

## Aaron Clauset

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CONTACT INFORMATION	Santa Fe Institute 1399 Hyde Park Rd. Santa Fe NM, 87501 USA	<i>voice:</i> (505) 946-2774 <i>fax:</i> (505) 982-0565 <i>email:</i> aaronc at the santafe domain <i>web:</i> www.santafe.edu/~aaronc
RESEARCH INTERESTS	Large-scale patterns in complex systems; Complex networks (structure, function, algorithms); Computational biology, macroevolution, coevolution and ecology; Statistics of violent conflicts (terrorism, war); The Internet (structure, routing, security); Power-law distributions (data, mechanisms); Adaptive and evolutionary computation; Self-organization; Robustness; Innovation.	
EDUCATION	Ph.D. Computer Science with distinction, University of New Mexico (2006) <ul style="list-style-type: none"><li>• Dissertation: “Structural Inference and the Statistics of Networks”</li><li>• Committee: C. Moore (chair), M. E. J. Newman, S. Forrest, and J. Saia</li></ul> B.S. Physics and Computer Science with honors, Haverford College (2001)	
ACADEMIC POSITIONS	Postdoctoral Research Fellow <i>Santa Fe Institute</i> , Santa Fe NM	Dec. 2006 – present
	Research Assistant <i>University of New Mexico</i> , Albuquerque NM	Jan. 2003 – Dec. 2006
	Research Fellow <i>University of Pennsylvania</i> , Philadelphia PA	June 2000 – May 2001
INDUSTRY POSITIONS	Corporate Advisory Board Scientific & Technical Consultant <i>33across LLC</i> , New York NY	April 2008 – present Dec. 2007 – present
	Strategy & Management Consultant <i>FischerJordan LLC</i> , New York NY	May 2005 – Oct. 2005
	Research Consultant <i>Argonne National Laboratory</i> , Argonne IL	Feb. 2005 – June 2005
	Project Scientist <i>Targacept Inc.</i> , Winston-Salem NC	June 2001 – May 2002
SELECTED HONORS & AWARDS	Boulder School for Condensed Matter and Material Physics Travel Grant, International Conference on Network Science (NetSci) Travel Grant, UCLA IPAM Workshop on Random and Dynamic Graphs and Networks Graduation Speaker, U. New Mexico School of Engineering Convocation Elected to Sigma Xi Honor Society Outstanding Graduate Student Award, U. New Mexico School of Engineering Travel Grant, UCSD CAIDA Workshop on Internet Topology Travel Grant, National Academy of Science Workshop on Statistics of Networks Travel Grant, MSRI Workshop on Models of Real-World Random Networks Santa Fe Institute Complex Systems Summer School (CSSS)	2007 2007 2007 2006 2006 2006 2006 2005 2005 2003

- A. Clauset and S. Redner, "An Evolutionary Model of Species Body Mass Diversification." *Physical Review Letters*, to appear (2008).
- A. Clauset, D. J. Schwab and S. Redner, "How many species have mass  $M$ ?" *American Naturalist*, to appear (2008).
- D. Achlioptas, A. Clauset, D. Kempe and C. Moore, "On the Bias of Traceroute Sampling (or, Power-law Degree Distributions in Regular Graphs)." *Journal of the ACM*, to appear (2008).
- A. Clauset, H. G. Tanner, C. T. Abdallah and R. H. Byrne, "Controlling across complex networks – Emerging links between networks and control." *Annual Reviews in Control* **32**, 183–192 (2008).
- A. Clauset and D. H. Erwin, "The evolution and distribution of species body size." *Science* **321**, 399–401 (2008).
- A. Clauset, C. Moore and M. E. J. Newman, "Hierarchical structure and the prediction of missing links in networks." *Nature* **453**, 98–101 (2008).
- A. Clauset, M. Young and K. S. Gleditsch, "On the Frequency of Severe Terrorist Attacks." *Journal of Conflict Resolution* **51**(1): 58–88 (2007).
- A. Clauset, C. Moore and M. E. J. Newman, "Structural Inference of Hierarchies in Networks." In E. M. Airoldi et al. (Eds.): *ICML 2006 Ws, Lecture Notes in Computer Science* **4503**: 1-13. Springer-Verlag, Berlin Heidelberg (2007).
- V. Kalapala, V. Sanwalani, A. Clauset and C. Moore, "Scale Invariance in Road Networks." *Physical Review E* **73** 026130 (2006).
- J. T. Ayers, A. Clauset, J. D. Schmitt, L. P. Dvoskin and P. A. Crooks, "Molecular modeling of mono- and bis-quaternary ammonium salts as ligands at the  $\alpha 4\beta 2$  nicotinic acetylcholine receptor subtype using nonlinear techniques." *American Association of Pharmaceutical Scientists Journal* **7**(3): E678–85 (2005).
- Y. D. Xiao, A. Clauset, R. Harris, E. Bayram, P. Santago II, and J. D. Schmitt, "Supervised Self-Organizing Maps in QSAR I: Robust behavior with underdetermined datasets." *Journal of Chemical Information and Modeling* **46**(6): 1679 – 1758 (2005).
- A. Clauset, "Finding local community structure in networks." *Physical Review E* **72**, 026132 (2005).
- D. Achlioptas, A. Clauset, D. Kempe and C. Moore, "On the bias of traceroute sampling (or: Why almost every network looks like it has a power law)." In *Proceedings of the 37<sup>th</sup> ACM Symposium on Theory of Computing* (Baltimore, May 2005).
- A. Clauset and C. Moore, "Accuracy and Scaling Phenomena in Internet Mapping." *Physical Review Letters* **94** 018701 (2005).
- A. Clauset, M. E. J. Newman and C. Moore, "Finding community structure in very large networks." *Physical Review E* **70**, 066111 (2004).
- E. Bayram, P. Santago II, R. Harris, Y. Xiao, A. Clauset and J. D. Schmitt, "Genetic Algorithms and Self-Organizing Maps: A Powerful Combination for Modeling Complex QSAR and QSPR Problems." *Journal of Computer-Aided Molecular Design* **18** (7-9): 483-493 (2004).

- SUBMITTED PAPERS A. Clauset, C. R. Shalizi and M. E. J. Newman, “Power-law distributions in empirical data.” Submitted to *SIAM Reviews* (2007). (Preprint at [arxiv:0706.1062](https://arxiv.org/abs/0706.1062).)
- GRANTS (co-PI) “Statistical Inference and Machine Learning for Complex Networks.” J. S. McDonnell Foundation, *Studying Complex Systems* program. Awarded September 1<sup>st</sup>, 2008; \$417,576 over 3 years (Research Award). With (PI) C. Moore (SFI) and (co-PI) M.E.J. Newman (U. Michigan).
- PREPRINTS A. Clauset and M. Young, “Scale Invariance in Global Terrorism.” Preprint [physics/0502014](https://arxiv.org/abs/physics/0502014) (2005).
- A. Clauset and C. Moore, “How Do Networks Become Navigable?” Preprint [cond-mat/0309415](https://arxiv.org/abs/cond-mat/0309415) (2003).
- A. Clauset, N. Grigg, M. T. Lim and E. Miller, “Chaos You Can Play In: The Malkus Waterwheel” *Proc. Santa Fe Institute Complex Systems Summer School*, Santa Fe, NM, June 7-July 7, 2003
- INVITED TALKS (RECENT)
- Comparative and International Studies (CIS) Complexity Colloquium, ETH Zürich Switzerland, November 25 2008
  - Network Models of Biological and Social Contagion Workshop, Center for Discrete Mathematics and Theoretical Computer Science (DIMACS) and Center for Dynamic Data Analysis (DyDAn), Rutgers University, Piscataway NJ, November 3–4 2008
  - Yahoo! Research, New York NY, October 28 2008
  - Selection Tinkering and Emergence in Complex Networks Workshop, Santa Fe Institute and Google, San Francisco CA, June 24 2008
  - Applied Mathematics Colloquium, University of North Carolina, Chapel Hill NC, March 21 2008
  - Workshop on Theoretical Aspects and Models of Large Complex and Open Information Networks, Institute for Scientific Interchange (ISI), Turino Italy, November 19–21 2007
  - Complex Networks: Dynamics and Community Detection Mini-Symposium, SIAM Conference on Applications of Dynamical Systems (DS07), Snowbird UT, May 31–June 1 2007
  - Workshop on Scalable Algorithms for Network Simulation and Analysis, Los Alamos Computer Science Institute (LACSI) Symposium 2006, Santa Fe NM, October 17 2006
  - Workshop on Social Network Analysis, International Conference on Machine Learning (ICML), Pittsburgh PA, June 29 2006
  - Workshop on Predictive Analysis for Counter-Terrorism, MITRE Corporation, Joint Chiefs of Staff, the Department of Defense, and the Defense Intelligence Agency, McLean VA, December 5 2005
- COLLOQUIA & SEMINARS (RECENT)
- “Paleontology: Macroevolution, Diversity and Biogeography” Session, Geological Soc. of America Joint Annual Meeting, Houston TX, October 5–9 2008
  - Computer Science Dept. Seminar Series, Swarthmore College, Swarthmore PA, February 25 2008
  - Statistics Dept. Seminar Series, University of NM, Albuquerque NM, February 8 2008
  - Computational Methods for Dynamic Interaction Networks Workshop, Center for Discrete Mathematics and Theoretical Computer Science (DIMACS) and Center for Dynamic Data Analysis (DyDAn), Rutgers University, Piscataway NJ, Sept. 24–25 2007
  - International Conference on Network Science (NetSci), New York NY, May 22–25 2007
  - CNLS Algorithms, Inference, and Statistical Physics Conference, Santa Fe NM, May 1–4 2007
  - Physics Dept. Seminar Series, University of Maryland, College Park MD, April 5 2007
  - International Conference on Network Science (NetSci), Bloomington IN, May 22–25 2006
  - UCSD CAIDA Workshop on Internet Topology (WIT), San Diego CA, May 10–12 2006
  - ACM Symposium on Theory of Computation (STOC), Baltimore MD, May 21–24 2005

## TEACHING

### Students

- Benjamin Edwards (MA Sociology, U. New Mexico. Expected 2009)
- Benjamin Good (REU, Santa Fe Institute. Summer 2008)

### Courses

- Lecturer, Santa Fe Institute Complex Systems Summer School, Beijing 2008–2009
- Lecturer, Santa Fe Institute Complex Systems Summer School, Santa Fe 2007–2008
- Guest Lecturer in Computational Physics, Haverford College, Physics 304 Spring 2008
- Guest Lecturer in Data Structures and Algorithms, UNM, CS 361 Fall 2004, 2006
- Guest Lecturer in Advanced Scheme Programming, UNM, CS 591 Spring 2004
- Guest Lecturer in Programming Language Paradigms, UNM, CS 451 Spring 2004
- Teaching Assistant for Introduction to the Theory of Computation, UNM, CS 500 Spring 2004
- Teaching Assistant for Data Structures and Algorithms, UNM, CS 361 Fall 2002

## REFEREE WORK

- **Biology:** Bioinformatics, IET Systems Biology, Journal of Animal Ecology, Journal of Theoretical Biology, PLoS Biology
- **Computer Science:** Computer Science Reviews, IEEE International Conference on Robotics and Automation (2006), RANDOM (2007), ACM Journal of Experimental Algorithmics, Journal of Statistical Analysis and Data Mining, ACM-SIAM Symposium on Discrete Algorithms (2006, 2007), SDM Workshop on Analysis of Dynamic Networks (2009), NIPS Workshop on Analyzing Graphs (2008), Workshop on Experimental Algorithms (2006), ACM SIGKDD Workshop on Social Network Mining and Analysis (2008)
- **General:** Proceedings of the National Academy of Science USA, Science Magazine
- **Physics:** European Physical Journal B, Europhysics Letters, New Journal of Physics, Physica A, Physical Review E, Physical Review Letters
- **Political Science:** Defense & Peace Economics, Journal of Peace Research
- **Others:** Advances in Complex Systems, Journal of Chemical Information and Modeling, Networks and Spatial Economics

## PROFESSIONAL SERVICE

### Workshops

- *Statistical Inference for Complex Networks*  
Santa Fe Institute, Santa Fe NM, December 3–5 2008.  
Organized with C. Moore (UNM, SFI).
- *Navigability and Complex Networks*  
Santa Fe Institute and UCSD's Cooperative Association for Internet Data Analysis (CAIDA), Santa Fe NM, August 4–6, 2008.  
Organized with D. Krioukov (UCSD) and kc claffy (UCSD).
- *Is there a Physics of Society?*  
Santa Fe Institute, Santa Fe NM, January 10–12, 2008.  
Organized with M. Girvan (UMD).

### Conferences

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

### Program Committees

- Workshop on *Analysis of Dynamic Networks* (part of SIAM International Conf. on Data Mining) Sparks, Nevada, April 30 – May 2, 2008.
- *CompleNet 2009* Workshop, Catania, Italy, May 12–13, 2009.
- Workshop on *Analyzing Graphs: Theory and Applications* (part of NIPS 2008) Whistler, Canada, December 12, 2008.
- *2<sup>nd</sup> Workshop on Social Network Mining and Analysis* (part of ACM SIGKDD 2008) Las Vegas NV, August 24–27, 2008
- *5<sup>th</sup> International Workshop on Experimental Algorithms* Menorca Spain, May 24–27, 2006

### Professional Society Positions

- President, Computer Science Graduate Student Association (CSGSA), University of New Mexico, 2004 – 2005
- Vice President, Computer Science Graduate Student Association (CSGSA), University of New Mexico, 2003 – 2004

### SYNERGISTIC ACTIVITIES

- Science blogger at *Structure+Strangeness* ([cs.unm.edu/~aaron/blog/](http://cs.unm.edu/~aaron/blog/)) 2005 – present
- Wikipedia contributor, science and mathematics articles 2006 – present