

Curriculum Vitae

Björn Birnir

Address

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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 Míningarrít, 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 and MA Students, and Postdocs

Bjorn has graduated 19 Ph.D. Students to date as a main advisor. All of his students have academic and or research positions. In addition he has served on a large number of Ph.D. committees both interdisciplinary and not. He has graduated 5 M.A. students to date and served on large number of M.A. committees. In addition Bjorn has served as the postdoctoral advisor to 9 postdocs to date.

Lectures Series

Bjorn has presented 10 invited lecture series all over the world during the last 25 years.

Research Funding

Bjorn has obtained a large number of grants both alone and with collaborators. Over the last 15 years this amounts to over 7 millions dollars in grant funding, the last one being a 1 million dollar grant for computing infrastructure (2010-2013).

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

Bjorn is a frequent organizer of conferences and workshops. He has organized 13 workshops and conferences over the last 25 years. He also frequently serves on national and international committees and panels, including NSF panels. In 2001-2003 he served on SIAM's committee for travel support for young mathematicians. In 2003 he served on SIAM's selection committee for sessions chairs for ICIAM, Sydney Australia, July 2003. He was the SIAM representative on the AMS-INS-SIAM Committee on Summer Conferences in 2004 and chair 2005-2007 of that committee. His most recent international panel was the International Panel for Research Centers of Excellence, Norwegian Research Council in 2011, a panel to evaluate the Swedish University KTH in 2012 and a panel for the Swedish Research Council to determine research funding in 2012.

Bjorn is frequently invited to participate in national and international research programs. He has participated in 10 such programs at research institutions over the last 20 years and was most recently invited to participate in the Turbulence program at the KITP Institute at the National Academy in Beijing, China, in the spring of 2012.

Bjorn consults frequently with industry and research and academic institutions, he was a Scientific Consultant at Los Alamos National Laboratory in 1991-5. Bjorn has a long history of professional and scientific activities for the University of California and their international education programs. He has served both on the Graduate Council and the Budget and Planning committee for the University of California, Santa Barbara, and been chair of both committees and served on the corresponding University of California systemwide committees. He was been the Director Center for Complex and Nonlinear Science, UCSB from 1998 and Director of the University of California Education Abroad Program in Spain 2009-2011. He became the Editor in Chief of The International Journal of Nonlinear Science and Numerical Simulations in 2013. Bjorn is a frequent Ph.D. Examiner and serves often on professorial promotion committees in the University of California, at other universities in the United States and internationally. He has been a Ph.D. examiner 4 times and an outside expert in promotion cases 9 times during the last 15 years.

Invited Conference Lectures, Colloquia and Seminars

Bjorn has given over 150 invited lectures in seminars, colloquia and at conferences.

Popular Lectures and Public Service

Bjorn is a sought after speaker for popular lectures. He is one of the main lecturers in the UC Santa Barbara lecture series, including his popular lecture "The Fractal Universe".

Selected Publications

Bjorn has published over 80 publications in professional journals, including two books that he edited and one he wrote. Below is a selection of his paper and books:

1. Complex Hill's equation and the complex period Korteweg-de Vries equations, *Comm. Pure and Applied Math.*, **39**, 1-49, 1986.
2. 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.
3. Chaotic solution of KdV I: rational solutions, *Physica D*, **19**, 238-254, 1986.
4. Coauthor P. Smereka. Existence theory and invariant manifolds of driven bubble clouds. *Comm. Pure and Applied Math.*, **43**, 363-413, 1990.
5. Coauthors H. McKean and A. Weinstein, The rigidity of sine-Gordon breathers, *Comm. Pure and Applied Math.*, **47**, 1043-1051, 1994.
6. 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.
7. Coauthors S.B. Giddings, J.A. Harvey and A. Strominger, Quantum Black Holes, *Phys. Rev. D*, **46**, 638, 1992.
8. Coauthors Nordstrom, K. B, Johnsen, K., Allen, SJ, Jauho, A. P., and others, Excitonic dynamical Franz-Keldysh effect, *Phys. Rev. Lett.*, **81**, 2, 457-460, 1998.
9. Coauthor B. Galdrikian, Period doubling and strange attractors in quantum wells, *Phys. Rev. Lett.*, **29**, April 1996, 3308-3311.
10. Coauthors K. Nordstrom et al., Observation of dynamical Franz-Keldysh effect, *Phys. Stat. Sol.(b)*, **204**, 52-54, 1997.
11. Coauthor H. A. Hauksson, The basic control of viscous Moore-Greitzer partial differential equations, *Siam Journal of Control and Optimization*, **38**, 5, 2000, 1554-1580.
12. Coauthors T. R. Smith, G. E. Merchant, Towards an elementary theory of drainage basin evolution: I. The theoretical basis, *Computers and Geosciences*, **23**, 8, 811-822, 1997.
13. Coauthors T. Smith, and G. Merchant, The scaling of fluvial landscapes, *Computers and Geosciences*, **27**, 10, 1189-1216, 2001.
14. Coauthors Adriano Batista, Pablo Tamborenea and David Citrin. Nonlinear terahertz properties of n-type quantum-well heterostructures. *IEEE Journal of Selected Topics in Quantum Electronics*, **8**, 3, 464-473, 2002.
15. An ODE Model of the Motion of Pelagic Fish. *Journ. Stat. Phys.*, **128**, 1 / 2, 535-568, July 2007.
16. Coauthors B. Erickson and D. Lavallé. A Model for Aperiodicity in Earthquakes.

- Nonlinear Process. Geophys.*, **66**, 565-594, 2008.
17. Turbulent Rivers, *Quarterly of Applied Math.*, **66**, 565-594, 2008.
 18. Coauthors K. Mertens, V. Putkaradze and P. Vorobieff, Noise Driven Meandering Streams. *Phys. Rev. Lett.*, **101**, 11450, 2008.
 19. Coauthors Alethea Barbaro, Baldvin Einarsson, Sven Sigurðsson, Héðinn Valdimarsson, Ólafur Karvel Pálsson, Sveinn Sveinbjörnsson and Þorsteinn Sigurðsson, Modeling and Simulations of the Migration of Pelagic Fish, *ICES Journal of Marine Science*, **6**, pp. 826-838.
 20. The Kolmogorov-Obukhov Statistical Theory of Turbulence, *Journal of Nonlinear Science*, **0938-8974**, 1-32, 2013, DOI: 10.1007/s00332-012-9164-z.
<http://dx.doi.org/10.1007/s00332-012-9164-z>
 21. The Kolmogorov-Obukhov Theory of Turbulence, Springer-Verlag New York, 2013. <http://link.springer.com/book/10.1007/978-1-4614-6262-0/page/1>