Biographical Sketch

John K. Hunter

Education

10/81	Ph.D.	Mathematics	Stanford University
6/79	M.S.	Mathematics	Stanford University
6/77	B.A.	Mathematics	Cambridge University

Experience

6/89 —	Professor of Mathematics University of California at Davis
7/01 — 6/04	Chair, Department of Mathematics University of California at Davis
7/87 — 5/89	Associate Professor of Mathematics Colorado State University
9/81 — 6/87	Assistant Professor of Mathematics Colorado State University
9/81 — 8/82	Visiting Assistant Professor University of Wisconsin

Publications

1. Further observations of the Orion Nebula cluster, *Monthly Notices of the Royal Astronomical Society* 171 (1975), 219-234 (with M. Penston and A. O'Neill)

2. Weakly nonlinear wave propagation, Ph.D. Thesis, Stanford University (1981)

3. Weakly nonlinear high frequency waves, *Comm. Pure Appl. Math.* 36 (1983), 547-569 (with J. B. Keller)

4. Viscoelastic fluid flow exhibiting hysteritic phase changes, *Phys. Fluids* 26 (1983), 2345-2351 (with M. Slemrod)

5. Solitary and periodic gravity-capillary waves of finite amplitude, *J. Fluid Mech.* 134 (1983), 205-219 (with J.-M. vanden-Broeck)

6. Accurate computation of steep gravity solitary waves, *J. Fluid Mech.* 136 (1983), 63-71 (with J.-M. vanden-Broeck)

7. Weak shock diffraction, *Wave Motion* 6 (1984), 79-90 (with J. B. Keller)

8. A ray method for slowly modulated nonlinear waves, *SIAM J. Appl. Math.* 45 (1985), 735-749

9. Resonantly interacting weakly nonlinear hyperbolic waves II: several space variables, *Stud. Appl. Math.* 75 (1986), 187-226 (with A. Majda and R. Rosales)

10. Caustics of nonlinear waves, *Wave Motion* 9 (1987), 187-443 (with J. B. Keller)

11. Weakly dispersive short waves, *Proceedings of the IVth international Congress on Waves and Stability in Continuous Media*, Sicily (1987) (with K. Tan)

12. Transverse diffraction of nonlinear waves and singular rays, *SIAM J. Appl. Math.* 48 (1988), 1-37

13. Nonlinear hyperbolic waves, *Proc. Roy. Soc. A* 417 (1988), 299-308 (with J. B. Keller)

14. Modelling selectivity loss during CVD tungsten deposition, in *Tungsten and other Refractory Metals for VLSI Applications*, ed. V. Wells, 125-131, Materials Research Society, Pittsburgh (1988), (with C. McConica, K. Tan, and M. Szczepaniak)

15. Existence of perturbed solitary wave solutions to a model equation for water waves, *Physica D* 32 (1988), 253-268 (with J. Scheurle)

16. Strongly nonlinear hyperbolic waves, in *Nonlinear Hyperbolic Equations, Notes on Numerical Fluid Mechanics, Volume 24*, ed. J. Ballman and R. Jeltsch, Vieweg, Braunschweig (1989)

17. Hyperbolic waves and nonlinear geometrical acoustics, *Transactions of the Sixth Army Conference on Applied Mathematics and Computing*, Boulder CO (1989), 527-569

18. Nonlinear Surface Waves, *Contemporary Mathematics* 100 (1989), 185-202

19. Numerical solution of some nonlinear dispersive wave equations, *Lectures in Applied Mathematics* 26 (1990), 301-316

20. Rotationally invariant hyperbolic waves, *Comm. Pure Appl. Math.* 63 (1990), 1037-1053 (with M. Brio)

21. Nonlinear Geometrical Optics, in *Multidimensional Hyperbolic Problems and Computations*, IMA Volumes in Mathematics and its Applications, Volume 29, 179-197, J. Glimm and A. J. Majda (eds.), Springer-Verlag, New York (1991)

22. Interacting weakly nonlinear hyperbolic and dispersive waves, in *Nonlinear Waves and Microlocal Analysis*, IMA Volumes in Mathematics and its Applications, Vol.30, 83-112, eds. M. Beals. R. Melrose, and J. Rauch, Springer-Verlag, New York (1991)

23. Nonlinear transverse waves in an isotropic medium, *Proceedings of the Third International Conference on Hyperbolic Problems, Theory, Numerical Methods and Applications*, eds. B. Enquist and B. Gustafsson, Studentliteratur, 131-140, Lund (1991)

24. A transport equation for the evolution of shock amplitudes along rays, Proceedings of the VI International Conference on Waves and Stability in Continuous Media, *Le Matematiche*, XLVI (1991), pp. 403–413 (with G. Russo)

25. Dynamics of director fields, *SIAM J. Appl. Math.* 51 (1991) 1498–1521 (with R. Saxton)

26. Interaction of elastic waves, *Stud. Appl. Math.* 86 (1992) 281–314

27. Asymptotic equations for conservation laws of mixed type, *Wave Motion* 16 (1992) 57–64 (with M. Brio)

28. Mach reflection for the two dimensional Burgers equation, *Physica D* 60 (1992), pp. 194–207, (with M. Brio)

29. Simplified asymptotic equations for the transition to detonation in reactive granular materials, *SIAM J. Appl. Math.* 52 (1992) 1199–1237 (with P. Embid and A. Majda)

30. A model equation for shock waves in a random medium, *Canadian Quarterly of Applied Mathematics* 1 (1993) 443–474 (with R. Vedantham)

31. A von Neumann reflection for the two-dimensional Burgers equation, *Proc. Symp. Appl. Math.* **48** (1994), 265-268 (with M. Brio)

32. Asymptotic equations for nonlinear hyperbolic waves, in *Surveys in Applied Mathematics*, Vol. 2, ed. M. Freidlin et.al., 167-276, Plenum Press, 1995

33. On a completely integrable nonlinear hyperbolic variational equation, *Physica D* 79 (1994) 361–386 (with Y. Zheng)

34. On a nonlinear hyperbolic variational equation: I. Global existence of weak solutions, *Arch. Rat. Mech. Anal.* 129 (1995) 305–353, (with Y. Zheng)

35. On a nonlinear hyperbolic variational equation: II. The zero dissipation and dispersion limits, 129 (1995) 355–383 *Arch. Rat. Mech. Anal.* (with Y. Zheng)

36. Irregular reflection of weak shocks, Proceedings for the *Fifth International Conference on Hyperbolic Problems, Theory, Numerics, and Applications*, 347–353, World Scientific, Singapore, 1996 (with M. Brio)

37. Singularities in a nonlinear variational wave equation, *J. Diff. Eq*, 129 (1996) 49-78 (with R. T. Glassey and Y. Zheng)

38. Singularities and oscillations in a nonlinear variational wave equation, in *Singularities and Oscillations*, IMA Volumes in Mathematics and its Applications, Vol. 91, 37–60, ed. J. Rauch, Springer-Verlag, 1997 (with R. T. Glassey and Y. Zheng)

39. Resonant reflection of sound waves by large amplitude entropy waves, Proceedings of the VIII International Conference on Waves and Stability in Continuous Media, Part I (Palermo, 1995), *Rend. Circ. Mat. Palermo* (2) Suppl. No. 45, part I (1996) 17–26, (with G. Alì).

40. Nonlinear wave diffraction, in *Geometrical Optics and Microlocal Analysis*, 221-244, ed. F. Colombini and N. Lerner, Birkhauser,Boston 1997.

41. Sound wave propagation through incompressible flows, *Wave Motion* 26 (1997) 319-328 (with R. Vedantham)

42. Weak shock reflection, in *Proceedings of the Fifth International Congress on Sound and Vibration*, Adelaide Australia, 1997 (with M. Brio).

43. Wave interactions in magnetohydrodynamics, *Wave Motion* 27 (1998) 257-277 (with G. Alì)

44. Scale invariant elastic surface waves, *Proceedings of the IX International Conference on Waves and Stability in Continuous Media*, ed. S. Rionero, Bari, Italy, 1997, Reniconti Del Circolo Mathematico di Palermo, Serie II, Suppl. 57 (1998), 381-392. (with D. Parker).

45. Large amplitude gravitational waves, *J. Math. Physics*, **40**, (1999), 3035–3052. (with G. Alì).

46. The generation of gravitational waves by the resonant interaction of sound waves, *J. Math. Physics*, **40**, (1999), 4474-4494. (with A. M. Anile and B. Truong)

47. Weak shock reflection, *J. Fluid Mech.* **410**, (2000), 235–261 (with M. Brio).

48. The von Neumann paradox in weak shock reflection, *J. Fluid Mech.*, **422**, (2000), 193–205 (with M. Brio, A. Zakharian, and G. Webb).

49. The resonant interaction of sound waves with a large amplitude entropy wave, *SIAM J. of Appl. Math.*, **61**, 2000, 131–148. (with G. Alì).

50. Hamiltonian equations for scale-invariant waves, *Stud. Appl. Math.*, **108** (2002) 305–321 (with G. Alì, and D. Parker).

51. Self-similar solutions for weak shock reflection, *SIAM J. Appl. Math.*, **63** (2002), 42–61 (with A. Tesdall).

52. Interactive visualization and steering of CFD simulations, in *Data Visualization 2002 (Proceedings of the Joint Eurographics and IEEE TCVG Symposium on Visualization)*, 25-34, eds. D. S. Ebert, P. Brunet, and I. Navazo, Association for Computing Machinery, New York (2002) (with O. Kreylos, A. M. Tesdall, B. Hamann, and K. L. Joy).

53. Reactive autophobic spreading of drops, *J. Comp. Phys.*, **182** (2002) 1–32 (with Z. Li, and H. Zhao).

54. Nonlinear surface waves on a tangential discontinuity in magnetohydrodynamics, *Quart. Appl. Math.*, **61** (2003), 451–474., (with G. Alì).

55. Singularity formation and instability in the unsteady inviscid and viscous Prandtl equations, *Communications in Mathematical Sciences*, **1** (2003) (with L. Hong).

56. Nonlinear hyperbolic wave propagation in a one-dimensional random medium, *Wave Motion*, **37** (2003), 381–405 (with J. B. Thoo).

57. Transonic solutions for the Mach reflection of weak shocks, *Proceedings of the Symposium Transsonicum IV*, ed. H. Sobieczky, 7–12, Dordrecht, Kluwer, 2003. (with A. M. Tesdall).

58. Weak shock reflection, in *A Celebration of Mathematical Modeling*, 93–112, Kluwer, Dordrecht, 2004 (with A. M. Tesdall).

59. Short-time existence for scale-invariant Hamiltonian waves, *J. Hyperbolic Differential Equations*, **3** (2006), 247–267.

60. Variational systems of wave equations, *Oberwolfach Reports*, **3** (2006), 1678–1681 (with G. Alì).

61. Diffractive nonlinear geometrical optics for variational wave equations and the Einstein equations, *Comm. Pure Appl. Math.*, **60** (2007), 1522–1557 (with G. Alì).

62. Orientation waves in a director field with rotational inertia, Kinetic and Related Models, **2** (2009), 1–37 (with G. Alì).

63. Nonlinear Hamiltonian waves with constant frequency and surface waves on vorticity discontinuities, *Comm. Pure Appl. Math.*, **63** (2010) 303–336 (with J. Biello).

64. Nonlinear surface waves, IMA Volume on "Nonlinear Conservation Laws and Applications," ed. A. Bressan. G.-Q, Chen, M. Lewicka, and D. Wang (2011), 303–314

65. On the weakly nonlinear Kelvin-Helmholtz instability of tangential discontinuities in MHD, *J. Hyperbolic Differential Equations*, **8** (2011), 691–726 (with J. Thoo)

66. On the self-similar diffraction of a weak shock into an expansion wavefront, *SIAM J. Appl. Math.*, **72** (2012), 124–143 (with A. M. Tesdall)

67. Enhanced lifespan of smooth solutions of a Burgers-Hilbert equation, *SIAM J. Math. Anal.*, **44** (2012), 2039–2052 (with M. Ifrim)

68. Self-similar solutions for the diffraction of a weak shocks, *J. Computational Science*, **4** (2013), 92-100 (with A. M. Tesdall)

69. A quasi-linear Schrodinger equation for large amplitude inertial oscillations in a rotating shallow fluid, *IMA Journal of Applied Mathematics*, **78** (2013), 777–796 (with M. Ifrim).

70. Long time solutions for a Burgers-Hilbert equation via a modified energy method, *Proc. AMS*, In Press, 2013 (with M. Ifrim, D. Tataru, and T. K. Wong)

71. Nonlinear variational surface waves, invited paper submitted to *Communications in Information and Systems*, special volume for Marshall Slemrod's 70th bithday (with L. Austria)

Books

Ray Methods for Nonlinear Waves in Fluids and Plasmas, Longman 1993 (with A. Anile, P. Pantano, and G. Russo).

Applied Analysis, World Scientific 2001 (with B. Nachtergaele).

Editorships

Associate editor for: *Canadian Quarterly of Applied Mathematics*
Associate editor for: *Quarterly of Applied Mathematics*

Recent Invited Talks

Interdisciplinary, international conference in Applied Mathematics, Modeling and Computational Science, Waterloo, Canada, August 2013

2nd Pacific Rim Mathematical Association Congress, Shanghai, June 2013

Stanford University, Stanford, Seminar, May 2013

University of California, Berkeley, Seminar, March 2012

MAA-AMS Joint Mathematics Meeting, Boston, January 2012

SIAM Conference on Analysis of PDEs, San Diego, November 2011

Workshop on Wave Breaking and Global Solutions in the Short-Pulse Dispersive Equations, Fields Institute, Toronto, May 2011

AMS Sectional Meeting, Ames, Mar 2011

The 8th AIMS Conference on Dynamical Systems, Differential Equations and Applications, Dresden, May 2010

Penn State University, State College, Colloquium, Apr 2010

SIAM Conference on Analysis of PDEs, Miami, December 2009

IMA Summer Program on Nonlinear Conservation Laws and Applications, Minneapolis, July 2009