

College of Engineering Biographical Data

University of Illinois at Urbana-Champaign

Department (% appnt): Physics **Date:** May 2009

1. Name: Hubler, Alfred **Birth Date:** 5/16/1957 **Citizenship:** Germany
Wilhelm

2. Present Academic Rank: Associate Professor **3. Tenure Status:** A

4. Administrative Title: Director, Center for Complex Systems Research

5. Degrees (*field, institution, year awarded*)

1. Abitur, Max-Planck-Gymnasium, Munich, Germany, 1977
2. Diplom, Nuclear Condensed Matter Physics, Technical University of Munich, Germany, 1983
3. Ph.D., Physics, Technical University of Munich, Germany, 1987

6. Academic Positions at U of I and elsewhere (*rank, institution, field, inclusive dates*) (*show % if you hold multiple appointments*)

1. *Lecturer, Fachhochschule München, Germany, Nov. 1987-Jan. 1989
2. *Postdoc, Institute for Theoretical Physics & Synergetics, University of Stuttgart, Jan. 1988-Dec. 1989
3. Visiting Assistant Professor, Dept. of Physics & Beckman Institute, UIUC, Jan. 1989-Dec. 1989
4. Assistant Professor, Dept. of Physics & Beckman Institute, UIUC, Jan 1990-Aug. 1996
5. Assoc. Director, Center for Complex Systems Research, UIUC, Sept. 1990-Aug. 1998
6. Senior Researcher, Office of Supercomputing Appl. (NCSA), UIUC, Aug. 1991-Aug. 1996
7. External Faculty Member, Santa Fe Institute, Santa Fe, NM, Mar. 1991-present
8. Visiting Maxwell Fellow, Santa Fe Institute, Santa Fe Institute, Santa Fe, NM, May 1991-July 1991
9. Assoc. Fellow, Center for Advanced Study, UIUC, Aug. 1991-May 1992
10. Toshiba Chair Professor, Keio University, Tokyo, Japan, June 1993-Aug. 1994
11. Associate Professor, Dept. of Physics, UIUC, Sept. 1996-present
12. Director, Center for Complex Systems Research, UIUC, Sept. 1998-present
13. Research Associate Professor, Materials Computation Center & Materials Research Lab, UIUC, Sept. Sept. 2008-present

7. Professional Activities

a. Other Professional Employment (*title, organization, location, inclusive dates*)

1. Research Fellow, Messerschmidt-Bölkow-Blohm Company, Munich, Germany, Jan. 1983-Dec. 1987

b. Major Consulting Activities (*past five years*) (*list organization and location*)

1. How-Why, LLC Urbana 1998-present

c. Professional Registrations (*field, location, date*)

1. American Physical Society, Member

8. Honors, Recognition, and Outstanding Achievements (*list year*)

a. Teaching

Award Name	Citation	Date Awarded
Amoco Foundation Award for Innovation in Undergraduate Instruction, USA 1996		
List of Excellent Teachers almost every semester since 2001		
CyberProf, interactive Web based educational software system, was used by several thousand UIUC students in Chemistry and Biology		
A. E. Nordsieck Award for Excellence in Graduate Teaching, 2006		

b. Research

Award Name	Citation	Date Awarded
Diploma thesis (1983) and Ph.D. (1987): summa cum laude		
Summer Fellowship, Institute for Scientific Interchange, Torino, Italy, Summer 1990		
Visiting Robert Maxwell Fellow, Santa Fe Institute, New Mexico, May 1991-July 1991		
Center for Advanced Studies, UIUC, Fellowship Aug. 1991-May 1992		
Toshiba Chair Professor, Keio University, Japan, June 1993- Aug. 1994		
National Science Foundation links Hübler's Research Group to its WWW pages http://www.nsf.gov/news/overviews/physics/physics_q03.jsp		

c. Public Service

Award Name	Citation	Date Awarded
CyberClub, Partnership Illinois Program for 12-14 year olds at risk (minority) computer and math literacy program, 1996-2003		
Links2Go Key Resource Award for the Center for Complex Systems Research, 2000		

FACTUAL INFORMATION

A. Resident Instruction and Continuing Education (*attach Teaching Activity reports, which covers 10 years*)

1. Resident Instruction (*verify the information on the appended page for sections in which you had primary responsibility; pencil in corrections*)

1. All teaching graduate students in my group are listed on the list of excellent teachers, fall 2003 and fall 2004.

2. Continuing Education (*credit courses only*) (*year, course, # of students, delivery method*)

Course	Year	Number of Students	Delivery Method
Course director of UIUC Guided Individual Study Course Physics x199d	1998-2008	2-5	www

3. Other Instructional Activities (*prelim and final exams, course development, short courses, etc.*)

1. Prelim - Advisor (after 11/2003)
 - Xu 11/03
 - Brown 12/03
 - Fleck 5/04
 - Sivil 5/04

- Wotherspoon 4/05
Gintautas 9/06
2. Prelim - Committee (after 11/2003)
Johnson 12/03
Conway 12/04
Dong 9/05
Cook 9/05
Fendt 12/06
Poore 4/07
3. Final - Committee (after 11/2003)
- Williams 4/04
 - Finkenstadt 1/05
 - Johnson 5/05
4. Final - Advisor (after 11/2003)
Jun 9/04
Xu 9/06
Gerig 4/07
5. Prelim - Chair (after 11/2003) Lin 4/06

a. Prelim and Final Exams

b. Course Development

1. Freshman Discovery Course x199bcs: Fall 2001 - Spring 2009
2. Physics 194 developed and approved: Fall 2009 - present

c. Short Courses

1. Workshop: Learning Java, 2x 3 hours, taught 2 times/year, 2001 - present
2. Workshop: Learning Perl, 3 hours, taught 2 times/year, 2001 - present

4. Undergraduate Advising

a. Academic Advising (*number of students, current year only*)

1. 8

b. Student Organizations (*list past five years*)

c. Design Teams (*past five years*)

d. Other (*individual projects, engineering open house, etc. past five years*)

1. Research advisor of several undergraduate students
2. Assisted in Physics Complex Systems Exhibit at EOH 2001

B. Research, Creative, and Other Scholarly Activities

1. Publications

List publications in print or accepted, with authors' names ordered the way they appear on the publications. Provide inclusive page numbers for papers in proceedings and journals. Follow the outline given below for the organization of the list of publications. Within each category place items in chronological order.

- (*) has undergone stringent editorial review by peers
- (**) invited and carries with it prestige and recognition
- (s) based on work as a student
- (w) co-authored with students you supervise
- (!) represents most important contribution of the past decade
- (P) derived from PhD thesis
- (D) co-authored with post-docs

a. Books Authored or Co-Authored

1. Original Editions

2. Revisions

b. Books Edited or Co-Edited

1. Original Editions

2. Revisions

c. Chapters in Books

d. Monographs (*longer than an article, but shorter than a book*)

e. Articles

1. Articles In Journals

1. (*) (S) T. Butz, A. Hubler, A. Lerf, and W. Biberacher. The tantalum hyperfine interaction in the charge density state of 2H-TaS₂. *Mat. Res. Bull.* 541-553 (1981).
2. (*) (S) W. Biberacher, A. Lerf, F. Buheitl, T. Butz, and A. Hubler. On the preparation and characterization of NaOH-TaS₂. *Mat. Res. Bull.* 17, 633-636 (1982).
3. (*) (S) F. Dinkelacker, A. Hubler and E. Luscher. Pattern formation of powder on a vibrating disc. *Biol. Cybern.* 56, 51-56 (1987).
4. (*) (S) G. Feuerecker, A. Hubler and E. Luscher. Dendritic structures in fluids of high viscosity. *Bio. Cybern.* 56, 57-59 (1987).
5. (*) (S) A. Rosenberger, A. Hubler and E. Luscher. Pattern formation of metallic particles in electric and magnetic fields. *Biol. Cybern.* 56, 151-154 (1987).
6. (*) (S) A. Hubler and E. Luscher. Conservative patterns. *Biol. Cybern.* 56, 269-278 (1987).
7. (*) (S) T. Eisenhammer, T. Hecht, A. Hubler, and E. Luscher. Skalengesetze für den maximalen Energieaustausch nichtlinearer gekoppelter Systeme. *Naturwissenschaften* 74, 336-338 (1987).
8. (*) (S) W. Eberl, M. Kuchler, A. Hubler, and E. Luscher. Analytical representation of stroboscopic maps of ordinary nonlinear differential equations. *Z. für Physik B* 68, 253-258 (1987).
9. (*) (S) J. Cremers and A. Hubler. Construction of differential equations from experimental data. *Z. Naturforsch* 42a, 797-802 (1987).
10. (*) (S) G. Reiser, A. Hubler and E. Luscher. Algorithm for the determination of the resonances of anharmonic damped oscillators. *Z. Naturforsch* 42a, 803-807 (1987).
11. (W) E. Luscher and A. Hubler. Resonant stimulation of complex systems. *Helv. Phys. Acta* 62, 545-557 (1989).
12. (*) (W) A. Hubler and E. Luscher. Resonant stimulation and control of nonlinear oscillators. *Naturwissenschaften* 76, 67-69 (1989).
13. (*) (W) F. Ohle, P. Lehmann, E. Roesch, H. Eckelmann and A. Hubler. Description of transient states of Karman vortex streets by low dimensional differential equations. *Phys. Fluids A* 2, 479-481 (1990).

14. (*) (W) T. Eisenhammer, A. Hubler, T. Geisel and E. Luscher. Scaling behavior of the maximum energy exchange between coupled anharmonic oscillators. *Phys. Rev. A* 41, 3332-3342 (1990).
15. (*) (W) J. L. Breeden and A. Hubler. Reconstructing equations of motion from experimental data with unobserved variables. *Phys. Rev. A* 42, 5817-5826 (1990).
16. (*) (W) J. L. Breeden, F. Dinkelacker and A. Hubler. Noise in the modeling and control of dynamical systems. *Phys. Rev. A* 42, 5827-5836 (1990).
17. (*) (W) B. Plapp and A. Hubler. Nonlinear resonances and suppression of chaos in the rf-biased Josephson junction. *Phys. Rev. Lett.* 65, 2302-2305 (1990).
18. (*) E. A. Jackson and A. Hubler. Periodic entrainment of chaotic logistic map dynamics. *Physica D* 44, 407-420 (1990).
19. (*) (W) E. Roesch, F. Ohle, H. Eckelmann and A. Hubler. Modelle für transiente Zustände der Karmanschen Wirbelsrtasse und deren Anwendung zur Steuerung der Wirbelstrasse. *Z. angew. Math. Mech.* 70, T451-T452 (1990).
20. (*) (W) T. Eisenhammer, A. Hubler, N. H. Packard and J. A. S. Kelso. Modeling of experimental time series with ordinary differential equations. *Biological Cybernetics* 65, 107-112 (1991).
21. (*) (W) R. Wittmann, T. Kautzky, A. Hubler and E. Luscher. A simple experiment for the examination of dendritic river systems. *Naturwissenschaften* 78, 23-25 (1991).
22. (*) (W) R. Shermer, A. Hubler and N. H. Packard. Nonlinear control of the Bergers equation. *Phys. Rev. A* 43, 5642-5654 (1991).
23. (*) (W) K. Chang, A. Kodogeorgiou, A. Hubler and E. A. Jackson. General resonance spectroscopy. *Physica D* 51, 99-108 (1991).
24. (*) (W) S. Krempl, T. Eisenhammer, A. Hubler and G. Mayer-Kress. Optimal stimulation of a conservative nonlinear oscillator: Classical and quantum-mechanical calculations. *Phys. Rev. Lett.* 69, 430-433 (1992).
25. (*) (W) R. Wackerbauer, A. Hubler and G. Mayer-Kress. Algebraic calculation of stroboscopic maps of ordinary, nonlinear differential equations. *Physica D* 60, 335-357 (1992).
26. (*) (W) D. Pierre and A. Hubler. A theory for adaptation and competition applied to logistic map dynamics. *Physica D* 75, 343-360 (1994).
27. (*) (W) C. Wargitsch and A. Hubler. System identification with stochastic resonance. Center for Complex Systems Research, Beckman Institute Il Nuovo Cimento 17D, 969-976 (1995).
28. (*) (W) F. Yamaguchi, K. Kawamura and A. Hubler. Sudden drop of dissipation in field-coupled quantum dot transistors. *Jpn. J. Appl. Phys.* 34, L 105-108 (1995).
29. (*) (W) C. Wargitsch and A. Hubler. Resonances of nonlinear oscillators. *Phys. Rev. E* 51, 1508-1519 (1995).
30. (*) (W) L. E. Arsenault and A. Hubler. Dynamics of damped coupled oscillators near resonance. *Phys. Rev. E* 51, 3561-3571 (1995).
31. (*) (W) R. Mettin, W. Lauterborn, A. Hubler and A. Scheeline. Parametric entrainment control of chaotic systems. *Phys. Rev. E* 51, 4065-4075 (1995).
32. (*) (W) M. Dueweke, U. Dierker and A. Hubler. Self-assembling electrical connections based on the principle of minimum resistance. *Phys. Rev. E* 54, 496-506 (1996).
33. (*) (W) A. Hubler and A. M. Assad. CyberProf: An intelligent human-computer interface for asynchronous wide area training and teaching. *World Wide Web Journal* 4, 231-237 (1996).
34. (*) (W) A. Hubler, U. Kuhl, R. Wittmann and T. Nagata. Sharp diffraction peaks from chaotic structures. *Chaos* 7, 577-589 (1997).
35. (*) (W) D. Raineri, A. Hubler and B. Mehrstens. CyberProf ϕ : An intelligent human-computer interface for interactive instruction on the World Wide Web. *JALN* 1, 20-36 (1997).
36. (*) (W) M. Sperl, A. Chang, N. Weber and A. Hubler. Hebbian learning in the agglomeration of conducting particles. *Phys. Rev. E* 59, 3165-3168 (1999).
37. (*) (W) P. Melby, J. Kaidel, N. Weber and A. Hubler. Adaptation to the edge of chaos in the self-adjusting logistic map. *Phys. Rev. Lett.* 84, 5991-5993 (2000).
38. (*) (W) (!) L. J. Durak and A. Hubler. Scaling of knowledge in random conceptual networks. *Lecture Notes in Computer Science* 2074, 976-985 (2001).
39. (*) (**) (W) P. Melby, N. Weber and A. Hubler. Robustness of adaptation in controlled self-adjusting chaotic systems. *Phys. Fluctuation & Noise Lett.* 2, L285-292 (2002).

40. (W) D. Smyth and A. Hubler. Conductivity-dependent phase transition from closed-loop to open-loop dendritic networks. *Complexity* 9, 56-60 (2003).
41. (*) (W) J. Xu and A. Hubler. Enhanced diffraction pattern from a Fibonacci chain. *Phys. Rev. B* 67, 184202-1-4 (2003).
42. (*) (W) P. Melby, N. Weber and A. W. Hubler. Dynamics of self-adjusting system with noise. *Chaos* 15, 033902 (2005).
43. (*) (W) (!) J. K. Jun and A. W. Hubler. Formation and structure of ramified charge transportation networks in an electromechanical system. *PNAS* 102, 536â• 540 (2005).
44. (*) (W) (!) C. Streliaoff and A. Hubler. Medium term prediction of chaos. *Phys. Rev. Lett.* 96, 044101-1-4 (2006).
45. (*) (W) (!) M. Baym and A. Hubler. Conserved quantities and adaptation to the edge of chaos. *Phys. Rev. E* 73, 056210 (2006).
46. (*) (W) K. Phelps and A. Hubler. Towards an understanding of membership in youth organizations: Sudden changes in the average participation due to the behavior of one individual. *Emergence: Complexity & Organization (E:CO)* 8(4), 28-35 (2006); reprinted in the book "Complex Systems Leadership Theory" (Mansfield, MA: ISCE Publishers, 2007) by Jim Hazy.
47. (*) (W) (!) G. Foster, A. Hubler, and K. Dahmen. Resonant forcing of multidimensional chaotic map dynamics. *Phys. Rev. E* 75, 036212 (2007).
48. (*) (W) M. S. Singleton and A. Hubler. Learning rate and attractor size of the single-layer perceptron. *Phys. Rev. E* 75, 026704 (2007).
49. (*) (W) V. Gintautas and A. Hubler. Experimental evidence for mixed reality states in an interreality system. *Phys. Rev. E* 75, 057201 (2007).
50. (*) (W) A. Gerig and A. Hubler, Chaos in a one-dimensional compressible flow. *Phys. Rev. E* 75, 045202 (2007).
51. (*) (W) C. Streliaoff, J. Crutchfield, A. Hubler, k-th Order markov chains: Bayesian inference, model comparison, entropy rate, and out-of-class modeling. *Phys. Rev. E* 76, 011106 (2007).
52. (*) (W) V. Gintautas, G. Foster, and A. W. Hubler, Resonant forcing of select degrees of freedom of multidimensional chaotic map dynamics. *J. Stat. Phys.* 130 (3), 617-629 (2008).
53. (*) (W) J. Xu and A. W. Hubler, Detecting quasiperiodic structures with double diffraction. *Europhysics Letters* 81, 16002 (2008).
54. (*) (W) V. Gintautas and A. Hubler, Resonant forcing of nonlinear systems of differential equations. *Chaos* 18, 033118 (2008).
55. (*) (W) T. Wotherspoon and A. Hubler, Adaptation to the edge of chaos with random-wavelet feedback. *J. Phys. Chem. A* 113 (1), 19-22 (2009).
56. (*) (W) V. Gintautas and A. Hubler, A simple, low-cost, data-logging pendulum built from a computer mouse. Feature article in *Phys. Educ.* 44, 488-491(2009).
57. (W) A. Hubler and O. Osuagwu, Digital quantum batteries: Energy and information storage in nano vacuum tube arrays, *Complexity* 15(5), 48-55 (2010).
58. (*) (W) V. Soni, P. Ketisch, J. D. Rodriguez, A. Shpunt, and A. W. Hubler, Topological similarities in electrical and hydrological drainage networks, to appear in *Journal of Applied Physics*
59. (*) (W) M. Singleton, G. Heiss, and A. Hubler, Optimization of Ramified Absorber Networks Doing Desalination, to appear in *Phys. Rev. E*

2. Articles In Conference Proceedings

1. E. Luscher and A. Hubler. Instabilitaten und Strukturierung von Flussigkeitsoberflächen im nichtlinearen Potential, *Helv. Phys. Acta* 57, 264-267 (1984).
2. A. Hubler and E. Luscher, Konservative Strukturen. *Helv. Phys. Acta* 59, 120-123 (1986).
3. (W) K. Klotz, A. Hubler and E. Luscher. Über die Beschreibung raumlich-chaotischer Strukturen. *Helv. Phys. Acta*, 59, 124-127 (1986).
4. (W) G. Feuerecker, A. Hubler and E. Luscher. Experimentelle Beschreibung dendritischer Strukturen zäher Fluide. *Helv. Phys. Acta* 59, 128-131 (1986).
5. (W) Ch. Wachinger, A. Hubler, G. Reiser and E. Luscher. Chaotische Schwingungen im Lennard-Jones-artigen Potential. *Helv. Phys. Acta* 59, 132-135 (1986).

6. (W) A. Schmoller, W. Kropf, A. Rosenberger, A. Hubler and E. Luscher. Strukturbildung von Metallteilchen in elektrischen und magnetischen Feldern. *Helv. Phys. Acta* 60, 215-218 (1987).
7. (W) G. Feurecker, R. Wittmann, A. Hubler and E. Luscher. Beschreibung dendritischer Strukturen zäher Fluide. *Helv. Phys. Acta* 60, 219-221 (1987).
8. (W) T. Kautzky, A. Hubler and E. Luscher. Rekonstruktion von Differentialgleichungen chaotischer und experimenteller Oszillatoren. *Helv. Phys. Acta* 60, 222-225 (1987)
9. (W) A. Hubler, G. Reiser and E. Luscher. Über die Steuerung nichtlinearer Schwinger. *Helv. Phys. Acta* 60, 226-229 (1987).
10. (W) W. Stelzel, H. Kainzbauer, A. Hubler and E. Luscher, Stationäre Zustände in berandeten, normierten Systemen, *Helv. Phys. Acta* 60, 230-233 (1987).
11. (W) R. Georgii, A. Hubler and E. Luscher. Extremaleigenschaften dendritischer Strukturen. *Helv. Phys. Acta* 60, 211-214 (1987).
12. (W) F. Dinkelacker, A. Hubler and E. Luscher. Selbststrukturierung einer Pulverschicht auf einer homogen schwingenden Platte. *Helv. Phys. Acta* 60, 234-236 (1987).
13. (W) W. Eberl, A. Hubler and E. Luscher, Quasi-numerisches Näherungsverfahren zur Umwandlung von gewöhnlichen Differentialgleichungen in Differenzgleichungen, *Helv. Phys. Acta* 60, 237-240 (1987).
14. (W) B. Merte, P. Gaitzsch, M. Fritzenwanger, W. Kropf, A. Hubler and E. Luscher. Stable stationary dendritic patterns with minimal dissipation. *Helv. Phys. Acta* 61, 76-79 (1988).
15. (W) M. Kuchler, W. Eberl, A. Hubler and E. Luscher. Description of complex dynamical systems by simple maps. *Helv. Phys. Acta* 61, 232-235 (1988).
16. (W) R. Wackerbauer, W. Eberl, A. Hubler and E. Luscher. Analytical representation of stroboscopic maps of ordinary nonlinear differential equations. *Helv. Phys. Acta* 61, 236-239 (1988).
17. (W) B. Ruckerl, W. Eberl, A. Hubler and E. Luscher. Control of the dynamics of a water jet. *Helv. Phys. Acta* 61, 80-83 (1988).
18. (W) M. Athelougou, T. Kautzky, A. Hubler and E. Luscher. Experimentelle Untersuchung eines sinusförmig gestörten Van-der-Pol Oszillators. *Helv. Phys. Acta* 61, 84-87 (1988).
19. (W) B. J. Merten, B. Wohlmuth, A. Hubler and E. Luscher. Beschreibung und Steuerung des Getrieberauschens in einstufigen Getrieben. *Helv. Phys. Acta* 61, 88-91 (1988).
20. (W) R. Rothhardt, A. Hubler and E. Luscher. Response schwach nichtlinearer Potentialschwinger bei kleinen sinusförmigen Störungen. *Helv. Phys. Acta* 61, 220-223 (1988).
21. (W) W. Stelzel, T. Kautzky, P. Gaitzsch, A. Hubler and E. Luscher. Über die Eindeutigkeit der Lösungen der Eulerschen Gleichungen in der klassischen Mechanik. *Helv. Phys. Acta* 61, 224-227 (1988).
22. (W) C. Wagner, W. Stelzel, A. Hubler, E. Luscher and W. Altmann. Resonante Steuerung nichtlinearer Schwinger. *Helv. Phys. Acta* 61, 228-231 (1988).
23. (W) A. Hubler, R. Georgii, M. Kuchler, W. Stelzel and E. Luscher. Resonant stimulation of nonlinear damped oscillators by Poincaré maps. *Helv. Phys. Acta* 61, 897-900 (1988).
24. (W) M. Athelougou, P. Deisz, B. Merte, A. Hubler and E. Luscher. Extremal properties of dendritic patterns: Biophysical applications. *Helv. Phys. Acta* 62, 250-253 (1989).
25. (W) F. Dinkelacker, P. Deisz, A. Hubler and E. Luscher. Properties of hydrodynamic systems with flexible boundary conditions. *Helv. Phys. Acta* 62, 282-285 (1989).
26. (W) M. Rose, T. Kautzky, P. Deisz, A. Hubler and E. Luscher. Resonant stimulation and control of Karman's vortex street. *Helv. Phys. Acta* 62, 286-289 (1989).
27. (W) R. Georgii, W. Eberl, E. Luscher and A. Hubler. Resonant stimulation and control of a nonlinear mechanical pendulum by Poincaré maps. *Helv. Phys. Acta* 62, 290-293 (1989).
28. (W) B. Merte, G. Hadwisch, B. Binias, P. Deisz, A. Hubler and E. Luscher. Formation of selfsimilar dendritic patterns with extremal properties. *Helv. Phys. Acta* 62, 293-297 (1989).
29. (W) A. Hubler. Adaptive control of chaotic systems. *Helv. Phys. Acta* 62, 343-346 (1989).
30. (W) A. Wandelt, W. Eberl, A. Hubler and E. Luscher. Transformation to normal time for the calculation of Poincaré maps in a closed form. *Helv. Phys. Acta* 62, 339-342 (1989).
31. (W) V. Thurner, W. Eberl, A. Hubler, N. Packard und E. Luscher. Determination of the absolute maximum of polynomials by algebraic bisection. *Helv. Phys. Acta* 63, 549-550, 1990.

32. (W) D. Bensen, M. Welge, A. Hübler, and N. H. Packard. Characterization of complex systems by aperiodic driving forces. In N. B. Abraham (Ed), Measures of Complexity and Chaos (Plenum Press: New York, NY, 1989) pp 209-212.
33. (W) K. Chang, A. Hübler, and N. H. Packard. Universal properties of the resonance curve of complex systems. In N. B. Abraham (Ed), Measures of Complexity and Chaos (Plenum Press: New York, NY, 1989) pp 225-228.
34. (W) T. Meyer, A. Hübler, and N. H. Packard. Reduction of complexity by optimal driving forces. In N. B. Abraham (Ed), Measures of Complexity and Chaos (Plenum Press: New York, NY, 1989) pp 253-256.
35. (W) E. Roesch, F. Ohle, H. Eckelmann, A. Hübler. Modeling and control of Karman vortex streets. In J. Jimenez (Ed), The Global Geometry of Turbulence (Plenum Press: New York, NY, 1991) pp 111-119.
36. A. Hübler. Modeling and control of complex systems: Paradigms and applications. In L. Lam and V. Naroditsky (Eds), Modeling Complex Phenomena (Springer: New York, NY, 1992) pp 5-65.
37. (W) J. Wang, T. Meyer, A. Hübler, The production of solitons by optimal driving forces. In L. Nadel and D. Stein (Eds), SFI Studies in the Sciences of Complexity IV (Addison-Wesley: New York, NY, 1992) pp 1-8.
38. A. Hübler and D. Pines. Prediction and adaptation in an evolving chaotic environment. In G. Cowan, D. Pines, and D. Meltzer (Eds), Complexity: Metaphors, Models, and Reality (Addison-Wesley: Reading, MA, 1994) pp 343-364.
39. (W) A. Hübler and T. Ritz. Controlling complex systems and first principles of complex systems research. In Michael Coombs (Ed), Control Mechanisms for Complex Systems (NMSU Press: Las Cruces, NM, 1997) pp 51-66.
40. A. Hübler and C. Martinez. A complex systems perspective to computer-assisted learning. In T-W Chan, A. Collins and J. Lin (Eds.), Global Education on the Net, Proceedings of ICCE 98, Beijing, China, Oct. 14-17, 1998 (Springer: New York, NY, 1998), vol. 1, pp 5-12.
41. (W) G. Foster and A. Hübler. Robust and efficient interaction with complex systems. In Proc. of the IEEE Intl. Conf. on Systems, Man & Cybernetics, Washington, DC; Oct. 5-8 2003, vol. 2, pp 2029-2034.
42. (W) A. Hübler, A. Vlastic, E. Stiegler, L. Bievenue and D. Raineri. Interactive middle school courseware on abstract reasoning skills. In C. Crawford et al. (Eds.), *Proceedings of Society for Information Technology and Teacher Education International Conference 2006* (March 19, 2006; Orlando, FL) (AACE: Chesapeake, VA, 2006) Ed/ITLib Vol. 2006:1, pp 389-394.
43. A. Hübler and K. C. Phelps, Guiding an adaptive system through chaos, paper presented at Symposium on Complex Systems Engineering, RAND Corporation, Santa Monica, CA, January 11-12, 2007, <http://cs.calstatela.edu/wiki/images/6/6e/Hubler.pdf>
44. (W) G. Foster, A. W. Hubler, and K. Dahmen. Resonance curves of multidimensional chaotic systems. V. In, P. Longhini, and A. Palacios, Applications of Nonlinear Dynamics, Understanding Complex Systems (Springer-Verlag: Berlin Heidelberg 2009).

f. Pending Publications

1. B. Chase and A. Hubler, Inverse Energy-Uncertainty Relation for a Simple Information Engine, submitted to Physica D
2. P. M. Ketisch, J. D. Rodriguez, A. Shpunt, and A. Hubler, Modeling the degree distribution of a fractal transportation network with random graphs, submitted to PRL

g. Invited Lectures

Title	Conference	Location	Year	URL
	IUTAM Turbulence Symposium	Goettingen, Germany	April, 2000	
	International Conference for Complex System ICCS	Nashua, NH	May, 2000	

Robustness Symposium	Santa Fe, NM	March, 2001
UIUC Physics Colloquium	Urbana, IL	March, 2001
Leadership Retreat, US Department for Veteran Affairs	Portland, OR	April, 2001
MIT Conference on Fluid Flow	Boston, MA	June, 2001
APS March Meeting	Austin, TX	March, 2003
Biocomplexity in the Environment NSF Conference	Washington, DC	Sept., 2003
IEEE Man & Cybernetics Conference	Washington, DC	Oct., 2003
Ross Ashby Centennial Cybernetics Conference	Urbana, IL	March, 2004
American Institute of Mathematical Sciences, Conf. On Dynamical Systems and Differential Equations	Los Angeles, CA	June, 2004
Physics Colloquium, Univ. of Missouri, St. Louis	St. Louis, MO	Oct., 2004
Strategic Studies Group, Chief of Naval Operations	Newport, RI	Oct. 26, 2004
Complex Systems Seminar, U of Michigan	Ann Arbor, MI	November, 2004
Granular Materials in Lunar and Martian Exploration	Kennedy Spc Ctr, FL	February, 2005
American Math. Society, W Sect. Spring Mtg.	Santa Barbara, CA	April, 2005
Complex Systems Summer School	Santa Fe, NM	June, 2005
Net-Centric Systems, University of Maryland	College Park, MD	July, 2005
Physics Colloquium, Wright State University	Dayton, OH	October, 2005
Strategic Studies Group, Chief of Naval Operations	Newport, RI	October, 2005
Technology of Nature Nature of Technology Conference, University of New Mexico	Albuquerque, NM	November, 2005
West 2006, NAVY	San Diego, CA	March, 2006
SITE 2006 Annual Conference of the Society for Information Technology in Education	Orlando, FL	March, 2006
Complex Systems Summer School	Santa Fe, NM	June 2006
International Complex Systems Conf.	Boston, MA	June, 2006
Engineering Complex Systems, Rand Corporation	St. Monica, CA	January, 2007
APS March Meeting	Denver, CO	March, 2007
Complex Systems Summer School	Santa Fe, NM	June, 2007
NKS conference, Wolfram Research	Burlington, VT	July, 2007
International Conference on Applications in Nonlinear Dynamics	Poipu Beach, Koloa (Kauai), Hawaii,	September, 2007
Mathematica Technology Conference	Champaign, IL	

			October, 2007
	Innovative Organizations and Complex Systems workshop	Ottawa, CA	October, 2007
	Network Science Workshop	West Point, NY	October, 2007
	International Complex Systems Conf.	Boston, MA	October, 2007
Press conference	APS March Meeting	New Orleans	March 2008
	Complex Systems Summer School	Santa Fe, NM	June 2008
	MECS MITRE workshop	Washington, DC	July 2008
	Network Science Workshop	U.S. Military Academy, West Point	October 2008
	Bord of Trustees Symposium	Santa Fe Institute, NM	November 2008
	Nanostructured Advanced Materials (NSF)	Univeristy of Jordan in Amman, Jordan	November 2008
	Complex Systems Summer School	Santa Fe, NM	June 2009
	CNLS Colloquium	Los Alamos National LAB	July 2009
	CHAOS/XAOC 2009	National Academy of Sciences Conference Center at Woods Hole, MA	July 2009
	Business Network Theme Week: The Future is Not What it Used to Be	Santa Fe Institute, NM	September 2009
	Symposium of the Association for the Advancement of Artificial Intelligence	Washington, DC	October 2009
	Complex Systems Summer School	Santa Fe, NM	June 2010
	SFI Workshop Demystifying Complex Systems by Thinking About Networks	Santa Fe, NM	July 2010

h. Other Publications (*patents, bulletins or reports, magazine articles, etc.*)

1. Patents

1. H. Higuraskh, A. Toriumi, F. Yamaguchi, K. Kawamura, and A. Hübler. Correlation tunnel device. Unites States Patent # 5,679,961 (1997).
2. A. Hubler and O. Osuagwu, Digital Quantum Batteries, provisional patent filed by the University of Illinois (2009)

2. Bulletins

3. Magazine Articles

1. A. Hübler. Predicting complex systems with a holistic approach. *Complexity* 10, 11-16 (2005).
2. (W) A. Hübler and G. Foster. How to create a large response from chaotic systems: Optimal forcing functions complement the natural dynamics of a system. *Complexity* 11(4), 11-13 (2006).
3. A. Hübler. Information engines: Converting information into energy. *Complexity* 12(2), 10-12(2006).
4. (W) A. Hübler, G. Foster and K. C. Phelps. Managing chaos: Thinking out of the box. *Complexity* 12(3), 10-13 (2007).
5. A. Hübler, Understanding Complex Systems: Defining an abstract concept. *Complexity* 12(5), 5-9(2007).
6. (W) A. Hübler and K. C. Phelps, Guiding a self-adjusting system through chaos. *Complexity* 13(2) 10 (2007).

7. A. Hubler, Homeopathic dynamical systems. Complexity 13(3), 8-11 (2008).
8. (W) V. Gintautas and A. Hubler, Experimental evidence for mixed reality states, Complexity 13(6), 7-9(2008).
9. A. Hubler, Digital batteries. Complexity 14(3), 7-9 (2008).
10. (W) A. Hubler and T. Wotherspoon, Self-adjusting systems avoid chaos. Complexity 14(4), 8-11 (2009).
11. A. Hubler, Digital wires. Complexity 14(5), 7-9(2009).
12. (W) D. Sivil, A. Hubler, Quantized motion of a particle pushed around by waves, Complexity 15(2), 10-12 (2009).
13. (W) M. Singleton, G. Heiss, A. Hubler, The optimal shape of roots, Complexity (15)4, 9-11(2010).
14. (W) D. Farrell, A. Hubler, J. Brewer, I. Hubler, Acceleration beyond the wave speed in dissipative wave-particle systems, Complexity 15(5), 8-11 (2010).
15. A. Hubler and J. Crutchfield, Order and disorder in open systems, to appear in Complexity

4. Reports

2. Grants, contracts and gifts (*in chronological order up to past ten years*)

a. For Research

Years (Inclusive)	Brief Title or Description	Source of Funds	Total Funding	Funds Allocated to this prof	#PI's and lead PI if not this prof
2010-2013	Physical Intelligence	DARPA	\$1,300,000	\$1,300,000	1
2008-2009	Understanding Complex Systems Symposium	Office of Naval Research	\$10,000	\$10,000	1
2008-2009	Understanding Complex Systems Symposium	National Science Foundation	\$10,000	\$10,000	1
2007-2008	Understanding Complex Systems Symposium	Office of Naval Research	\$12,000	\$12,000	1
2007-2008	Understanding Complex Systems Symposium	National Science Foundation	\$10,000	\$10,000	1
2006-2007	Understanding Complex Systems Symposium 2006	National Institutes of Health	\$5,000	\$5,000	2
2006-2007	Understanding Complex Systems Symposium 2006	National Science Foundation	\$7,000	\$7,000	2
2005-2006	Understanding Complex Systems 2005: Computational Complexity and Informatics	National Institutes of Health	\$17,000	\$17,000	2
2004-2009	TRACK 2, GK-12:EdGrid Graduate Teaching Fellows Program	National Science Foundation	\$1,836,231	\$70,000	19, D. Raineri
2003-2010	NSF DMS 03 25939 ITR Materials Computation Center	National Science Foundation	\$3,991,798	\$196,000	14 D. Johnson
2002-2005	NSF 00 22948 Experimental Study of Adaptation to the Edge of Chaos & Critical Scaling in the Self-adjusting Peroxidase-Oxidase Reaction	National Science Foundation	\$167,908	\$84,000	2
1998-1999	CCD: Assessing and Disseminating a New Model for Undergraduate Physics Education	National Science Foundation	\$133,983		3 G. Gladding

	at Large Research Universities				
2002	Understanding Complex Systems Symposium 2002	Office of Naval Resources N00014-02-1-0724	\$7,800	\$7,800	1
1996-99	Nonlinear resonance spectroscopy theory & application	Office of Naval Resources N00014-96-1-0335	\$220,000	\$220,000	1
	Two unrestricted gifts	John Deere Co	\$34,000	\$34,000	1
	Unrestricted gift	MAS, LLC	\$4,000	\$4,000	1

b. For Instruction

Years (Inclusive)	Brief Title or Description	Source of Funds	Total Funding	Funds Allocated to this prof	#PI's and lead PI if not this prof
2004-09	NSF DGE 03 382152 GK-12: EdGrid Graduate Fellows Program	National Science Foundation	\$1,836,231		21 D. Raineri
1998-99	NSF DUE97-52539 A New Model for undergrad Physics education	National Science Foundation	\$110,000		3 G. Gladding
	Partnership Illinois Grants	UIUC	\$20,000		1
	Undergrad Innovation	AT&T	\$25,000		1
	Undergrad innovation	HP	\$25,000		1

3. Areas of Research (*brief description, key words are adequate*)

1. Nonlinear and complex dynamics
2. Control of Chaos, Pattern Formations
3. Information Flows and Science Education
4. Ph.D. thesis title : Modeling and Control of Nonlinear Systems

4. Graduate Thesis Research Advising (*list co-advisor, if any*)

a. M.S. Thesis Students (*name and year granted or anticipated*)

b. Ph.D. Thesis Students (*name and year granted or anticipated*)

Student Name	Year Graduated	Thesis Title	Placement
R. Shermer	1991	Model-based control of spatially extended systems	Naval Research Lab
J. L. Breeden	1992	Optimal representation of experimental data	Prediction Company
B. E. Hinrichs	1994	Characterizing complex time series from the scaling of prediction error	Univ of Tokyo
L. Arsenault	1996	Coupled oscillators near resonance	Virginia Tech, research professor
M. J. Dueweke	1997	A variational formulation describing the attractors of some open, dissipative, electromechanical systems	Cypress Semiconductor, researcher
N. N. Weber	2001	Modeling and control of evolving, noisy chaotic dynamical systems	Naval Research Lab, postdoc
P. C. Melby	2002	Adaptation to the Edge of Chaos and Critical Scaling in Self-adjusting Dynamical Systems	MITRE, researcher

J. Jun	2004	Dynamics of Self-Organization of Ramified Patterns in an Electromechanical System	Postdoc, Penn. State
J. Xu	2006	Double Diffraction of quasiperiodic structures and bayesian image reconstruction	Quantitative Researcher, Citadel
A. Gerig	2007	A theory for market impact: How order flow affects stock price	Santa Fe Institute, post doc
C. Streliaoff	2007	Uncertainty and inference in deterministic and noisy chaos	U Michigan, post doc
G. Foster	2008	Resonant forcing of nonlinear systems	private investment fund, research analyst
V. Gintautas	2008	Experimental evidence for mixed reality states in an interreality system, and, Generalized resonant forcing of nonlinear dynamics	Los Alamos National Lab, post doc
T. Wotherspoon	2009	Migration towards periodicity in systems with feedback	U.S. Peace Corps, science teacher in South Africa
D. Sivil	2010		
M Singleton	2010		
P. Fleck (Anderson Award recipient)	2011		
D. Lyon	2012		
M. LeBlanc	2013		

5. Editorships of Journals or Other Learned Publications (*list year*)

1. Executive Editor, Complexity, leading journal in the field of Complex Systems, 1999-present
2. Editorial Board, Advances in Complex Systems, 2000-2007

6. Post-doctoral Associates and Visiting Scientists (*>3 months stay in the past three years*) (*list name, year(s), country of origin, permanent employer*)

7. Other Scholarly Activities in the past five years (*conferences organized or chaired, unpublished presentations, etc.*)

a. Conferences Organized or Chaired

1. Chaired the organization committee of annual Complex Systems Symposium with more than 100 participants each at the UIUC Dept. of Physics May, 2001; May, 2002; May 2003; May 2004; May 2005; May 2006, May 2007, and May 2008.

b. Unpublished Presentations

c. Other Scholarly Activities

C. Service

1. Professional Societies (*list membership; office held, with dates; major committees or boards*)

1. American Physical Society member

2. University (*department, college and campus committees, administration, etc. for past five years*)

a. Department

1. Undergraduate Academic Advisor - Engineering Physics (2002-2006)
2. Materials Computation Center (MCC) Advisory Comm. (2004-2005)
3. PhD Qualifying Exam Comm. (Aug. 2001, Aug. 2004, Jan. 2005)
4. Dynamical Systems Seminar Chair (Sem. I & II) (2000-2004)
5. Physics Tower Remodeling Comm. (2000-2003)
6. PhD Qualifying Exam Committee (2008-2009)

b. College

1. Engineering College-Community College Liaison (standing comm.) (2001-present)
2. Engineering Co-Op Advisory Comm. (2003-2004)
3. College of Engineering Standing Committee; Scholarships (2001-2004)
4. Registration & Student Advisement Comm. Engineering College (2000-2001)

c. Campus

1. Campus Senate (Department Representative) (2000-2002, 2002-2004, 2008-2010)

3. Federal and State (*government commissions or panels, community, industrial extension, etc.*)

4. Other Outside Service

1. CSCS External Review Committee appointed by the Vice President of the University of Michigan
2. Lectures and labs at the Complex Systems Summer School of the Santa Fe Institute, (Summer 2005, 2006, 2007, 2008, 2009, 2010)
3. Volunteered 5 hours per week at the Campus Middle School for Girls in Urbana. (1999-2010)

D. Improvement Activities (*list any specific programs in which you have participated it improve teaching and professional competence*)

1. Aspen Center for Physics workshop on Physics Education and Outreach, Aspen, CO, June 28-July 11, 2004
2. Created the freshmen course Physics 194