

Aaron Clauset

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	Statistical laws for complex systems; Complex networks (structure, function, algorithms); Computational systems biology, macroevolution, evolutionary trends and dynamics, coevolution and ecology; Mathematics of violence (terrorism, warfare); 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">• Dissertation: “Structural Inference and the Statistics of Networks”• Committee: C. Moore (chair), M. E. J. Newman, S. Forrest, and J. Saia B.S. Physics and Computer Science with honors, Haverford College (2001)	
ACADEMIC POSITIONS	Assistant Professor, Computer Science, <i>University of Colorado</i> , Boulder CO Omidyar Fellow, <i>Santa Fe Institute</i> , Santa Fe NM Research Assistant, <i>University of New Mexico</i> , Albuquerque NM Research Fellow, <i>University of Pennsylvania</i> , Philadelphia PA	Fall 2010 – 2006 – present 2003 – 2006 2000 – 2001
INDUSTRY POSITIONS	Corporate Advisory Board, <i>33across LLC</i> , New York NY Scientific & Technical Consultant, <i>33across LLC</i> , New York NY Strategy & Management Consultant, <i>FischerJordan LLC</i> , New York NY Research Consultant, <i>Argonne National Laboratory</i> , Argonne IL Project Scientist, <i>Targacept Inc.</i> , Winston-Salem NC	2008 – present 2007 – present 2005 2005 2001 – 2002
HONORS & AWARDS (SELECTED)	Santa Fe Institute Public Lecture Series Boulder School for Condensed Matter and Material Physics Graduation Speaker, U. New Mexico School of Engineering Convocation Outstanding Graduate Student Award, U. New Mexico School of Engineering Santa Fe Institute Complex Systems Summer School (CSSS)	2010 2007 2006 2006 2003
GRANTS	(co-PI) “Statistical Inference and Machine Learning for Complex Networks.” J. S. McDonnell Foundation, <i>Studying Complex Systems</i> program. Awarded September 1 st , 2008; \$417,576 over 3 years (Research Award). With (PI) C. Moore (New Mexico and SFI) and (co-PI) M. E. J. Newman (Michigan).	
JOURNAL ARTICLES	A. Clauset , L. Heger, M. Young and K. S. Gleditsch, “The Strategic Calculus of Terrorism: Substitution and Competition in the Israel-Palestine Conflict.” <i>Cooperation & Conflict</i> , to appear. A. Clauset and F. W. Wiegel, “A generalized aggregation-disintegration model for the frequency of severe terrorist attacks.” <i>Journal of Conflict Resolution</i> 54 (1), 179-197 (2010). (Preprint at arxiv:0902.0724) A. Clauset , C. R. Shalizi and M. E. J. Newman, “Power-law distributions in empirical data.” <i>SIAM Review</i> 51 (4), 661–703 (2009). (Preprint at arxiv:0706.1062) D. Achlioptas, A. Clauset , D. Kempe and C. Moore, “On the Bias of Traceroute Sampling: Or, Power-law Degree Distributions in Regular Graphs.” <i>Journal of the ACM</i> 56 (4), article 21,	

28 pages (2009). (Preprint at [arxiv:cond-mat/0503087](https://arxiv.org/abs/cond-mat/0503087))

A. Clauset and S. Redner, “Evolutionary Model of Species Body Mass Diversification.” *Physical Review Letters* **102**, 038103 (2009). (Preprint at [arxiv:0808.4014](https://arxiv.org/abs/0808.4014))

A. Clauset, D. J. Schwab and S. Redner, “How many species have mass M ?” *American Naturalist* **173**, 256–263 (2009). (Preprint at [arxiv:0808.3433](https://arxiv.org/abs/0808.3433))

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). (Preprint at [arxiv:0901.0251](https://arxiv.org/abs/0901.0251))

A. Clauset, C. Moore and M. E. J. Newman, “Hierarchical structure and the prediction of missing links in networks.” *Nature* **453**, 98–101 (2008). (Preprint at [arxiv:0811.0484](https://arxiv.org/abs/0811.0484))

A. Clauset, M. Young and K. S. Gleditsch, “On the Frequency of Severe Terrorist Attacks.” *Journal of Conflict Resolution* **51**(1): 58–88 (2007). (Preprint at [arxiv:physics/0606007](https://arxiv.org/abs/physics/0606007))

V. Kalapala, V. Sanwalani, **A. Clauset** and C. Moore, “Scale Invariance in Road Networks.” *Physical Review E* **73** 026130 (2006). (Preprint at [arxiv:physics/0510198](https://arxiv.org/abs/physics/0510198))

J. T. Ayers, **A. Clauset**, J. D. Schmitt, L. P. Dwoskin 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. Santiago 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). (Preprint at [arxiv:physics/0503036](https://arxiv.org/abs/physics/0503036))

A. Clauset and C. Moore, “Accuracy and Scaling Phenomena in Internet Mapping.” *Physical Review Letters* **94** 018701 (2005). (Preprint at [arxiv:cond-mat/0410059](https://arxiv.org/abs/cond-mat/0410059))

A. Clauset, M. E. J. Newman and C. Moore, “Finding community structure in very large networks.” *Physical Review E* **70**, 066111 (2004). (Preprint at [arxiv:cond-mat/0408187](https://arxiv.org/abs/cond-mat/0408187))

E. Bayram, P. Santiago II, R. Harris, Y. D. 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).

CONFERENCE
PROCEEDINGS,
REFEREED

N. Eagle, **A. Clauset** and J. Quinn, “Location Segmentation, Inference and Prediction from Cellular Towers.” *Proc. 23rd AAAI Conference on Artificial Intelligence (AAAI '09)*.

N. Eagle, J. Quinn and **A. Clauset**, “Methodologies for Continuous Cellular Tower Data Analysis.” *Proc. 7th International Conference on Pervasive Computing (Pervasive '09)*, 342–353.

A. Clauset and N. Eagle. “Persistence and periodicity in a dynamic proximity network.” DIMACS Workshop on Computational Methods for Dynamic Interaction Networks (Piscataway), 2007.

A. Clauset, C. Moore and M. E. J. Newman, “Structural Inference of Hierarchies in Networks.” *Proc. Workshop on Statistical Network Analysis, 23rd International Conference on Machine Learning (ICML '06)*. E. M. Airoldi et al., Eds., *Lecture Notes in Computer Science* **4503**, 1–13.

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).” *ACM Proc. 37th Symp. on Theory of Computing (STOC '05)*, 694–703.

SUBMITTED
PAPERS

B. H. Good, Y.-A. de Montjoye and **A. Clauset**, “The performance of modularity maximization in practical contexts.” Submitted to *Physical Review E* (2009). (Preprint at [arxiv:0910.0165](https://arxiv.org/abs/0910.0165))

PREPRINTS

A. Clauset and K. S. Gleditsch, “The developmental dynamics of terrorist organizations.” Preprint, [arxiv:0906.3287](https://arxiv.org/abs/0906.3287) (2009).

A. Clauset, “The Yeast Protein Interaction Network is Hardly Scale Free: Comment on Yu et al. *Science* 322, 104 (2008).” Preprint, [arxiv:0901.0530](https://arxiv.org/abs/0901.0530) (2009).

A. Clauset and C. Moore, “How Do Networks Become Navigable?” Preprint, [arxiv:cond-mat/0309415](https://arxiv.org/abs/cond-mat/0309415) (2003).

INVITED TALKS
(RECENT)

- Workshop on Nonlinear Dynamics of Networks, University of Maryland, College Park MD, April 5–9, 2010
- MoMiNIS-MITACS Lecture Series, Dalhousie University, Halifax NS, Canada, March 30, 2010
- Analysis of Petascale Data via Networks Mini-Symposium, SIAM Conference on Parallel Processing & Scientific Computing (PP10), Seattle WA, February 24–26, 2010
- Workshop on Information Theory and Applications, San Diego CA, January 31–February 5, 2010
- Physics Colloquium, Korea Adv. Inst. of Sci. and Tech. (KAIST), Daejeon, Korea, Dec. 3, 2009
- Physics Colloquium, Seoul National University, Seoul, Korea, Dec. 2, 2009
- Physics Colloquium, Sungkyunkwan University, Suwon, Korea, Nov. 30, 2009
- Plenary Talk, International Workshop on Coping with Crises in Complex Socio-Economic Systems, ETH, Zürich Switzerland, June 8–13, 2009
- Center for Complex Network Research, Northeastern University, Boston MA, May 13 2009
- Physics Dept. Colloquium Series, New Mexico Tech., Socorro NM, May 7 2009
- Computer Science Colloquium, University of Colorado, Boulder CO, March 12 2009
- Statistical Sciences (CCS-6) Seminar, Los Alamos Nat. Lab., Los Alamos NM, February 26 2009
- Comp. Sci. Research Inst. (CSRI) Seminar, Sandia Nat. Lab., Albuquerque NM, January 14 2009
- 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
- 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

SEMINARS
(RECENT)

- Ecological Society of America (ESA) Annual Meeting, Albuquerque NM, Aug. 2–7 2009
- “Paleontology: Macroevolution, Diversity and Biogeography” Session, Geological Soc. of America (GSA) Joint Annual Meeting, Houston TX, October 5–9 2008
- International Conference on Network Science (NetSci), New York NY, May 22–25 2007

TEACHING

Students

- Andrew Mauboussin (High School Research Fellow, Santa Fe Institute) Summer 2009
- Benjamin Good (BS Physics, Swarthmore College; Santa Fe Institute REU) 2008–2010
- Benjamin Edwards (MA Sociology, U. New Mexico) Expected 2010

Courses

- CU Boulder CSCI 7000, Inference, Models and Simulation for Complex Systems Fall 2010
- Faculty, Santa Fe Institute Research Workshop on Frontiers in Complex Systems, Beijing 2009
- Faculty, Santa Fe Institute Complex Systems Summer School, Beijing 2008
- Faculty, Santa Fe Institute Complex Systems Summer School, Santa Fe 2007–2008

REFEREE WORK

- **Applied Math:** SIAM ICDM Workshop on Analysis of Dynamic Networks (2009)
- **Biology:** Bioinformatics, Global Ecology and Biogeography, IET Systems Biology, Journal of Animal Ecology, Journal of Theoretical Biology, PLoS Biology
- **Computer Science:** Computer Science Reviews (CSR), Foundations and Trends in Machine Learning, ACM Journal of Experimental Algorithmics (JEA), Journal of Statistical Analysis and Data Mining, ACM Transactions on Knowledge Discovery from Data (TKDD), ACM Transactions on the Web (TWEB), IEEE International Conference on Robotics and Automation (2006), RANDOM (2007), SIMPLEX (2010), SODA (2006, 2007), SDM Workshop on Analysis of Dynamic Networks (2009), NIPS Workshop on Analyzing Graphs (2008), Workshop on Experimental Algorithms (2006), ACM SIGKDD Workshop on Social Network Mining and Analysis (2008, 2009), WSDM (2010), WWW (2010)
- **General:** Nature, Proceedings of the National Academy of Science USA, Science Magazine, PLoS ONE
- **Physics:** European Physical Journal B, Europhysics Letters, Journal of Statistical Mechanics, New Journal of Physics, Physica A, Physical Review E, Physical Review Letters
- **Political Science:** Defense & Peace Economics, Journal of Peace Research
- **Others:** Advances in Complex Systems, Computational Linguistics, Journal of Chemical Information and Modeling, Networks and Spatial Economics

PROFESSIONAL SERVICE

Workshops

- *The Mathematics of Terrorism*
Joint with MITRE, Santa Fe NM, Aug. 31–Sept. 2, 2009. Organized with B. Tivnan (MITRE).
- *Statistical Inference for Complex Networks*
Santa Fe NM, Dec. 3–5 2008. Organized with C. Moore (New Mexico, SFI).
- *Navigability and Complex Networks*
Joint with UCSD's Cooperative Association for Internet Data Analysis (CAIDA), Santa Fe NM, Aug. 4–6, 2008. Organized with D. Krioukov (UCSD) and kc claffy (UCSD).
- *Is There a Physics of Society?*
Santa Fe NM, Jan. 10–12, 2008. Organized with M. Girvan (Maryland).

Conferences

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

Program Committees

- *CompleNet 2010*, Rio de Janeiro Brazil, October 13–15, 2010.
- *SIMPLEX 2010*, Genoa Italy, June 21, 2010.
- *World Wide Web Conference (WWW) 2010*, Raleigh NC, April 26–30, 2010.
- *3rd ACM International Conference on Web Search and Data Mining (WSDM) 2010*, New York NY, February 4–6, 2010.
- *3rd Workshop on Social Network Mining and Analysis* (part of ACM SIGKDD 2009), Paris France, June 28–July 1, 2009
- *CompleNet 2009*, Catania Italy, May 12–13, 2009.
- *Workshop on Analysis of Dynamic Networks* (part of SIAM International Conf. on Data Mining), Sparks, Nevada, April 30 – May 2, 2009.
- *Workshop on Analyzing Graphs: Theory and Applications* (part of NIPS 2008), Whistler, Canada, December 12, 2008.
- *2nd Workshop on Social Network Mining and Analysis* (part of ACM SIGKDD 2008), Las Vegas NV, August 24–27, 2008
- *5th International Workshop on Experimental Algorithms*, Menorca Spain, May 24–27, 2006

Institutional Committees

- CU Boulder, Colorado Initiative in Molecular Biotech. (CIMB), Task Force 2010 – present
- Santa Fe Institute, Colloquium Committee 2007 – 2009
- UNM Computer Science Faculty Search Committee 2005 – 2006

Professional Society Positions

- President, UNM Computer Science Grad. Student Assoc. (CSGSA) 2004 – 2005
- Vice President, UNM Computer Science Grad. Student Assoc. (CSGSA) 2003 – 2004

Professional Societies

American Physical Society (APS), Association of Computing Machinery (ACM), Ecological Society of America (ESA), Geological Society of America (GSA), Midwest Political Science Association (MPSA), American Society of Naturalists (ASN), Society for Industrial and Applied Mathematics (SIAM)

SYNERGISTIC ACTIVITIES

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