BARBARA LEE KEYFITZ
Department of Mathematics
The Ohio State University
Columbus, Ohio 43210-1174
March 27, 2014

PERSONAL:

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

Address: 300 West Spring Street, Unit 1604 PHONE: (614) 292-5583 (Office)
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 - .
Dr. Charles Saltzer Professor, The Ohio State University, October 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.
Dr. Charles Saltzer Professor of Mathematics, The Ohio State University, October 2009 - .
Honorary Doctor of Mathematics Degree and Convocation Speaker, University of Waterloo, June 2010.
SIAM Fellow, July 2010.
Selected as 33rd Noether Lecturer by the Association for Women in Mathematics, January 2012.
Selected as 2012 AWM-SIAM Kovalevsky Lecturer by AWM and SIAM, July 2012.
Awarded 2012 SIAM Prize for Distinguished Service to the Profession, July 2012.
AMS Fellow, September 2012.
Fields Institute Fellow, June 2013.

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 - 2009.
Editorial Board, Chinese Journal of Engineering Mathematics, 2007 - .
Mathematical Reviews Editorial Committee (AMS), 2010 - 2018.

ORGANIZING COMMITTEES (since 2005):

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.

Co-organizer, with Kevin Payne, of Special Session on 'Partial Differential Equations of Mixed Elliptic-Hyperbolic Type and Applications', AMS Sectional Meeting, Penn State, October 24-25, 2009.

Member, Organizing Committee, NAMIAM (First Joint CAIMS-SIAM-SMM Meeting on Applied Mathematics), Huatulco, Mexico, December 8-10, 2010.

Member, Scientific Advisory Committee, ICM Satellite Conference, 'Mathematics in Science and Technology', New Delhi, August 15-17, 2010.

Member, Scientific Committee, International Conference on Applied Mathematics, Modeling and Computational Science (AMMCS-2011), Waterloo, July 25 - 29, 2011.

Co-organizer (with Katarina Jegdic) of session, 'Conservation laws – analytical and numerical approaches', at *40 Years and Counting: AWM's Celebration of Mathematics* meeting at Brown University, September 17-18, 2011.

Co-organizer (with Charis Tsikkou), Special Session, 'Hyperbolic Conservation Laws and Related Topics', JMM 2012, Boston MA, January 2012.

Member, Scientific Committee, "International Conference on Conservation Laws and Applications", 1-3 July 2013, Tata Institute of Fundamental Research - Center for Applicable Mathematics, Bangalore.

Member, Scientific Committee, International Conference on Hyperbolic Problems (HYP2014), Rio de Janeiro, Brazil, July 28 - August 4, 2014.

PROFESSIONAL SERVICE (National and International, since 2009):

Treasurer, International Council for Industrial and Applied Mathematics, 2003-2010.

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

Appraisal committee for Ontario Council on Graduate Studies review of Applied Mathematics graduate program, University of Western Ontario, April, 2009.

Reviewer for Symposium Proposals, American Association for the Advancement of Science, May, 2009.

Member, CRM Scientific Advisory Committee, June 1, 2009 - May 31, 2014.

President-Elect, International Council for Industrial and Applied Mathematics, October 1, 2009 - September 30, 2011 (President, October 1, 2011 - September 30, 2015; Past President, October 1, 2015 - September 30, 2017).

Member, Site Visit Committee for IPST (Institute of Physical Science and Technology), University of Maryland, February 26, 2010.

Member, Committee to Select the Winner of the Steele Prize (AMS), February 1, 2010 - January 31, 2013.

Chair, Board of ICERM (Institute for Computational and Experimental Research in Mathematics), NSF-funded institute at Brown University, 2010 -.

Member, US National Committee for IIASA (International Institute for Applied Systems Analysis), July 2009 - March 2012.

PI, AWM-NSF Travel Grant, 2009-2011 and 2012-2014.

Chair, AWM Long Range Planning Committee, 2009 - 2012.

Member, AWM Advisory Committee Task Force, 2010.

Participant, NSF workshop on 'Incentives and Barriers to U.S. Academics' Participation in International Collaborations', Washington, June 2-4, 2010.

Member, AWM Task Force on Staffing Needs and Costs, January-February, 2011.

Vice-President, American Mathematical Society, February 2011 - January 2014.

Member, Electorate Nominating Committee, AAAS, 2013-2016.

Chair, Program Committee, ICWM (International Congress of Women Mathematicians), Seoul, Korea, August 12-14, 2014.

AWM Representative to Section A (Mathematics) AAAS, 2011-2014 and 2014-2017.

Recommendation and reference letters about 11 (2008), 11 (2009), 7 (2010), 14 (2011), 12 (2102), 12 (2013), 2 (2014).

RESEARCH SUPPORT (since 2005):

NSERC of Canada, Operating Grant, 2005-2010 (terminated 2009).
National Science Foundation, Standard Grant, 2008-2011 (with Katarina Jegdic).
DOE, Office of Energy Research, Grant 2009-2012.
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
Canadian Mathematical Society
Canadian Applied and Industrial Mathematics Society

REVIEWER (selected, since 2006):

NSF
The Mathematical Intelligencer
Nonlinear Analysis Series A: Theory, Methods & Applications
Quarterly of Applied Mathematics
NSERC of Canada
Science Foundation of Ireland
Journal of Hyperbolic Differential Equations
EPSRC of the United Kingdom
Ryerson University Mathematics Department Undergraduate Program
Carnegie-Mellon Mathematics Department External Review

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 detta 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.

42. A. M. Tesdall and B. L. Keyfitz, 'A Continuous, Two-Way Free Boundary in the Unsteady Transonic Small Disturbance Equations', Journal of Hyperbolic Differential Equations, **7** (2010), 317-338.

43. B. L. Keyfitz, 'Singular Shocks: Retrospective and Prospective', Confluentes Mathematici, **3** (2011), 445-470.

44. B. L. Keyfitz and Charis Tsikkou, 'Conserving the Wrong Variables in Gas Dynamics: A Riemann Solution with Singular Shocks', Quarterly of Applied Mathematics, **LXX** (2012), 407-436.

45. B. L. Keyfitz, Allen M. Tesdall, Kevin Ray Payne, Nedyu I. Popivanov, 'The Sonic Line as a Free Boundary', Quarterly of Applied Mathematics, **LXXI** (2013), 119-133.

Refereed Conference Proceedings:

46. 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.

47. 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.

48. 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.

49. 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.

50. 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.

51. 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.

52. S. Čanić and B. L. Keyfitz, 'Oblique Shock Interactions and the von Neumann Paradox', in *Proceedings of* 20^{th} *International Conference on Shock Waves, Volume I*, (B. Sturtevant, J. E. Schepherd and H. G. Hornung, editors) World Scientific, Singapore, 1996, 435-440.

53. 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.

54. 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.

55. 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, Basil, 2002, 217-226.

56. 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, 2007, 125-163.

57. B. L. Keyfitz, 'First Order Partial Differential Equations', Proceedings of Workshop, International Centre for Mathematical and Computer Sciences, October 2007 (Abuja, Nigeria), ed G. O. S. Ekhaguere and C. R. Nwozo, Publication of the ICMCS, 2008, 101-158.

58. B. L. Keyfitz, 'Hyperbolic conservation laws. Past and future'. *Proceedings of ICIAM 07 - 6th International Congress on Industrial and Applied Mathematics*, Eur. Math. Soc., Zrich, 2009, 219 - 238.

59. H. Ying and B. L. Keyfitz, 'A Two-Dimensional Riemann Problem for Scalar Conservation Laws', in *IMA Volume 153: Nonlinear Conservation Laws and Applications*, (A Bressan, G-Q Chen, M Lewicka, D-H Wang, editors), Springer Science + Business Media, LLC, New York, NY, 2011, 447-455.

Unrefereed Conference Proceedings:

60. 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.

61. 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.

62. 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.

63. 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.

64. 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.

65. 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.

66. 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.

67. 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, P. Charrier, B. Hanouzet, and J.-L. Joly, eds), Springer, LNM **1402**, 1989, 185-197.

68. 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.

69. 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.

70. 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.

71. 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.

72. 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.

73. B. L. Keyfitz, 'Mathematical Properties of Nonhyperbolic Models for Incompressible Two-Phase Flow', Proceedings of 4^{th} International Conference On Multiphase Flow (E. Michaelides ed.), New Orleans, 2001 (CD-ROM).

74. 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:

75. 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.

76. 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.

77. B. L. Keyfitz, 'Hopf-Hopf mode interaction in a circular porous plug burner flame: modeling and analysis using activation energy asymptotics', preprint, 1988.

78. 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.

79. 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.

80. B. L. Keyfitz, 'Development of singularities in Riemann invariants', UH Math Department Research Report UH/MD-129, 1992.

81. B. L. Keyfitz, 'The Legacy of Olga Oleĭnik in Hyperbolic Conservation Laws', extended abstract, 2006. Published online at `http://topo.math.auburn.edu/pub/2Olgas-proceedings/`.

82. K. Jegdić, B. L. Keyfitz and S. Čanić, 'A free boundary value problem for the isentropic gas dynamics equations – transonic regular reflection', under revision for *Communications in PDE*.

Book Reviews:

83. Review of *Nonlinear Deformation Waves*, Nigul and Engelbrecht, eds, in *Applied Mechanics Reviews*, 1985.

84. Review of *Shock Waves and Reaction Diffusion Equations*, by J.A. Smoller, in American Math. Monthly, **93**, (1986), 315-318.

85. Review of *Systems of Conservation Laws: Two-Dimensional Riemann Problems*, by Yuxi Zheng, in SIAM Review, **46**, (2004), 171-174.

86. Review of *How Mathematicians Think : Using Ambiguity, Contradiction, and Paradox to Create Mathematics*, by William Byers, in University of Toronto Quarterly, **78,** (2009), 141-143.

Professional Nontechnical Writing:

87. B. L. Keyfitz, 'A Welcome to MexSIAM', SIAM News, November, 2001.

88. B. L. Keyfitz, 'MexSIAM Takes Lead in Forging Links Between Mexican and U. S. Researchers', SIAM News, January/February 2003.

89. Carolyn Gordon and B. L. Keyfitz, 'Women in Academia: Are We Asking the Right Questions?', AMS Notices, August 2004, 784-786.

90. 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).

91. Interview in P. C. Kenshaft, *Change Is Possible*, AMS Providence, 2005, p. 178.

92. 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.

93. B. L. Keyfitz, 'Change and Challenge', University of Toronto, Mathematics Newsletter, February 2005.

94. B. L. Keyfitz, 'Women (and Men) in Science: How to Ask the Wrong Questions', PIMS Newsletter, Fall 2005.

95. 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.

96. 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.)

97. '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).

98. 'The Fourteenth General Meeting of *European Women in Mathematics*', AWM Newsletter, Nov/Dec 2009.

Other Communications:

99. SIAM Blog, 2013

ADDITIONAL INFORMATION:
Postdoctoral Visitors:

Milton da Costa Lopes Filho, 1990-1992. (Current position, Professor, Campinas University, Brazil.)
Sunčica Čanić, 1992-1993. (Current position, Cullen Professor, University of Houston.)
Eun Heui Kim, 1999-2001. (Current position, Professor, California State University, Long Beach.)
Fu Zhang, 2002-2004. (Current position, Faculty member, Cheyney University of Pennsylvania.)
Katarina Jegdic, 2004-2006 (Current position, Associate 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 (Current position, Lecturer, Humber College).
Charis Tsikkou (The Ohio State University) 2010-2012 (Currrent position, Assistant Professor, West Virginia University).

PhD Students Supervised:

Vaidyanath Vinod; Ph.D. University of Houston, December, 1992. (Employed in industry)
Zhang Zhuang Zhi; Ph.D. University of Houston, August, 1997. (Employed in industry)
Andrea Reiff; Ph.D. University of Houston, December, 1997. (National Security Agency)
Claudia Mora, 1996-2004, University of Houston, ABD (Current position: Senior Lecturer, Utah State University).
Hao Ying, The Ohio State University (current).
Ting-Hao Hsu, The Ohio State University (current).

PhD Thesis Committees (since 2008):

Marte Godvik; Ph.D. NTNU (University of Trondheim), October 2008; member of committee.
Albert Hartono; Ph.D Computer Science and Engineering, OSU, 2009; Graduate Faculty Representative.
Magali Mercier; Ph.D. Université de Lyon 2009; member of jury.
Dan Munther; Ph.D. Mathematics, The Ohio State University, 2011; member of committee.
Isabel Averill; Ph.D Mathematics, The Ohio State University, 2011; member of committee.
Günyaz Ablay; Ph.D. Nuclear Engineering, The Ohio State University, 2012; Graduate Faculty Representative.
Wei Sun, Ph.D. Mathematics, The Ohio State University, 2013; member of committee.
Yuhan Jia; Ph.D. Mathematics, The Ohio State University, 2013; member of committee.
Samik Bhattacharya; Ph.D. Aeronautical and Astronautical Engineering, 2013; Graduate Faculty Representative.

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.

MS Students Advised:

James Voss (engineering), 2014.
Math dept students Laine Noble, Xiaohui Xu, Davis Buenger, Marissa Renardy, Peter Kosek, Irfan Glogic, Samir Chowdhury

MS Thesis Committees:

Griffin Reiner-Roth, 2013.

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)
Chris Clifford (engineering, OSU); Independent Study, Summer 2010.

Department, College and University Committees (since 2008, Ohio State):

Mathematics Department Recruitment Committee, 2008-09; 2009-10; 2010-2012.
Mathematics Department CENT (Promotion and Tenure) Deliberating Body, 2009-.
Mathematics Department Salary Committee, 2008-09.
Mathematics Department Advisory Committee, 2009-2013, Chair 2010-2012.
Graduate Faculty Representative to Final Defense of Albert Hartono, CS&E Department, 2009.
Mathematics Department Graduate Advising Committee, 2009-10; 2010-2011; 2011-2012.
Mathematics Department Graduate Recruitment Committee, 2010-2011.
Mathematics Department Mentoring Committee for Untenured Faculty, 2009-10; 2010-2011; 2011-2012.
Project CEOS, Peer Mentoring Committee, 2009-10; 2010-2011.
Member and Chair, Mathematics Department PROCOMP Committee, 2010-2011.
Mathematics Department Executive Committee (ex officio), 2010-2012.
Action Learning Task Force on Promotion of Associate Professors, Project CEOS, January, 2011 - ; Chair, September, 2011 - .
Mathematics Department CENT Committee, Member, 2011-2012.
Member, Mathematics Department PROCOMP Committee, 2012-2013, 2013-2014.
Member, Departmental Self-Study Committee preparing for external review, 2012.
Member, Search Committee for Arts and Sciences Executive Dean, 2013.

Conference, Colloquium and Seminar Talks (2009):

Special Session on Nonlinear Partial Differential Equations and Applications, Joint Mathematics Meetings, Washington DC, January 5, 2009; *Self-similar multidimensional conservation laws: the sonic line as a free boundary.*

Applied Mathematics Seminar, Ohio State University, February 12, 2009; *Self-similar multidimensional conservation laws: the sonic line as a free boundary.*

University of Alabama, Huntsville, Karen Ames Lecture Series talk, April 3, 2009;*Linear and Nonlinear Stability of Shocks: Some of the Things I Learned from Karen Ames.*

Workshop on Computational Methods for Hyperbolic Problems, Fields Institute and University of Waterloo, Waterloo, April 21, 2009; *Linear and Nonlinear Stability of Shocks.*

IMA program on conservation laws, July 21-31, 2009; *The Sonic Line as a Free Boundary: Stability under Perturbations.*

EWM Conference, plenary speaker, Novi Sad, August, 2009; *Where the Wild Things Might Be: Function Spaces for Multidimensional Conservation Laws.*

Conference Generalized Functions Vienna 2009, Plenary Speaker, August 31- September 4, 2009; *Where the Wild Things Might Be: Function Spaces for Multidimensional Conservation Laws.*

University of Michigan, PDE Seminar speaker, October 1, 2009; *The sonic line as a free boundary: Stability under perturbations.*

Invitation to Mathematics Lectures, Ohio State University, Columbus, October 12 and 19, 2009; *Connections in Conservation Laws: How Hodograph Transforms, Fourier Transforms and Sturm-Liouville Theory Come Together to Solve an Elementary Problem in Multidimensional Theory.*

OSU PDE Seminar, Nov 3, 2009; *Singular Shocks and Loss of Hyperbolicity in Conservation Laws.*

Conference in Honor of Michelle Schatzman's 60^{th} Birthday, University of Lyons, December 8-9, 2009; *Singular Shocks and Loss of Hyperbolicity in Conservation Laws.*

Conference, Colloquium and Seminar Talks (2010):

CAMS Colloquium, University of Southern California, April 26, 2010; *Singular Shocks and Loss of Hyperbolicity in Conservation Laws.*

Invited speaker, 'CFL condition - 80 years gone by'; International Conference, Rio de Janeiro, May 3-8, 2010; *Singular Shocks and Loss of Hyperbolicity in Conservation Laws.*

PDE Seminar, Campinas University, Campinas, May 10, 2010; *Singular Shocks and Loss of Hyperbolicity in Conservation Laws.*

Special Session Speaker, 8th AIMS Conference on Dynamical Systems, Differential Equations and Applications, Dresden, May 25 - 28, 2010; *The Sonic Line as a Free Boundary: Stability Under Perturbations.*

Seminar, Applied Mathematics Department, University of Waterloo, June 18, 2010; *The Sonic Line as a Free Boundary: Stability Under Perturbations.*

Invited Speaker, ICM Satellite Conference, Mathematics in Science and Technology, New Delhi, August 15-17, 2010; *The sonic line as a free boundary: Stability under perturbations.*

Plenary Speaker, First North American Meeting on Industrial and Applied Mathematics, Huatulco, Mexico, December 8, 2010; *Singular Shocks and Loss of Hyperbolicity in Conservation Laws.*

Conference, Colloquium and Seminar Talks (2011):

Speaker, Special Workshop on Industrial and Applied Mathematics, Shanghai, February 11-13, 2011; *Singular Shocks and Loss of Hyperbolicity in Conservation Laws.*

Speaker, Conference on 'New Perspectives in Nonlinear PDEs', University of Michigan, 2-6 May, 2011; *Shock Formation at the Sonic Line: Two Pictures.*

Speaker, Conference on Hyperbolic Conservation Laws and Continuum Mechanics, In Honor of Constantine Dafermos 70th Birthday, Brown University, May 12-14, 2011; *A New Look at Singular Shocks.*

Special Session Speaker, AMMCS 2011 Conference, Sir Wilfred Laurier University, July 25-29, 2011; *A New Look at Singular Shocks.*

Special Session Speaker, AMS Sectional Meeting, Cornell, September 10-11, 2011; *Singularities at the Sonic Line.*

NSF CSUMS Speaker, Undergraduate Seminar, University at Buffalo, September 19, 2011; *Stuck in Traffic.*

Plenary Speaker, AWM Conference, '40 Years and Counting: AWM's Celebration of Women in Mathematics', Brown University, September 17-18, 2011; *My Forty Years of Conservation Laws.*

Plenary Speaker, Mexican Mathematical Society Annual Meeting, October 11, 2011; *Why We Still Study Conservation Laws.*

Colloquium Speaker, Wright State University, Dayton, October 14, 2011; *Why We Still Study Conservation Laws.*

Poster, DOE Applied Mathematics Program Meeting, Reston, October 17-19, 2011; *Shock Formation at the Sonic Line.*

Women in Math & Sciences, Lunch with a Professor, October 20, 2011.

Undergraduate Student Seminar talk, OSU, October 27, 2011; *Stuck in Traffic.*

Minisymposium Speaker, SIAM-APDE Conference, November 14-17, 2011; *Singularities at the Sonic Line.*

Conference, Colloquium and Seminar Talks (2012):

2012 AWM Noether Lecture, Joint Mathematics Meetings, Boston, January 5, 2012; *Conservation Laws, Not Exactly à la Noether.*

Speaker, Oberwolfach Workshop, 'Recent Developments in the Numerics of Nonlinear Hyperbolic Conservation Laws and their Use in Science and Engineering', January 15-21, 2012; *Some Reasons this Analyst Wants Better (High Order) Numerical Solutions.*

Invited Talk, CUNY Graduate Center Symposium on Applied Mathematics: Hyperbolic Conservation Laws and Applications, New York, April 26, 2012; *Using Geometric Singular Perturbation Theory to Understand Singular Shocks.*

Talk to Undergraduate Women, RIMS, Kyoto, June 3, 2012; *Analysis and Me: How I Became a Mathematician (With a Lot of Help from Other People).*

Contributed Talk, Fourteenth International Conference on Hyperbolic Problems: Analysis, Numerics, and Applications, Padua, June 24-28, 2012; *Using Geometric Singular Perturbation Theory to Understand Singular Shocks.*

Kovalevsky Lecture, SIAM Annual Meeting, Minneapolis, July 9, 2012; *The Role of Characteristics in Conservation Laws: A Legacy of Sonya Kovalevsky.*

Jean Rubin Memorial Lecture, Purdue University, October 2, 2012: *The Role of Characteristics in Conservation Laws.*

Invitations to Mathematics, The Ohio State University, October 10 & 17, 2012; *The Role of Characteristics in Conservation Laws.*

Talk to Radical Pi, November 14, 2012; *Stuck in Traffic*.

Speaker, Workshop on Industrial Modeling, Sao Carlos, Brazil, December 12, 2012; *Singular shocks in a chromatography model: singular pertubation theory and geometric insight.*

Invited Talk, VII ITLA 2012, Rosario, Argentina, December 17, 2012 (Seventh Italian Latin-American Congress on Applied and Industrial Mathematics); *Singular shocks in a chromatography model: singular pertubation theory and geometric insight.*

Conference, Colloquium and Seminar Talks (2013):

Panelist and Speaker, conference on Career Options for Women in Mathematical Sciences, Institute for Mathematics and its Applications March 3-5, 2013; *Conservation Laws for Beginners.*

Distinguished lecture, Center of Mathematical Modeling and Scientific Computing, National Chiao Tung University, Hsin Chu, Taiwan (ROC), May 7, 2013; *Some Analysis of Multidimensional Hyperbolic Conservation Laws.*

Lecture, Institute of Computational Mathematics of Chinese Academy of Sciences (CAS), Beijing, China, May 13, 2013.

Banff International Research Station, speaker in program on Nonlinear Conservation Laws and Related Models, June 9 – 14, 2013.

Mathematics Department Colloquium, Tulane University, November 7, 2013; *Wave Equations, Gas Dynamics and Multidimensional Conservation Laws.*

Ohio State, Undergraduate Seminar, December 3, 2013.

Minisymposium Talk, SIAM Activity Group on Analysis of PDE Meeting, Orlando, December 9, 2013; *Linear and Nonlinear Reflection Patterns in Gas Dynamics.*