

## **Curriculum Vitae of Harvey Segur**

Feb. 9, 2016

### **BIOGRAPHICAL DATA**

Birth date: September 12, 1942  
Birthplace: Oak Park, Illinois  
Citizenship: U.S.A.

### **PROFESSIONAL EXPERIENCE**

1989-present Professor of Applied Mathematics  
University of Colorado  
Boulder, CO

## AWARDS

### TEACHING

- 1994 Teaching Excellence Award  
presented by the Boulder Faculty Assembly,  
University of Colorado
- 1995 Faculty Award  
presented by the Minority Engineering Program  
University of Colorado
- 1998 CU President's Teaching Scholar  
presented by John Buechner, President  
University of Colorado

### RESEARCH

- 2004 Distinguished Research Lectureship  
presented by the Council on Research and Creative Work  
University of Colorado

### TEACHING AND RESEARCH

- 2011 Hazel Barnes Prize  
the highest faculty recognition for teaching and research  
awarded by the University of Colorado at Boulder

### PRINCIPAL LECTURER

International Workshop on Tsunami and Nonlinear Waves (3 lectures), Calcutta, India, March 6-10, 2006

SIAM Workshop on Stability (4 lectures), U of Washington, Seattle, Sept. 6-8, 2006

NSF/CBMS Regional Conference on "Water Waves: Theory and Experiment" (10 lectures), held at Howard University, Washington, D.C., May 13-18, 2008

Geophysical Fluid Dynamics Summer School, on "Nonlinear Waves" (11 lectures), Woods Hole Oceanographic Institute, Woods Hole, MA, June 15- August 21, 2009

### PUBLICATIONS

#### BOOKS

SIAM, Philadelphia, 425 pp., with M.J. Ablowitz, 1981 (also translated and published in Russian and in Japanese)

, North Holland, Amsterdam, 487 pp., ed. by D.K. Campbell, A.C. Newell, J.R. Schrieffer & H. Segur, 1986

, Plenum Press, New York, 389 pp., ed. by H. Segur, S. Tanveer & H. Levine, 1992

## RESEARCH ARTICLES

1. "Analytical Procedure for Determining Hydrogen Peroxide Exhaust Impingement Heating," Rep't GD/C-BTD65-116, General Dynamics/Convair, San Diego, CA, 1965
2. "Stratified Flow into a Contraction," (Ph.D. thesis) Rep't AS69-15, University of California, Berkeley, 1969
3. "A limitation on Long's model in stratified fluid flows," *Journal of Fluid Mechanics*, **48**, pp. 161-179, 1971
4. "Method for Solving the Sine-Gordon Equation," *Journal of Mathematical Physics*, **30**, p. 1262, with M.J. Ablowitz, A.C. Newell & D.J. Kaup, 1973 (reprinted in "Series of Selected Papers in Physics," **59**, by the Physical Soc. of Japan)
5. "Nonlinear Evolution Equations of Physical Significance," *Journal of Mathematical Physics*, **31**, p. 125, with M.J. Ablowitz, A.C. Newell & D.J. Kaup, 1973 (reprinted in "Series of Selected Papers in Physics," **59**, by the Physical Soc. of Japan)
6. "The Korteweg-deVries equation and water waves, Part I: Solutions of the equation," *Journal of Mathematical Physics*, **59**, p. 721, 1973
7. "The Korteweg-deVries equation and water waves, Part II: Comparison with experiments," *Journal of Mathematical Physics*, **65**, pp. 289-314, with J.L. Hammack, 1974
8. "An Alternative Method to Solve the Korteweg-deVries Equation?," in Nonlinear Wave Motion, ed. by A.C. Newell,

20. "On the evolution of packets of water waves," *J. Geophys. Res.*, **92**, p. 691, with M.J. Ablowitz, 1979
21. "Ordinary Differential Equation of Painlevé Type and the Inverse Scattering Transform," in *Math. Methods & Appl. of Scattering Theory*, ed. by J.A. DeSanto, A.W. Seanz & W.W. Zachery, *J. Geophys. Res.*, **130**, Springer-Verlag, NY, 1979
22. "A Note on Miura's Transformation," *J. Geophys. Res.*, **20**, p. 999, with M.J. Ablowitz & M.D. Kruskal, 1979
23. "Long Internal Waves in Fluids of Great Depth," *J. Geophys. Res.*, **62**, p. 249, with M.J. Ablowitz, 1980
24. "A Connection Between Nonlinear Evolution Equations and Ordinary Differential Equations of P-Type I," *J. Geophys. Res.*, **21**, pp. 715-721, with M.J. Ablowitz & A. Ramani, 1980
25. "A Connection Between Nonlinear Evolution Equations and Ordinary Differential Equations of P-Type II," *J. Geophys. Res.*, **21**, p. 1006-1015, with M.J. Ablowitz & A. Ramani, 1980
26. "Resonant Interactions Between Surface and Internal Gravity Waves," *J. Geophys. Res.*, **23**, p. 2556, 1980
27. "Asymptotic Solutions of Nonlinear Evolution Equations and a Painlevé Transcendent," *J. Geophys. Res.*, **3D**, p. 165, with M.J. Ablowitz, 1981
28. "Viscous Decay of Envelope Solitons in Water Waves," *J. Geophys. Res.*, **24**, p. 2372, 1981
29. "Solitons and the Inverse Scattering Transform," in *Proc. of International School of Physics "Enrico Fermi", Course LXXX* (1980), ed. by A.R. Osborne & P.M. Rizzoli, North Holland, Amsterdam, 1982
30. "On the Periodic Intermediate Long Wave Equation," *J. Geophys. Res.*, **15**, p. 781, with M.J. Ablowitz, A. Fokas, & J. Satsuma, 1982
31. "Soliton models of long internal waves," *J. Geophys. Res.*, **118**, p. 285, with J.L. Hammack, 1982
32. "Integrable Hamiltonian Systems and the Painlevé Property," *J. Geophys. Res.*, 3rd series, **25**, p. 1257, with T. Bountis & F. Vivaldi, 1982
33. "Viscous Decay of Long Internal Solitary Waves," *J. Geophys. Res.*, **25**, p. 942, with C. Leone & J.L. Hammack, 1982
34. "Comments of Inverse Scattering for the Kadomtsev-Petivashvili Equation," in *Math. Methods in Hydrodyn. & Integrability in Dynam. Syst., A.I.P. Conf. Proc. #88*, ed. by M. Tabor & Y.M. Treve, p. 211, 1982
35. "Logarithmic Singularities and Chaotic Behaviour in Hamiltonian Systems," in *Math. Methods in Hydrodyn. & Integrability in Dynam. Syst., A.I.P. Conf. Proc. #88*, ed. by M. Tabor & Y.M. Treve, with T. Bountis, 1982
36. "Wobbling Kinks in  $f^4$  and Sine-Gordon Theory," *J. Geophys. Res.*, **24**, p. 1439, 1983
37. "Integrable Models of Shallow Water Waves," in *Nonlinear Phenomena*, Lect. Notes in Phys #189, ed. by K.B. Wolf, Springer-Verlag, NY, p. 212, 1983
38. "Towards a New Kinetic Theory of Resonant Triads," *J. Geophys. Res.*, **28**, p. 281, 1984

39. "An Analytical Model of Periodic Waves in Shallow Water," *Journal of Geophysical Research*, **73**, pp. 183-220, with A. Finkel, 1985
40. "Basic Form for Riemann Matrices," in Nonlinear Syst. of PDEs in App. Math., ed by B. Nicolaenko, D.D. Holm & J.M. Hyman, *Journal of Geophysical Research*, **23**, p. 47, with A. Finkel, 1986
41. "Some Open Problems," *Journal of Geophysical Research*, **18D**, p. 1, 1986
42. "Nonexistence of Small-Amplitude Breather Solutions in  $f^4$  Theory," *Journal of Geophysical Research*, **58**, p. 747, with M.D. Kruskal, 1987
43. "The KP Equation and Biperiodic Water Waves," in Nonlinear Evolutions, ed by J. Leon, World Scient., Singapore, p. 517, with J.L. Hammack & N.W. Scheffner, 1987
44. "Asymptotics Beyond All Orders," in Trans of 5th Army Conf. on App. Math & Comp., ARO Rep't 88-1, p. 369, 1988
45. "Two-dimensional Periodic Waves in Shallow Water," *Journal of Geophysical Research*, **209**, pp. 567-589, with J.L.Hammack & N. Scheffner, 1989
46. "Solitons," in Handbook of Solitons, ed. by G. Trigg & R. Lerner, VCH Pub., NY, p. 1154, 1991
47. "Stem Waves Along Breakwater", a Discussion, *Journal of Geophysical Research*, **115**, pp. 542-543, with J.L. Hammack & N.W. Scheffner, 1991
48. "A note on the generation and narrowness of periodic rip currents", *Journal of Geophysical Research*, **96**, pp. 4909-4914, with J.L. Hammack & N.W. Scheffner, 1991
49. "The Kadomtsev-Petviashvili equation and water waves," in Proc. of Chaos & Order, ed. by N. Joshi & R. Dewar, World Sci., Singapore, pp. 109-120, with J. Hammack & N. Scheffner, 1991
50. "Who cares about integrability?", *Journal of Geophysical Research*, **51**, pp.343-359, 1991
51. "Asymptotics Beyond All Orders in a Model of Crystal Growth", *Journal of Geophysical Research*, **85**, pp. 129-182, with M.D. Kruskal, 1991
52. "Periodic Waves in Shallow Water", Proc. of Int.School of Physics "Enrico Fermi", Course CIX (1988), ed. by A.R. Osborne, North Holland, Amsterdam, pp. 891-914, with J. Hammack & N. Scheffner, 1991
53. "An asymptotic symmetry of the rapidly forced pendulum", *Journal of Geophysical Research*, **51**, pp. 109-118, with Chang Y.-H., 1991
54. "An overview of the geometric model", in Asymptotics Beyond All Orders, ed. by

60. "Wave Collapse and Instability of Solitary Waves of a Generalized Kadomtsev-Petviashvili Equation", **D78**, pp. 241-265, with X.P. Wang & M.J. Ablowitz, 1994

79. “Integrable models of waves in shallow water”, in Probability, Geometry and Integrable Systems, MSRI Publication **55**, pp. 307-333, 2008
80. “Finite-dimensional pole dynamics of solutions of the viscous Burgers equation”, **40**, 5459-5467, with B. Deconinck & Y. Kimura, 2007
81. “The modulational instability revisited”, **147**, 25-43, with D.M. Henderson, 2007
82. “Explosive instability due to 4-wave mixing”, **99**, DOI: 10.1103/PhysRevLett.99.245004, with B.R. Safdi, 2007
83. “Stable deep-water waves propagating in one and two dimensions”, **7**, pp. 1101401-1101402, with D. Henderson, 2007
84. “Explosive instability due to 3-wave or 4-wave mixing, with or without dissipation”, **6**, pp. 1-16, 2008
85. “Demonstration experiment in the NSF-CBMS Regional Conference on Water Waves”, Conf. Proc. on Water Waves, Theory and Experiment, World Scientific, New Jersey, pp. 191-201, with D. Henderson, R. Geist & K. Hammack, 2010
86. “Experimental evidence of stable wave patterns on deep water”, **658**, pp. 247-278, with D.M. Henderson & J.D.Carter, 2010
87. Proceedings of the Conference on Water Waves – Theory and Experiment, ed. by M.F. Mahmood, D. Henderson & H. Segur, World Scientific Pub., New Jersey, 201 pp., 2010
88. “The Benjamin-Feir Instability and Propagation of Swell across the Pacific”, **82**, pp. 1172-1184 with Diane Henderson, 2012
89. “Seismically generated tsunamis”, **370**, pp. 1505-1542, doi: 10.1098/rsta.2011.0457, with D. Arcas, 2012
90. “The role of dissipation in the evolution of ocean swell”, **118**, pp. 5074-5091, doi:10.1002/jgrc.20324, with D.M. Henderson, 2013
91. “Dissipation of narrow-banded surface water waves”, **75**, pp. 163-183 with D. Henderson & G.K. Rajan, 2015
- 92.

- 4) SIAM Conference on Nonlinear Waves, U. of Washington, Seattle, WA, June 13-16, 2012
- 5) 8<sup>th</sup> IMACS Conference on Nonlinear Evolution Equations and Wave Phenomena, U. of Georgia, Athens, GA, March 24-28, 2013
- 6) “Workshop on Ocean Wave Dynamics”, Fields Institute for Research in Mathematical Sciences, Toronto, Ontario, CANADA, May 6-11, 2013
- 7) NSF-CBMS Regional Conference on “Solitons in two-dimensional water waves and applications to tsunamis”, University of Texas/Pan-American, Edinburg, TX, May 20-24, 2013
- 8) “Water waves: Computational Approaches for Complex Problems”, Banff International Research Station, Banff, Alberta, CANADA, July 1-5, 2013
- 9) “Hamiltonian PDEs: Analysis, Computation and Applications”, Fields Institute for Research in Mathematical Sciences, Toronto, Ontario, CANADA, Jan. 9-12, 2014
- 10) “Theory of Water Waves”, Isaac Newton Institute, Cambridge, U.K., July 14-25, 2014
- 11) “Impacts of Waves along Coastlines”, Institute for Mathematics and its Applications, Minneapolis, MN, Oct. 14-17, 2014
- 12) 9<sup>th</sup> IMACS Conference on Nonlinear Evolution Equations and Wave Phenomena, U. of Georgia, Athens, GA, April 1-4, 2015

#### SCIENTIFIC ORGANIZING COMMITTEES (since 2009)

- 1) Organizing Committee: Geophysical Fluid Dynamics Summer Program, Woods Hole Oceanographic Institute, Woods Hole, MA, July 15-August 21, 2009
- 2) 7<sup>th</sup> IMACS Conference on Nonlinear Evolution Equations and Wave Phenomena, U. of Georgia, Athens, GA, April 4-7, 2011
- 3) 8<sup>th</sup> IMACS Conference on Nonlinear Evolution Equations and Wave Phenomena, U. of Georgia, Athens, GA, March 24-28, 2013
- 4) 9<sup>th</sup> IMACS Conference on Nonlinear Evolution Equations and Wave Phenomena, U. of Georgia, Athens, GA, April 1-4, 2015

#### RESEARCH CONTRACTS

Principal or Co-Principal Investigator on various contracts with the U.S. Army Research Office (Mathematics), the Department of Energy (Applied Mathematical Sciences), the U.S. National Science Foundation (Geophysics, Mathematics, Special Programs, Focused Research Group, VIGRE, MCTP, CCLI), NATO (Scientific Affairs Division), and the U.S. Office of Naval Research (Fluid Mechanics, Physics).