

Curriculum Vitae

Björn Birnir

Address

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Personal Data

Birthdate: August 19, 1953, Reykjavík, Iceland
Married, to Inga D. Björnsdóttir (UCSB Cultural Anthropology), with two children.
Home Address: 925 West Campus Lane, Goleta CA 93117
Home Telephone: (805) 685-4879

Education

B.S. (Physics) Union College, Schenectady N. Y., June 1976
M.S. (Mathematics) The Courant Institute, New York University, February 1978
Postgraduate (Mathematics) Oxford University Mathematical Institute, 1979-1980
Ph.D. (Mathematics) The Courant Institute, New York University, October 1981

Advisors

Graduate: Henry P. McKean (Courant)
Postdoctorate: Jerrold E. Marsden (Caltech)

Professional

Assistant Professor, University of Arizona, Tucson, 1981-1983
Research Associate, University of California, Berkeley, 1983-1984
Research Scientist, University of Iceland, Reykjavík, 1984-1985
Assistant Professor, University of California, Santa Barbara, 1984-1988
Associate Professor, University of California, Santa Barbara, 1988-1993
Professor, University of California, Santa Barbara, 1993-present
Research Fellow, Mittag-Leffler Institute, Stocholm, Sweden, fall 1994
Visiting Professor, University of Granada, Spain, 2003-2004
Director, Center for Complex and Nonlinear Science, University of California, Santa Barbara, 1998-present.
Guest Professor University of Iceland, Reykjavík, Iceland, 2006-present.

Director, UC Education Abroad Programs in Spain, UC Center Madrid, 2009-2011.
Visiting Professor, The Courant Institute, New York University, New York, 2011.
Visiting Member CKITP Chinese Academy of Sciences, April 2012.
Visiting Member ZiF Bielefeld, Germany, March 2013.

Area of Specialization

Stochastic Nonlinear Partial Differential Equations and Turbulence; Dynamical Systems
Theory of Nonlinear Partial Differential Equations; Mathematical Geomorphology and
Seismology; Complex and Nonlinear Models in Biology; Nonlinear Phenomenon in
Quantum Mechanical Systems applications and simulations of the above.

Editorship

- Leifur Ásgeirsson Minningarrit, Collected works and proceedings of a memorial conference 1991 (edited with R. Axelsson, O. Björnsson and J.R. Stefánsson) University of Iceland Press Reykjavík, 1998
- Associate Editor, The Journal of Nonlinear Mathematical Physics, 1997-2004
- Associate Editor, Journal of Function Spaces and Applications, 2002-present
- Probability, Geometry and Integrable Systems, Proceedings of a conference in honor of H. McKean's 75th birthday at MSRI, Berkeley CA, (edited with M. Pinsky) Cambridge Univ. Press, 2007
- Associate Editor, ISRN Applied Mathematics, 2011-present.
- Editor in Chief, International Journal of Nonlinear Science and Numerical Simulations, 2013-present.

Honors and Awards

- Fulbright Fellowship, 1973-1976
- Sigma Xi, 1976
- Invited Plenary Address, SIAM/MAA Meeting Los Angeles, 1990
- Invited Plenary Address, The 21st. Congress of Scandinavian Mathematicians, Sweden 1992
- Invited Plenary Address, Congress of Scandinavian Science Teachers, Sweden 1996
- Best paper award, with T. Smith and G. Merchant, The International Association for Mathematical Geology, 1997
- Trustee, UC Santa Barbara Foundation 06-08
- Invited Plenary Lecture, International Conference on Approximation Methods and Numerical Modeling of the Environment and Natural Resources MAMERN'07, Granada, Spain, July 2007
- Trustee UC Santa Barbara Foundation 08-09.
- Fellow of the American Association for the Advancement of Science, January 2010.

PhD Students

1. Peter Smereka: The dynamics of bubbles and bubble clouds (1989) Department of Mathematics, University of Michigan, Ann Arbor.
2. Bryan Galdrikian: Nonlinear and nonperturbative dynamics in quantum wells (1994) Mathengine, Inc. San Francisco.
3. Kenneth L. Nelson: The existence of smooth attractors of damped and driven wave equations (1995) National Security Agency, Maryland.
4. Höskuldur Hauksson: The basic attractor of the viscous Moore-Greitzer equation (1997) Goldman-Sachs Inc., London.
5. Kristinn Johnsen (Danish Technical University, Copenhagen): Dynamical quantum theory (1997) Mentis Cura Inc., Reykjavík, Iceland.
6. Niklas Wellander (Lulea University, Lulea Sweden): Homogenization of Maxwell's equations (1997) FOI, Swedish Defense Research Corporation, Linköping, Sweden.
7. George E. Merchant: An elementary theory of drainage basin evolution (2000) Geoscience Institute, Stanford University.
8. Adriano de Albuquerque Batista: Nonlinear dynamics in boundary lubricated interfaces and in semiconductor quantum wells (2000) University of Brasilia, Brazil.
9. Songming Hou: Solutions of multidimensional hyperbolic systems of conservation laws by discontinuous Galerkin methods and a derivation of the Moore-Greitzer Equation using homogenization (2002) Department of Mathematics, University of Michigan, East Lansing.
10. Edward Welsh (Duke University): Fluvial erosion (2002) Department of Mathematics, Westfield State College, Massachusetts.
11. Jorge Hernandez: A general framework for term structure and credit risk models driven by Lévy processes (2004) California Investment Fund, Los Angeles.
12. Alethea Barbaro: Dynamics and Migrations of Schools of Pelagic Fish (2008) UCLA Department of Mathematics, Los Angeles.
13. Michael Crowell (2004-2009) Materials of Jet Engines, Los Alamos National Lab.
14. Melissa Hendrata (2006-2009) Dynamics of Myxobacteria, CSU Los Angeles.
15. Brittany Erickson (2007-2010) Models and Simulations of Earthquakes, Stanford University.
16. Baldvin Einarsson (2007-2011) Interacting Particle Model and Dynamic Energy Budget Theory, Analysis and Application, Universidad de Complutense Madrid.
17. Shahab Karimi (2012-) Two-dimensional Turbulence, UCSB.
18. Jonathan Essen (2012-) Modeling of Terahertz Detectors, UCSB.
19. Jorge Cornejo (2012-) Effect of Protected Areas on Disputed Fish Stocks. UCSB.

MA Students

Julia Hassett, Nonlinear Dynamics (1988)
 Kirsten Meeker, Parallel Computations of Landsurfaces (2000)
 Brittany Erickson, A Model for Aperiodic Earthquakes (2006)
 Baldvin Einarsson, Simulations of Schools of Fish (2007)
 David Cattán, Rivers on Eroding Surfaces (2013)

Postdocs

1. Rainer Grauer (1989-1990): Nonlinear dynamics of PDE's. Theoretical Physics Institute, University of Bochum, Germany.
2. Nils Svanstedt (1993-1995): Homogenization of fluid equations. University of Goteborg and Chalmers Institute of Technology, Gothenburg, Sweden.
3. Bryan Galdrikian (1995-1996): Parallel computations of quantum structures. Mathengine, Inc.
4. Eero Sacksman (1996): Harmonic Analysis. Helsinki University, Finland.
5. LiHong Wang (1996-1997): Quantum structures and laser optics. TRW Space and Technology Division, Redondo Beach, California.
6. Adriano Batista (1998-2000): Quantum bifurcations. University of Brasilia, Brazil.
7. Niklas Wellander (2000-2003): Homogenization of Maxwell's equations. FOI, Swedish Defense Corporation, Linköping, Sweden.
8. Helena McGaghan, main advisor G. Ponce, (2006-): Noncommutative Wave Equations, UCSB.
9. Julie Rowlett, main advisor X. Dai, (2008-2009): Erosion and Optimal Transport, Univ. of Bonn.

Student Advising

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|-----------|---|
| 1998-2007 | Advisor for undergraduate students, Mathematics |
| 1998-2001 | Advisor for the EAP program |
| 2007-2009 | Graduate Student Advisor, Applied Mathematics |

Lectures Series

1. Integrable and Chaotic Motion, Univ. de Nice, Observatoire, June 1987, ARTEMIS Observatoire de Nice, Lecture Notes, ed. J. C. Fernandez and R. Grauer (1987)
2. Chaotic Dynamics (with T. Bohr) Akureyri, Iceland, August 1994
3. Basic attractors and basic control of nonlinear partial differential equations ECMI lecture series, Chalmers Inst. of Tech. and Goteborg Univ. Sweden, June 2000
4. Basic attractors and basic control of nonlinear partial differential equations. Beijing University, China, August 2002
5. Nonlinear Quantum Dynamics, Simulations, and Theory, Universities of Carlos III and Autonoma, Madrid, Spain, April 2004
6. Nonlinear Quantum Dynamics, Experiments, Universities of Carlos III and Autonoma, Madrid, Spain, May 2004
7. Scaling Laws for the Earth's Surface, Igert Lecture Series, Univ. of Oregon, Corvallis, Sept. 2005.
8. Dynamics of Schools of Fish and Fluvial Landsurfaces, Summer School, Colorado State University, Fort Collins, June 2006.

9. The Mathematical Theory of SOC Systems with Applications to the Evolution of the Earth's Surface, IPAM, May's Landing, Malibu, March 2008.
10. Aarhus University. The Mathematics of Turbulence, September 2011.

Research Funding

1. The Icelandic Science Foundation 1981-1982, 1985 and 1990-1991
2. The National Science Foundation 1983-1994
3. The National Science Foundation Equipment Grant, with K. Millett 1986-1987
4. The National Science Foundation Equipment Grant, with K. Millett, 1989-1990
5. Incor Grant, 1989-1993 and 1994-1997
6. NSF Material Research Grant, with A. Evans, 1992-1995
7. Lacor grant 1994-1995
8. The National Science Foundation, 1997-2000
9. 10/95-9/96 LANL 6855V0016-3A High Performance Computations of Electron Microstructures \$35,212 B. Birnir
10. 8/96-7/97 NSF DMS-9628606 Mathematical Sciences Computing Research Environment \$36,638 NSF and \$45,000 UCSB T. Sideris, W. Cai, B. Birnir and D. Long
11. 10/96-9/99 NSF PHY96-01954 Acquisition of a High Performance Computing Facility \$627,392 R. Sugar B. Birnir and others
12. 3/97-12/98 Icelandic Science Foundation Nonlinear Quantum Mechanics \$8,418 B. Birnir
13. 8/97-7/00 NSF DMS-9704874 Applications of Qualitative Analysis of Nonlinear PDE's \$103,000 B. Birnir
14. 2/99-1/02 NSF BCS98-19095 Towards a Qualitative Theory of Nonlinear Geographic Systems: Regular and Stochastic Evolution in Fluvial Landforms \$447,053 B. Birnir and T. Smith
15. 7/99-6/03 DARPA-Navy:N00014-99-1-0935 Solid State Terahertz Source for Sensing and Satellite Communication \$999,473 S.J. Allen, B. Birnir and others
16. 7/00-6/03 NSF DMS-0072191 Analysis and Control of Flow and Flutter in Aeroengines \$109,809 B. Birnir
17. 9/01-8/04 NSF DMS-0112388 SCREMS \$107,750 B. Birnir, H. Ceniceros, X. Liu, T. Sideris
18. 07/01/02-06/30/07 NSF BCS98-19095 IGERT: Development of a Graduate Education Program in Computational Science and Engineering with Emphasis on Multiscale Problems in Fluids and Materials \$2,684,749.00 B. Birnir, L. Petzold, B. Homsy, E. Meiburg
19. 02/15/04-12/31/06 NSF DMS-0352563 SGER, Stochastic Theory of Turbulent Combustion \$64,214.00 B. Birnir
20. 1/04-12/06 Icelandic Science Foundation Quantum Geometry \$556,000 L. Thorlacius, T. Jonsson and B. Birnir
21. 6/05-6/06 NSA Conference support, Probability, Geometry and Integrable Systems, MSRI \$15,000 B. Birnir
22. 7/06 – 7/07 Univ. of Iceland Research Foundation Characteristics of Fish Migration Models \$ 16,000 B. Birnir and S. Sigurðsson
23. 7/07-6/08 Academic Senate UCSB 8-584535-19900-7 The Mathematical Theory of

- Turbulence \$5,160.00 B. Birnir
24. 7/07-7/09 The Icelandic Marine Science Institute Simulations of the Migration of the Capelin and its Ocean Environment \$64,000 B. Birnir
 25. 07/01/10-06/30/13 NSF/MRI Computing Environment Grant \$650,000 + 350,000 matching = \$ 1million, B. Birnir, , F. Brown , C. Carcia-Cervera.
 26. 01/01/12-09/01/14 The Icelandic Marine Science Institute, Oceanographic Data on the Internet, \$100,000 B. Birnir.

Membership

Society for Industrial and Applied Mathematics, The American Mathematical Society, The American Physical Society, The Icelandic Mathematical Society, The International Society for Mathematical Geology, American Association for the Advancement of Science, European Geophysical Union.

Professional Activities

Conferences and Workshops Organized

- Organizer of the University of California Annual Nonlinear Conference, Santa Barbara, March 1986
- Organizer of a conference to Commemorate Leifur Ásgeirsson, Reykjavík, October 1990
- Organizer of a PDE conference, Santa Barbara, October 1992
- Organizer of a PDE conference Santa Barbara, May 1993
- Organizer Conference on Nonlinear Dynamics and Scientific Computing, ITP, UCSB. April 7-9, 1999
- Organizer SIAM Snowbird, mini-symposium 1999
- Organizer AMS Session, Weakly hyperbolic systems, UCSB, Oct. 2000
- Organizer SIAM Snowbird mini-symposium, 2001
- Organizer Invited symposium SIAM Control Conference, San Diego, August 2001
- Co-organizer of a conference on “Probability, Geometry and Integrable Systems” at MSRI, Dec. 2005
- Organizer of a conference “Complexity Day” at UC Santa Barbara, Dec. 2006
- Co-organizer of a conference on “Transport Systems in Geography, Geoscience and Networks” at IPAM, May 2008
- Co-organizer of conference on “Lagrangian Turbulence”, Reykjavik, Iceland 2012
- Invited session on Turbulence, SPA, Boulder, CO, August 2013.

Service on National Committees and Panels

- 2001-2003 SIAM Travel support for young mathematicians
- NSF Panel on Applied Mathematics Funding 2003
- 2003 SIAM Selection committee for sessions chairs for ICIAM, Sydney

- Australia, July 2003.
- AMS-INS-SIAM Committee on Summer Conferences, Member 2004
- AMS-INS-SIAM Committee on Summer Conferences, Chair 2005-2007
- NSF Panel on Applied Analysis Funding 2005
- Swedish Research Council Panel on Research Support in Mathematics 2000-2010, June 2010.
- International Panel for Research Centers of Excellence, Norwegian Research Council, 2011.
- International Panel to Evaluate KTH, Sweden, June 2012.
- Swedish Research Council Panel for Research Support Application, 2012.
- Swedish Research Council Panel for Research Support Application, 2013.

Invited Participation in National and International Research Programs

- Research Fellow, Program in Dynamics and Symplectic Geometry, MSRI Berkeley, Spring 1989.
- Member, Dynamical Systems and Probabilistic Methods for PDEs, MSRI, Spring 1994.
- Research Fellow, Program on Nonlinear PDE's, Statistical Mechanics and Turbulence, Mittag-Leffler Institute, Stockholm, Fall 1994.
- Member, Program on Finite and Infinite-dimensional Dynamical Systems, Newton Institute, Cambridge, October 1995.
- 1/01-7/01 Member ITP program in Statistical Physics and Biological Information
- 8/01-1/02 Member ITP program in Quantum Information, Entanglement, Decoherence and Chaos
- 4/07-6/07 Member MSRI program on Dynamical System
- 9/07-10/07 Member Mittag-Leffler program on Stochastic PDEs
- 4/08-6/08 Member IPAM program on Optimal Transport
- Winter 2011 Member KITP program on Turbulence
- April 2012 Member CKITP program on Turbulence, Beijing
- March 2013 Member ZiF Bielefeld, Germany, program on Global Change and Stochastics

Consulting

- Scientific Consultant, Los Alamos National Laboratory, 1991-5.

UCSB Professional and Scientific Activities

- Chairman, University of California, Santa Barbara. Nonlinear Science Committee, 1985-1987.
- Nonlinear Science Institute Advisory Board, 1990-1993.
- UCSB Quantum Institute Advisory Board, Member, 1993-2006
- Search committee for Director of iQuest, Chair 2003
- Director Center for Complex and Nonlinear Science, UCSB, 1998-present

- Coordinator for the College of Letters and Science, Program in Computational Science and Engineering
- Institute for Quantum and Complex Dynamics Advisory Board, 2006-2008
- Mathematics Representative, UCSB Education Abroad Program, 2004-2008

UC Systemwide Professional Service

- The Coordinating Committee for Nonlinear Science 1987-1991
- The Systemwide Graduate Council Coordinating Committee 2004-2005
- The Systemwide Council on Budget and Planning Committee 2007-2009
- Education Abroad Program Faculty Exchange University of Granada, Spain 2006

International Education

- 1998-2001 Advisor UC Education Abroad Program
- 1998-2001 Member UCSB Education Abroad Program Committee
- 2001 Instituted an academic exchange program between UCSB and the University of Iceland
- 2001-2003 Representative UCSB Education Abroad Program
- 2006 EAP Faculty Exchange University of Granada, Spain
- 2012 Council for International Education

Ph.D. Examiner and Professorial Promotion Committees

- Examiner (Opponent) Lulea Univ. of Technology, Sweden, Anders Holbom, Des. 1996.
- Examiner (Opponent) Lulea Univ. of Technology, Sweden, Niklas Wellander, Feb. 1997.
- Outside Expert (2001) University of Michigan, Ann Arbor
- Expert Advisor (2002) Lulea University, Lulea Sweden
- Expert Advisor (2002) UC Irvine
- Expert Advisor (2002) Univ. of Illinois Chicago Circle
- Outside Expert (2005) University of Michigan, Ann Arbor
- Expert Advisor (2006) Lulea University, Lulea Sweden
- Expert Advisor (2007) UC Irvine
- Examiner 2008 PhD Defense, Lulea Univ. Sweden
- Examiner 2009 PhD Defense, Ostersund, Sweden
- Expert Advisor (2010) UC Davis
- Expert Advisor (2011) UC Merced.
- Expert Advisor (2011) Dartmouth, NH.
- Expert Advisor (2011) Oregon State University, Corvallis, OR.

Invited Conference Lectures, Colloquia and Seminars

1. Bi-Annual Conference of the Icelandic Physical Society, Munadarnesi, September 1984.

2. Conference on Solitons and Coherent Structures, Institute of Theoretical Physics, Santa Barbara, January 1985.
3. Workshop on Stability in Fluids and Plasma, Berkely, January 1986.
4. Icelandic Physical Society Bi-Annual Conference, Munadarnesi, October 1986.
5. The 4th International Workshop on Nonlinear Evolution Equations and Dynamical Systems, Montpellier, June 1987.
6. 20th Nordic Congress of Mathematicians, Trondheim, August 1988.
7. Workshop on Joshepson Junctions and Attractors of Perturbed sine-Gordon Equation. Reykjavik, Sept. 1988.
8. Mathematical Methods in Plasma Physics, Cornell University, October 1988.
9. Dynamics in Multi-Degree of freedom Systems, Los Alamos, Feb. 1990. MAA Invited Address, SIAM/MAA Meeting Los Angeles, March 1990.
10. UC-NASA Workshop on Nonlinear Control, Santa Barbara, April 1990.
11. AMS Summer Conference on Inverse Scattering and Applications, Amherst, June 1990.
12. Larger Scale Structure in Turbulence and Inertial Manifolds, Los Alamos, August 1990.
13. A Conference to Commemorate Leifur Ásgeirsson, Reykjavik, October 1990.
14. Asymptotics Beyond All Orders, San Diego, Jan. 1991.
15. Quantum Chaos, Copenhagen, June 1991.
16. 21st Nordic Congress of Mathematicians, Lulea, June 1992, Plenary Address.
17. AMS meeting in Los Angeles, October 1992.
18. Solitons and Coherent Structures, Bayereuth, June 1993.
19. Symmetries and Turbulence, Cargese, Corsica, Sept. 1993.
20. Computational Mathematics, Lake Arrowhead Feb. 1994.
21. Dynamical Systems Methods in PDEs, MSRI, March 1994.
22. Chaotic Dynamics, Akureyri, Iceland, Aug. 1994.
23. Statistical Mechanics and Turbulence, Mittag-Leffler Institute, Sweden, Sept. 1994.
24. Dynamical Systems, Snowbird, Utah, May 1995.
25. Nonlinear Waves and Dynamics, Boulder Colorado, August 1995.
26. Inertial Manifolds, Newton Institute, Cambridge, October 1995.
27. 7/96 Chaos in quantum mechanics Congress of Scandinavian Science Teachers, Linkoping, Sweden, Invited Plenary Address
28. 8/96 Chaos in quantum wells Conference on Complexity and Coherence, Copenhagen, Denmark
29. 11/96 Strange attractors in dynamical systems AMS Meeting Pasadena
30. 12/96 Homogenization of fluids Math. Institute, Lulea Univ., Lulea, Sweden
31. 1/97 KdV and nonlinear Fourier transform, Solitons, PDEs and Nonlinear Analysis Conference, Sidney, Australia
32. 5/97 Homogenization and turbulence SIAM Dynamical Systems Conference, Snowbird, Utah
33. Quantum strange attractors, Arizona State Univ., Tempe, Arizona
34. 7/97 Homogenization of oscillatory fluids and the Kolmogorov scaling, Heinrich Heine Univ., Dusseldorf, Germany
35. 7/97 Chaos in quantum wells, Heinrich Heine Univ., Dusseldorf, Germany
36. 8/97 Basic attractors in dynamical systems, Large Time Behavior in Dynamical Systems, Analysis and Numerics Conference, Oberwolfach, Germany

37. 8/97 Jet engine flow, Univ. of Iceland, Reykjavik, Iceland
38. 10/97 The basic attractor of jet engine flow, Colloquium Dept. of Math. Notre Dame Univ.
39. 10/97 The basic attractor of jet engine flow, Univ. of Michigan, Ann Arbor
40. 10/97 Basic attractor and stability of jet engine flow, Dept. of Math. UCSB Jet engine flow, Colloquium Math. Institute, Lulea Univ., Lulea, Sweden
41. 2/98 Landscape formation, Nordita, Copenhagen
42. 4/98 KdV and inverse scattering, AMS Meeting, Manhattan, Kansas
43. The basic attractor of jet engine flow, AMS Meeting, Davis, CA
44. 5/98 Scaling in landscape formation, Dynamical Systems Conference, UCLA
45. 1/99 The nonlinear dynamics and control of jet engine flow Stanford Univ. Stanford, CA
46. 3/99 An index for completely integrable PDEs Birmingham, Alabama
47. 4/99 The nonlinear dynamics and control of jet engine flow ITP, Santa Barbara, CA
48. 4/99 Evolution of organized patterns of drainage and their scaling ITP, Santa Barbara, CA
49. 5/99 Nonlinear dynamics control of jet-engine flow SIAM Control, Atlanta, GA
50. 5/99 Analysis and Control of Jet-Engine Flow SIAM Dynamical Systems Conference/Snowbird, Utah
51. 7/99 Control of jet-engine flow Oberwolfach, Germany
52. 10/99 Rayleigh-Benard flow University of Iceland Engineering Faculty
53. 11/99 The evolution of fluvial landscape Univ. of Dusseldorf, Germany
54. 11/99 The evolution of fluvial landscape Univ. of Cologne, Germany
55. 11/99 The evolution of fluvial landscape Univ. of Bonn, Germany
56. 12/99 How is the landscape formed? Science Inst. Colloquium Univ. of Iceland
57. 4/00 Basic control of aeroengine flow AMS meeting Notre Dame, special session on nonlinear waves and integrable systems, Notre Dame, IN
58. 4/00 The evolution of fluvial landscape Duke Univ. NC
59. 4/00 Nonlinear dynamics and control of jet engine flow USC
60. 7/00 Dynamics and control of jet engine flow SIAM annual meeting Puerto Rico
61. 9/00 Nonlinear quantum mechanics Physics Colloquium, Univ. of Iceland, Reykjavik
62. 11/00 The scaling of fluvial landscape Statistics and Applied Probability Colloquium, UCSB
63. 11/00 The scaling of fluvial landscapes AMS meeting in San Francisco
64. 12/00 Nonlinear dynamics and control of jet engine flow 39th IEEE CDC Conference, Sydney, Australia
65. 5/01 Effectively nonlinear quantum systems SIAM conference on applications of dynamical systems, Snowbird, UT
66. 8/01 The mathematical theory of SOC systems SIAM control conference, San Diego
67. 9/01 Homogenization of jet engine flow SIAM-EMS conference, Berlin
68. 9/01 The mathematical theory of SOC systems Univ. of Iceland
69. 10/01 Homogenization of jet engine flow UC Irvine
70. 5/01 Effectively nonlinear quantum systems SIAM conference on applications of dynamical systems, Snowbird, UT
71. 8/01 The mathematical theory of SOC systems SIAM control conference, San Diego

72. 9/01 Homogenization of jet engine flow SIAM-EMS conference, Berlin
73. 9/01 The mathematical theory of SOC systems Univ. of Iceland
74. 10/01 Homogenization of jet engine flow UC Irvine
75. 3/02 Subharmonics in Josephson qubits APS National Meeting, Indianapolis
76. 9/02 The scaling and stochasticity of fluvial landscapes International Conference on Mathematical Geology, Berlin
77. 3/12/03 Homogenization of jet engine flow AMS meeting Univ. of Indiana Bloomington
78. 3/14/03 The mathematical theory of SOC systems Duke University
79. 5/17/03 Computational Approaches to Stochastic Models, Partial Differential Equations and SOC models Conference on Regeneration in Biology Univ. of Indiana Bloomington
80. 6/19/03 Two scale compensated compactness AMS, Spanish Math. Soc. Meeting Sevilla Spain
81. 8/17/03 SOC a new paradigm in Biology Notre Dame Univ. Conference on Multi-scales in Biology
82. 8/17/03 Two scale compensated compactness Notre Dame Univ. Conferenced on Hyperbolic PDEs
83. 8/26/03 The Mathematical Theory of SOC and fluvial landscapes Nordita, Copenhagen
84. 8/27/03 Statistical properties of the genotype to phenotype map for rhesus monkeys N. Bohr Instit. Copenhagen
85. 9/29/03 The scaling and stochasticity of fluvial landscapes Univ. of Granada, Spain
86. 9/30/03 Nonlinear quantum dynamics Univ. of Granada, Spain
87. 10/01/03 Two scale compensated compactness Univ. of Granada, Spain
88. 10/24/03 Nonlinear quantum dynamics Univ. of Carlos III, Madrid, Spain
89. 11/20-24/03 Plenary Lecture: Two-scale compensated compactness and its application to fluid flow and porous media Conference on Filtration Problems, Institute of Hydraulic Engineering, University of Stuttgart, Germany
90. 11/27/03 Two scale compensated compactness Univ. of Bilbao, Spain
91. 03/17/04 Stochastic Models of Fluvial Landsurfaces Columbia University, New York
92. 04/ 05 The Stochastic Theory of Fluvial Landsurfaces Applied Math. Colloq., UCLA
93. 9/05 The Stochastic Theory of Fluvial Landsurfaces Colloquium, Univ. of Oregon, Corvallis
94. 9/05 Scaling Laws for the Earth's Surface Igert Lecture Series, Univ. of Oregon, Corvallis
95. 10/05 Stochastic Simulations of Schools of Fish Conference on Applications of Stochastic Systems and Statistical Physics in Biology, Notre Dame
96. 10/05 The Stochastic Theory of Fluvial Landsurfaces Applied Math. Colloquium, University of Michigan, Ann Arbor
97. 12/05 Turbulent Flow of a Uniform Stream Conference on Probability, Geometry and Integrable Systems, MSRI
98. 2/06 Simplicity and swarming in Discrete and Continuous Models of Pelagic Fish Conference on Swarming by Nature and Design, IPAM
99. 4/06 Turbulent Rivers Colloquium, USC
100. 7/06 Stochastic Theory of Fluvial Landsurfaces Colloquium, Colorado State

University, Fort Collins

101. 7/06 Dynamics of Schools of Fish and Fluvial Landsurfaces Summer School, Colorado State University, Fort Collins
102. 10/06 Turbulence of Uniform Flow Advances and Challenges in the Solutions of Stochastic Partial Differential Equations, Brown Univ. RI
103. 10/06 Dynamics and Migrations of Schools of Fish Seminar USC
104. 10/06 Migrations of Schools of Fish, External Influence and Internal Triggers Symposium on Biomathematics, University of Iceland, Reykjavik
105. 11/06 Turbulence of Uniform Flow Math Colloquium, UCSB
106. 03/07 The woman who broke the barrier, Sonya Kovalevsky, Jacob's theorem and algebraic geometry Hypatian Seminar, UCSB
107. 4/07 Homogenization and Control of Jet Engine Flow Introduction of Multiscale Methods, MSRI
108. 4/07 Stochastic Theory of Surface Erosion and River Meanders EGU Vienna Austria
109. 5/07 Turbulence of Uniform Flow, Mathematical Issues in Stochastic Approaches for Multiscale Modeling, MSRI
110. 7/07 Dynamics and Migrations of Schools of Fish Plenary Lecture Mammern07, Granada Spain
111. 09/07 Simulations of the Life-cycle of Myxobacteria Nordita Copenhagen
112. 10/07 Uniqueness, an Invariant Measure and Kolmogorov's Scaling, of the Stochastic Navier-Stokes Equation, The Mittag-Leffler Institut, Stockholm, Sweden.
113. 10/07 Uniqueness, an Invariant Measure and Kolmogorov's Scaling, of the Stochastic Navier-Stokes Equation, KTH, Stockholm, Sweden.
114. 10/07 Uniqueness, an Invariant Measure and Kolmogorov's Scaling, of the Stochastic Navier-Stokes Equation, Humboldt University, Berlin, Germany.
115. 10/07 Dynamics and Migrations of Schools of Fish, Univ. of Cologne, Germany.
116. 10/07 Uniqueness, an Invariant Measure and Kolmogorov's Scaling, of the Stochastic Navier-Stokes Equation, Imperial College, London, UK.
117. 10/07 The Migrations of the Capelin, University of Iceland, Reykjavik.
118. 10/07 Turbulence of Uniform Flow, Advance and Challenges in the Solution of Stochastic Partial Differential Equation, Brown Univ., Providence
119. 02/08 Uniqueness of Solutions to the Stochastic Navier-Stokes, the Invariant Measure and Kolmogorov's Theory, UC Davis
120. 03/08 Uniqueness of solutions to the stochastic Navier-Stokes equation the invariant measure and Kolmogorov's theory, Mathematics of Fluids, USC, Los Angeles
121. 04/08 Dynamics and Migrations of Schools of Fish, UC Santa Cruz
122. 10/08 An Approximation of the Invariant Measure for the Stochastic Navier-Stokes The iTi Conference on Recent Progress in Turbulence, Bertinoro, Italy
123. 11/08 A Dynamical Systems Simulation of Myxobacteria, Driven by Bio-energy Notre Dame
124. 11/08 The Invariant Measure of Turbulence USC
125. 03/11-14/08 The Mathematical Theory of SOC Systems with Applications to the Evolution of the Earth's Surface, IPAM Tutorials May's Landing, Malibu
126. 05/09 Quantifying Stochasticity in Geoscience, Transport Systems in Geography, Geosciences, and Networks, IPAM, Los Angeles

127. 06/09 Existence, uniqueness and statistical theory of the stochastic Navier-Stokes equation in three dimensions, Conference on Analysis, Inequalities and Homogenization Theory, Lulea, Sweden
128. 07/09 Turbulent solutions of the stochastic Navier-Stokes equation, Geometrical Singularities and Singular Geometries, IMA Minneapolis
129. 09/09 Changes in Migration Patterns of the Capelin as an Indicator of Temperature Changes in the Arctic Ocean, Conference on Ecology of the Arctic Ocean, Stockholm
130. 10/09 [Changes in Migration Patterns of the Capelin as an Indicator of Temperature Changes in the Arctic Ocean](#), [Institut Henri Poincaré et Ecole Normale Supérieure](#), Paris
131. 10/09 Existence, uniqueness and statistical theory of the stochastic Navier-Stokes equation in three dimensions, Bilbao
132. 10/09 A Dynamical Systems Simulation of Myxobacteria, Driven by Bio-energy, Notre Dame, South Bend, Indiana
133. 11/09 Basic Attractor, a Dynamical Systems Theory for PDEs, The Courant Institute, New York
134. 11/09 [Changes in Migration Patterns of the Capelin as an Indicator of Temperature Changes in the Arctic Ocean](#), The Courant Institute, New York
135. 10/2-4/09 A Dynamical Systems Simulation of Myxobacteria, regulated by Dynamic Energy Budget (DEB) Theory, Multiscale Methods in Biology, MBI Ohio State, Columbus, Ohio
136. 12/09 Er Loðnan að Hverfa ? (Is the Capelin Moving North from Iceland?) The University of Iceland and the Icelandic Marine Science Institute
137. 12/09 Existence, uniqueness and statistical theory of the stochastic Navier-Stokes equation in three dimensions, SIAM Conference on PDEs, Miami, Florida.
138. 01/10 A simulation of the life-cycle of myxobacteria, *Nonequilibrium Systems, Leganes Spain*
139. 03/11 The Invariant Measure of Turbulence, KIPT, Santa Barbara, CA.
140. 09/11 The PDF of Turbulence, Conference on Ambient Processes, Sandbjerg, Denmark.
141. 09/11 The PDF of Turbulence, Max-Planck Institute, Göttingen, Germany.
142. 09/11 The Stochastic Theory of Turbulence, Lectures, Aarhus University, Denmark.
143. 10/11 The Kolmogorov-Obukov Theory of Turbulence, Columbia University, New York, NY.
144. 10/11 Erosion, The Courant Institute, New York University, New York, NY.
145. 11/11 The Stochastic Theory of Turbulence, SIAM PDE Conference, San Diego CA.
146. 11/11 The Kolmogorov-Obukov Theory of Turbulence, University of Notre Dame, Indiana.
147. 12/11 The Burrige-Knopoff with Dietrich-Ruina Friction Model of Earthquakes, Princeton University, Princeton NJ.
148. 12/11 The Kolmogorov-Obukov Theory of Turbulence, The Courant Institute, New York University, New York, NY.
149. 1/12 Simulations of Fish Migrations in the Ocean, Swarming Conference, Banff, Canada.
150. 2/12 The Kolmogorov-Obukov Theory of Turbulence, CSU Northridge, CA.

151. 4/12 The Kolmogorov-Obukov Theory of Turbulence, KITP Beijing, China.
152. 5/12 The Kolmogorov-Obukov Theory of Turbulence, IAMIS workshop, UC Riverside, CA.
153. 6/12 The Kolmogorov-Obukov Theory of Turbulence, conference on Lagrangian Turbulence, Reykjavík, Iceland.
154. 10/12 The Kolmogorov-Obukov Theory of Turbulence, Progress in Turbulence, fifth iTi conference, Bertinoro, Italy.
155. 10/12 The Kolmogorov-Obukov Theory of Eulerian Turbulence, AMS meeting Tucson, AZ.
156. 10/12 The Kolmogorov-Obukov Theory of Lagrangian Turbulence, AMS meeting Tucson, AZ.
157. 12/12 The Kolmogorov-Obukov Theory of Lagrangian Turbulence, AGU meeting, San Francisco, CA.

Popular Lectures and Public Service

- 1995-2002 Training of the Isla Vista Elementary School Mathematics Team
- 9/00 The Optimists Club, Goleta
- 10/00 The Cosmopolitan Club, Goleta
- 6/01 The Unitarian Universalist Church, Ventura
- 10/05 Valley Verde Retirement Home, Santa Barbara
- 01/07 The Rotary Club, Santa Barbara
- 10/07 The Migration of the Capelin, Univ. of Iceland Popular Lecture Series, Reykjavik
- 07/11 The Fractal Universe, Discovery Center Thousand Oaks, CA.
- 09/12 Research in Complex Science, Math Club, UCSB.

UC Santa Barbara Academic Senate Committee Service

2012-2013 Council on International Education
 2008-2009 Council on Planning and Budget, Chair
 2007-2008 Council on Planning and Budget, Vice Chair
 1993-2007 Academic Senate promotion committees
 2006-2008 UC Santa Barbara Foundation
 2006-2008 UC Foundation Development Committee
 2006-2007 Central Recruitment Fellowship Committees
 2006-2007 Council on Planning and Budget, Member
 2006-2007 Committee on Development and Community Relations, Chair
 2004-2005 Graduate Council, Chair
 2004-2005 Executive Council, Member
 2004-2005 Faculty Legislature Ex Officio
 2004-2005 Committee on Graduate Student Affairs, Member
 2002-2003 Graduate Council, Vice Chair
 2002-2003 Committee on Graduate Funding and Fellowships, Member
 2000-2002 Graduate Council, Member
 1992-1994 Faculty Legislature Member

UC Systemwide Academic Senate Committee Service

2007-2009 UC Council on Planning and Budget

2007-2008 Academic Senate Task Force on Graduate Funding

2008 UCOP Task Force on the Education Abroad Program

Publications

1. Ph.D Dissertation, Complex KdV, *The Courant Institute*, Sept. 26, 1981. *University Microfilms International*, Ann Arbor, Michigan, **29**, vi, 4-148, 1981.
2. Complex Hill's equation and the complex period Korteweg-de Vries equations, *Comm. Pure and Applied Math.*, **39**, 1-49, 1986.
3. Singularities of the complex KdV flows, *Comm. Pure and Applied Math.*, **39**, 283-305, 1986.
4. Coauthor J. Marsden. 3-dimensional irregular solutions of a perturbed KdV equation, *Proceedings of the Bi-Annual Conference of the Icelandic Physical Society*, Munadarnesi, Sept. 1984, ed. L. Kristjánsson. *Proc. Icelandic Physical Society*, **4**, 125-144, 1984.
5. Chaotic perturbations of the KdV equation, *Proceedings of the Conference on Solitons and Coherent Structures*, UCSB, Jan 1985, ed. A. Newell, *Physica D*, **18**, 464-466, 1986.
6. An example of finite-time blow-up of the complex Korteweg-de Vries equation and existence beyond blow-up, *SIAM Journal of Applied Math.*, **47**, 710-725, 1987.
7. Chaotic solution of KdV I: rational solutions, *Physica D*, **19**, 238-254, 1986.
8. Coauthor P. J. Morrison. Structural stability and chaotic solutions of the perturbed Benjamin-Ono equations, *Univ. of Iceland Science Institute*, **RH-03-86**, 1986.
9. Coauthor P. Smereka. Structural stability of solutions to integrable nonlinear PDE'S, *Proceedings of the 4th Conference on Nonlinear Evolution Equations and Dynamical Systems*, Montpellier, June 1987, ed. S. Leon, *World Scientific Publishing*, Singapore, (1987).
10. Coauthor M. Vinson. The Structural stability of ion-acoustic waves in plasma, *Proceedings of the Bi-Annual Conference of the Icelandic Physical Society*, Munadarnesi, Oct. 1986, ed. J. Pétursson and T. Jakobsson. *Proc. Icelandic Physical Society*, **7**, 164-172, 1987.
11. Coauthors P. Smereka and S. Banerjee. Regular and chaotic bubble oscillations in periodically driven pressure fields, *Physics of Fluids*, **30**, 3342-3350, 1987.
12. Regular and Chaotic Motion in Perturbations of Integrable Partial Differential Equations. *ARTEMIS Observatoire de Nice*, Lecture Notes, ed. J. C. Fernandez and R. Grauer (1987).
13. Coauthor P. Smereka. Existence theory and invariant manifolds of driven bubble clouds. *Comm. Pure and Applied Math.*, **43**, 363-413, 1990.
14. Coauthor R. Grauer. The center manifold and bifurcations of damped and driven sine-Gordon breathers, *Physica D*, **56**, 165-184, 1992.
15. Qualitative analysis of radiating breathers, *Comm. Pure and Applied Math.*, **47**, 103-

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16. Coauthors H. McKean and A. Weinstein, The rigidity of sine-Gordon breathers, *Comm. Pure and Applied Math.*, **47**, 1043-1051, 1994.
17. Coauthor R. Grauer. An explicit description of the global attractor for the damped and driven sine-Gordon equation, *Comm. Math. Physics*, **162**, 539-590, 1994.
18. Coauthors S.B. Giddings, J.A. Harvey and A. Strominger, Quantum Black Holes, *Phys. Rev. D*, **46**, 638, 1992.
19. Coauthors B. Galdrikian, M. Sherwin and R. Grauer, Nonperturbative resonances in periodically driven quantum wells, *Phys. Rev. B*, **47**, 6795, 1993.
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81. Coauthors B. Einarsson and L. Bonilla, Ordered, Disordered and Partially Synchronized Schools of Fish, submitted 2012.
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