CURRICULUM VITAE

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Education:

1. Ph. D., The University of Wisconsin-Madison, June 1990, Mathematics Department.
2. B. S., Fudan University, Shanghai, China, 1983, Pure Mathematics and Applied Mathematics

Professional Experience:

1. Professor, Mathematics Department, Virginia Polytechnic Institute and State University, September 2002 – Present
2. Visiting Professor, Department of Mathematics, Korea University, South Korea, October 24, 2008 --- December 10, 2008
3. Visiting Taft Fellow, Department of Mathematical Sciences, The University of Cincinnati, September 2006 –December 2006
4. Associate Professor, Mathematics Department, Virginia Polytechnic Institute and State University, September 1997 – August 2002
5. Visiting Researcher, Mathematics Department, Stanford University, September 1999 –December 1999
6. Visiting Researcher, Institut Non Lineaire de Nice, Universite de Nice, France, June 1999 – August 1999
7. Visiting Researcher, Mathematisches Institut A, Universitat Stuttgart, Germany, June 1998
8. Assistant Professor, Mathematics Department, Virginia Polytechnic Institute and State University, September 1992 - August 1997
9. Visiting Assistant Professor, Mathematics Department, University of Wisconsin-Madison, August 1991 - August 1992.
10. Postdoctoral Research Associate, Mathematics Department, University of Wisconsin-Madison, July 1990 - July 1991.

Publications in Refereed Journals:

1. M. C. Shen and S. M. Sun, Ray method for surface waves on ferromagnetic fluid, Wave Motion 9 (1987), 99-106.
2. M. C. Shen and S. M. Sun, Critical viscous surface waves over an incline, Wave Motion 9 (1987), 323-332.

3. M. C. Shen and S. M. Sun, Nonlinear surface waves on a ferromagnetic fluid of variable depth, Wave Motion 9 (1987), 563-574.
4. S. P. Shen, M. C. Shen and S. M. Sun, A model equation for surface waves over a bump, J. Eng. Math 23 (1989), 315-323.
5. S. M. Sun, Existence of a generalized solitary wave solution for water waves positive Bond number less than 1/3, J. Math. Anal. Appl. 156 (1991), 471-504.
6. S. M. Sun and M. C. Shen, A new solitary wave solution for water waves with surface tension, Ann. Mat. Pura Appl. 162 (1992), 179-214.
7. M. C. Shen, S. M. Sun and R. E. Meyer, Surface waves on viscous magnetic fluid flow down an inclined plane, Phys. Fluids A 3 (1991), 439-445.
8. S. M. Sun and M. C. Shen, Exponentially small estimate for the amplitude of capillary ripples of a generalized solitary wave, J. Math. Anal. Appl. 172 (1993), 533-566.
9. S. M. Sun and M. C. Shen, Exact theory of secondary supercritical solutions for steady surface waves over a bump, Physica D 67 (1993), 301-316.
10. S. M. Sun and M. C. Shen, Solitary waves in a two-layer fluid with surface tension, SIAM J. Math. Anal. 24 (1993), 866-891.
11. S. M. Sun and M. C. Shen, Exact theory of surface waves in a stratified fluid with surface tension. Part I. Classical solitary wave theory, J. Diff. Eqs. 105 (1993), 94-116.
12. S. M. Sun and M. C. Shen, Exact theory of surface waves in a stratified fluid with surface tension. Part II. Generalized solitary wave theory, J. Diff. Eqs. 105 (1993), 117-166.
13. S. M. Sun and M. C. Shen, Exact theory of generalized solitary waves in a two-layer liquid in the absence of surface tension, J. Math. Anal. Appl. 180 (1993), 245-274.
14. M. C. Shen, S. M. Sun and D. Y. Hsieh, Forced capillary-gravity waves in a circular basin, Wave Motion 18 (1993), 401-412.
15. S. M. Sun and M. C. Shen, Exponentially small asymptotics for internal solitary waves with oscillatory tails in a stratified fluid, Meth. and Appl. of Anal. 1 (1994), 81-107.
16. S. M. Sun, Long nonlinear waves in an unbounded rotating jet or rotating two-fluid flow, Phys. Fluids 6 (1994), 1204-1212.
17. J. H. Choi, S. M. Sun and M. C. Shen, Steady capillary-gravity waves on the interface of a two-layer fluid over an obstruction-Forced Modified K-dV Equation, J. Eng. Math. 28 (1994), 193-210.
18. S. M. Sun and M. C. Shen, Linear water waves over a gently sloping beach, Q. Appl. Math. 52 (1994), 243-259.
19. S. M. Sun and M. C. Shen, On solitary waves and nonlinear oscillations in a stratified fluid with surface tension, J. Math. Anal. Appl. 183 (1994), 551-570.
20. S. M. Sun and M. C. Shen, Exponentially small estimate for a generalized solitary wave solution to the perturbed K-dV equation, J. Nonlinear Anal. 23 (1994), 545-564.
21. Y. Renardy and S. M. Sun, Stability of a layer of viscous magnetic fluid flow down an inclined plane, Phys. Fluids 6 (1994), 3235-3246.

22. S. M. Sun, Bifurcation theory for semi-linear elliptic equations in a two or three-dimensional cylindrical domain, J. Math. Anal. Appl. 187 (1994), 887-918.
23. S. M. Sun and M. C. Shen, Justification of the linear long-wave approximation to viscous fluid flow down an inclined plane, Q. Appl. Math. 52 (1994), 759-775.
24. S. M. Sun and M. C. Shen, Existence of solitary pressure pulses in a cylindrical fluid-filled tube, J. Diff. Equations 115 (1995), 224-256.
25. S. M. Sun, M. C. Shen and D. Y. Hsieh, Nonlinear theory of forced surface waves in a circular basin, Wave Motion 21 (1995), 331-341.
26. S. M. Sun, On the existence of solitary waves in rotating fluids, Proc. Royal Soc. Edinburgh A 125 (1995), 1105-1129.
27. J. W. Choi, S. M. Sun and M. C. Shen, Internal capillary-gravity waves of a two-layer fluid with free surface over an obstruction, Phys. Fluids 8 (1996), 397-404.
28. S. M. Sun, The Korteweg-de Vries equation on a periodic domain with singular point dissipation, SIAM J. Control and Opt. 34 (1996), 892-912.
29. M. C. Shen and S. M. Sun, Asymptotic method for interfacial solitary waves in a compressible fluid, Meth. and Appl. of Anal. 3 (1996), 135-156.
30. S. M. Sun, Asymptotic behavior and symmetry of internal waves in two-layer fluids of great depth, J. Diff. Equations 129 (1996), 18-48.
31. S. M. Sun, Some analytical properties of capillary-gravity waves in two-fluid flows of infinite depth, Proc. Royal Soc. (London) Ser. A 453 (1997), 1153-1175.
32. S. M. Sun, On stability of liquid flow down an inclined plane, Q. Appl. Math. 55 (1997), 375-397.
33. S. M. Sun, On the solitary tails with arbitrary phase shift for solutions of the perturbed K-dV equation, SIAM J. Appl. Math. 58 (1998), 1163-1177.
34. D. L. Russell and S. M. Sun, Stability properties of non-constant stationary solutions of the periodic Korteweg-de Vries equation, Applicable Analysis 68 (1998), 207-240
35. S. M. Sun, Non-existence of truly solitary waves in water with small surface tension, *Proc. Royal Soc. (London)* Ser. A Vol. 455 (1999), 2191-2228
36. S. M. Sun, Existence of large amplitude periodic waves in two-fluid flows of infinite depth, *SIAM J. Math. Anal.* 32 (2001), 1014-1031
37. S. M. Sun and J. B. Keller, Capillary-gravity wave drag, *Physics of Fluids* **13** (2001), 2146-2151
38. M. D. Groves, M. Haragus-Courcelle and S. M. Sun, Transverse instability of gravity-capillary line solitary water waves, *C. R. Acad. Sci.* Serie I. **333** (2001), 421--426
39. J. L. Bona, S. M. Sun and B. Y. Zhang, A non-homogeneous boundary-value problem for the Korteweg-de Vries equation in a quarter-plane, *Transaction of the American Mathematical Society* **354** (2002), 427--490
40. S. M. Sun, Solitary internal waves in continuously stratified fluids of great depth, *Physica* D (2002) **166**, 76--103.
41. M. Grove, M. Haragus-Courcelle and S. M. Sun, A dimensional-breaking phenomenon in the theory of steady gravity-capillary water waves, *Phil. Trans. Royal Soc. Lond.* **A**. (2002) **360**, 2189--2243.

42. G. Iooss, E. Lombardi and S. M. Sun, Gravity traveling waves for two superposed fluid layers, one being of infinite depth: a new type of bifurcation, *Phil. Trans. Royal Soc. Lond.* A. (2002) **360**, 2245--2336.
43. J. L. Bona, S. M. Sun and B. Y. Zhang, A nonhomogeneous boundary-value problem for the Korteweg-de Vries equation posed on a finite domain, *Comm. Partial Differential Equations* (2003) **28**, 1391--1436.
44. J. L. Bona, S. M. Sun and B. Y. Zhang, Forced oscillations of a damped Korteweg-de Vries equation in a quarter plane, *Comm. Comtemp. Math.* (2003) **5**, 369--400.
45. R. Pego and S. M. Sun, On transverse linear instability of solitary water waves with large surface tension, *Proc. Royal Soc. Edinburgh Sect.* A **134** (2004), 733-752.
46. J. Bona, S. M. Sun and Bing-yu Zhang**,** Conditional and unconditional well-posedness for nonlinear evolution equations, *Advances in Differential Equations* **9** (2004), 241-265.
47. Jerry L Bona, Hongqiu Chen, Shu-Ming Sun, B.-Y. Zhang, Comparison of quarter-plane and two-point boundary value problems: the BBM-equation. *Discrete Contin. Dyn. Syst.* **13** (2005), 921--940.
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49. J. L. Bona, S. M. Sun and Bing-yu Zhang, Comparison of quarter-plane and two-point boundary value problems: the KdV-equation. *Discrete Contin. Dyn. Syst Ser. B.* **7** (2007), 465—495.
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52. J. W. Choi, S. M. Sun and S. I. Whang, Supercritical surface gravity waves generated by a positive forcing. *European Journal of Mechanics - B/Fluids* **27** (2008), 750--770.
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62. S. M. Sun, and N. Zhong, On effective convergence of numerical solutions for differential equations. ACM Transactions on Computation Theory 6 (2014), 2578219.

63. J. W. Choi, D. S. Lee, S. H. Oh, S. M. Sun, and S. I. Whang, Multi-hump solutions of some singularly-perturbed equations of KdV type. Discrete Contin. Dyn. Syst. Ser. A 34 (2014), 5181--5209.

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69. R. Pego, R. and S. M. Sun, Linear spectrum analysis of solitary water waves. Archive for Rational Mechanics and Analysis 222 (2016), 1161--1216.

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71. S. M. Sun, E. Trelat, B.-Y. Zhang, and N. Zhong, On sharpness of the local Kato-smoothing property for dispersive wave equations. Proc. Amer. Math. Soc. 145 (2017), 653--664.

72. S. Deng and S, M. Sun, Multi-hump solutions with small oscillations at infinity for stationary Swift-Hohenberg equation. Nonlinearity 30 (2017), 765--809.

73. J. L. Bona, S. M. Sun and B.-Y. Zhang, Nonhomogeneous boundary value problems of one-dimensional nonlinear Schrodinger equation. J. Math. Pures Appl. 109 (2018), 1--66.

74. Y. Ran, S. M. Sun and B.-Y. Zhang, Nonhomogeneous boundary value problems of nonlinear Schrodinger equations in a half plane. SIAM J. Math. Anal. 50 (2018), 2773--2806.
75. R. A. Capistrano-Filho, S. M. Sun, and B.-Y. Zhang, General boundary value problems of the Korteweg-de Vries equation on a bounded domain. Math. Control and Related Fields 8 (2018), 583--605.
76. J. Cui and S. M. Sun, Nonlinear Schrodinger Equations on a Finite Interval with Point Dissipation. Math. Control and Related Fields, in press.

Publications in Referred Books and Conference Proceedings:

1. S. M. Sun, N. Zhong, and M. Ziegler, On Computability of Navier-Stokes Equation. "Evolving Computability" (eds. Beckmann, A., Mitrana, V., and Soskova, M.), *Lecture Notes in Computer Science*, Vol. 9136, (2015), 334--342.
2. J. W. Choi, D. S. Lee, S. H. Oh, S. M. Sun and S. I. Whang, Mathematical, numerical and experimental study of solitary waves. "Nonlinear Dynamics in Partial Differential Equations" (eds. Kawashima, S., Ei, S.-I., Kimura, M., and Mizumachi, T.), Advanced Studies in Pure Mathematics, Vol. 64, (2015), 263--271.
3. S. M. Sun, Exact theory of existence and stability for two- and three-dimensional solitary waves. *Proceedings of the Conference on Water Waves: Theory and Experiment,* Edited by M. F Mahmood, D. Henderson, and H. Segur, Published by World Scientific, 2010, pp. 101--119.
4. S. Deng and S. M. Sun**,** On the existence of gravity-capillary waves on water with small surface tension*. Proceedings of the National Institute for Mathematical Sciences: Fluid Dynamics and Scientific Computation*, Volume 3, Number 11 (2009), 61--74.
5. S. Deng and S. M. Sun, Exact theory of three-dimensional water waves with small surface tension, Proceedings of the National Institute for Mathematical Sciences: Fluid Mechanics, Volume 2, Number 6 (2008), 199—207.
6. S. M. Sun, Singularly perturbed Korteweg-de Vries equations with forcing, *2004 International Workshop on Mathematical Fluid Dynamics and Applications,* edited by J. Kweon, et al. (2004), 179-189.
7. S. M. Sun, A note on exact estimates for the amplitude of oscillations of generalized solitary waves, *Proceedings of the International Conference on Differential Equations,* Edited by B. Fiedler, K. Groger, and J. Sprekels, Published by World Scientific, 2000, pp. 1360-1365
8. S. M. Sun, Existence of solitary internal waves in a two-layer fluid of infinite depth, *Nonlinear Analysis* 30 (1997), 5481-5490.
9. S. M. Sun, Solitary waves on the free surface of a rotating cylindrical flow, *Contemporary Mathematics* 200 (1996), 173-192.
10. S. M. Sun, Periodic waves in two-layer fluids, *Advances in Multi-Fluid Flows*, edited by Y. Renardy, et al., SIAM, (1996), 339-345.

11. M. C. Shen and S. M. Sun, Solitary waves with ripples at infinity, *Current Topics in the Physics of Fluids*, edited by Council of Scientific Information, India, Published by Research Trends, 1 (1994), 35-44 (invited review article).

12. J. W. Choi, S. M. Sun, and M. C. Shen, Internal surface waves in a two-layer fluid over an obstruction, *Proceedings of the Fifth Asian Conference on Fluid Mechanics,* (1994), 175-178.

13. M. C. Shen and S. M. Sun, Generalized Solitary Waves in a Stratified Fluid, *Asymptotic Beyond All Orders*, edited by H. Segur et al. (1991), 299-307.

14. S. P. Shen, S. M. Sun and M. C. Shen, Subcritical and supercritical solutions of a model equation for steady surface waves over a bump, *Continuum Mechanics and Its Applications*, edited by G. A. C. Graham and S. K. Malik (1989), 399-409.

Conferences Organized and Conference Proceedings Edited:

1. Special session on "*Nonlinear Dispersive Waves*", The 12th AIMS Conference on Dynamical Systems, Differential Equations and Applications, the National Taiwan University, Taipei, Taiwan, July 5--9, 2018.
2. Workshop on "*Nonhomogeneous boundary-value problems for nonlinear waves*", American Institute of Mathematics, Polo Alto, CA, May 13 – 17, 2013.
3. Symposium on "*Asymptotic methods in fluid dynamics*", San Diego State University, San Diego, CA, January 8, 2008.
4. Special session on "*Recent Developments in Nonlinear Dispersive Wave Theory*" in the First Joint International Meeting with the Shanghai Mathematical Society, Shanghai, China, December 17 – 21, 2008.
5. "NIMS International Workshop on Fluid Mechanics", in the National Institute for Mathematics Sciences, Daejun, South Korea, June 10 –12, 2007.
6. Workshop on "theory and applications of fluid mechanics", The University of Cincinnati, Cincinnati, December 9-10, 2006.
7. Nonlinear Waves, Special Session in 2004 AMS Fall Central Section Meetings, Evanston, IL, October 23-24, 2004.
8. Analysis of multi-fluid flows and interfacial instabilities, 1995 Joint AMS-IMS-SIAM Summer Research Conference in the Mathematical Sciences, Seattle, July, 1995.
9. Advances in Multi-Fluid Flows, edited by Y. Renardy, A. Coward, D. Papageorgiou, and S. M. Sun, SIAM, 1996.
10. Mini-symposium on Problems in Applied Mathematics, PhD Centennial Conference, May 22-24, 1997, Madison, Wisconsin.