Newman, and C. M. Warmbrand, A network analysis of committees in the United States House of Representatives. *Proc. Natl. Acad. Sci. USA* **102**, 7057–7062 (2005).
81. M. E. J. Newman, A measure of betweenness centrality based on random walks. *Social Networks* **27**, 39–54 (2005).
82. M. T. Gastner, C. R. Shalizi, and M. E. J. Newman, Maps and cartograms of the 2004 US presidential election results. *Advances in Complex Systems* **8**, 117–123 (2005).
83. L. Ancel Meyers, B. Pourbohloul, M. E. J. Newman, D. M. Skowronski, and R. C. Brunham, Network theory and SARS: Predicting outbreak diversity. *J. Theor. Bio.* **232**, 71–81 (2005).
84. J. Park and M. E. J. Newman, Solution of the 2-star model of a network. *Phys. Rev. E* **70**, 066146 (2004).
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#### BOOK CHAPTERS

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2. A. Clauset, C. Moore, and M. E. J. Newman, Structural inference of hierarchies in networks. In E. Airoldi, D. M. Blei, S. E. Fienberg, A. Goldenberg, E. P. Xing, and A. X. Zheng (eds.), *Statistical Network Analysis: Models, Issues, and New Directions*, number 4503 in Lecture Notes in Computer Science, pp. 1–13, Springer, Berlin (2007).
3. M. E. J. Newman, Who is the best connected scientist? A study of scientific coauthorship networks. In E. Ben-Naim, H. Frauenfelder, and Z. Toroczkai (eds.), *Complex Networks*, number 650 in Lecture Notes in Physics, pp. 337–370, Springer, Berlin (2004).
4. M. E. J. Newman, Random graphs as models of networks. In S. Bornholdt and H. G. Schuster (eds.), *Handbook of Graphs and Networks*, pp. 35–68, Wiley-VCH, Berlin (2003).
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8. G. T. Barkema and M. E. J. Newman, New Monte Carlo algorithms for classical spin systems. In D. Ferguson, J. I. Siepmann, and D. G. Truhlar (eds.), *Monte Carlo Methods in Chemical Physics*, John Wiley, New York (1999).

## PRESENTATIONS

### INVITED CONFERENCE PRESENTATIONS:

1. Networks 2021, Joint meeting of the Network Science Society and INSNA (online), July 6, 2021, plenary speaker
2. Workshop on Community Structure in Networks, Networks 2021 (online), July 1, 2021, keynote speaker
3. American Physical Society March Meeting (online), March 15–19, 2021, invited speaker
4. Workshop on Sustainable Exit Strategies for COVID-19, Arizona State University, May 28 and 29, 2020, invited speaker
5. International Conference on Network Science (NetSci 2019), Burlington, Vermont, May 29–31, 2019, keynote speaker
6. Workshop on Statistical Inference for Network Models (SINM 2019), Burlington, Vermont, May 27, 2019, invited panelist
7. SIAM Workshop on Network Science (NS17), Pittsburgh, Pennsylvania, July 13 and 14, 2017, keynote speaker
8. 3rd Annual Conference on Financial Stability, Center on Finance, Law, and Policy, Ann Arbor, Michigan, November 16 and 17, 2017, invited panelist
9. APS Ohio Section Annual Meeting, Eastern Michigan University, May 5-6, 2017, invited speaker
10. Symposium on Spatial Networks, University of Oxford, September 7-8, 2016, invited speaker
11. Workshop on Statistical Network Analysis, Isaac Newton Institute, Cambridge University, July 11-15, 2016, invited speaker
12. Workshop on Cultural Patterns: Multiscale Data-driven Models, Institute for Pure and Applied Mathematics, UCLA, Los Angeles, California, May 9-13, 2016, invited speaker
13. Inference on Networks, Santa Fe Institute workshop, Santa Fe, New Mexico, December 14–18, 2015, invited speaker
14. Complex Systems Summer School, Santa Fe, New Mexico, June 2015, principal lecturer
15. International Conference on Social Computing, Behavioral Modeling, and Prediction, Washington, DC, March 31–April 3, 2015, keynote speaker
16. 6th Workshop on Complex Networks (CompleNet 2015), New York City, March 25–27, 2015, keynote speaker
17. Conference on Complexity Science, Brighton, UK, August 19–22, 2014, keynote speaker
18. Conference on Computational Physics (CCP 2014), Boston, Mass., August 11–14, 2014, invited speaker

19. International Conference on Network Science (NetSci 2014), Berkeley, California, June 2–6, 2014, invited speaker
20. Cambridge Networks Day, Cambridge University, UK, May 23, 2014, keynote speaker
21. 111th Rutgers Statistical Mechanics Meeting, New Brunswick, New Jersey, May 11–13, 2014, invited speaker
22. Santa Fe Institute Annual Science Symposium, Santa Fe, New Mexico, May 2, 2014, invited speaker
23. Statistical Mechanics Foundations of Complexity, Santa Fe Institute, May 8–10, 2014, invited speaker
24. American Physical Society March Meeting, Denver, Colorado, March 3–7, 2014, invited speaker
25. Neural Information Processing Systems (NIPS 2013), Lake Tahoe, Nevada, December 5–10, 2013, invited speaker
26. DIMACS Workshop on Statistical Analysis of Network Dynamics and Interactions, Rutgers University, New Jersey, November 7–8, 2013, keynote speaker
27. Deep Computation in Statistical Physics, Santa Fe, New Mexico, August 1–3, 2013, invited speaker
28. Structure, Statistical Inference, and Dynamics in Networks, Santa Fe, New Mexico, May 6–9, 2013, invited speaker
29. Dynamics Days, Denver Colorado, January 3–6, 2013, invited speaker
30. Lawrence Livermore Workshop on Current Challenges in Computing, Napa, CA, August 27–29, 2012, invited speaker
31. Complex Systems Summer School, Santa Fe, New Mexico, June 2012, principal lecturer
32. 12th Experimental Chaos and Complexity Conference, Ann Arbor, Michigan, May 16–19, 2012, invited speaker
33. International Conference on Complex Systems, Boston, Massachusetts, June 26 to July 1, 2011, plenary speaker
34. 4th Annual Political Networks Conference, Ann Arbor, Michigan, June 14–18, 2011, plenary speaker
35. Complex Systems Summer School, Santa Fe, New Mexico, June 2011, co-organizer and lecturer
36. Conference on Computation as a Lens on the Sciences, Berkeley, California, May 7 and 8, 2011, invited speaker
37. Conference on Complex Systems, Northwestern University, Evanston, Illinois, March 6 and 7, 2011, keynote speaker
38. Conference on Statistics of Networks, SAMSI, North Carolina, August 29–September 1, 2010, invited speaker
39. Workshop on Statistics of Networks, Isaac Newton Institute, Cambridge, England, June 24–25, 2010, invited speaker
40. Workshop on Information, Networks, and Markets, Cambridge, England, June 22, 2010, invited speaker
41. International Conference on Network Science, Cambridge, Massachusetts, May 11–14, 2010, keynote speaker
42. American Physical Society March Meeting, Portland, Oregon, March 15–19, 2010, invited speaker
43. 2010 Berkeley Statistical Mechanics Meeting, University of California, Berkeley January 8–10, 2010, invited speaker



44. 2009 INFORMS Marketing Science Conference, University of Michigan, June 4–6, 2009, invited speaker
45. Society of Industrial and Applied Mathematics Front Range Conference, Denver, Colorado, March 14, 2009, keynote speaker
46. 100th Rutgers Statistical Mechanics meeting, New Brunswick, New Jersey, December 13–18, 2008, invited speaker
47. Workshop on Statistical Inference for Complex Networks, Santa Fe, New Mexico, December 3–5, 2008, invited speaker
48. Workshop on Advances in Theory of Networks and Strategic Interaction, Northwestern University, Evanston, October 3–4, 2008, invited speaker
49. Annual Meeting of the Association for the Advancement of Artificial Intelligence (AAAI 2008), Chicago, July 14–18, 2008, invited speaker
50. Annual Meeting of the Society for Industrial and Applied Mathematics (SIAM), San Diego, California, July 7–11, 2008, plenary speaker
51. International Conference on Network Science (NetSci 2008), Norwich, England, June 23–27, 2008, plenary speaker
52. Complex Systems Summer School, Santa Fe, New Mexico, June 2008, principal lecturer
53. European Conference on Complex Systems, Dresden, Germany, October 1–5, 2007, keynote speaker
54. 23rd International Conference on Statistical Physics (STATPHYS 23), Genoa, Italy, July 9–13, 2007, invited speaker
55. Conference on Complex Networks: From biology to information technology, Sardinia, Italy, July 2–6, 2007, invited speaker
56. Complex Systems Summer School, Santa Fe, New Mexico, June 2007, principal lecturer
57. International Conference on Network Science, New York City, May 21–24, 2007, invited speaker
58. Workshop on Random and Dynamic Graphs and Networks, Institute for Pure and Applied Mathematics, UCLA, Los Angeles, California, May 7–11, 2007, invited speaker
59. John Wiley Jones Distinguished Lecture in Science, Rochester Institute of Technology, May 30, 2007
60. British Applied Mathematics Colloquium, Bristol, England, April 17–19, 2007, plenary speaker
61. Workshop on Complex Networks and their Applications, Georgia Institute of Technology, Atlanta, Georgia, January 22–24, 2007, plenary speaker
62. École d'Été de Physique Théorique, Les Houches, France, July 3–7, 2006, invited lecturer
63. Summer School on Complex Networks, Bristol, England, July 10–14, 2006, invited lecturer
64. Conference on Optimization in Complex Networks, Los Alamos National Laboratory, New Mexico, June 19–22, 2006, invited speaker
65. Complex Systems Summer School, Santa Fe, New Mexico, June 2006, principal lecturer
66. International Conference on Network Science, Spencer, Indiana, May 22–25, 2006, invited speaker
67. March Meeting of the American Physical Society, Baltimore, March 13–17, 2006, invited speaker
68. Workshop on Statistics on Networks, National Academy of Sciences, Washington, DC, September 26–27, 2005, invited speaker

69. Workshop on Mathematical Epidemiology, Banff International Research Station, Banff, Canada, August 21–24, 2005, invited speaker
70. Santa Fe Institute Public Lecture, Santa Fe, New Mexico, June 15, 2005
71. Complex Systems Summer School, Santa Fe, New Mexico, June 2005, principal lecturer
72. Conference on Models of Real-World Random Networks, University of California, Berkeley, April 18–22, 2005, invited speaker
73. Conference on Network Science: Implications for Biology and Medicine, University of British Columbia, Vancouver, Canada, January 19–22, 2005, keynote speaker
74. Conference on Complex Systems, Northwestern University, Evanston, Illinois, October 29 and 30, 2004, invited speaker
75. Intel Corporation, Forum and Workshop on Modeling Complexity, October 5–6, 2004, keynote speaker
76. 13th Annual Conference on Computational Analysis of Social and Organizational Systems, Pittsburgh, Pennsylvania, June 27–29, 2004, keynote speaker
77. Complex Systems Summer School, Santa Fe, New Mexico, June 2004, invited lecturer
78. Rutgers Statistical Mechanics Meeting, Piscataway, New Jersey, May 16–18, 2004, invited speaker
79. March Meeting of the American Physical Society, Montreal, March 22–26, 2004, invited speaker
80. Annual Meeting of the American Association for the Advancement of Science, Seattle, February 12–16, 2004, invited speaker
81. Workshop on Networks and the Population Dynamics of Disease Transmission, Institute for Mathematics and its Applications, University of Minnesota, Minneapolis, November 17–21, 2003, invited speaker
82. Conference on Discrete Models for Complex Systems, Lyon, France, June 16–19, 2003, invited speaker
83. SIAM Conference on Applications of Dynamical Systems, Snowbird, Utah, May 27–31, 2003, invited speaker
84. CNLS Conference on Networks: Structure, Dynamics and Function, Santa Fe, May 11–16, 2003, invited speaker
85. National Academy Arthur M. Sackler Colloquium, Irvine, May 9–11, 2003, invited speaker
86. DIMACS meeting on Spatio-Temporal and Network Modeling of Diseases, Rutgers University, April 22–26, 2003, invited speaker
87. Annual Meeting of the American Mathematical Society, Baltimore, January 13–17, 2003, invited speaker
88. Fifteenth International Symposium on Mathematical Theory of Networks and Systems, University of Notre Dame, South Bend, August 12–16, 2002, invited speaker
89. NEC Lectures on Biophysics, Princeton, June 16–20, 2002, invited lecturer
90. Sitges Conference on Statistical Mechanics, Barcelona, Spain, June 10–14, 2002, invited speaker
91. March Meeting of the American Physical Society, Indianapolis, March 18–22, 2002, invited speaker
92. Berkeley Statistical Mechanics Meeting, UC Berkeley, January 11–13, 2002, invited speaker
93. Conference on Computational Physics, Aachen, Germany, September 5–8, 2001, plenary speaker
94. European Physical Society International Conference on Dynamical Networks in Complex Systems, Kiel, Germany, July 25–27, 2001, invited speaker

95. Summer School on Complex Systems, Central European University, Budapest, Hungary, July 16–20, 2001, principal lecturer
96. Gordon Conference on Nonlinear Science, Mount Holyoke, Massachusetts, June 17–22, 2001, invited speaker
97. SIAM Conference on Applications of Dynamical Systems, Snowbird, Utah, May 20–24, 2001, invited speaker
98. DARPA Principal Investigators Meeting, Santa Fe, April 17 and 18, 2001, keynote speaker
99. National Academy Arthur M. Sackler Colloquium, Irvine, March 23 and 24, 2001, invited speaker

#### SEMINARS AND COLLOQUIA:

1. UC Berkeley, Department of Statistics, Neyman Seminar, September 9, 2020
2. University of Edinburgh, Institute for Adaptive and Neural Computation, seminar, November 18, 2020
3. Ohio State University, Translational Data Analytics Institute, seminar, October 25, 2019
4. Northeastern University, Network Science Institute, Distinguished Speaker Seminar, March 27, 2019
5. Myhill Lectures 2018, Department of Mathematics, SUNY Buffalo, October 24, 25, and 26, 2018
6. Santa Fe Institute, seminar, July 5, 2018
7. University of Oxford, Department of Statistics, Distinguished Speaker Seminar, May 18, 2018
8. University of Oxford, Institute of New Economic Thinking, seminar, May 17, 2018
9. University of Chicago, Statistics colloquium, February 13, 2017
10. Gentry Lectures, Wake Forest University, Winston-Salem, NC, November 30–December 1, 2016, invited lecturer
11. Indiana University, Network Science Lecture, October 24, 2016
12. Case Western Reserve University, Physics colloquium, October 13, 2016
13. Cambridge University, Mathematical Sciences seminar, September 15, 2016
14. Turing Lecture, Alan Turing Institute, London, March 2, 2016
15. Royal Statistical Society, London, February 10, 2016, invited speaker
16. Oxford University, Distinguished Seminar in Statistics, March 11, 2016
17. Oxford University, Physics Colloquium, February 12, 2016
18. Oxford University, Physics Department public lecture, February 6, 2016
19. Oxford University, Mathematics Colloquium, January 29, 2016
20. Sandia Distinguished Lecture, Sandia National Laboratory, Albuquerque, New Mexico, June 25, 2015
21. Washington University, St. Louis, Physics colloquium, October 16, 2014
22. Harvard University, School of Engineering and Applied Sciences colloquium, October 6, 2014
23. University of Pittsburgh, Mathematics colloquium, September 26, 2014
24. University of Pittsburgh, Department of Mathematics, Theme Semester on Discrete Networks, invited lecturer, September 24–26, 2014
25. Ohio State University, Physics colloquium, August 26, 2014

26. UCLA, IPAM seminar, June 6, 2014
27. UCLA, Physics colloquium, June 5, 2014
28. Northwestern University, Institute on Complex System seminar, March 12, 2014
29. Stanford University, Physics colloquium, February 11, 2014
30. Harvard University, Badger Lecture in Network Medicine, November 19, 2013
31. Massachusetts Institute of Technology, Information and Decision Systems seminar, November 19, 2013
32. Center for Complex Network Research, Northeastern University, seminar, May 1, 2013
33. Boston University, Physics colloquium, April 30, 2013
34. Distinguished Lecture on Scientific Computing, Simon Fraser University, March 15, 2013
35. Center for Studies in Physics and Biology, Rockefeller University, seminar, October 8, 2012
36. Stony Brook University, Physics colloquium, March 20, 2012
37. Hitachi Distinguished Lecture, University of Oklahoma, November 11, 2011
38. Oxford University, Theoretical physics colloquium, October 14, 2011
39. Ockham Lecture, Oxford University, October 16, 2011
40. University of Chicago, Computation Institute seminar, April 4, 2011
41. Case Western Reserve University, Biomathematics seminar, March 25, 2011
42. Florida State University, Mathematics colloquium, January 28, 2011
43. Florida State University, Physics colloquium, January 27, 2011
44. Indiana University, Cognitive Science colloquium, November 8, 2010
45. University of Massachusetts, Amherst, Physics colloquium, October 6, 2010
46. Center for Computational Molecular Biology, University of Michigan, colloquium, September 29, 2010
47. Ulam Lectures, Santa Fe Institute (series of three lectures), September 14–16, 2010
48. University of Colorado, Boulder, Mathematics colloquium, March 13, 2009
49. Distinguished Lecture on Network Science, Pennsylvania State University, State College, Pennsylvania, January 14, 2009
50. 2008 NICO Distinguished Lecture, Northwestern University, Evanston, October 13, 2008
51. NSF ADVANCE Distinguished Lecture, Kansas State University, Manhattan, Kansas, September 4, 2008
52. Toyota Technological Institute at Chicago, seminar, November 9, 2007
53. Harvard University Medical School, seminar, November 16, 2006
54. University of Notre Dame, Condensed Matter seminar, October 27, 2006
55. Harvard University, Radcliffe Seminar, October 20, 2006
56. Northwestern University, Engineering Science and Applied Mathematics colloquium, October 16, 2006
57. Emory University, Physics colloquium, September 22, 2006

58. Santa Fe Institute, seminar, June 20, 2006
59. MIT, EECS seminar, May 11, 2006
60. Harvard University, Dana Farber Cancer Institute, Systems Biology seminar, April 27, 2006
61. Virginia Tech Corporate Research Center, April 10, 2006
62. Northwestern University, Industrial Engineering and Management Sciences seminar, April 7, 2006
63. University of Michigan, School of Information, STIET seminar, February 23, 2006
64. University of Rochester, Physics colloquium, February 22, 2006
65. William and Mary College, Physics colloquium, November 11, 2005
66. Cornell University, Applied Mathematics seminar, October 28, 2005
67. Perimeter Institute, Waterloo, Ontario, Institute colloquium, September 21, 2005
68. Harvard University, School of Public Health, seminar, May 2, 2005
69. Google Corporation, April 20, 2006
70. Indiana University, Complex Systems seminar, April 18, 2005
71. Princeton University, Ecology and Evolutionary Biology seminar, November 29, 2004
72. Syracuse University, Physics Colloquium, November 11, 2004
73. University of Maryland, Physics colloquium, November 9, 2004
74. NYU Stern School of Business, Information Systems seminar, October 14, 2004
75. University of Illinois, Urbana-Champaign, Physics colloquium, September 23, 2004
76. University of Oxford, Complex Systems seminar, May 11, 2004
77. Umeå University, Sweden, Physics seminar, May 6, 2004
78. Michigan State University, "Science on the Edge" seminar, April 30, 2004
79. University of Delaware, Mathematical Sciences colloquium, April 27, 2004
80. Georgia Tech, Applied Mathematics seminar, April 2, 2004
81. Harvard University, Kennedy School of Government, Colloquium on Complexity and Social Networks, March 15, 2004
82. Northwestern University, Engineering Science and Applied Mathematics colloquium, March 12, 2004
83. Microsoft Research, Theory Group seminar, February 13, 2004
84. Johns Hopkins University, Applied Mathematics and Statistics seminar, February 5, 2004
85. Wayne State University, Physics colloquium, January 22, 2004