

## **HERNÁN A. MAKSE**

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### **Education**

- Ph.D. in Physics, Boston University (Prof. H. E. Stanley, advisor), 1993–1997
- “Licenciatura” in Physics, University of Buenos Aires, Argentina, 1987–1991

### **Appointments**

- Sep 2008–present. Professor of Physics, Levich Institute and Department of Physics, City College of New York
- Sep 2008–present. Professor, Graduate Center, City University of New York
- Jan 2005–Sep 2008. Associate Professor of Physics, Levich Institute and Department of Physics, City College of New York
- Sep 2000–Dec 2004. Assistant Professor of Physics, Levich Institute and Department of Physics, City College of New York
- Sep 1997–Sep 2000. Postdoctoral Fellow, Schlumberger-Doll Research, Ridgefield, CT, USA. Laboratory of Dr. D. L. Johnson
- Aug 1996–Sep 1997. Postdoctoral period shared between laboratories of Prof. R. C. Ball, Cavendish Laboratory, University of Cambridge and Prof. P.-G. de Gennes, Collège de France, Paris

### **Fellowships, Awards, Honors, Visiting Positions**

- 2017-present. Associate Editor, Journal of Computational Social Science
- 2016–2017. Visiting Professor, Physics Department, Federal University of Ceará
- 2016-2019. Editorial Board, Europhysics Letters
- 2015-2019. Editorial Board Member, Heliyon, Elsevier
- Oct 2013. Visiting Professor, Department of Thermal Engineering, Tsinghua University, Beijing, China
- 2012-present. Editorial Board Member, Nature Scientific Reports

- 2012. Fellow of the American Physical Society. Citation: *For his contributions to a broad range of topics in non-equilibrium systems ranging from urban dynamics and complex networks to statistical mechanics of jammed matter, in particular, the elucidation of the random close packing state of granular matter.*
- Nov 2012. Visiting Adjunct Professor, Physics Department, University of Buenos Aires, Argentina
- 2011–2013. Consultant. Schlumberger-Doll Research, Cambridge, MA, USA
- 2007. Cesar Milstein Award, Secretaría de Ciencia y Técnica, Programa Raíces, Argentina
- 2006. Career Advancement Award, NSF-MCB, *Self-organization and robustness in evolving biological networks*
- 2005. New York City Mayor’s Young Investigator Award for Excellence in Science and Technology, New York Academy of Sciences
- 2005-present. Member of Scientific Committee for Powders and Grains, AEMMG, L’Association pour L’Etude de la Micromecanique des Milieux Granulaires
- 2004-present. Editor, Journal of Statistical Mechanics: Theory and Experiments
- 2004. Consultant. Schlumberger-Doll Research, Ridgefield, CT, USA
- 2003. Career Award, NSF-DMR, *Statistical mechanics of particulate systems far from equilibrium*
- 2000. Sixth German-American Frontiers of Science. US National Academy of Sciences, Alexander von Humboldt Foundation and Max Planck Society, Irvine, CA
- 1998. *The Year in Science: Top 100 Science Stories of 1997*, Periodical Discover. Article [28]
- 1995. Goldhaber Prize by a Graduate Student, Boston University

## Press Coverage and Media

- **Brain networks:**

Article [41] was featured the cover of *Neuroscience* and also in the Editorial by Araújo, Andrade, *Physical modeling and data analysis bring subliminal perception into consciousness*, *Neuroscience* **411**, 15 July 2019, Pages 279, and Science News and Medical Press.

- **Ecological networks:**

Article [3] was featured in “*CCNY finds K-core as a predictor of structural collapse in mutualistic ecosystems*”, EurekaAlert, Phys.org, ScienceDaily, and Technology.org. It was mentioned in the cover of Nature Physics.

- **Fake news:**

Article [2] was featured in a Nature Communications Editors' Highlights Webpage of recent research on From Brain to Behaviour in January 2019 and PhysicsWorld.com. See also, *Une étude belge a chiffré le nombre de "fake news" diffusées sur Twitter lors de l'élection présidentielle américaine* at La Libre. *L'UCL a compté le nombre de fake news sur Twitter lors de la campagne présidentielle américaine* at 7SUR7.be and 7sur7.cd. *Une étude belge a chiffré le nombre de "fake news" diffusées sur Twitter lors de l'élection présidentielle américaine* at La Dernière Heure (La DH). *Ruim 7,5 miljoen tweets met fake news tijdens Amerikaanse ...* at Het Nieuwsblad. *The language gives it away: How an algorithm can help us detect fake news*, at The Conversation. *MIL-OSI Global: The language gives it away: How an algorithm can help us detect fake news* at Foreign Affairs New Zealand. *News story from Big News Network on Wednesday 14 August 2019*, at Big News Network. *How an algorithm can help us detect fake news* at Alternet.

- **Artificial intelligence to predict elections:**

Article [45] has been featured in a Special Issue of Science on *Prediction and its limits*, Science **355** (Feb 3, 2017) by B. Jasny and R. Stone (cover), and in a feature article by *The Pulse of the People* by J. Bohannon, Science **355**, 470-472 (2017), Science Daily, *Analytics developed to predict poll trends* (October 2017), NCC News, *Twitter Can Predict The Presidential Election*, Democracy Chronicles, *Physicists Promise Accurate Election Predictions Using Twitter*, Science Daily, Science et vie.

- **Maximization Influence in Big-Data Social Networks:**

Article [9] was featured in a News & Views Nature Editorial by I. A. Kovács, A.-L. Barabási, "Destruction Perfected", Nature **524**, 38-39 (August 6, 2015). Phys.Org, July 1, 2015, "Smaller is smarter in superspreading of influence in social network." Press release in Daily News & Analysis, Times of India, Financial Express, TeCake, Odisha Samaya, Delhi Daily News, Microfinance Monitor, Austrian Tribune, Uncover Michigan, Bharat Press, AniNews, Ibcworldnews, New Kerala, Business Standard.

- **Brain Networks:**

Article [10] was featured in a News & Views Nature Physics editorial "Multilayer Networks: Dangerous Liaisons?" by Ginestra Bianconi, October 2014; Phys.org: "Why natural networks are more stable than man-made networks"; El Pais: "Tus neuronas mejorarán las redes que mueven el mundo"; Sociedade Brasileira de Física: sbfisica.org.br; Pesquisa FAPESP: "A estabilidade do cérebro"; abc.es: "Diseñan redes tecnológicas mediante experimentos con el cerebro humano".

- **Obesity Epidemic, Urban Growth and Health:**

Article [79] was featured in USNews, Science Daily, NSF Highlights, Medicalxpress, Science Blog, Care2.com, The visible embryo, The Atlantic Cities. Article [69] on green cities was featured in MIT Technology Review and Arizona News and article [64] on suicides in cities appeared in MIT Technology Review, Medical Daily, The Guardian and Olga Khazan's piece in The Atlantic: "Hell might be other people, but they might just save you from yourself", and nextcity.org.

- **Superspreading of Information in Complex Networks:**

Article [16] was featured in the cover of *Nature Physics*, November 2010. Press release in NSF-BIO news, *Physics World*, *Science Daily*, *Physorg.com*, *Technology Review*, *India Times*, *NSF Highlights*. Chosen 2011 winner GSNP group in the Gallery of the American Physical Society. Feature in cover *Chaos Journal*, December 2011. Featured in *Faculty of 1000*, *f1000.com*. *MIT Technology Review*, “The Emerging Science of Superspreaders (And How to Tell If You’re One Of Them)”, May 2014.

- **Packing of Hard-Spheres:**

Article [20] was accompanied by a *News & Views* editorial “Mathematical physics: Packings close and loose” by Francesco Zamponi, *Nature* **453**, 606-607 (29 May 2008) and featured in the Editor Summary. *Research Highlights*, *Nature Physics*, **4** 435 (2008). Press release in *Physics World*, *Science Daily*, *Physorg.com*, *Genetic Engineering and Biotechnology News*.

- **Self-similarity in Complex Networks:**

Article [25] was accompanied by a *News & Views* editorial “Complex systems: Romanesque networks” by S. H. Strogatz, *Nature* **433**, 365-366 (2005) and featured in *Science News* **167**, No. 5, Jan. 29, 2005, p. 68, “Sizing Up Complex Webs: Close or far, many networks look the same” by E. Klarreich.

- **Jamming in Granular Materials:**

Article [26] was accompanied by *News & Views* editorial “Granular materials: taking the temperature” by B. Behringer, *Nature* **415**, 594-595 (2002), and featured in a *News Feature* editorial “Think outside the sandbox” by Mark Buchanan, *Nature* **425**, 556-557 (2003).

- **Pattern Formation in Granular Flows:**

The stratification experiments depicted in Article [28] were described as the “Top 100 Science Stories of 1997” in the periodical *Discover*, **18** [1], 52 (Jan 1998). Article [28] was accompanied by *News & Views* editorial “From Cinderella’s dilemma to rock slides” by J. Fineberg, *Nature* **386**, 323–324 (1997), and described in detail in P. Ball, *The Self-Made Tapestry: Pattern Formation in Nature* (Oxford Univ. Press, NY, 1999), *BBC World News*, “World in Action”, August 1997. “Les couches de sable”, *Pour la Science* **237**, 24 (July 1997). “Schutten schafft Ordnung”, *Geo Magazine*, June 1997, p. 134. *Frankfurter Allgemeine Zeitung*, June 1997. “Deadly rock slide explained at last”, *The Ottawa Citizen (Canada)*, April 6, 1997. “Grains sort themselves into layers”, *Science News* **151**, 206 (April 5 1997). “Rocks that roll across the plain”, *Daily Telegraph (London)*, March 29, 1997. *MRS Bulletin*, March 1997, p. 72.

- **Urban Economics:**

Article [29] was accompanied by *News & Views* editorial “New ways of looking at cities” by M. Batty, *Nature* **377**, 574 (1995). Cover story, I. Peterson “The Shapes of Cities: Mapping out Fractal Models of Urban Growth”, *Science News* **149**, 8-9 (Jan 6 1996). *Physics World*, May 1997, p. 29. *Daily Telegraph (London)*, Sept. 25, 1996. *Scienza & Vita*, April 1996. *Diario El Pais (Spain)*, November 1995.

## Funding

## A. Current Grants

- NIH Brain Initiative, 1R01EB022720-01, 2016-2019, \$1,217,825. *Graph theoretical analysis of the effect of brain tumors on functional MRI networks*, PIs: Makse, Holodny, MSKCC
- NIH/NCI, U54 MSKCC-CCNY Partnership for Cancer Research, Prevention, and Community Outreach, 2016-2019, \$125,000. *Graph Theoretical Analysis of Pre-Operative fMRI Data in Bilingual Patients with Brain Tumors*, PIs: Makse, Holodny, MSKCC
- NSF-CRCNS, IIS-1515022, 2015-2019, \$749,000. *Targeted Stimulations in Brain Network of Networks*, PI: Makse. co-PI: Lucas Parra, Biomedical Engineering, CCNY.
- ARL-NSCTA, W911NF-09-2-0053, 2009-2019, \$1,060,000. *Social Dynamics, Opinion Spreading, and Influencing in Social Networks*, PI: Boleslaw Szymanski (RPI). co-PI: Makse, in one thrust.

## B. Previous Grants

- NSF-PoLS, PHY-1305476, 2013-2017, \$285,000. *Statistical Physics of Brain Networks*, PI: Makse.
- NSF-CMMT, DMR-1308235, 2013-2017, \$270,000. *Packings of Non-Spherical Objects*, PI: Makse.
- NIH-NIGMS, 1R21GM107641-01, 2013-2016, \$375,000. *Multiscale Theory of Disease Spreading in Social Networks*, PI: Makse.
- DOE-BES. Geosciences, DE-FG02-03ER15458, 2003-2016, \$855,000. *Study of Elasticity, Acoustics, and Dissipation in Earth Materials*, PI: Makse. Co-PI: David L. Johnson, Schlumberger-Doll Research.
- NSF-CMMT, DMR-0907004, 2008-2012, \$270,000. *Statistical Analysis of Jammed Matter*, PI: Makse.
- NSF-Emerging Frontiers, EF-0827508, 2008-2011, \$523,333. *Mathematical Frameworks for Biological Modular Networks*, PI: Makse. Co-PI: Thomas Rattei, Systems Biology, University of Vienna.
- NSF-HSD. SES-0624116, 2007-2011, \$680,000. *Dynamics of Social Networks*, PI: Makse.
- NSF-MCB. MCB-0615660, Career Advancement Award, 2006-2008. \$149,957. *Self-Organization and Robustness in Evolving Biological Networks*, PI: Makse.
- CUNY Equipment Award, 2005, \$66,000. *Transmitted light and epi-fluorescence microscopy systems with ultrafast image acquisition and processing for studies of jamming in emulsions, smooth muscle cell contraction, and intracellular protein distribution*, PI: Makse.
- DoD. Equipment grant, 2004, \$354,000. *Confocal Microscopy of Particulate Systems Far from Equilibrium*, Co-PI: Makse.

- DOE-BES. Division of Materials Sciences and Engineering, 2003-2007, \$305,000. *Non-equilibrium thermodynamics of densely packed granular matter and compressed emulsions*, PI: Makse.
- NSF-CMMT, Career Award, DMR-0239504, 2003-2008, \$400,000. *Statistical Mechanics of Particulate Systems Far from Equilibrium*, PI: Makse.
- PSC-CUNY Award Year 34, 2003-2004, \$3,840. *Slowly Driven Granular Materials*, PI: Makse.
- NSF-CREST, 2002-2007, \$2,000,000. *Center for Mesoscopic Modeling and Simulations*, Participate in one IRG.
- CUNY Equipment Grant Competition, 2002-2003, \$75,000. *High speed/high resolution visualization system and diffusing-wave spectrometer for the study of out-of-equilibrium disordered systems*, PI: Makse. Co-PI: Prof. M. Shattuck, CCNY.
- CUNY Institute for Software Design & Development, 2002, \$8,000. *Discrete element methods for the study of unconsolidated granular materials through computational modeling*, PI: Makse.
- ExxonMobil Research, Annandale, NJ, 2002, \$15,000. *Summer 2002 Graduate Student Internship*
- Schlumberger-Doll Research, Ridgefield, CT, 2002, \$12,000. *Summer 2002 Graduate Student Internship*.
- Petroleum Research Fund, 2001-2003, \$25,000. *Avalanche Segregation in Granular Flows*, PI: Makse.
- PSC-CUNY Award Year 32, 2001-2002, \$5,000. *Thermodynamic Approach to Slowly Driven Dense Granular Materials*, PI: Makse.

## Reviewer Activity

- **Reviewer of granting agencies:** NSF-CMMT. NSF-CRCNS. NSF-PoLS. NSF-DMR. NSF-BIO. NSF-Physics Frontiers Centers. NIH-NIGMS. NIH-Brain Initiative. Department of Energy. Petroleum Research Fund. United States-Israel Binational Science Foundation. European Science Foundation. Foundation for Fundamental Research on Matter, Netherlands. Conicyt, Chile. European Commission, Future Emerging Technologies. Italian Ministry for Education University and Research.
- **Reviewer of journals:** Nature, Nature Physics, Nature Communications, Nature Biotechnology, Science, Proceedings of the National Academy of Sciences, Physical Review Letters, Physical Review E, Physical Review X, Physica A, Journal of Non-Newtonian Fluid Mechanics, Physics of Fluids, European Physical Journal, Physica D, Europhysics Letters, J. Stat. Mech.: Theor. Exp., Geophysics Journal, Granular Matter, Microfluidics and Nanofluidics, Soft Matter, International Journal of Modern Physics B, Journal of the

Royal Society Interface, PlosOne, Fluctuation and Noise Letters, Chaos, Solitons & Fractals, Frontiers, Scientific Reports, Powder Technology, Physics Letters A, New Journal of Physics, NeuroImage: Clinical, Biomicrofluidics, Journal of Urban Health, Proceeding A: Royal Society, Palgrave Communications, Cogent Physics, Physical Chemistry Chemical Physics, Journal of Complex Networks, Fractals, Computational Social Networks, Particulate Science and Technology, Nonlinearity, Journal of the Operational Research Society, Complexity, Applied Computing and Informatics, The Computer Journal, Environment and Planning B: Urban Analytics and City Science, Current Biology, TCNS: The IEEE Transactions on Control of Network Systems.

## **Panelist**

- Mar 19-20, 2018. NSF-NIH, CRCNS Computational Neuroscience, Panelist
- Feb 15-16, 2018. NSF, CRCNS Collaborative Research in Computational Neuroscience USA - Spain, Participant
- Mar 9-10, 2017. NSF-NIH, CRCNS Computational Neuroscience, Panelist
- Feb 21, 2017. NSF, Neuronex, Brain Initiative. Panelist
- May 22, 2015. NSF, Ideas Lab, Cracking the olfactory code. Panelist
- Feb 12-13, 2015. NSF-PolS, Panelist
- Jan 29, 2015. NIH-NIGMS, ZRG1 HDM-J (55) Modeling Social Behavior, Panelist
- Nov 4, 2014. European Commission, Future Emerging Technologies, H2020-FET Open, Novel Ideas for Radical New Technologies. Panelist
- Oct 30, 2014. NIH-NIGMS, ZRG1 HDM-Q Modeling Social Behavior, Online Panelist
- Jun 1, 2014. NIH-NIGMS, ZRG1 HDM-Q Modeling of Social Behavior, Online Panelist
- Feb 3-4, 2014. NSF-PolS, Panelist
- Jul 24-25, 2012. NIH-NIGMS, ZGM1 BBCB-9, Panelist
- Feb 27 - Mar 3, 2012. European Commission, Future Emerging Technologies, FP7-ICT, Panelist
- Jan 23-24, 2012. NSF-NIH, CRCNS Computational Neuroscience, Panelist

## **Meeting Organization**

- March 2018, Organizer Focus Session APS March Meeting, Boston, Big Data in Physics (DCOMP, GSNP).
- July 22-27, 2018, Program Committee, International Conference on Complex Systems (ICCS 2018), Cambridge, MA.

- Nov 29-Dec 1 2017. Program Committee, 6th International Conference on Complex Networks and Their Applications, Complex Networks 2017, Lyon, France
- Jul 10-14 2017. Advisory Committee, International Conference on Statistical Physics (SigmaPhi2017), Statistical and Nonlinear Physics Division of the European Physical Society, Corfu, Greece
- Oct 10-14, 2016. International Advisory, Committee Collaborative Conference on Big Data (CCBD), Las Vegas
- Jun 1-3, 2016. Scientific Program Committee, NetSci2016, Seoul, Korea
- Jun 20-22, 2016. Scientific Program Committee, Summer Solstice 2016 - 8th International Conference on Discrete Models of Complex Systems. University of Aveiro, Portugal
- Nov 23-27, 2015. Program Committee, The 4th International Workshop on Complex Networks and their Applications and The 11th International Conference on Signal Image Technology & Internet Based Systems, Bangkok, Thailand
- Nov 23-27 2014. Program Committee, Third International Workshop on Complex Networks and their Applications, and The 11th International Conference on Signal Image Technology & Internet Based Systems SITIS, Marrakesh, Morocco
- Sep 15-18, 2014. Chair of Packing Session, Jam-Packed - Packing and Jamming of Particulate Systems, Erlangen, Germany
- Jul 8-12, 2013. Session Chair, International School on Biological Complex Networks, Natal, Brazil
- Mar 29-Apr 1, 2009. Session Chair, Minerva Workshop, Science of Complexity, Eilat, Israel
- Jun 6, 2006. Co-organizer of 4th Northeastern Granular Materials Workshop, City College of New York, New York
- Jul 18-22, 2005. Chair of Jamming Session, Powders & Grains 2005, Stuttgart, Germany
- Jul 25-28, 2005. Session Chair, Dynamical Networks Symposium, XXV Dynamics Days Europe, Berlin
- Sep 26, 2003. Session Chair, Flow Regimes, Transitions and Segregation in Granular and Particle-Laden Flows, Isaac Newton Institute, Cambridge, UK
- Mar 1998. Session Chair of Granular Matter II, APS March Meeting
- Nov 9-13, 1998. Chair of Complex Fluids Session, Tohwa University Symposium, Fukuoka, Japan, November 1998

## LIST OF PUBLICATIONS

### A. Most Relevant Publications



1. F. Morone, H. A. Makse, *Symmetry group factorization reveals the structure-function relation in the neural connectome of *Caenorhabditis elegans**, **Nature Commun.** (2019).
2. A. Bovet, H. A. Makse, *Influence of fake news in Twitter during the 2016 US presidential election*, **Nature Comm.** **10**, 7 (2019).
3. F. Morone, G. Del Ferraro, H. A. Makse, *The *k*-core as a predictor of structural collapse in mutualistic ecosystems*, **Nature Phys.** **15**, 95-102 (2019).
4. A. Babino, H. A. Makse, R. DiTella, M. Sigman, *Maintaining trust when agents can engage in self-deception*, **Proc. Nat. Acad. Sci.** **115**, 8728-8733 (2018).
5. G. Del Ferraro, A. Moreno, B. Min, F. Morone, U. Pérez-Ramírez, L. Pérez-Cervera, L. C. Parra, A. Holodny, S. Canals, H. A. Makse, *Finding influential nodes for integration in brain networks using optimal percolation theory*, **Nature Comm.** **9**, 2274 (2018).
6. A. Baule, F. Morone, H. J. Herrmann, H. A. Makse, *Edwards statistical mechanics for jammed granular matter*, **Rev. Mod. Phys.** **90**, 015006 (2018).
7. F. Morone, K. Roth, B. Min, H. E. Stanley, H. A. Makse, *A model of brain activation predicts the neural collective influence map of the brain*, **Proc. Nat. Acad. Sci.** **114**, 3849-3854 (2017).
8. S. Luo, F. Morone, C. Sarraute, H. A. Makse, *Inferring personal economic status from social network location*, **Nature Comm.** **8**, 15227 (2017).
9. F. Morone, H. A. Makse, *Influence maximization in complex networks through optimal percolation*, **Nature** **524**, 65-68 (2015).
10. S. D. S. Reis, Y. Hu, A. Babino, J. S. Andrade Jr., S. Canals, M. Sigman, H. A. Makse, *Avoiding catastrophic failure in correlated network of networks*, **Nature Phys.** **10**, 762-767 (2014).
11. Y. Hu, S. Havlin, H. A. Makse, *Conditions for viral influence spreading through correlated multiplex networks*, **Phys. Rev. X** **4**, 021031 (2014).
12. A. Baule, R. Mari, L. Bo, L. Portal, H. A. Makse, *Mean-field theory of random close packings of axisymmetric particles*, **Nature Comms** **4**, 2194 (2013).
13. L. K. Gallos, S. Havlin, F. Liljeros, H. A. Makse, *How people interact in evolving online affiliation networks*, **Phys. Rev. X** **2**, 031014 (2012).
14. L. K. Gallos, H. A. Makse, M. Sigman, *A small world of weak ties provides optimal global integration of self-similar modules in functional brain networks*, **Proc. Nat. Acad. Sci.** **109**, 2825-2830 (2012).
15. H. D. Rozenfeld, D. Rybski, X. Gabaix, H. A. Makse, *The area and population of cities: New insights from a different perspective on cities*, **American Economic Review** **101**, 560-580 (2011).
16. M. Kitsak, L. K. Gallos, S. Havlin, F. Liljeros, L. Muchnik, H. Eugene Stanley, H. A. Makse, *Identification of influential spreaders in complex networks*, **Nature Phys.** **6**, 888-893 (2010).

17. V. Galvao, Jose G. V. Miranda, R. F. S. Andrade, J. S. Andrade Jr., L. K. Gallos, H. A. Makse, *Modularity map of the network of human cell differentiation*, **Proc. Nat. Acad. Sci.** **107**, 5750-5755 (2010).
18. D. Rybski, S. Buldyrev, S. Havlin, F. Liljeros, and H. A. Makse, *Scaling laws of human interaction activity*, **Proc. Nat. Acad. Sci.** **106**, 12640-12645 (2009).
19. H. D. Rozenfeld, D. Rybski, J. S. Andrade Jr., M. Batty, H. E. Stanley, and H. A. Makse, *Laws of population growth*, **Proc. Nat. Acad. Sci.** **105**, 18702-18707 (2008).
20. C. Song, P. Wang, H. A. Makse, *A phase diagram for jammed matter*, **Nature** **453**, 629-632 (2008).
21. L. K. Gallos, C. Song, S. Havlin, H. A. Makse, *Scaling theory of transport in complex biological networks*, **Proc. Nat. Acad. Sci.** **104**, 7746-7751 (2007).
22. P. Wang, C. Song, and H. A. Makse, *Dynamic particle tracking reveals the aging temperature of a colloidal glass*, **Nature Phys.** **2**, 526-531 (2006).
23. C. Song, S. Havlin, and H. A. Makse, *Origins of fractality in the growth of complex networks*, **Nature Physics** **2**, 275-281 (2006).
24. C. Song, P. Wang, and H. A. Makse, *Experimental measurement of an effective temperature for jammed granular materials*, **Proc. Nat. Acad. Sci.** **102**, 2299-2304 (2005).
25. C. Song, S. Havlin and H. A. Makse, *Self-similarity of complex networks*, **Nature** **433**, 392-395 (2005).
26. H. A. Makse and J. Kurchan, *Testing the thermodynamic approach to granular matter with a numerical model of a decisive experiment*, **Nature** **415**, 614-617 (2002).
27. T. Boutreux, H. A. Makse and P. G. de Gennes, *Surface flows of granular mixtures: Canonical model*, **Eur. Phys. J.-B** **9**, 105-115 (1999).
28. H. A. Makse, S. Havlin, P. R. King, and H. E. Stanley, *Spontaneous stratification in granular mixtures*, **Nature** **386**, 379-381 (1997).
29. H. A. Makse, S. Havlin, and H. E. Stanley, *Modelling urban growth patterns*, **Nature** **377**, 608-612 (1995).

## B. Books and Book Chapters

30. S. Pei, J. Wang, F. Morone, H. A. Makse. *Influencer identification in dynamical complex systems*, **J. Complex Networks** (review article) (2019).
31. A. Bovet, S. Pei, F. Morone, H. A. Makse, *The Science of Influencers Using Mathematically Rigorous Theories - Understanding the Future of Society, Biology, Markets and Ecosystems* (Springer Nature, Switzerland, 2019) forthcoming.
32. S. Pei, F. Morone, H. A. Makse. *Theories for influencer identification in complex networks*, in *Complex Spreading Phenomena in Social Systems*, edited by Sune Lehmann and Yong-Yeol Ahn (Springer Nature, 2017).

33. B. Min, F. Morone, H. A. Makse, *Searching for influencers in big-data complex networks*, Diffusive Spreading in Nature, Technology and Society, A. Bunde, J. Caro, J. Karger, G. Vogl (Edts), (Springer Verlag, 2016).
34. H. A. Makse, J. Brujić, and S. F. Edwards, *Statistical Mechanics of Jammed Matter*, in *The Physics of Granular Media*, edited by H. Hinrichsen and D. E. Wolf (Wiley-VCH, 2004).
35. S. F. Edwards, J. Brujić, and H. A. Makse, *A Basis for the Statistical Mechanics of Granular Systems*, in *Unifying Concepts in Granular Media and Glasses*, edited by A. Coniglio, A. Fierro, H. J. Herrmann and M. Nicodemi (Elsevier, Amsterdam, 2004).

### C. Other Publications

36. A. Bovet H. A. Makse, Dynamics and influence of misinformation and traditional fact-based news in Twitter (2019).
37. F. G. Operti, A. A. Moreira, A. Gabrielli, H. A. Makse, J. S. Andrade, Dynamics of racial segregation and gentrification in New York City, submitted to *Computers, Environment and Urban Systems* (2019).
38. S. Pei, F. Morone, F. Liljeros, H. A. Makse, J. Shaman, Inference and control of the nosocomial transmission of Methicillin-resistant *Staphylococcus aureus*, **eLife** **7**, e40977 (2018).
39. L. Pasquini, M. Jenabi, M. Gene, K. K. Peck, H. A. Makse, G. Del Ferraro, V. Tabar, A. Holodny, Tumor-induced functional modifications of language and voxel-based morphometry of the cortex: a possible window on brain plasticity. Submitted to **Brain and Language** (2019).
40. G. Del Ferraro, Q. Li, K. K. Peck, A. I. Holodny, H. A. Makse, Brain network construction from task-based fMRI data, **Network Neuroscience**, submitted (2018).
41. F. Arese-Lucini, G. Del Ferraro, M. Sigman, H. A. Makse, How the brain transitions from conscious to subliminal perception, **Journal of Neuroscience** **411**, 279 (2019). Cover.
42. F. Arese-Lucini, F. Morone, M. S. Tomassone, H. A. Makse, Diversity increases the stability of ecosystems, **Sci. Rep.** (2019).
43. Q. Li, J. W. Dong, G. Del Ferraro, N. Petrovich Brennan, K. K. Peck, V. Tabar, H. A. Makse, A. I. Holodny, Functional translocation of Broca's area in a low-grade left frontal glioma: graph theory reveals the novel, adaptive network connectivity, **Frontiers in Neurology**, Applied Neuroimaging, accepted (2019).
44. Q. Li, G. Del Ferraro, L. Pasquini, K. Peck, H. A. Makse, A. Holodny. *Functional Network Analysis of the Language Circuits identified using fMRI in Healthy Controls*, **Brain Connectivity** **10**, 702 (2019).
45. A. Bovet, F. Morone, H. A. Makse, *Validation of Twitter opinion trends with national polling aggregates: Hillary Clinton vs Donald Trump*, **Sci. Rep.** **8673** (2018).
46. H. P. M. Melo, S. D. S. Reis, A. A. Moreira, H. A. Makse, J. S. Andrade Jr., *The price of a vote: Diseconomy in proportional elections*. PLoS ONE **13** e0201654 (2018).

47. E. A. Oliveira, V. Furtado, J. S. Andrade, H. A. Makse, *A worldwide model for boundaries of urban settlements*, **R. Soc. open sci.** **5**, 180468 (2018).
48. E. Kyeyune-Nyombi, F. Morone, W. Liu, S. Li, M. L. Gilchrist, H. A. Makse, *High-resolution of particle contacts via fluorophore exclusion in deep-imaging of jammed colloidal packings*, **Physica A** **490**, 1387-1395 (2018).
49. K. Roth, F. Morone, B. Min, H. A. Makse, *Emergence of robustness in network of networks*, **Phys Rev. E** **95**, 062308 (2017).
50. S. Pei, X. Teng, J. Shaman, F. Morone, H. A. Makse, *Efficient collective influence maximization in cascading processes with first-order transitions*, **Sci. Rep.** **7**, 45240 (2017).
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### C. Conference Proceedings

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166. C. Song, P. Wang, H. A. Makse, *Theory of random packings*, AIP Workshop on Granular Matter, Reggio Calabria (2010).

## Teaching and Advising

### A. Teaching

- 2001-2007. PHY 203 and PHY 204, Physics Department, CCNY.
- Spring 2004. Granular Matter, Advanced graduate course, Graduate Center, City University of New York.
- Fall 2007. PHY 321, Modern Physics, Physics Department, CCNY.
- Spring 2008. PHY 321, Modern Physics, Physics Department, CCNY.
- Fall 2008. PHY 204, Physics Department, CCNY.
- 2009-2010. PHY 208, General Physics for Engineering, Physics Department, CCNY.

- 2010-2015. PHY 203 and PHY 204, Physics Department, CCNY.
- Fall 2012. Graph Theory, Advanced graduate course. Visiting Professor, Physics Department, University of Buenos Aires.
- Fall 2013. Granular Materials, Graduate course. Visiting Professor, Department of Thermal Engineering, Tsinghua University, Beijing.
- Spring 2014. Complex Networks, Advanced graduate course. Graduate Center, City University of New York.
- Fall 2014. Topics in Theoretical Physics II, Graduate course. Visiting Professor, Department of Physics, University Federal of Ceará, Brazil.
- Spring 2015, PHY 203 and PHY 204, Physics Department, CCNY
- Spring 2017. PHY 204, Physics Department, CCNY.
- Spring 2017. Complex Networks, Advanced graduate course. Graduate Center, City University of New York.
- Spring 2018. PHY 204, Physics Department, CCNY.

## **B. Service on Committees - CCNY**

- 2003-2004. Physics Department Web Page Committee, CCNY
- 2005. Levich Institute Faculty Search Committee, CCNY
- 2007. Condensed Matter Faculty Search Committee, CCNY
- 2012-2014. Pre-medical Health Studies Recommendation Committee, CCNY
- 2014. Uniformization Curriculum for General Physics Committee, CCNY
- 2015. Levich Fellow Search Committee, CCNY
- 2015-2016. Initiative for Theoretical Physics, CUNY Faculty Search Committee
- 2017. Levich Faculty Search Committee, CCNY
- 2017. ASRC Neuroscience Initiative Faculty Search Committee, CUNY

### C. Graduate Students

| Name                       | Term      | Current Position   |
|----------------------------|-----------|--|
| Chaoming Song              | 2002-2007 | Assistant Professor, University of Miami, Erdős-Rényi Prize                          |
| Ping Wang                  | 2002-2007 | Postdoc, Virginia State University   |
| Fabricio Potiguar, UFC     | 2004-2008 | Assistant Professor, Universidade Federal do Pará, Brasil                            |
| Chris Briscoe              | 2004-2009 | Physical Security Consultant at Stroz Friedberg, LLC                                 |
| Kun Wang                   | 2006-2011 | Analytics Consultant at Wells Fargo  |
| Yuliang Jin                | 2007-2012 | Assistant Professor, Institute of Theoretical Physics at Chinese Academy of Sciences |
| Lin Bo                     | 2010-2014 | Data Scientist at Zenefits, San Francisco  |
| Marlon Ramos, PUC          | 2011-2015 | Postdoc, PUC   |
| Sen Pei, CSC, Beihang U.   | 2011-2015 | Postdoc, Mailman School of Public Health, Columbia U.                                |
| Weiwen Liu, Tsinghua U.    | 2014-2015 | Tsinghua University  |
| Xian Teng, CSC, Beihang U. | 2015-2016 | Virginia University  |
| Kevin Roth, ETH            | 2015-2016 | ETH  |
| Muhua Zheng, CSC           | 2015-2016 | University of Barcelona  |
| Eru Kyeyune-Nyombi, ChemE  | 2012-2017 | Brooklyn College, Postdoc  |
| Andrés Babino, UBA         | 2013-2018 | Rockefeller University, postdoc  |
| Shaojun Luo                | 2013-2018 | Data Scientist at Enigma Technologies  |
| Kate Burtleson-Lesser      | 2015-2018 | Data Scientist   |
| Qiongge Li                 | 2015-2019 | Medical School, U. Maryland  |
| Francesca Lucini-Arese     | 2015-2019 |  |
| Ian Leifer                 | 2017-     |  |
| Rafael Bonfim (UFC)        | 2017-     |  |

### D. Notable Undergraduates

| Name              | Term      | Current Position   |
|-------------------|-----------|--|
| Shai Carmi        | 2006      | Postdoc, Columbia University   |
| Vanessa Magnanimo | 2007      | Assistant Professor, University of Twente                              |
| Sam Meyer         | 2008      | Assistant Professor, Institut National des Sciences Appliquées de Lyon |
| Max Danisch       | 2010-2011 | PhD student, Université Pierre et Marie Curie                          |
| Taishan Zhu       | 2012      | PhD student, UIUC  |
| Louis Portal      | 2013      | PhD student, ETH Zürich  |
| Angello Maggio    | 2014-2015 | PhD student  |
| Thomas Aubry      | 2015-2016 | PhD student, Supméca - Institut Supérieure de Mécanique de Paris       |
| Edouard Viollet   | 2015-2016 | PhD student, Supméca - Institut Supérieure de Mécanique de Paris       |

## E. Postdoctoral Fellows

| Name                 | Term      | Current Position  |
|----------------------|-----------|---|
| Nicolas Gland        | 2002-2005 | Senior Acoustic and Geomechanics Engineer, Schlumberger               |
| Guillaume Marty      | 2005-2006 | Research Engineer, L'Oréal  |
| Shomeek Mukhopadhyay | 2006-2008 | Associate Research Scientist, Yale University                         |
| Diego Rybski         | 2006-2009 | Research Professor, Potsdam Institute Climate Impact Research         |
| Hernán Rozenfeld     | 2007-2010 | Assistant Editor, Physical Review E                                   |
| Lazaros Gallos       | 2008-2012 | Research Professor, Rutgers. Assistant Editor, Physical Review X      |
| Adrian Baule         | 2010-2011 | Lecturer, Queen Mary University of London                             |
| Yanqing Hu           | 2011-2013 | Assistant Professor, Sun Yat-Sen University                           |
| Saulo Reis           | 2012-2014 | Assistant Professor, Universidade Federal do Ceará, Brazil            |
| Romain Mari          | 2012-2015 | Postdoc, Cambridge University   |
| Faraz Zaidi          | 2014-2015 | Data Scientist, MetricAid Inc, Canada                                 |
| Byungjoon Min        | 2014-2016 | Assistant Professor, Physics Department, Chungbuk National University |
| Flaviano Morone      | 2014-     |   |
| Alexandre Bovet      | 2016-2017 | Université Catholique de Louvain                                      |
| Gino del Ferraro     | 2016-     |   |
| Mishael Sanchez      | 2018-     |   |

## Entrepreneurial Activities

- 11/01/2018. US Patent App. 16/019075 (2018). Title: *Method to maximize message spreading in social networks and find the most influential people in social media*. Inventors: Hernán Makse and Flaviano Morone.
- 2016. Co-founder. [kcore-analytics.com](http://kcore-analytics.com). Kcore-analytics is an influencer platform to identify Top Influencers in Social Media using proprietary cutting-edge optimization algorithms.

## Talks

### A. Invited Talks, Plenary Talks and Keynote Talks

1. European Physical Society, Annual Meeting (Condensed Matter Physics), York, UK, 16–19 December 1996, *Segregation phenomena*
2. Minerva Workshop on Mesoscopics, Fractals, and Neural Networks, Eilat, Israel, 24-28 March 1997, *Stratification instability in granular flows*
3. Workshop on Complex Systems, Brasilia, May 04-08, 1998, *Granular flow*
4. Tohwa University Symposium, Fukuoka, Japan, Nov 9-13, 1998, *Dynamics of stratification and segregation in granular mixtures*

5. Sixth German-American Frontiers of Science 2000, organized by the US National Academy of Sciences, the Alexander von Humboldt Foundation and the Max Planck Society, Irvine, California, June 8-10 2000, *Pattern Formation in Granular Media*, Plenary talk
6. 85th Statistical Mechanics Conference, Rutgers University, May 6-8, 2001, *Fluctuation-dissipation relation in slowly sheared dense granular materials*
7. STATPHYS 21, Cancún, July 19, 2001, *Fluctuation-dissipation relation in slowly sheared dense granular materials*
8. ICTP-Trieste Workshop on Challenges in Granular Physics, August 7-11, 2001, *Nonlinear elasticity and thermodynamics of granular matter*
9. Horizons in Complex Systems, Messina, Italy, December 5-8, 2001, *Thermodynamics and effective temperatures in dense granular materials*
10. SIAM50, Pittsburgh, July 8-12, 2002, *Thermodynamics, jamming and effective temperatures in granular materials and glasses*
11. Minerva Workshop on Disordered Systems, Eilat, Israel, January 5-8, 2003, *Jamming*
12. APCTP Winter School on Granular Material and Complex Systems, Phoenix Park, Korea, February 4-7, 2003, *Jamming and effective temperature in out-of-equilibrium systems*
13. APS March 2003 Meeting, March 2003, *Testing the thermodynamics for granular matter*
14. Unifying Concepts in Granular Media and Glasses, Anacapri, Italy, June 25 - 28, 2003, *Jamming and effective temperatures in granular media*
15. Isaac Newton Institute for Mathematical Sciences, Granular and Particle-Laden Flows, September 4, 2003, *Thermodynamics of jammed matter*
16. SIAM51, Los Angeles, May 23-26, 2004, *Experimental measurements of effective temperatures in granular matter*
17. Granular Matter Workshop, Yale University, June 3, 2004, *Effective temperatures in slowly sheared granular matter*
18. STATPHYS 22, Bangalore, India, July 9, 2004, *Statistical mechanics of jammed matter*
19. School and Workshop on Structure and Function of Complex Networks, ICTP, Trieste, May 16-28, 2005, *Complex networks are self-similar*
20. Powders & Grains 2005, July 18-22, 2005, Stuttgart, *Reversibility and effective temperatures in granular matter*
21. XXV Dynamics Days Europe, Berlin, July 25-28, 2005, *Self-similarity of complex networks*
22. X International workshop on Disordered Systems, Molveno, Italy, 18-21 March 2006, *Jamming and glass transitions*
23. NetSci, 2006, Indiana University, May 22-25, 2006, *Complex networks*
24. Dygram2006, Workshop of granular dynamics, jamming, rheology and instabilities, Rennes, France, June, 19-23 2006, *Granular matter*

25. PASI "From Disordered systems to Complex systems", Mar del Plata, Argentina, December 11-23 2006, *Complex systems*
26. BES Geosciences Symposium, Gaithersburg, VA, May 3-4 2007, *Stress-dependent acoustic propagation and dissipation in granular materials*
27. Gordon Conference on Nonlinear Science, Colby College, Maine, June 24 - June 29, 2007, *The phase diagram of jammed matter*
28. Statphys satellite meeting, Statics and dynamics of granular media and colloidal suspensions, Napoli, July 4-6 2007, *Statistical mechanics predicts the phase diagram of jammed matter*
29. DYSONET meeting, Palermo, November 27, 2007, *Renormalization in complex networks*
30. Workshop on The Structure and Dynamics of Complex Networks, ICCMP, Brasilia, December 10-14, 2007, *Scaling in complex networks*
31. Workshop in Statistics for System Biology, Institut Henri Poincaré, Paris, December, 17-18, 2007, *Modularity and renormalization in biological networks*
32. 99th Statistical Mechanics Conference, Rutgers University, May 11-13, 2008, *Phase diagram for jamming*
33. APS March Meeting 2009, Pittsburgh, March 16-12, 2009, *Theory of random packings*
34. Minerva Workshop on The Science of Complexity, Eilat, Israel, March 29- April 1, 2009, *Renormalization group describes information flow in complex networks*
35. Traffic and Granular Flow, TGF 09, Shanghai University, June 21-25, 2009, *Jamming transition in granular matter*
36. Workshop on Statistical mechanics of static granular media, Lorentz Center, Leiden, July 05-11, 2009, *Theory of random packings*
37. IUTAM Symposium, Mathematical Modeling and Physical Instances of Granular Flows, 14-18 September 2009, Reggio Calabria, Italy, *Theory of random packings*
38. XI Latin American Workshop on Nonlinear Phenomena, LAWNP 2009, October 5-9 2009, Buzios, Brazil, *Jamming in granular matter*
39. Emergence in Geographic Space: Concepts, Methods and Models, European Network S4 - Spatial Simulation for Social Sciences, November 23-25 2009, Paris, *Urban growth models*, Keynote presentation
40. Perspectives and Challenges in Statistical Physics and Complex Systems, November 2011, Natal, Brasil, *Collective behavior in human activity: from population growth to the obesity epidemic and the human brain*
41. Complexity in Oil Industry, November 2011. International Center of Theoretical Physics, Natal, Brazil, *Nonlinear elasticity of granular materials*
42. Frontier in Statistical Physics and Complex Systems, June 2-5, 2012, Catania, Italy, *Theory of packings*



43. Wolfram Data Summit September 6-7, 2012, Washington, DC, *Statistical Physics for non-Physics problems: obesity epidemics and information flow in society*
44. International School on Biological Complex Networks, July 8-12, 2013, Natal, Brazil, *Modularity and evolution in protein interaction networks*
45. Yukawa Workshop on Glasses, July 16-19, 2013, Kyoto, Japan, *From Kepler to Ulam: searching for the optimal packing*
46. STATPHYS 25, July 22-26, 2013, Seoul, South Korea, *Statistical mechanics of jammed matter*
47. Mechanics of Particulates, February 12, 2014, NYU School of Engineering, New York, *Packings on nonspherical particles*
48. Jam Packed - Packing and Jamming of Particulate Systems, September 15-18, 2014, Erlangen, Germany, *Packings of spherical and nonspherical hard particles*, Plenary lecture
49. III Dynamics days South America, November 3-7, 2014, Viña del Mar, Chile, *The emerging science of superspreaders and success*
50. Unifying Concepts in Glass Physics VI, Aspen Institute, Aspen, February 1-7, 2015, *Unifying statistical mechanics framework for packings: from spherical to non-spherical particles with adhesion, friction, polydispersivity, and for any dimension*
51. CompleNet: 6th Workshop on Complex Networks, Queens, New York, March 25-27, 2015, *Searching for superspreaders in networks: from Twitter to the brain*, Keynote speaker
52. Brain Networks Satellite, NetSci 2015, Zaragoza, June 1-2, 2015, *Percolation and cascading in a brain network of networks*
53. NetSci 2015, Zaragoza, June 3-5, 2015, *Collective optimization of influence makes visible the invisible*
54. Diffusion Fundamentals VI, Dresden, August 23-26, 2015, *A new class of superspreader: From Twitter, cities and the brain*
55. IV International Workshop on Complex Collective Dynamics: Brains and beyond, Capri, August 31 - September 4, 2015, *Percolation and cascading in a brain Network of Networks*
56. NetSci2016 Satellite Brain Networks, Seoul, Korea, May 31, 2016, *Influencers in the Brain*
57. NetSci2016, Seoul, Korea, June 1-3, 2016, *Searching for superspreaders via optimal percolation: from Twitter to the Brain*
58. Workshop on Jamming and Granular Matter, QMUL, London, July 13-15, 2016, *Searching for optimal packings*
59. CORBI Course, Mathematical approaches to brain structure and function in health and disease. From early childhood development to adulthood, La Coruña, Spain, July 26 - August 5, 2016, *Superspreaders in the brain*
60. Gordon Research Conference, Granular Matter, Easton, MA, July 24-19, 2016, *Searching for the perfect packing*

61. 11th International School on Mind, Brain and Education: From Brain-to-Brain to Social Interaction, Ettore Majorana Centre for Scientific Culture, Erice, Italy, September 7-13, 2016, *Essential nodes in the Brain*
62. Collaborative Research in Computational Neuroscience (CRCNS) PI meeting, Brown University, June 14-16, 2017, *Finding essential nodes for integration in the brain using network optimization theory*
63. Santa Fe Institute 2017 Short Course on Networks and Big Data, New York, July 26-28, 2017, *Networks, Machine Learning and Big Data: from predicting elections to understanding the brain*
64. Workshop on Complex networks: from socio-economic systems to biology and brain, Lipari, Italy, Sep 9-13, 2017, *Finding essential nodes for integration in the brain using network optimization theory*
65. Mapping Complexity Foundations and Applications of Network Geometry, BCN 2017 Workshop on Network Geometry, Barcelona, Nov 6-8, 2017, *Essential nodes and keystone species in the brain and ecosystems*
66. Scientific Seminars on Computational Neuroscience, Instituto Cajal, Madrid, February 14, 2018, *Cracking the locomotion code in C. elegans*
67. CONES 2018: Frontiers of Non-Equilibrium Science, King's College, London, June 25-27, 2018, *Essential nodes in Biological Networks and the Brain*
68. Complex Network Society 2018, Thessaloniki, September 24-28, 2018, *Essential nodes in Networks: Brain, genes and ecosystems*
69. Complex Network Society 2018, Thessaloniki, September 24-28, 2018, *Essential nodes in Networks: Brain, genes and ecosystems*
70. DATAM'18, Thessaloniki, September 26, 2018, *Essential nodes in Twitter*
71. Pujiang Innovation Forum 2018, Shanghai, October 29 - 31, 2018, *Influencers and Innovators The subtle success of a complex mindset*, **Nature Physics** **14**, 1149 (2018)
72. Complex Networks 2018, Cambridge, United Kingdom, December 11-13, 2018, *Essential nodes and keystone species in the brain, ecosystems and social systems*
73. IFISC Colloquium, Palma de Mallorca, June 21, 2019, *Essential nodes and keystone species in the brain, ecosystems and social systems*. <https://www.youtube.com/watch?v=JGT1UHLe2eo>
74. Lipari School Workshop on Complex networks, Lipari, Italy, July 14-18 2019, *Structure and function in Biology*.

## **B. Invited Talks to Universities**

75. Harvard University, Materials Science Seminar, February 1996, *Scaling of rough surfaces*, invited talk with Prof. H. E. Stanley.
76. Princeton University, Materials Science Institute Seminar, February 1996, *A Model for erosion via ion-sputtering: from pattern formation to rough surfaces*

77. University of Massachusetts at Amherst, Physics Department Colloquium, April 1996, *Size segregation and layering in a sandpile: Experiment and model*
78. Lehman College, CUNY, Physics Department Colloquium, May 22, 1997, *Granular matter*
79. Schlumberger-Doll Research, Ridgefield, Connecticut, Colloquium, May 29, 1997, *Pattern formation in sandstone*
80. Universidade de Ceará, Fortaleza, Brazil, Physics Department Colloquium, July 24, 1997, *Granular segregation and stratification*
81. LASSP Seminar, Cornell University, Jan. 18, 1999, *Granular matter*
82. Clark University, Physics Colloquium, February 18, 1999, *Patterns in Nature*
83. California State University at Northridge, Physics Colloquium, March 5, 1999, *Pattern formation in Nature: Growing order out of disorder*
84. State University of New York at Stony Brook, Physics Colloquium, April 16, 1999, *The unusual properties of granular materials*
85. NIST, Inorganic Building Materials Group Seminar, November 5, 1999, *Granular Matter: a liquid, a fragile solid, a nonlinear elastic solid?*
86. MIT, Physics Department Seminar, January 25, 2000, *Granular matter*
87. Cornell University, Applied Mechanics Seminar, February 9, 2000, *Segregation in rapid granular flows*
88. Levich Institute, Fluid Mechanics Series, City College of New York, February 15, 2000, *Pattern formation in granular flows*
89. NEC Research Institute, Princeton, February 18, 2000, *Pattern formation in sandpiles*
90. Michigan Technological University, Physics Department Colloquium, February 22, 2000, *Granular flows*
91. University of Missouri-Rolla, Physics Department Colloquium,, March 1, 2000, *Packing of compressible granular materials*
92. University of Central Florida, Physics Department Seminar, March 30, 2000, *Pattern formation in granular flows*
93. George Washington University, Physics Department Seminar, April 3, 2000, *Granular flows*
94. Stanford University, Geophysics Department, April 27, 2000, *Granular flows*
95. City College of New York, Chemical Engineering Seminar, September 18, 2000, *Solid and liquid-like properties of granular materials*
96. Rutgers University, Pharmaceutical Engineering Seminar, October 9, 2000, *Segregation of granular materials in 2D cascades*
97. PMMH-ESPCI, Paris, November 24, 2000, *Numerical granular simulations and amazing Poisson's ratios in sands*
98. ExxonMobil Research and Engineering Co, New Jersey, Colloquium, June 5, 2001, *Non-linear elasticity of granular materials*

99. Universidade Federal de Ceará, Physics Department Colloquium, July 21, 2001, *Thermodynamics of granular materials*
100. City College of New York, Physics Department Colloquium, December 12, 2001, *Thermodynamics, jamming, and effective temperatures in granular matter and glasses*
101. University of Massachusetts at Amherst, Physics Department Colloquium, May 2, 2002, *Thermodynamics of Granular Materials*
102. Yale University, Mechanical Engineering Seminar, October 23, 2002, *Granular matter needs a new statistical mechanics*
103. New York University, Courant Institute, Applied Mathematics Seminar, February, 27, 2003, *Jamming and thermodynamics in soft-matter systems*
104. Northwestern University, Nonlinear Seminar, October 25, 2003, *Jamming is even cooler than you thought*
105. Universidade de Ceará, Fortaleza, Brasil, Physics Department Seminar, December 2, 2004, *From grains to proteins: the physics of energy landscapes and complex networks*
106. City College of New York, Physics Department Colloquium, March 9, 2005, *Complex Networks*
107. Emory University, Physics Department Colloquium, March 11, 2005, *The physics of energy landscapes and complex networks*
108. Princeton University, Condensed Matter Seminar, April 4, 2005, *The physics of energy landscapes and complex networks*
109. Columbia University, Biological Sciences Colloquium, April 27, 2005, *Principles of self-organization in complex networks: from sand to proteins*
110. Yeshiva University, Physics Department Colloquium, May 4th, 2005, *From the grains to the WWW: the physics of energy landscapes and complexity*
111. University of Maryland, Applied Mathematics Seminar, November 12, 2005, *Complex Networks*
112. Queens College, Physics Department Colloquium, December 12, 2005, *Complexity*
113. New York University, Biology Department, September 23, 2006, *Emergence of modularity in protein interaction networks*
114. ETH, Zurich, January 10, 2007, *Scaling, renormalization and self-similarity in complex networks*
115. Universidad de Amazonas, Manaus, Brasil, February 26, 2007, *Scaling, renormalization and self-similarity in complex networks*
116. Levich Institute, CCNY. December 4, 2007, *Statistical mechanics of jammed matter*
117. NJIT, Mechanical Engineering Dept. December 11, 2007, *Phase diagram for jamming*
118. Physics Department Colloquium, CCNY. September 10, 2008, *Statistical mechanics of jammed matter and the nature of fruit packings*

119. Mathematical Sciences, NJIT Colloquium, Feb 23, 2009, *Theory of random packings*
120. Physics Department Colloquium, Fudan University, June 26, 2009, *Renormalization group in complex networks*
121. ETH, Zurich. September 12, 2009, *Renormalization group analysis of complex networks, modularity and information flow*
122. City College of New York. March 7, 2012, *Collective behavior in human activity: from population growth and the economy, to the obesity epidemic and the human brain*
123. University College London, CASA. April 2, 2012, *Collective behavior in human activity: from population growth, the economy to the obesity epidemic*
124. Tsinghua University. Particle and Combustion Engineering Research Group, Department of Thermal Engineering. October 14, 2013, *From avalanches to packings: the physics of granular matter*
125. Beijing Normal University. Systems Science School. October 15, 2013, *Viral influence spreading in social networks*
126. City College of New York. Physics Department. October 8, 2014, *The emergent science of superspreaders*
127. Institute of Neuroscience. Alicante, Spain. July 23, 2015, *Percolation and cascading in a Brain Network of Networks*