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EDUCATION

Ph.D., Program in Applied Mathematics , University of Arizona, Tucson, AZ, Oct. 1994
M.S., Program in Applied Mathematics, University of Arizona,Tucson, AZ, Dec. 1991
B.A. Magna Cum Laude, Math and Physics, St. Olaf College, Northfield, MN, May 1989

EMPLOYMENT

Staff Member, Theoretical Division, Los Alamos National Laboratory, Oct. 1997 - present
Senior Software Engineer, Digital Island/Exodus, Cable and Wireless, Aug. 2000 - Aug. 2002
Postdoctoral Research Associate, Los Alamos National Laboratory, Oct. 1994 - Sep. 1997
DOE Computational Science Graduate Fellow, University of Arizona, Sep. 1992 - Aug. 1994
Graduate Research Assistant, Los Alamos National Laboratory, Jun. 1991 - Aug. 1992
Research Assistant, University of Arizona, Aug. 1990 - May 1991

RESEARCH INTERESTS

Nonlinear dynamics, pattern formation, complex systems, network dynamics, social and technological networks, distributed sensor networks, epidemic modeling, Data mining, data analysis, information theory, scientific computing with Python

AWARDS AND ACTIVITIES

Editorial Board, SIAM Journal of Applied Dynamical Systems
Referee for *Physics Letters A*, *Physica D*, *Physical Review Nonlinearity*, *SIAM*
Member Society for Industrial and Applied Mathematics
Los Alamos Achievement Award for designing and building “Avalon”, 1998
Los Alamos coordinator for DOE Computational Science Graduate Fellowship
Los Alamos Center for Nonlinear Studies Postdoc Award, 1997
DOE Computational Science Graduate Fellowship September 1992
Departmental Distinction, Mathematics, St. Olaf College, 1989

SELECTED RESEARCH PAPERS

- [1] J. BOLLEN, H. VAN DE SOMPTEL, A. HAGBERG, AND R. CHUTE. A principal component analysis of 39 scientific impact measures. Preprint, 2009.
- [2] V. GINTAUTAS, A. HAGBERG, AND L. M. A. BETTENCOURT. When is social computation better than the sum of its parts? Preprint, 2009.
- [3] A. GUTFRAIND, A. HAGBERG, AND F. PAN. Interdiction of a Markovian evader. Preprint, 2009.
- [4] J. BOLLEN, H. VAN DE SOMPTEL, A. HAGBERG, L. BETTENCOURT, R. CHUTE, M. A. RODRIGUEZ, AND L. BALAKIREVA. Clickstream data yields high-resolution maps of science. *PLoS ONE*, 4:e4803, 2009.
- [5] A. GUTFRAIND, A. HAGBERG, AND F. PAN. Optimal interdiction of unreactive Markovian evaders. To appear in Springer LNCS, 2009.
- [6] R. MANOR, A. HAGBERG, AND E. MERON. Wavenumber locking and pattern formation in spatially forced systems. Submitted, 2009.
- [7] A. A. HAGBERG, D. A. SCHULT, AND P. J. SWART. Exploring network structure, dynamics, and function using NetworkX. In *Proceedings of the 7th Python in Science Conference (SciPy2008)*, pages 11–15, Pasadena, CA USA, August 2008.
- [8] A. HAGBERG AND D. A. SCHULT. Rewiring networks for synchronization. *Chaos*, 18:037105, 2008.
- [9] M. BRADONJIĆ, A. HAGBERG, AND A. G. PERCUS. The structure of geographical threshold graphs. To appear in *Internet Mathematics*, 2008.
- [10] R. MANOR, A. HAGBERG, AND E. MERON. Wave-number locking in spatially forced pattern-forming systems. *EPL*, 83:10005, 2008.
- [11] M. BRADONJIĆ, A. HAGBERG, AND A. G. PERCUS. Giant component and connectivity in geographical threshold graphs. In *Algorithms and Models for the Web-Graph (WAW 2007)*, pages 209–216, San Diego, CA USA, 2007.
- [12] B. MARTS, D. J. W. SIMPSON, A. HAGBERG, AND A. L. LIN. Period doubling in a periodically forced Belousov-Zhabotinsky reaction. *Phys. Rev. E*, 76:026213, 2007.
- [13] L. M. A. BETTENCOURT, A. A. HAGBERG, AND L. B. LARKEY. Separating the wheat from the chaff: Practical anomaly detection schemes in ecological applications of distributed sensor networks. In *Distributed Computing in Sensor Systems (DCOSS 2007)*, pages 223–239, Santa Fe, NM USA, June 2007.
- [14] A. HAGBERG, P. J. SWART, AND D. A. SCHULT. Designing threshold networks with given structural and dynamical properties. *Phys. Rev. E*, 74:056116, 2006.

- [15] S. L. COLLINS, L. M. A. BETTENCOURT, A. HAGBERG, R. F. BROWN, D. I. MOORE, G. BONITO, K. A. DELIN, S. P. JACKSON, D. W. JOHNSON, S. C. BURLEIGH, R. R. WOODROW, AND J. M. MCAULEY. New opportunities in ecological sensing using wireless sensor networks. *Frontiers in Ecology*, 4:402–407, 2006.
- [16] B. MARTS, A. HAGBERG, E. MERON, AND A. L. LIN. Resonant and non-resonant patterns in forced oscillators. *Chaos*, 16:037113, 2006.
- [17] A. HAGBERG, A. YOCHELIS, H. YIZHAQ, C. ELPHICK, L. PISMEN, AND E. MERON. Linear and nonlinear front instabilities in bistable systems. *Physica D*, 217:186–192, 2006.
- [18] A. HAGBERG, B. MARTS, A. L. LIN, AND E. MERON. Bloch-front turbulence: Theory and experiments. *Physica A*, 356:88–94, 2005.
- [19] A. YOCHELIS, C. ELPHICK, A. HAGBERG, AND E. MERON. Frequency locking in extended systems: the impact of a Turing mode. *Europhys. Lett.*, 69:170–176, 2005.
- [20] B. MARTS, A. HAGBERG, E. MERON, AND A. L. LIN. Bloch-front turbulence in a periodically forced Belousov-Zhabotinsky reaction. *Phys. Rev. Lett.*, 93:108305, 2004.
- [21] A. YOCHELIS, C. ELPHICK, A. HAGBERG, AND E. MERON. Two-phase resonant patterns in forced oscillatory systems. *Physica D*, 199:201–222, 2004.
- [22] A. L. LIN, A. HAGBERG, E. MERON, AND H. L. SWINNEY. Resonance tongues and patterns in periodically forced reaction-diffusion systems. *Phys. Rev. E*, 69:066217, 2004.
- [23] A. HAGBERG AND E. MERON. Vortex-pair dynamics in anisotropic bistable media: a kinematic approach. *Phys. Rev. Lett.*, 91:224503, 2003.
- [24] A. YOCHELIS, A. HAGBERG, E. MERON, A. L. LIN, AND H. L. SWINNEY. Development of standing-wave labyrinthine patterns. *SIADS*, 1(2):236–247, 2002.
- [25] E. MERON, M. BÄR, A. HAGBERG, AND U. THIELE. Front dynamics in catalytic surface reactions. *Catalysis Today*, 70(4):331–340, 2001.
- [26] A. L. LIN, A. HAGBERG, A. ARDELEA, M. BERTRAM, H. L. SWINNEY, AND E. MERON. Four-phase patterns in forced oscillatory systems. *Phys. Rev. E*, 62:3790–3798, 2000.
- [27] A. HAGBERG AND E. MERON. Spiral wave nucleation. In *Interfaces, Pulses and Waves in Nonlinear Dissipative Systems. RIMS Project 2000: Reaction-diffusion systems: theory and application. Takao Ohta, ed.*, pages 66–71, RIMS, Kyoto, 2001.
- [28] M. BÄR, A. HAGBERG, E. MERON, AND U. THIELE. Front propagation and pattern formation in anisotropic media. *Phys. Rev. E*, 62(1):366–374, 2000.
- [29] A. HAGBERG, E. MERON, AND T. PASSOT. Phase dynamics of nearly stationary patterns in activator-inhibitor systems. *Phys. Rev. E*, 61(6):6471–6476, 2000.

- [30] C. ELPHICK, A. HAGBERG, AND E. MERON. Phase front solutions and instabilities in forced oscillations. In *Equadiff 99 : Proceedings of the International Conference on Differential Equations Berlin, Germany 12 August 1999*, 2000.
- [31] M. BÄR, A. HAGBERG, E. MERON, AND U. THIELE. Stratified spatiotemporal chaos in anisotropic reaction-diffusion systems. *Phys. Rev. Lett.*, 83:2664–2667, 1999.
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- [33] C. ELPHICK, A. HAGBERG, AND E. MERON. Multiphase patterns in periodically forced oscillatory systems. *Phys. Rev. E*, 59(5):5285–5291, 1999.
- [34] A. HAGBERG AND E. MERON. Order parameter equations for front transitions: nonuniformly curved fronts. *Physica D*, 123:460, 1998.
- [35] A. HAGBERG AND E. MERON. Propagation failure in excitable media. *Phys. Rev. E*, 57:299, 1998.
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- [51] Y. A. RZHANOV, H. RICHARDSON, A. A. HAGBERG, AND J. V. MOLONEY. Spatio-temporal oscillations in a semiconductor etalon. *Phys. Rev. A*, 47(2):1480–1491, 1993.

SOFTWARE

NetworkX: A Python package for the creation, manipulation, and study of the structure, dynamics, and functions of complex networks. <https://networkx.lanl.gov/>.

Pygraphviz: A Python interface to the Graphviz graph drawing package. <https://networkx.lanl.gov/pygraphviz>.

PRESENTATIONS

- SIAM Conference on Computational Science and Engineering, Miam, FL, March 2009.
- Python in Science Conference (SciPy2008), Pasadena, CA, August 2008.
- Japanese-American Frontiers of Science Workshop, Kanagawa Japan, Dec 2007.
- SIAM Conference on Applications of Dynamical Systems, Snowbird, Utah, May 2007.
- DIMACS - Georgia Tech Workshop on Complex Networks and their Applications, Atlanta, GA, January 2007.
- Challenges and Opportunities in Distributed Sensor Networks, Los Alamos National Laboratory, Los Alamos NM, March 2006.
- Gordon Research Conference on Nonlinear Science, Colby College Waterville, Maine, June 2005.
- SIAM Conference on Applications of Dynamical Systems, Snowbird, Utah, May 2005.
- XIV Conference on Nonequilibrium Statistical Mechanics and Nonlinear Physics, La Serena, Chile, December 2004.
- SciPy04, California Institute of Technology, Pasadena, CA, September 2004.
- Center for Nonlinear Studies, Los Alamos, NM, December 2003
- SIAM Meeting on Dynamical Systems, Snowbird, UT, May 2001
- Center for Nonlinear Dynamics, University of Texas at Austin, October 1999
- SIAM Meeting on Dynamical Systems, Snowbird, UT, May 1999
- Nonlinear Waves and Solitons in Physical Systems Meeting, Los Alamos, NM, May 1997
- Program in Applied Mathematics, University of Arizona, Tucson, January 1997
- Instituto Nazionale di Ottica, Florence, Italy, April 1997
- Max-Planck-Institute for Complex Systems Physics, Dresden, Germany, March 1996
- Fritz-Haber-Institute, Berlin, Germany, March 1996
- Workshop on Domain Walls Near and Far from Equilibrium,
J. Blaustein Institute for Desert Research, Sede Boker, Israel, February 1996
- Department of Chemical Engineering, Princeton University, Princeton, November 1995
- Institute for Nonlinear Science, University of California, San Diego, November 1995
- Applied Math Colloquium, University of New Mexico, Albuquerque, NM, October 1995
- Santa Fe Institute, Santa Fe, NM, October 1995
- Center for Nonlinear Studies, Los Alamos, NM, September 1995
- Applied Math Department University of Colorado, Boulder, CO, March 1995
- Computational Science Graduate Fellowship Conference, Minneapolis, MN, August 1993