

BARBARA LEE KEYFITZ

Department of Mathematics
The Ohio State University
Columbus, Ohio 43210-1174

January 20, 2009

PERSONAL:

Date of birth: November 7, 1944, Ottawa, Canada
Marital Status: Married (to Martin Golubitsky), two children
Citizenship: United States and Canada

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Columbus, OH 43215 (614) 824-1111 (Home)

EDUCATION: BS, Mathematics, Toronto, 1966
MS, New York University, 1968
PhD, New York University, 1970
Thesis Advisor: Peter D Lax
Ph.D. Thesis: 'Time-decreasing functionals of solutions of
nonlinear equations exhibiting shock waves'.

POSITIONS:

Permanent:

Assistant Prof., Columbia Univ., Math Methods Dept, Sept 1970 - Dec 1976
Lecturer, Princeton Univ., Mech. and Aero Dept, Jan 1977 - Sept 1979
Assistant Professor, Arizona State University, Sept 1979 - Aug 1981
Associate Professor, Arizona State University, Sept 1981 - Aug 1983
Associate Professor, University of Houston, 1983 - 1987
Professor, University of Houston, 1987 -
Director of Graduate Studies, Math Dept, Univ of Houston, 1989 - 1997.
John and Rebecca Moores University Scholar, University of Houston, 1998 - 2000.
John and Rebecca Moores Professor, University of Houston, 2000 - 2008.
Professor, The Ohio State University, 2009 - .

Visiting:

NSF Research Fellow, Grumman Aero Corp, June - August, 1975
Visiting Member, Université de Nice, Jan - June 1980
Visiting Associate Professor, Duke Univ, Sept - Dec 1981
Visiting Associate Professor, Univ of California, Berkeley, Jan - July 1982
Visiting Professor, Université de St Etienne, June 1988
Visiting Member, Inst for Math and Appl, Minneapolis, Jan - June 1989
Visiting Member, Math Research Inst, Univ of Warwick, June - Aug, 1989
Visiting Member, Fields Institute, Waterloo, Canada, Jan - June, 1993.
Visiting Professor, Mathematics Department and Division of Applied Mathematics,
Brown University, September 1999- May 2000.

Visiting Member, Institute of Mathematics, Chinese University of Hong Kong, March, 2001.

Visiting Member, National Center for Theoretical Sciences, Taiwan, March, 2002.

Director, The Fields Institute for Research in Mathematical Sciences, Toronto, Canada, July, 2004 - December, 2008.

Consulting:

Grumman Aero Corp, Research Department, Jan 1976 - Dec 1977;

Exxon Production Research, Feb 1985.

Precision Tube Holding Corporation, Nov 2002.

HONORS AND AWARDS:

Fellow of AAAS, February 1992.

Houston City Council Award, June 1993.

Moores University Scholar (Moores Professor), University of Houston, 1998 - 2008.

Krieger-Nelson Prize Lecture, Canadian Mathematical Society, 2005.

Esther Farfel Award, University of Houston, 2006.

EDITORIAL BOARDS:

Editorial Board, American Mathematical Society, Proceedings, 1988 - 1992;

Coordinating Editor, AMS Proceedings, 1992 - 1994.

Associate Editor, Journal of Mathematical Analysis and Applications, 1994 - 1998.

Editorial Board, SIAM Journal of Applied Mathematics, 1997 - 2003.

Editorial Board, American Mathematical Society, Transactions, 1998 - 2002.

Advisory Editorial Board, Mathematical Methods in the Applied Sciences, 1998 - 2006.

Editorial Board, Fields Institute Monographs and Fields Institute Communications, 2004 - .

Editorial Board, CMS Treatises in Mathematics, 2005 - .

Editorial Board, Chinese Journal of Engineering Mathematics, 2007 - .

ORGANIZING COMMITTEES (since 2000):

Organizer (with Richard R. C. Somerville), Symposium on 'Earth, Sea and Sky: Mathematical Modeling in the Earth Sciences, AAAS Annual Meeting, Washington DC, February 17-22, 2000.

Co-organizer (with S. Čanić), Minisymposium on 'Free Boundary Problems', SIAM Annual Meeting, San Juan, Puerto Rico, July 10-14, 2000.

Co-organizer (with Zhouping Xin), Minisymposium on 'Hyperbolic Conservation Laws', SIAM Pacific Rim Dynamical Systems Conference, August 9 - 13, 2000.

Co-organizer (with Pablo Padilla), Special SIAM-SMM Session, Sociedad Matemática Mexicana, XXXIII Congreso Nacional, Saltillo, Mexico, October 9-13, 2000.

Organizing Committee, SIAM Mathematics in Industry Workshop, University of Houston, April 27-28, 2001

Co-organizer (with Pablo Padilla), Special SIAM-SMM Session, Sociedad Matemática Mexicana, XXXIV Congreso Nacional, Toluca, Mexico, October 7-12, 2001

Scientific Committee, International Conference on ‘Hyperbolic Problems: Theory, Numerics and Applications’, CalTech, March 25-30, 2002.

Co-organizer (with Randy LeVeque), Minisymposium on ‘Hyperbolic Conservation Laws, SIAM Annual Meeting, Philadelphia, July 8-12, 2002.

Co-organizer (with Pablo Barrera and Pedro González-Casanova), Special SIAM-SMM Session, Sociedad Matemática Mexicana, XXXV Congreso Nacional, Durango, Mexico, October 7-11, 2002.

Co-Chair (with Lee Seng Luan and Nhan Phan-Thien), International conference on Scientific and Engineering Computation, Singapore, December 3-5, 2002.

Co-organizer (with Marshall Slemrod and Konstantina Trivisa), SIAM Special Session on ‘Hyperbolic Conservation Laws and Related Topics’, Joint Mathematics Meetings, Baltimore, January 15-18, 2003.

Member, Organizing Committee, IMA conference, ‘The IMA at 20: Mathematics and its Impact’, June 6-7, 2003.

Member, Organizing Committee, APDE SIAG conference, Houston, December 6-8, 2004.

Member, Steering Committee, ICIAM 11, 2005-2011.

Member, Organizing Committee, Symposium *Beyond Pi: Grand Challenges in the Mathematical Sciences*, AAAS Annual Meeting, St. Louis, February 18, 2006.

Member, Steering Committee, International Congress on the Applications of Mathematics, Center for Mathematical Modelling, University of Santiago, Chile, March 13-17, 2006.

Co-chair, Organizing Committee, AWM-MSRI workshop, ‘Women in Mathematics: the legacy of Ladyzhenskaya and Oleinik’, Berkeley, May 18-20, 2006.

Member, Organizing Committee, BIRS Workshop on ‘Women in Mathematics’, Banff, September 23-27, 2006.

Member, Organizing Committee, SIAM Conference on Mathematics for Industry: Challenges and Frontiers, October 9-11, 2007.

Co-Organizer, Special Session on ‘Women in Mathematics’, Canada-France Meeting, Montreal Jun 2-6, 2008.

Member, Scientific Committee, 12th International conference on Hyperbolic Problems - HYP2008, University of Maryland, June 9-13, 2008.

Co-chair, Organizing Committee, SIAM Annual Meeting, Pittsburgh, July 2010.

Member, Steering Committee, ICIAM 2011, Vancouver, Canada, July 2011.

PROFESSIONAL SERVICE (National and International, since 2000):

AMS Representative to AMS-SIAM-IMS Committee on Joint Summer Research Conferences, 1994-1997; chair, 1996, 1997; SIAM Representative, 1998 - 2003.

Vice President for Programs, SIAM, 1998-2003

Member, Scientific Advisory Panel, Fields Institute, 1999-2003.

Member, US National Committee for Mathematics, NRC, 1999-2002.

Member at Large, Steering Committee of Section on Mathematics (A), American Association for the Advancement of Science, 2000-2004.

Member, Panel on Focused Research Groups, NSF, February 13-15, 2000

Member, College of Reviewers for the Canada Research Chairs (CRC) Program, NSERC, 2000-2002

Member, Panel on Partial Differential Equations, NSF, February 26-28, 2001

Member, Reallocations Committee, NSERC, 2001-2002

Science Engineering Fair of Houston Judge (Mathematics), March 23, 2001

Member, AWM Travel Grant Selection Committee, 2001

Chair, SIAM Activity Group on Analysis of Partial Differential Equations, 2003-2004

Member, Panel on Interdisciplinary Grants in the Mathematical Sciences, NSF, April 30- May 2, 2003.

Associate Chair, US National Committee for Mathematics, NRC, 2003-2004

Treasurer, International Council for Industrial and Applied Mathematics, 2003-2007; 2008-2011.

President, Association for Women in Mathematics, 2005-6 (President-elect 2004, Past President 2007)

Chair, Section A (Mathematics) AAAS, February 22, 2005 - February 20, 2006 (Chair-elect, February 17, 2004 - February 21, 2005; Retiring Chair February 21, 2006 - February 19, 2007)

Member, The Brockhouse Prize of Canada Selection Committee, 2004.

Member, Board of Directors, MITACS NCE (Mathematics of Information Technology and Complex Systems, Network of Centres of Excellence), 2004 - 2008.

Member, Board of Directors, NPCDS (National Program in Complex Data Structures), 2004 - 2008.

Member, Board of Directors, AARMS (Atlantic Association for Research in the Mathematical Sciences), 2005 - 2008.

Member, Science Foundation Ireland Mathematics Initiative 2006 Panel Review Committee, April, 2006.

Member, Connaught Award Review Committee, University of Toronto, 2006 - 2008.

Member, Collatz Prize Committee, ICIAM, 2006.

Member, Committee to review the proposal to establish a Mathematics Research Institute in Spain, 2007.

Chair, NSERC Site Visit Review Committee (MRS Biogeosciences Centre Grant Application) January, 2009.

RESEARCH SUPPORT (since 2000):

Texas Advanced Research Program Grant, 2002-2003

DOE, Office of Energy Research, Grants 2000-2003; 2003-2006

National Science Foundation, POWRE Grant (Professional Opportunities for Women in Research and Education) 1999-2000

National Science Foundation, Standard Grant, 2003-2006 (transferred to Richard Sanders)

NSERC of Canada, Operating Grant, 2005-2010.

National Science Foundation, Standard Grant, 2008-2011 (with Katarina Jegdic).

DOE, Office of Energy Research, Grant 2008-2011 (with Allen Tesdall).

Texas Advanced Research Program Grant, 2008-2010 (transferred to Cleopatra Christoforou).

ORGANIZATIONS:

American Mathematical Society

Society for Industrial and Applied Mathematics

American Association for the Advancement of Science

Association for Women in Mathematics

Sigma Xi

Phi Kappa Phi

Canadian Mathematical Society

Canadian Applied and Industrial Mathematics Society

REVIEWER (selected):

NSF
 Communications on Pure and Applied Mathematics
 Duke Mathematics Journal
 Electronic Journal of Differential Equations
 IMA Journal of Applied Mathematics
 Journal of Fluid Mechanics
 Proceedings of the AMS
 SIAM Journal on Mathematical Analysis
 Zeitschrift für Angewandte Mathematik und Physik
 Austrian Science Fund
 Cambridge University Press
 Canada Research Chairs
 Civilian Research and Development Foundation
 Environmental Institute of Houston
 Handbook of Fluid Dynamics
 NSERC of Canada
 Science Foundation of Ireland
 Journal of Hyperbolic Differential Equations
 EPSRC of the United Kingdom
 Ryerson University Mathematics Department Undergraduate Program

PUBLICATIONS: Chapters in Books:

1. B. L. Keyfitz, ‘Hold that Light! Modeling of Traffic Flow by Differential Equations’, in *Six Themes on Variations*, (R. Hardt and R. Forman, eds), American Mathematical Society, 2005.

Books edited:

2. B. L. Keyfitz and H. C. Kranzer, eds., *Nonstrictly Hyperbolic Conservation Laws*, Contemporary Mathematics, **60**, American Mathematical Society, Providence, 1987.
3. B. L. Keyfitz and M. Shearer, eds., *Nonlinear Evolution Equations that Change Type*, IMA Series Volume **27**, Springer Verlag, 1990.

Publications in Refereed Journals:

4. B. L. Keyfitz, ‘Solutions with shocks: an example of an L^1 contractive semi-group’, *Comm. Pure Appl. Math.* **XXIV**, (1971), 125-132.
5. E. Brodheim, C. Derman, and B. L. Keyfitz, ‘On the stationary probabilities for a certain class of denumerable Markov chains’, *Jnanabha*, (Sec. A), **4**, (1974), 93-103.
6. B. L. Keyfitz, Appendix to ‘On finite difference approximations and entropy conditions for shocks’, by A. Harten, J. M. Hyman and P. D. Lax, *Comm. Pure Appl. Math.* **XXIX**, (1976), 297-322.

7. B. L. Keyfitz, R. E. Melnik and B. Grossman, 'An analysis of the leading-edge singularity in transonic small-disturbance theory', *Quarterly Journal of Mechanics and Applied Mathematics*, **XXXI**, (1978), 137-155.
8. B. L. Keyfitz and H. C. Kranzer, 'Existence and uniqueness of entropy solutions to the Riemann problem for hyperbolic systems of two nonlinear conservation laws', *Journal of Differential Equations*, **27**, (1978), 444-476.
9. B. L. Keyfitz, R. E. Melnik and B. Grossman, 'The leading-edge singularity in transonic small-disturbance theory: numerical resolution', *AIAA Journal*, **17**, (1979), 296-299.
10. B. L. Keyfitz and H. C. Kranzer, 'A system of hyperbolic conservation laws arising in elasticity theory', *Arch. Rat. Mech. Anal.*, **72**, (1980), 219-241.
11. M. Golubitsky and B. L. Keyfitz, 'A qualitative study of the steady-state solutions for a continuous flow stirred tank chemical reactor', *SIAM J. Math. Anal.*, **11**, (1980), 316-339.
12. M. Golubitsky, B. L. Keyfitz and D. Schaeffer, 'A singularity theory analysis of a thermal-chainbranching model for the explosion peninsula', *Comm. Pure Appl. Math.*, **34** (1981), 433-463.
13. B. L. Keyfitz, 'Bounds for viscosity profiles for 2×2 systems of conservation laws', *Rocky Mountain Math. J.*, **12**, (1982), 225-231.
14. B. L. Keyfitz and H. C. Kranzer, 'The Riemann problem for a class of hyperbolic conservation laws exhibiting a parabolic degeneracy', *Journal of Differential Equations*, **47**, (1983), 35-65.
15. B. L. Keyfitz and H. J. Kuiper, 'Bifurcation resulting from changes in domain in a reaction diffusion equation', *Journal of Differential Equations*, **47**, (1983), 378-405.
16. V. Balakotaiah, D. Luss and B. L. Keyfitz, 'Steady state multiplicity analysis of lumped parameter systems described by a set of algebraic equations', *Chem. Eng. Commun.* **36**, (1985), 121- 147.
17. B. L. Keyfitz, 'Classification of one state variable bifurcation problems up to codimension seven', *Dynamics and Stability of Systems*, **1**, (1986), 1-41.
18. P. Chossat, M. Golubitsky and B. L. Keyfitz, 'Hopf-Hopf mode interaction with $O(2)$ symmetry', *Dynamics and Stability of Systems*, **1**, (1986), 255-292.
19. B. L. Keyfitz, 'Change of type in three-phase flow: a simple analogue', *Journal of Differential Equations*, **80**, (1989), 280-305.
20. B. L. Keyfitz and G. G. Warnecke, 'The existence of viscous profiles for transonic shocks', *Communications in Partial Differential Equations*, **16**, (1991) 1197-1221.
21. B. L. Keyfitz, 'Admissibility conditions for shocks in systems that change type', *SIAM Jour of Math An.*, **22**, (1991), 1284-1292.

22. B. L. Keyfitz and M. C. Lopes Filho, 'A geometric study of shocks in equations that change type', *Journal of Dynamics and Differential Equations*, **6**, (1994), 351-393.
23. B. L. Keyfitz and H. C. Kranzer, 'Spaces of weighted measures for conservation laws with singular shock solutions', *Journal of Differential Equations*, **118**, (1995), 420-451.
24. B. L. Keyfitz, 'A geometric theory of conservation laws which change type', *Zeitschrift für Angewandte Mathematik und Mechanik*, **75**, (1995), 571-581.
25. S. Čanić and B. L. Keyfitz, 'An Elliptic Problem Arising from the Unsteady Transonic Small Disturbance Equation', *Journal of Differential Equations*, **125**, (1996), 548-574.
26. S. Čanić and B. L. Keyfitz, 'A Smooth Solution for a Keldysh Type Equation', *Communications in Partial Differential Equations*, **21**, (1996), 319-340.
27. B. L. Keyfitz and N. Keyfitz, 'The McKendrick Partial Differential Equation and its Uses in Epidemiology and Population Study', *Mathematical and Computer Modelling*, **26**, (1997), 1-9.
28. S. Čanić and B. L. Keyfitz, 'Riemann Problems for the Two-Dimensional Unsteady Transonic Small Disturbance Equation', *SIAM Journal on Applied Mathematics*, **58**, (1998), 636-665.
29. S. Čanić and B. L. Keyfitz, 'Quasi-One-Dimensional Riemann Problems and Their Role in Self-Similar Two-Dimensional Problems', *Archive for Rational Mechanics and Analysis*, **144**, (1998), 233-258.
30. S. Čanić, B. L. Keyfitz and G. M. Lieberman, 'A Proof of Existence of Perturbed Steady Transonic Shocks via a Free Boundary Problem', *Communications on Pure and Applied Mathematics*, **53** (2000), 484-511.
31. S. Čanić, B. L. Keyfitz, and E. H. Kim, 'Free Boundary Problems for the Unsteady Transonic Small Disturbance Equation: Transonic Regular Reflection', *Methods and Applications of Analysis*, **7**, (2000), 313-336.
32. S. Čanić, B. L. Keyfitz, and E. H. Kim, 'A Free Boundary Problem for a Quasilinear Degenerate Elliptic Equation: Regular Reflection of Weak Shocks', *Communications on Pure and Applied Mathematics*, **55** (2002), 71-92.
33. S. Čanić, B. L. Keyfitz, and E. H. Kim, 'Mixed Hyperbolic-Elliptic Systems in Self-Similar Flows', *Boletim da Sociedade Brasileira de Matemática*, **32** (2002), 1-23.
34. B. L. Keyfitz, R. Sanders and M. Sever, 'Lack of Hyperbolicity in the Two-Fluid Model for Two-Phase Incompressible Flow', *Discrete and Continuous Dynamical Systems - B*, **3** (2003), 541-563.
35. B. L. Keyfitz, M. Sever and F. Zhang, 'Viscous Singular Shock Structure for a Nonhyperbolic Two-Fluid Model', *Nonlinearity*, **17** (2004), 1731-1747.

36. B. L. Keyfitz, ‘Self-Similar Solutions of Two-Dimensional Conservation Laws’, *Journal of Hyperbolic Differential Equations*, **1** (2004), 445-492.
37. S. Čanić, B. L. Keyfitz and E. H. Kim, ‘Free Boundary Problems for Nonlinear Wave Equations: Mach Stems for Interacting Shocks’, *SIAM Journal on Mathematical Analysis*, **37** (2005), 1947-1977.
38. K. Jegdić, B. L. Keyfitz and S. Čanić, ‘Transonic regular reflection for the nonlinear wave system’, *Journal of Hyperbolic Differential Equations*, **3** (2006) 443-474.
39. A. Tesdall, R. Sanders and B. L. Keyfitz, ‘The Triple Point Paradox for the Nonlinear Wave System’, *SIAM Journal on Applied Mathematics*, **67** (2006), 321-336.
40. B. L. Keyfitz, ‘The Fichera Function and Nonlinear Equations’, *Rendiconti Accademia delle Scienze dei XL, Memorie di Matematica e Applicazioni*, **XXX** (2006), 83-94.
41. A. Tesdall, R. Sanders and B. L. Keyfitz, ‘Self-similar Solutions for The Triple Point Paradox in Gas Dynamics’, *SIAM Journal on Applied Mathematics*, **68** (2008), 1360-1377.

Refereed Conference Proceedings:

42. B. L. Keyfitz, ‘A criterion for certain wave structures in systems that change type’, in *Current Progress in Hyperbolic Systems: Riemann Problems and Computations*, (B. Lindquist, ed), *Contemporary Mathematics*, **100**, Amer. Math. Soc., Providence, 1989, 203-213.
43. B. L. Keyfitz, ‘Change of type in simple models of two-phase flow’, in *Viscous Profiles and Numerical Approximation of Shock Waves*, (M. Shearer, ed), SIAM, Philadelphia, 1991, 84-104.
44. B. L. Keyfitz, ‘Conservation laws that change type and porous medium flow: a review’, in *Modeling and Analysis of Diffusive and Advective Processes in Geosciences*, (W. E. Fitzgibbon and M. F. Wheeler, eds), SIAM, Philadelphia, 1992, 122-145.
45. B. L. Keyfitz, ‘Multiphase saturation equations, change of type and inaccessible regions’, in *Proceedings of the 1992 Oberwolfach Conference on Porous Media* (J. Douglas and U. Hornung, eds), Birkhäuser, Int. Ser. of Num. Math, **114**, 103-116.
46. B. L. Keyfitz and M. Lopes, ‘How to use symmetry to find models for multidimensional conservation laws’, in *Proceedings of AMS/SIAM Summer Seminar on Exploiting Symmetry in Applied and Numerical Analysis* (E. L. Allgower, K. Georg and R. Miranda, eds), AMS, Lectures in Applied Mathematics, **29** (1993), 273-284.
47. S. Čanić, B. L. Keyfitz and David H. Wagner, ‘A Bifurcation Diagram for Oblique Shock Interactions in the Unsteady Transonic Small Disturbance Equation’, in *Proceedings of the Fifth International Conference on Hyperbolic Problems: Theory, Numerics and Applications* (J. Glimm, M. J. Graham, J. W. Grove and B. J. Plohr, eds), World Scientific, Singapore, 1996, 178-187.

48. S. Čanić and B. L. Keyfitz, ‘Oblique Shock Interactions and the von Neumann Paradox’, in *Proceedings of 20th International Conference on Shock Waves, Volume I*, (B. Sturtevant, J. E. Schepherd and H. G. Hornung, editors) World Scientific, Singapore, 1996, 435-440.
49. S. Čanić and B. L. Keyfitz, ‘A Useful Class of Two-Dimensional Conservation Laws’, *Proceedings of ICIAM 95: Supplement 2: Applied Analysis*, Mathematical Research, Vol. 87, eds. K. Kirchgässner, O. Mahrenholtz and R. Mennicken, Akademie Verlag Berlin, ZAMM, 1996, 133-136.
50. B. L. Keyfitz and C. A. Mora, ‘Prototypes for Nonstrict Hyperbolicity in Conservation Laws’, *Nonlinear PDEs, Dynamics and Continuum Physics*, (Jerry Bona, Katarzyna Saxton and Ralph Saxton, editors), American Mathematical Society, Providence, 2000, 125-137.
51. S. Čanić, B. L. Keyfitz, and E. H. Kim, ‘Weak Shock Reflection Modeled by the Unsteady Transonic Small Disturbance Equation’, *Proceedings of the Eighth International Conference on Hyperbolic Problems*, (Heinrich Freistühler and Gerald G. Warnecke, editors), Birkhäuser, Basel, 2002, 217-226.
52. K. Jegdić, B. L. Keyfitz and S. Čanić, ‘Transonic regular reflection for the Unsteady Transonic Small Disturbance Equation - details of the subsonic solution’, *Free and Moving Boundaries: Analysis, Simulation and Control*, (Roland Glowinski and Jean Paul Zolesio, editors), CRC Press, Boca Raton, 2008, to appear.
53. B. L. Keyfitz, ‘First Order Partial Differential Equations’, *Proceedings of Workshop, International Centre for Mathematical and Computer Sciences*, October 2007 (Abuja, Nigeria), ed C. R. Nwozo. To appear.

Unrefereed Conference Proceedings:

54. M. Golubitsky, B. L. Keyfitz and D. Schaeffer, ‘A singularity theory approach to qualitative behavior of complex chemical systems’, in *New Approaches to Nonlinear Problems in Dynamics*, (Philip Holmes, ed.) SIAM, Philadelphia, 1980, 257-270.
55. B. L. Keyfitz and H. C. Kranzer, ‘Non-strictly hyperbolic systems of conservation laws: formation of singularities’, in *Nonlinear Partial Differential Equations*, (Joel A. Smoller, ed.) Contemporary Mathematics, **17**, Amer. Math. Soc., Providence, 1983, 77-90.
56. B. L. Keyfitz, ‘The Riemann problem for nonmonotone stress-strain functions: a “hysteresis” approach’, in *Nonlinear Systems of Partial Differential Equations in Applied Mathematics*, (B. Nicolaenko, ed.) Lectures in Appl. Math. **23**, (1986), Amer. Math. Soc., Providence, 379-395.
57. B. L. Keyfitz, M. Golubitsky, M. Gorman and P. Chossat, ‘The use of symmetry and bifurcation techniques in studying flame stability’, in *Reacting Flows: Combustion and Chemical Reactors*, Part 2, (G.S.S. Ludford, ed.), Lectures in Appl. Math. **24**, (1986), Amer. Math. Soc., Providence, 293-325.

58. B. L. Keyfitz, 'Some elementary connections among nonstrictly hyperbolic conservation laws,' in *Nonstrictly Hyperbolic Conservation Laws*, (B. L. Keyfitz and H. C. Kranzer, eds.), Contemporary Mathematics, **60**, Amer. Math. Soc., Providence, 1987, 67-77.
59. B. L. Keyfitz, 'A survey of nonstrictly hyperbolic conservation laws,' in *Nonlinear Hyperbolic Problems*, (C. Carasso, J. P. Raviart and D. Serre, eds) Lecture Notes in Math, **1270**, Springer, Berlin, 1987, 152-162.
60. B. L. Keyfitz, 'An analytic model for change of type in three-phase flow,' in *Numerical Simulation in Oil Recovery*, (M. F. Wheeler, ed), **IMA Vol 11**, Springer, New York, 1988, 149-160.
61. B. L. Keyfitz and H. C. Kranzer, 'A viscous approximation to a system of conservation laws with no classical Riemann solution', in *Nonlinear Hyperbolic Problems* (C. Carasso, ed), Springer, LNM **1402**, 1989, 185-197.
62. B. L. Keyfitz, 'The use of vectorfield dynamics in formulating admissibility conditions for shocks in systems that change type', in *Problems Involving Change of Type*, (K. Kirchgassner, ed), Springer Lecture Notes in Physics **359**, 1990, 141-150.
63. B. L. Keyfitz, 'Shocks near the sonic line: a comparison between steady and unsteady models for change of type', in *Nonlinear Evolution Equations that Change Type*, (B. L. Keyfitz and M. Shearer, eds), IMA **27**, Springer, 1990, 89-106.
64. H. C. Kranzer and B. L. Keyfitz, 'A strictly hyperbolic system of conservation laws admitting singular shocks', in *Nonlinear Evolution Equations that Change Type*, (B. L. Keyfitz and M. Shearer, eds), IMA **27**, Springer, 1990, 107-125.
65. K. A. Ames and B. L. Keyfitz, 'Stability of shocks in systems that change type: the linear approximation', in *Third International Conference on Hyperbolic Problems: Theory, Numerical Methods and Applications*, (B. Engquist and B. Gustaffson, eds), Chartwell-Bratt-Studentlitteratur, Lund, 1991, 36-47.
66. B. L. Keyfitz, 'Conservation Laws, Delta Shocks and Singular Shocks', in *Nonlinear Theory of Generalized Functions*, (M. Grosser, G. Hörmann, M. Kunzinger, and M. Oberguggenberger, eds), Chapman & Hall/CRC Press, Boca Raton, 1999, 99-111.
67. B. L. Keyfitz, 'Mathematical Properties of Nonhyperbolic Models for Incompressible Two-Phase Flow', Proceedings of 4th International Conference On Multiphase Flow (E. Michaelides ed.), New Orleans, 2001 (CD-ROM).
68. S. Čanić, B. L. Keyfitz, and E. H. Kim, 'Self-Similar Problems in Multidimensional Conservation Laws', Proceedings of IC-SEC Conference on Recent Advances in Computational Science and Engineering, Singapore, December, 2002.

Technical Reports:

69. B. L. Keyfitz, R.E. Melnik, and B. Grossman, 'The leading edge singularity in transonic small-disturbance theory', Grumman Research Department Report RE-525, 1976.

70. B. L. Keyfitz, R.E. Melnik, and B. Grossman, ‘Analytic and numerical solutions of the transonic small-disturbance equation in the vicinity of a blunt leading edge’, AIAA paper 77-676, 1977.
71. B. L. Keyfitz, ‘Hopf-Hopf mode interaction in a circular porous plug burner flame: modeling and analysis using activation energy asymptotics’, preprint, 1988.
72. B. L. Keyfitz and H. C. Kranzer, ‘A system of conservation laws with no classical Riemann solution’, UH Math Department Research Report UH/MD-86, 1990.
73. V. Vinod and B. L. Keyfitz, ‘Godunov’s nonuniqueness example: a proof that the construction fails’, UH Math Department Research Report UH/MD-117, 1991.
74. B. L. Keyfitz, ‘Development of singularities in Riemann invariants’, UH Math Department Research Report UH/MD-129, 1992.
75. B. L. Keyfitz, ‘The Legacy of Olga Oleĭnik in Hyperbolic Conservation Laws’, extended abstract, 2006. Published online at <http://topo.math.auburn.edu/pub/201gas-proceedings/>.

Book Reviews:

76. Review of *Nonlinear Deformation Waves*, Nigul and Engelbrecht, eds, in *Applied Mechanics Reviews*, 1985.
77. Review of *Shock Waves and Reaction Diffusion Equations*, by J.A. Smoller, in *American Math. Monthly*, **93**, (1986), 315-318.
78. Review of *Systems of Conservation Laws: Two-Dimensional Riemann Problems*, by Yuxi Zheng, in *SIAM Review*, **46**, (2004), 171-174.

Professional Nontechnical Writing:

79. B. L. Keyfitz, ‘A Welcome to MexSIAM’, *SIAM News*, November, 2001.
80. B. L. Keyfitz, ‘MexSIAM Takes Lead in Forging Links Between Mexican and U. S. Researchers’, *SIAM News*, January/February 2003.
81. Carolyn Gordon and B. L. Keyfitz, ‘Women in Academia: Are We Asking the Right Questions?’, *AMS Notices*, August 2004, 784-786.
82. Susan Friedlander and B. L. Keyfitz, ‘Olga Ladyzhenskaya and Olga Oleinik: two great women mathematicians of the 20th Century’, *LA GACETA DE LA RSME*, Vol. 7.3 (2004), 621-628 (reprinted in *AWM Newsletter*, **35 #3** May-June 2005, 20-24).
83. B. L. Keyfitz, ‘President’s Report’, *AWM Newsletter*, Volume 35 (2005) # 2 March-April; # 3 (‘New Look = Old Look’) May-June; #4 (‘Congratulations All Around’) July-August; #5 (‘Workshops, Workshops’) September-October; #6 (‘What is the Right Number of Women?’) November-December; Volume 36 (2006) #1 (‘The Year in Review’) January-February; #2 (‘Hidden Help’) March-April; # 3 (‘Advice Column’) May-June; # 4 (‘AWM and World Affairs’) July-August; # 5 (‘Leadership’) September-October; # 6 (‘Women Doing Mathematics Internationally’) November-December; Volume 37 (2007) #1 (‘Thanks to All’) January-February.

84. B. L. Keyfitz, 'Change and Challenge', University of Toronto, Mathematics Newsletter, February 2005.
85. B. L. Keyfitz, 'Women (and Men) in Science: How to Ask the Wrong Questions', PIMS Newsletter, Fall 2005.
86. B. L. Keyfitz, *Message from the Director* column, *FieldsNotes*, Volume 5 #1 ('Hello') September 2004; #2 ('People') January 2005; #3 ('Existence Proofs') May 2005; Volume 6 #1 ('Enjoying the AGM') September 2005; #2 ('The Fields Institute and the Real World') January 2006; #3 ('From the Director') May 2006; Volume 7 #1 ('The ICM') September 2006; #2 ('Envelopes and Stamps') January 2007; #3 ('A Boon for the Mathematical Community') May 2007; Volume 8 #1 ('ICIAM 07 and Applied Mathematics') September 2007; #2 ('Happy New Programs') January 2008; #3 ('Message from the Director') May 2008; Volume 9 #1 ('Getting the Most out of Fields') September 2008.
87. B. L. Keyfitz, 'Mathematics and industry: an interdisciplinary perspective', *Madrid Intelligencer, International Congress of Mathematicians, Madrid 2006*, (F. Chamizo and A. Quirós, eds.), Springer, New York, 2006. (Translated into Spanish in *Boletín de la Sociedad Española de Matemática Aplicada* **37** (2006) 123-132.)
88. Interview in P. C. Kenshaft, *Change Is Possible*, AMS Providence, 2005, p. 178.
89. 'Women Mathematicians in the Academic Ranks: A Call to Action', report of the 2006 BIRS workshop on Women and Mathematics; published online <http://math.uh.edu/blk/blkp.html> (2007).

ADDITIONAL INFORMATION:

Postdoctoral Visitors:

- Milton da Costa Lopes Filho, 1990-1992. (Current position, Professor, Campinas University, Brazil.)
- Sunčica Čanić, 1992-1993. (Current position, Professor, University of Houston.)
- Eun Heui Kim, 1999-2001. (Current position, Associate Professor, California State University, Long Beach.)
- Fu Zhang, 2002-2004. (Current position unknown.)
- Katarina Jegdic, 2004-2006 (Current position, Assistant Professor, University of Houston, Downtown.)
- Allen Tesdall, 2004-2006 (Current position, Assistant Professor, College of Staten Island.)
- Mary Chern (Fields Institute), 2007-2008.
- Kehinde Ladipo (Fields Institute), 2008.

PhD Students Supervised:

- Vaidyanath Vinod; Ph.D. December, 1992. (Employed in industry)
- Zhang Zhuang Zhi; Ph.D. August, 1997. (Employed in industry)

Andrea Reiff; Ph.D. December, 1997. (National Security Agency)

MS Students Supervised:

John Alford (tutorial), 1992-1993.
 Hea Chung (tutorial), 1993-1994.
 Annette Goodreau (tutorial), 1994-1995.
 Charles Burrus (tutorial), 1994-1995.
 Claudia Mora (tutorial), 1995-1996.

Undergraduate Students Supervised:

Jason Graham (senior project), 2003-2004; *A Study of Stability in Differential-Delay Equations* (MS Southern Methodist, 2007; now in PhD program, University of Iowa)

Department, College and University Committees (since 2000):

(Houston) Department of Mathematics, Promotion and Tenure Committee, 1987-2008; chair, 2001-2003
 (Houston) Department of Mathematics, Graduate Studies Committee, Member, 2000-2004
 (Houston) Department of Mathematics, Executive Committee, 1989-1999, 2001-2002, 2003-2004.
 (Houston) Department of Mathematics, Colloquium and Seminars Committee, 1989-2004.
 (Houston) Department of Mathematics, Bylaws Committee, 2000
 (Houston) Department of Mathematics, VIGRE Proposal Committee, 2000-2001.
 (Houston) NSM College Policy Committee, 2001-2003; chair 2002-2003.
 University of Houston, Committee on the Status of Women, 1997-1999, 2001-2003
 (OSU) Mathematics Department Recruitment Committee, 2008-09.
 (OSU) Mathematics Department CENT (Promotion and Tenure) Deliberating Body, 2009-.
 (OSU) Mathematics Department Centenary Celebration Planning Committee, 2008-09.

Conference, Colloquium and Seminar Talks (2004):

Panel member, AWM Workshop, Joint Mathematics Meetings, January 10, 2004; *Shaping a Career*.

Invited talk, workshop on Schemes for the multidimensional structure of hyperbolic systems, Technical University of Hamburg, March 1-5, 2004; *Pattern and Paradox: Shock Interactions in the Nonlinear Wave System*.

Invited talk, Midwest PDE Seminar, March 19-21, 2004; *Hyperbolic conservation laws, degenerate elliptic equations and free boundary problems*.

Colloquium, University of Akron, April 16, 2004; *Multidimensional Conservation Laws: How to Solve Hyperbolic Problems with Elliptic Methods*.

Banquet speaker, Pi Mu Epsilon, University of Akron, April 16, 2004; *101 Things You Can Do With a Degree in Mathematics*.

Invited lecture, International Conference on Mechanics and PDEs, on the occasion of the sixtieth birthday of Marshall Slemrod, Madison, April 29-May 2, 2004; *Multidimensional Conservation Laws*.

Panel member, AWM Workshop, SIAM Annual Meeting, Portland, July 12-16, 2004; *Career Questions and Potential Options*.

CRM Distinguished Lecture Series talk, Ottawa University, Ottawa, September 10, 2004; *Why Are Multidimensional Conservation Laws So Difficult?*

Colloquium, York University, Toronto, October 7, 2004; *Why Are Multidimensional Conservation Laws So Difficult?*

PDE/Analysis/Applied Math Seminar, University of Toronto, November 1, 2004; *Hyperbolic conservation laws, degenerate elliptic equations and free boundary problems*.

Invited talk, IFIP WG 7.2 Conference on Free and Moving Boundaries: Analysis, Simulation and Control, Houston, TX, December 2-4, 2004; *A Free Boundary Problem arising in Multidimensional Conservation Laws*.

Minisymposium talk, SIAM Conference on Analysis of Partial Differential Equations, Houston, TX December 6-8, 2004; *Balance Laws and Lack of Hyperbolicity in Two-Fluid Models*.

Conference, Colloquium and Seminar Talks (2005):

Invited lecture, PASI Americas VI meeting on Non Linear Analysis and Differential Equations, Santiago, Chile, Jan 17-21, 2005; *Self-Similar Solutions of Two-Dimensional Conservation Laws*.

Colloquium, McMaster University, Hamilton, January 28, 2005; *Why Are Multidimensional Conservation Laws So Difficult?*

Colloquium, University of Toronto, February 2, 2005; *Challenges in Conservation Laws*.

Undergraduate Talk, University of Toronto, April 12, 2005; *Can partial differential equations help when you are stuck in traffic?*

Krieger-Nelson Prize Lecture, CMS Summer Meeting, Waterloo, June 4-6, 2005; *Hyperbolic Conservation Laws: Past and Future*.

Presidential Address, 33rd Annual Meeting, Statistical Society of Canada, Saskatoon, June 12-15, 2005; *Deterministic and Statistical Models for Turbulence: What Could Burgers Have Said to Kolmogorov?*

Mentoring lecture, *Connecting Women in Mathematics Across Canada* Workshop, Banff, July 21-23, 2005; *My Career: a Tour of Applied Analysis*.

Invited talk, Frontiers of Applied Analysis - A Conference in the Occasion of the 15th Anniversary of the CNA, Carnegie-Mellon University, September 8-10, 2005 *Can self-similar problems tell us anything about multi-dimensional conservation laws?*

Syncrude/PIMS/AMI Lecture, University of Alberta, Edmonton, September 23, 2005; *Hyperbolic Conservation Laws: Do We Need Proofs?*

Applied Math/Women in Math Colloquium, University of Waterloo, Waterloo, September 30, 2005; *Hyperbolic Conservation Laws: Do We Need Proofs?*

Invited talk, Conference on Differential Equations: From Theory to Computational Science and Engineering, in honor of Rolf Jeltsch's 60th birthday, ETH-Zurich, October 20-22, 2005; *Multidimensional Conservation Laws: Can Analysis and Numerical Methods be Friends?*

Panel member, McMaster School of Computational Engineering and Science media rountable, Fields Institute, Toronto, November 9, 2005.

Invited talk, First East Asia SIAM Symposium and Second International conference on Scientific Computing and Partial Differential Equations, Hong Kong, December 12-16, 2005; *Why Are Multidimensional Conservation Laws So Difficult?*

Conference, Colloquium and Seminar Talks (2006):

Panel member, Workshop for Women Graduate Students and Recent PhDs, Joint Mathematics Meetings, San Antonio, January 15, 2006.

Plenary speaker, FRG meeting on Multidimensional Conservation Laws, University of Houston, March 1-5, 2006; *Self-Similar Solutions*.

Colloquium, University of Michigan, March 28, 2006; *Why Are Multidimensional Conservation Laws So Difficult?*

Invited speaker, Shanghai Forum on Industrial and Applied Mathematics, Fudan University, May 25, 2006; *Multidimensional Gas Dynamics*

Invited speaker, Conference on Advances in PDE in honor of the eightieth birthdays of Peter Lax and Louis Nirenberg, Toledo, Spain, June 7-10, 2006; *Some interesting questions in multidimensional conservation laws*.

Joint Plenary speaker, Analysis of PDE Conference and Topical speaker, SIAM Annual Meeting, Boston, July 9-12, 2006; *Multidimensional Conservation Laws*.

AARMS Distinguished Lecturer (3 talks), University of New Brunswick (October 16), Memorial University of Newfoundland (October 18), and Dalhousie University (October 20), 2006; *Multidimensional Conservation Laws - More Questions than Answers*

Panel Co-chair, BIRS Workshop on Hyperbolic Conservation Laws, Banff, October 29 - November 2, 2006; *Conservation Laws: Open Problems and Perspectives*.

Colloquium, Worcester Polytechnic Institute, Worcester, December 1, 2006; *Multidimensional Conservation Laws - More Questions than Answers*

Panel member, workshop on *Connecting Women in Mathematics Across Canada*, Fields Institute, Toronto, December 7-8, 2006.

Conference, Colloquium and Seminar Talks (2007):

Panelist, Project NExT session, Joint Mathematics Meetings, New Orleans, January 7, 2007; *Expanding One's Research Horizons after the PhD*.

Colloquium, Northwestern University, Evanston, January 19, 2007.

Plenary speaker, Ninth Annual Nebraska Conference for Undergraduate Women in Mathematics, Lincoln, February 9-11, 2007; *Three ways to look at conservation laws*.

Seminar, Applied Mathematics, CRM-UdM, Montreal, March 26, 2007; *Multidimensional Conservation Laws - More Questions than Answers*.

Colloquium, University of Texas Arlington, March 30, 2007.

Invited Speaker, FRG Meeting on Multidimensional Conservation Laws, Stanford, June 26-30, 2007.

Invited speaker, International Congress on Industrial and Applied Mathematics, Zurich, 16-20 July, 2007; *Hyperbolic Conservation Laws: Past and Future*.

Conference speaker, International Centre for the Mathematical and Computer Sciences, Abuja, Nigeria, 8-12 October, 2007.

Plenary Speaker, Southeast Atlantic Regional Conference on Differential Equations (SEARCDE), October 19-20, 2007; *Hyperbolic conservation laws: more questions than answers*.

Week-long visitor, Thematic Program in Mathematical Frontiers in Fluid Mechanics, TATA INSTITUTE OF FUNDAMENTAL RESEARCH, Bangalore, November 2007.

Special Session, SIAM APDE Activity Group meeting, Mesa AZ, December 10-12; *Shocks, Rarefactions and Triple Points in Multidimensional Conservation Laws*.

Conference, Colloquium and Seminar Talks (2008):

Colloquium, University of Manitoba, February 28, 2008.

Seminar, Simon Fraser University, April 11, 2008; *Hyperbolic Conservation Laws: The Next Generation*.

PIMS seminar, Vancouver, May 2, 2008; *Hyperbolic Conservation Laws: The Next Generation*.

Keynote speaker, 2008 Vivien M. Srivastava Career Mentoring Workshop, University of British Columbia, May 3, 2008; *Applied Analysis: In Mathematics, and in Life*.

Invited speaker, conference on ‘Perspectives in Numerical Analysis, TKK’, in honour of Olavi Nevanlinna and Juhani Pitkäranta, Helsinki University of Technology, May 27-29, 2008; *Multidimensional Conservation Laws: Speaking of Numerical Methods*.

Speaker in Special Session on Conservation Laws, Canada-France meeting, 2-6 June, 2008.

Speaker, Canadian Undergraduate Mathematics Conference 2008, Toronto, July 9-12, 2008; *Analysis and modelling with nonlinear partial differential equations; or how I became resigned to waiting at traffic lights*.

Invited Speaker, VIGRE Conference on Partial Differential Equations and their Applications, University of Iowa, Iowa City, July 25-27, 2008; *Analysis and modelling with nonlinear partial differential equations; or how I became resigned to waiting at traffic lights*.

Seminar, Maxwell Institute’s Centre of Analysis and Nonlinear PDEs, September 5, 2008; *Hyperbolic Conservation Laws — Past and Future*.

Seminar, Loughborough University, September 10, 2008; *Hyperbolic Conservation Laws — Past and Future*.

Invited Speaker, International Conference on Infinite Dimensional Dynamical Systems York University, Toronto Sept. 24-28, 2008; *The Trouble with Conservation Laws*.

- Seminar, Applied math/PDE/Analysis, University of Toronto, November 14, 2008; *Self-similar multidimensional conservation laws: the sonic line as a free boundary*.