

CURRICULUM VITAE

Zoltán Toroczka

Associate Professor

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Family: Married + 2
US citizen

EDUCATION:

- High-school: Báthory István Liceum (former Mathematical-Physics Liceum no. 3) Cluj, Romania.
- Undergraduate institution: Babeş-Bolyai University, Romania.
- **Diploma de Licență (MSc.), Physics:** degree granted June 1992, Babeş-Bolyai University, Mihail Kogalniceanu nr. 1, RO-400084 Cluj-Napoca, Romania.
- **Ph.D., Physics :** degree granted May 9, 1997, Virginia Polytechnic Institute and State University, Blacksburg, VA, 24061 USA. Thesis: “Analytic Results for Hopping Models with Excluded Volume Constraint”, advisor Royce K.P. Zia.

SCHOLARSHIPS AND FELLOWSHIPS:

- Erdélyi Múzeum Egyesület and the Department of Education of Hungary Scholarship, 1992
- C.H. Wan Scholarship for academic excellence in physics, Virginia Tech, 1996
- MHB research fellow, Eötvös University, Hungary, 1992-94.
- Director’s Postdoctoral Fellow, 2000 – 2002, Los Alamos National Laboratory (LANL)

POSITIONS:

- Associate Professor, Physics Department, University of Notre-Dame, 2006-present
- Deputy Director, Center for Nonlinear Studies, LANL, 2004-2006
- Technical Staff Member, Complex Systems Group, LANL, 2002-present
- Director’s Postdoctoral Fellow, LANL, 2000-2002.
- Research Associate, University of Maryland at College Park, 98–2000.
- Graduate Research Assistant and Research Associate, Virginia Tech, 94–98.

DISTINCTIONS, HONORS and AWARDS:

- 1999 Special Merit Award for Outstanding Participation in the Materials Research Science and Engineering Center's Education Outreach Program, University of Maryland
- 1997 National Science Foundation and the Georgia Institute of Technology ICMP Travel Grant for the XIIth International Congress of Mathematical Physics, Brisbane, Australia
- 1995 Bolyai College of Eötvös University, Supplementary Grant for Summer School and Workshop, Budapest, Hungary
- 1993 Niels Bohr Institute Supplementary Grant for Summer School, Humlabæk, Denmark
- 1989 Special Prize, "Traian Lalescu" National Problem Solving Competition in Physics, Romania

PROFESSIONAL MEMBERSHIPS:

- American Physical Society

BOOKS and MONOGRAPHS

- *Complex Networks*, Lecture Notes in Physics **650**, Springer-Verlag, Eds. Ben-Naim, H. Frauenfelder, Z. Toroczkai, (2004), 520 pages, ISBN 3-540-22354-1.

REFEREED PUBLICATIONS

58. E. Ravasz, S. Gnanakaran, Z. Toroczkai. Network Structure of Protein Folding Pathways. *submitted*, (2007), preprint.
57. S. Sreenivasan, R. Cohen, E. Lopez, Z. Toroczkai, and H. E. Stanley. Communication Bottlenecks in Scale-Free Networks. *Phys. Rev. E*, *in press* (2007) <http://arxiv.org/abs/cs.NI/0604023>
56. Z. Toroczkai, H. Guclu. Proximity Networks and Epidemics. *Physica A*, *in press*, (2007). <http://arxiv.org/abs/physics/0701255>
55. H. Guclu, G. Korniss, Z. Toroczkai. Extreme fluctuations in noisy task-completion landscapes on scale-free networks. *submitted*, (2007). <http://arxiv.org/abs/cond-mat/0701301>
54. Z. Toroczkai, B. Kozma, K.E. Bassler, N.W. Hengartner and G. Korniss. Gradient Networks, *submitted* (2007). <http://arxiv.org/abs/cond-mat/0408262>

53. B. Danila, Y. Yu, S. Earl, J.A. Marsh, Z. Toroczkai, K.E. Bassler. Congestion-gradient driven transport on complex networks, *Phys. Rev. E*, **74** 046114 (2006).
52. H. Guclu, G. Korniss, M. A. Novotny, Z. Toroczkai, and Z. Rácz, *Phys. Rev. E*, **73** 066115 (2006).
51. Z. Toroczkai, K.E. Bassler. Network dynamics: Jamming is Limited in Scale-free Systems, *Nature*, **428** 716 (2004).
50. S. Eubank, H. Guclu, V.S.A. Kumar, M. Marathe, A. Srinivasan, Z. Toroczkai and N. Wang. Controlling Epidemics in Realistic Urban Social Networks. *Nature*, **429**, 180 (2004).
49. T. Tél, T. Nishikawa, A.E. Motter, C. Grebogi, and Z. Toroczkai. Universality in active chaos. *Chaos*, **14**, 72 (2004); LA-UR-02-7579
48. M. Anghel, Z. Toroczkai, K.E. Bassler, G. Korniss. Competition-driven Network Dynamics: Emergence of a Scale-free Leadership Structure and Collective Efficiency. *Phys.Rev.Lett.*, **92** 058701 (2004). LA-UR-02-7580
47. I.J. Benczik, Z. Toroczkai and T. Tél. Advection of Finite-size Particles in Open Flows. *Phys.Rev.E* **67** 036303 (2003).
46. I. Scheuring, T. Czárán, P. Szabó, G. Károlyi, and Z. Toroczkai. Spatial models of prebiotic evolution: soup before pizza? *Origins of Life and Evolution of the Biosphere*, **33**, 319 (2003).
45. G. Korniss, M.A. Novotny, H. Guclu, Z. Toroczkai, P.A. Rikvold, Suppressing Roughness of Virtual Times in Parallel Discrete-Event Simulations. *Science*, **299**, 677 (2003); LA-UR-02-5811.
44. I.J. Benczik, Z. Toroczkai and T. Tél. Selective Sensitivity of Open Chaotic Flows on Inertial Tracer Advection: Catching Particles with a Stick. *Phys.Rev.Lett.* **89**, 164501 (2002); cover-page article; LA-UR-02-2364
43. I.Scheuring, G.Károlyi, Z. Toroczkai, T. Tél, and Á. Péntek. Competing populations in flows with chaotic mixing. *Theor.Pop.Biol.* **63**(#2), 77 (2003); LA-UR-01-4666.
42. J.M. Finn, J.D. Goette, Z. Toroczkai, M. Anghel and B.P. Wood. Estimation of Entropies and Dimensions by Nonlinear Symbolic Time Series Analysis. *Chaos*, **13**(#2), 444 (2003); LA-UR-02-3386.
41. S. Das Sarma, P.P. Chatrathorn, Z. Toroczkai. Universality class of discrete solid-on-solid limited mobility nonequilibrium growth models for kinetic surface roughening. *Phys. Rev. E*, **65**, 0366144 (2002).
40. Z. Toroczkai, T. Tél. Introduction: Active Chaotic Flow. *Chaos*, **12**(#2), 372 (2002)

39. Z. Toroczkai. Topological classification of the Horton-Strahler index on binary trees, *Phys.Rev.E*, **65** 016130 (2002); LA-UR-01-5224.
38. G. Korniss, M.A. Novotny, P.A. Rikvold, H. Guclu and, Z. Toroczkai. Going Through Rough Times: from Non-equilibrium Surface Growth to Algorithmic Scalability. Materials Research Society Symposium Proceedings, Statistical Mechanical Modelling in Materials Research, Series **700**, 297 (2002); LA-UR-01-6631.
37. G. Santoboni, T. Nishikawa, Z. Toroczkai and C. Grebogi. Autocatalytic reactions of phase distributed active particles. *Chaos*, **12**(#2), 408 (2002); LA-UR-01-6099
36. M. Chertkov, I. Gabbitov, P. Lushnikov, J. Moeser, and Z. Toroczkai. Pinning method of pulse confinement in optical fiber with random dispersion. *J.Opt.Soc.Am. B*, **19**, 2538 (2002); LA-UR-01-5307.
35. T. Nishikawa, Z. Toroczkai, C. Grebogi and T. Tél. Finite size effects on active chaotic advection, *Phys.Rev.E*, **65** 026216 (2002); LA-UR-00-0613.
34. P. Punyindu, Z. Toroczkai, S. Das Sarma. Epitaxial Mounding in Limited-Mobility Models of Surface Growth, *Phys.Rev.B*, **64**, 205407 (2001); LA-UR-00-0614.
33. Z. Toroczkai, G. Károlyi, Á. Péntek, T. Tél, and I. Scheuring. Autocatalytic Reactions in Systems with Hyperbolic Mixing: Exact Results for the Active Baker Map, *J.Phys.A: Math.Gen.* **34**, 5215 (2001); LA-UR-00-5814.
32. Z. Toroczkai, G. Korniss. Comment on “Extremal-Point densities of interface fluctuations in a quenched random medium”. *Phys.Rev.E*, **64** 048101 (2001); LA-UR-01-1332.
31. T. Nishikawa, Z. Toroczkai, and C. Grebogi. Advective coalescence in chaotic flows *Phys.Rev.Lett* **87** 038301 (2001); LA-UR-00-4319.
30. I. Miklós and Z. Toroczkai, An improved model for statistical alignment. *Lecture Notes In Computer Science* **2149**, pp. 1-10, (2001). LA-UR-01-3270. O.Gascuel, B.M. Moret (Eds.):**Algorithms in Bioinformatics** First International Workshop, WABI 2001, Aarhus, Denmark, Aug. 28-31, 2001.
29. G. Károlyi, Á. Péntek, I. Sheuring, T. Tél, and Z. Toroczkai. Chaotic flow: the physics of species coexistence, *Proc. Natl. Acad. Sci. USA*, **97** 13661 (2000) ; LA-UR-00-3602.
28. I. Sheuring, G. Károlyi, Á. Péntek, T. Tél, Z. Toroczkai. A model for resolving the plankton paradox: coexistence in open flows, *Freshwater Biology*, **45**, 123 (2000); LA-UR-00-4107.
27. Z. Toroczkai, G. Korniss, S. Das Sarma, and R. K. P. Zia. Extremal-Point densities of interface fluctuations, *Phys.Rev.E*, **62**, 276 (2000) .

26. G. Korniss, Z. Toroczkai, M.A. Novotny, and P.A. Rikvold. From massively parallel algorithms and fluctuating time horizons to non-equilibrium surface growth, *Phys.Rev.Lett.* **84** 1351 (2000).
25. S. Das Sarma, P. Punyindu, and Z.Toroczkai. Nonuniversal mound formation in nonequilibrium surface growth, *Surf. Sci. Letters*, **457**, L369, (2000).
24. T. Tél, G. Károlyi, Á. Péntek, I. Sheuring, Z. Toroczkai, C. Grebogi and J. Kadtke. Chaotic advection, diffusion, and reactions in open flows, *Chaos*, **10**, 89 (2000).
23. Z. Toroczkai, and E.D. Williams. Nanoscale fluctuations at solid surfaces, *Physics Today*, **52**, 24 (1999)
22. G. Károlyi, Á. Péntek, I. Sheuring, T. Tél, Z. Toroczkai, C. Grebogi, and J. Kadtke. Fractality, chaos, and reactions in imperfectly mixed open hydrodynamical flows, *Physica A* **274**, 120 (1999);
21. Z. Toroczkai, T. J. Newman and S. Das Sarma. Sign-time distributions for interface growth *Phys. Rev. E* **60**, R1115 (1999)
20. G. Károlyi, Á. Péntek, Z. Toroczkai, T. Tél, and C. Grebogi. Chemical or biological activity in open chaotic flows, *Phys. Rev. E* **59**, 5468 (1999)
19. T. J. Newman and Z. Toroczkai. Diffusive persistence and the "sign-time" distribution *Phys. Rev. E* **58**, R2685 (1998)
18. R.K.P. Zia and Z. Toroczkai. Random walk with a hop-over site: a novel approach to tagged diffusion and its applications, *J. Phys. A: Math.Gen.* **31**, 9667 (1998)
17. Z. Toroczkai, G. Károlyi, T. Tél, Á. Péntek, and C.Grebogi. Advection of active particles in open chaotic flows *Phys. Rev. Lett.* **80**, 500 (1998)
16. Z. Toroczkai, G. Korniss, B. Schmittmann, and R.K.P. Zia. Brownian-vacancy mediated disordering dynamics, *Europhys. Lett.* **40**, 281 (1997)
15. Z. Toroczkai. The Brownian vacancy driven walk, *Int. J. Mod. Phys. B* **11**, 3343 (1997)
14. Z. Toroczkai, and R.K.P. Zia. Periodic one-dimensional hopping model with one mobile directional impurity, *J. Stat. Phys.* **87**, 545 (1997)
13. Z. Toroczkai, G. Károlyi, Á. Péntek, T. Tél, C. Grebogi, and J.A. Yorke. Wada dye boundaries in open hydrodynamical flows, *Physica A***239**, 235 (1997)
12. Á. Péntek, T. Tél, and Z. Toroczkai. Transient chaotic mixing in open hydrodynamical flows, *Int. J. Bif. Chaos.* **6**, 2619 (1996)

11. Á. Péntek, J.B. Kadtko, and Z. Toroczkai. Stabilizing chaotic vortex trajectories: an example of high dimensional control, *Phys. Lett.* **A224**, 85 (1996)
10. Z. Toroczkai, and R.K.P. Zia. A model for electrophoresis of polymers with impurities: exact distribution for a steady state, *Phys. Lett.* **A217**, 97 (1996)
9. B. Sass, and Z. Toroczkai. Continuous extension of the geometric control method, *J. Phys. A: Math.Gen.* **29**, 3545 (1996)
8. Á. Péntek, Z. Toroczkai, T. Tél, C. Grebogi, and J.A. Yorke Fractal boundaries in open hydrodynamical flows: signatures of chaotic saddles, *Phys. Rev. E* **51**, 4076 (1995)
7. Á. Péntek, T. Tél, and Z. Toroczkai. Chaotic advection in the velocity field of leapfrogging vortex pairs, *J. Phys. A: Math.Gen.* **28**, 2191 (1995)
6. Á. Péntek, T. Tél, and Z. Toroczkai. Fractal tracer patterns in open hydrodynamical flows: the case of leapfrogging vortex pairs, *Fractals* **3**, 33 (1995)
5. Z. Toroczkai. Geometric method for stabilizing unstable periodic orbits, *Phys. Lett.* **A190**, 71 (1994)
4. Á. Péntek, Z. Toroczkai, D.H. Mayer, and T. Tél. A generalized Kac model as a dynamical system, *Z. Naturforsch.* **49a**, 1212 (1994)
3. Z. Toroczkai and Á. Péntek. Detecting phase transitions in intermittent systems by using the thermodynamical formalism, *Z. Naturforsch.* **49a**, 1235 (1994)
2. Á. Péntek, Z. Toroczkai, D.H. Mayer, and T. Tél. Kac Model from a dynamical system's point of view, *Phys. Rev. E* **49**, 2026 (1994)
1. Z. Toroczkai and Á. Péntek. Classification criterion for dynamical systems in intermittent chaos, *Phys. Rev. E* **48**, 136 (1993)

REFEREED BOOK CHAPTERS:

3. Z. Toroczkai, G. Korniss, M.A. Novotny and H. Guclu. Scalability, Random Surfaces and Synchronized Computing Networks In **Computational Complexity and Statistical Physics**, eds. A. Percus and G. Istrate, Oxford University Press, (2005), pp. 249.
2. Z. Toroczkai, M. Anghel, G. Korniss, K.E. Bassler. Effects of Inter-agent Communications on the Collective. In: **Collectives and the Design of Complex Systems**, eds.: K. Tumer and D.H. Wolpert, Springer-Verlag, 2004, pp. 185. LA-UR-03-0611.
1. G. Károlyi, Á. Péntek, T. Tél, and Z. Toroczkai. Chaotic tracer dynamics in open hydrodynamical flows, in **Nonlinear Dynamics, Chaotic and Complex Systems**, eds. E. Infeld, R. Zelazny, and A. Galkowski, (Cambridge University Press, Cambridge, 1997, pp. 24)

REFEREED PROCEEDINGS:

4. Z. Toroczkai, S. Eubank. Agent-based Modeling as a Decision Making Tool, Report of the National Academy of Engineering, *2005 U.S. Frontiers of Engineering Symposium*, pp. 99 (2005) also reprinted in *Bridge*, Winter 2005, pp. 22.
3. G. Korniss, M.A. Novotny, Z. Toroczkai, and P.A. Rikvold. Non-equilibrium Surface Growth and Scalability of Parallel Algorithms for Large Asynchronous Systems, **Computer Simulation Studies in Condensed Matter Physics XIII**, eds. D.P. Landau, S.P. Lewis, and H.-B. Schuttler, **86** 183 (2001)
2. G. Károlyi, Á. Péntek, T. Tél, and Z. Toroczkai. Hydrodynamically driven chemical or biological activity in open flows, *Proceedings of the: British-Finnish-Hungarian Workshop on Refined Flow and Transport Modeling in Shallow Water Environment*, Budapest, Hungary, April, (1999).
1. Á. Péntek, J.B. Kadtko, and Z. Toroczkai. Controlling symmetric vortex configurations, *Proceedings of ANDM'97, AIP Conference*, No. 411, pp. 109 (American Institute of Physics Publishing, 1997)

UNREFEREED PUBLICATIONS:

2. Z. Toroczkai. Complex Networks, invited paper, *Los Alamos Science*, **29**, 24 (2005).
1. Á. Péntek, and Z. Toroczkai, Éltető káosz a planktonok világában, (in Hungarian), *Korunk*, **XI/3**, 76 (2000).

OTHER PUBLICATIONS:

3. Z. Toroczkai. Analytic results for hopping models with excluded volume constraint, *Ph.D. Dissertation* Virginia Tech, 1997
2. Z. Toroczkai. Haosul intermiitent. Tranziții de fază (in romanian), *Diploma Thesis* Babeş-Bolyai University, Cluj, Romania, 1992.
1. Z. Toroczkai. Asymptotic behavior of discrete dynamical systems in chaos, *Studia Universitatis Babeş-Bolyai, PHYSICA* 1, 73 (1990)

INVITED LECTURES AND ADDRESSES:

- Condensed Matter Seminar, Physics Department, Notre Dame University, Nov. 2004.
- Physics Department seminar, Boston University, Oct. 2004.

- Rensselaer Polytechnic Institute, Troy, NY, Oct. 2004 (colloquium)
- Conference on Complex Systems, Northwestern University, Oct. 2004.
- Computational and Applied Mathematics Seminar, U.C. Irvine, Sept. 2004
- Eötvös University, Budapest, Hungary, July 2004 (colloquium).
- University of California at San Diego, May 2004.
- The University of Arizona, Tucson, AZ, March 2004 (colloquium)
- Conference on Growing Networks and Graphs in Statistical Physics, Finance, Biology and Social Systems, Midterm conference, COSIN, Rome, Italy, Sept. 2003.
- Workshop on Collectives and the Design of Complex Systems August 25-28, 2003, Stanford University, Palo Alto, CA, USA.
- APS March Meeting, 2003, Austin, TX.
- Eötvös University Physics Department Colloquium, Budapest, Hungary, December 2002, (colloquium)
- NASA workshop on Collectives and the Design of Complex Systems, NASA, Ames, Aug. 2002.
- UCLA conference on Agent-based modeling in the social sciences, Lake Arrowhead, May, 2002.
- EGS XXVII assembly meeting, Nice, France, April 2002.
- Northwestern University, Chemical Engineering Colloquium, February 2002.
- Santa Fe Institute Workshop on Mathematical Foundations of Distributed Intelligence, Santa Fe, January 2002.
- CNLS Statistical Physics Working Seminar Series, Fall, 2001 (3 lectures).
- Workshop on Computational complexity and Stat. Physics, Santa Fe, Sept. 2001.
- P/T Colloquium, May 10, LANL, 2001.
- SIAM-DS01 Dynamical Systems meeting, Snowbird, Utah, 2001.
- Eötvös University, Budapest, Hungary, 2000 (colloquium).
- Rensselaer Polytechnic Institute, Troy, NY, 2000 (colloquium).
- Duke University, CNLS-CNCS Workshop Durham, NC, 2000.

- University of Virginia, Charlottesville, VA, 1999.
- University of Maryland at College Park, 1998 (2 lectures)
- Center for Nonlinear Studies, Los Alamos National Laboratory, 1998.
- XIIth International Congress of Mathematical Physics, Brisbane, Australia, 1997.

GRANTS AND SPONSORED PROGRAMS:

- Principal Investigator, LANL LDRD-20040141DR, budget: \$4.5 Million, project title: *Statistical Physics of Infrastructure Networks*(S.P.I.N.), duration: 3 years, Sept. 2003 - Sept. 2006, status: awarded, expired.
- Co-Principal Investigator, LANL LDRD-20041010DR, budget: \$1.98 Million, project title: *Dynamics of Complex Networks: Biology, Information, and Security*, duration: 3 years Sept. 2004 - Sept. 2007, status: awarded, expired.
- Co-Principal Investigator, LANL LDRD-20050631DR, budget: \$1.83 Million, project title: *Nonlinear Behavior in Complex Systems* , duration: 3 years Sept. 2004 - Sept. 2007, status: awarded, expired.
- Co-Principal Investigator, LANL LDRD-20050632DR , budget: \$1.845 Million project title: *Cooperative Phenomena in Soft Matter* , duration: 3 years Sept. 2004 - Sept. 2007, status: awarded, expired.
- Principal Investigator, LANL LDRD-20030596ER, budget: \$150,000, project title: *Rare Event Statistics and Scaling in Systems Far from Equilibrium*, duration 1yr, Sept. 2002 - Sept. 2003, status: awarded, expired.
- Co-Principal Investigator, NSF-INT99, US-Hungarian International Agreement Project, NSF Number: INT0000526, budget: \$49,470; project title: *Effects of tracer inertia in active chaotic flows*, duration: 3 years, 1999-2002, status: awarded, expired.

MASTER'S THESIS DIRECTED:

- not applicable.

DOCTORAL DISSERTATIONS DIRECTED:

- not applicable.

OTHER NOTABLE CONTRIBUTIONS:

As non-faculty, Mentored Students in their Ph.D. Research

- Izabella Benczik, Eotvos University, 2002 student, wrote a cover-page PRL vol.89, 164501, and a PRE (vol. 67, 036303, 2003) on the work she did as a summer student at LANL. Since then she graduated, now she is postdoc at Virginia Tech.
- Hasan Guclu, Rensselaer Polytechnic Institute, summer 2002 and 2003. We wrote the paper *Science*, **299**, 677 (2003) and on the work he did as summer GRA at LANL in 2003 the paper *Nature*, **429**, 180 (2004). He graduated August 2005, and he is the recipient of a Director's Funded Postdoctoral Fellowship at LANL.
- Balazs Kozma (RPI), summer 2004, graduated 2006, currently at Université de Paris-Sud, Orsay, France.
- Eduardo Lopez (Boston U.) summer 2004, graduated April 2005. Currently LANL postdoc.
- Gerardo Chowell, Cornell University, summer 2003 and 2004. Gerardo is a Director Funded Postdoctoral Fellow at LANL.

Postdocs Mentored:

- Erica Camacho, 2004, graduated from from Cornell University in Applied Mathematics. Erica is now an assistant professor at Loyola Marymount U. (Los Angeles).
- Eduardo Lopez, 2004–2006, graduated from Boston University April 2005.
- Adilson Enio Motter, 2005–2007, Director's Funded Postdoctoral Fellow.
- Erzsébet Ravasz, 2004–2006, Director's Funded Postdoctoral Fellow, ND graduate now at Harvard Medical School.
- Yeo-Jin Chung, 2005, now assistant professor at Southern Methodist University.
- Natali Gulbahce, 2005-2007 LANL postdoc, graduated from Clark University January 2005.

Conference/Seminar organizer for:

- Network Science 2007 (NetSci 2007), May 20-25, The New York Hall of Science, New York.
- CNLS international workshop on Optimization in Complex Networks, June 19-22, 2006, Hilltop House, Los Alamos.
- CNLS international workshop on *Collectives Formation and Specialization in Biological and Social Systems*, April 20-22, 2005, Hotel Radisson, Santa Fe

- LANL-IMA workshop on *Agent based Modeling and Simulations*, November 3-6, 2003, Minnesota
- CNLS 23rd Annual International Conference on *Networks: Structure, Dynamics, and Function*, May 12-16, 2003, Hotel La Fonda, Santa Fe, over 350 participants
- Agent-based Modelling and Simulations Seminar series, February - November 2001, LANL, Los Alamos
- International Workshop on *Chemical and Biological Activity in Flows*, Max-Planck Institute for Complex Systems, August 26 - September 27, 2002, Dresden, GERMANY
- CNLS/TDO LANL Workshop on *Anomalous Distributions, Nonlinear Dynamical Systems, and Nonextensivity*, November 04-08, 2002, LANL, Los Alamos
- CNLS-LANL International Workshop on *Active Chaotic Flow*, May 2001, Los Alamos,
- SIAM-DS01 Minisymposium on *Active Chaos in Environmental Flows*, May 2001, Snowbird, Utah
- Dynamics Days, Fifteenth Annual Informal Workshop, June, 1994, Budapest, Hungary (over 300 participants)

Referee for:

- Nature, Physics Today, Journal of Fluid Mechanics, Journal of Theoretical Biology, Physics of Fluids, Physical Review Letters, Physical Review, Physics Letters A, Journal of Physics A: Mathematical and General, Physica A, Surface Science, Chaos, Drug Discovery Today, and Lecture Notes in Physics.

Proposal Reviewer for:

- National Science Foundation, NASA, and Los Alamos National Laboratory.

Editor for:

- (Guest Editor): CHAOS, Special Focus Issue on Optimization in Complex Networks, June 2007.
- Lecture Notes in Physics Series, volume on *Complex Networks*, Eds. E. Ben-Naim, Z. Toroczkai and H. Frauenfelder, Springer-Verlag, 2004.
- (Guest Editor): CHAOS, Special Focus Issue on Active Chaotic Flow, June 2002.

Management:

- **Training:** Group Management Development Course, 2004, Los Alamos National Laboratory.
- **Experience:**
 - 1) Team Leader for the LDRD DR project S.P.I.N., involving 16 research staff, 3 post-doctoral associates and 2 GRA summer students, and a yearly budget of \$1.5Million, since Oct. 2003 - present.
 - 2) Deputy Director for Center for Nonlinear Studies (CNLS), February 2004 - present. CNLS runs a strong postdoctoral program with 20 postdocs, a summer GRA student program (about 16 students every summer) a visitor program of about 200 visitors/year, a conferences program with one large-scale Annual Conference and about 12-15 workshops every year.

Media appearances, interviews:

- Interviewed by Ian Austen of New York Times, interview published in New York Times, February 27, (2003): *With 6 Degrees of Separation, Computers Stay in Sync*, <http://www.nytimes.com/2003/02/27/technology/circuits/27next.html?ex=1047357089&ei=1&en=be1b5dd6ca6ef132>
- Interviewed by Mike Martin of Science Newsweek, interview published in Newsfactor, February 6, 2003: *Cascading Failures Could Crash the Global Internet*, <http://www.newsfactor.com/perl/story/20686.html>
- Nature Science Update Article published in Nature, 15 December, (2000): *Still waters run species out* by Phillip Ball, on the PNAS article [29].

PROFESSIONAL REFERENCES:

- **Prof. Royce K.P. Zia** (PhD thesis advisor), Chair, Physics Department, Virginia Tech, Blacksburg, VA, 24061, PHONE: +(540) 231-5767, E-MAIL: rkpzia@vt.edu
- **Dr. Robert E. Ecke**, Director, Center for Nonlinear Studies, MS B258, Los Alamos National Laboratory, Los Alamos, NM, 87545, PHONE: (505) 665-0582, E-MAIL: ecke@lanl.gov
- **Prof. Tamás Tél**, Institute for Theoretical Physics Eötvös University P.O. Box 32, H-1518, Budapest, Hungary, PHONE: +36-1-209-0555, ext. 6124, E-MAIL: tel@poe.elte.hu
- **Prof. H. Eugene Stanley**, Director, Center for Polymer Studies, Boston University, Department of Physics, PHONE: (617) 353-2617, E-MAIL: hes@bu.edu
- **Dr. Stephen Eubank**, Basic and Applied Simulation Science Group (CCS-5), MS M997, Los Alamos National Laboratory, Los Alamos, NM, 87545, PHONE: (505) 665-3720, E-MAIL: eubank@lanl.gov
- **Prof. György Korniss**, Department of Physics, Applied Physics, and Astronomy, Rensselaer Polytechnic Institute, 110 8th street, Troy, NY 12180-3590, PHONE: (518) 276-2555, E-MAIL: korniss@rpi.edu
- **Distinguished Univ. Prof. Sankar Das Sarma** Physics Department, University of Maryland at College Park, College Park, MD, 20742, PHONE: +(301) 405-6145, E-MAIL: dassarma@physics.umd.edu
- **Prof. Ellen D. Williams**, Director of Materials Research Science and Education Center, Physics Department, University of Maryland at College Park, College Park, MD, 20742, PHONE: +(301) 405-6156, E-MAIL: edw@physics.umd.edu
- **Prof. Celso Grebogi**, Professor Titular Instituto de Física, Caixa Postal 66318, 05315-970 Sao Paulo, SP, BRASIL PHONE: +55-11-3091-6846, E-MAIL: grebogi@if.usp.br