

VITAE

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Date of birth: May 29, 1936
Place of birth: Shanghai, China,
Education: Graduated from Dept. of Math. Peking Univ. 1959
Occupation: Member, Chinese Academy of Sciences.
Fellow, Third World Academy of Science.
Professor of Math. Peking Univ.
Member, Commission of Development and Exchange, IMU.
Membre de Comite de redaction, Analyse nonlineaire, IHP, France.
Editor member, Science in China.
Editor member, International Journal of Mathematics, World Sci.
Publ. Co.
Consulting Editor, Proceedings A, the Royal Soc. Edinburgh, UK.
Editor member, Dynamic Systems and Applications, USA.
Editor member, Nonlinear Analysis TMA, Pergamon, USA.
Editor member, Discrete and Continuous Dynamical System, USA.
Associate Editor, Monographs in Math., Birkhauser, Swiss.

In the Profession:

1983, 2-present Professor, Peking Univ.
1978, 5-1982, 2 Associate Professor, Peking Univ.
1959, 9-1978, 5 Assistant, Peking Univ.
1999, 4, Distinguished Visiting Professor. National University of
Singapore.
1997, 10-11, Ordway Visiting Prof. Math. Univ. of Minnesota

1995, 9-12, Visiting Professor, UBC, Vancouver, Canada.
1993, 7-10, Visiting Mathematician, ICTP, Trieste, Italy.

1992, 10-12, Visiting Professor, Hong Kong Univ. of Sci & Tech.
 1990, 9-12, Visiting Professor, UCSB, USA.
 1990, 4-5, Visiting Professor, Univ. of Minnesota, USA.
 1989, 9-11, 1988, 7-8, ETH Zurich, Switzerland.
 1988, 1-3, Visiting Professor, UCLA, USA.
 1987, 9-12, Visiting Professor, Univ. of Wisconsin at Madison, USA
 1988, 4-5, 1981, 1-3, 1979, 1-12, Visiting member,
 Courant Institute of Math. Sci. USA.
 1984, 10-12, Visiting Professor, Univ. of Warwick, UK.
 1983, 5-8, Member, MSRI, Berkeley, USA.
 1981, 4, Visiting Member, IHES, France.
 1980, 4-12, Honorary Fellow, MRC, Univ. of Wisconsin, at Madison ,
 USA.
 1980, 1-3, Visiting Scholar, UC Berkeley, USA.

Invited speaker at the following conferences:

1980, 6, Texas, Arlington, USA, Nonlinear Phenomena in Mathematical
 Sciences.
 1981, 3, Sherbrook, Canada, Nonlinear Analysis.
 1983, 6-7, Montreal, Canada, 22nd Session Seminaire de mathematique
 superieures.
 1983, 7, Calif. Berkeley, USA, Nonlinear Functional Analysis.
 1983, 8, NY Albany, USA, AMS Annual Meeting.
 1985, 6, Calif. Santa Barbara, USA, Linear and Nonlinear Analysis
 (in honor of Ky Fan).
 1985, 8, Brno, Czechoslovakia, Equadiff 6.
 1986, 9, Calif. Berkeley, USA, Nonlinear Diffusion Equation and
 their Equilibrium.
 1987, 10, Illinois, Chicago, USA, PDE Midwest Conference.
 1988, 2, Trieste, Italy, College on Variational Problems.
 1988, 6, Paris, France, Variational Problems and Related Topics.
 1989, 8-9, Trieste, Italy, Topical Meetings on Variational Problems.
 1990, 5, New Brunswick, USA, Nonlinear Analysis and Partial
 Differential Equations.
 1990, 9, Trento, Italy, Partial Differential Equations and Related
 Topics.
 1992, 5, Erice, Italy, Nonlinear Analysis.
 1992, 8, Tampa, Florida, USA, World Congress of Nonlinear Analysts.

1992, 12, Hong Kong, Geometric Analysis Conference in Pacific rim.
 1994, 8, Zurich, Switzerland, 45 Min. Invited speaker, IMU' 94.

1996, 7, Athens, Greece, Second World Congress of Nonlinear Analysts.
 1996, 10, Manila, Philippine, International Conference on Functional Analysis and Global Analysis.
 1997, 5, Trieste, ICTP, Nonlinear Functional Analysis & Appl.
 1999, 6, Tianjin, China, 2nd International Conference on Nonlinear Analysis.

 2000, 1, Pisa, Italy, Topological and Variational Methods,
 2000, 3, Singapore, International Conference on Fundamental Sciences: Mathematics, and Theoretical Physics,
 2000, 6, Hong Kong, , International Conference on Foundations of Computational Mathematics, in honor of Prof. Smale,

Organizer of the following international conferences:

1982, 8, DD3, Changchuan, China.
 1986, 7, DD7, Tianjin, China.
 1985, 9-86, 7 Special year on PDE, Nankai Institute, Tianjin, China.
 1988, 1-2, College on Variational Problems, Trieste, Italy.
 1991, 8, International Conference on Nonlinear and Microlocal Analysis, Tianjin, China.
 1992, 5, Variational Methods in Nonlinear Analysis, Erice-Sicily, Italy.
 1992, 8, World Congress of Nonlinear Analysts, Tampa, Florida, USA.
 1995, 8, Conference on Partial Differential Equations & Applications to Geometry, Trieste, Italy.
 1996, 4-5, School of Nonlinear Functional Analysis and Applicationsto Differential Equations, Trieste, Italy.
 1997, 4-5, ibid.
 1998, 10, ibid.
 1999, 6, 2nd International Conference on Nonlinear Analysis, Tianjin, China,
 1999, 8, China-Canada 3 by 3 Mathematical Congress, Beijing, China.

Award:

- (1) 3rd Award, National Natural Science Award, 1982
- (2) S. S. Chern Prize of Mathematics, 1986
- (3) 2nd Award, National Natural Science Award, 1987
- (4) Third World Academy of Science Award in Mathematics, 1993
- (5) HLHL Prize, Science and Technology Progress Award. 1995.

Books:

1. Linear Functional Analysis, (with Kwang C.C. et al.)1979, Shanghai Sci. Tech. Press, Shanghai, China, (Chinese).
2. Infinite Dimensional Morse Theory And Its Applications,1985, SMS les presses de L'universite de Montreal, Montreal, Canada.
3. Critical Point Theory & application, 1986, Shanghai Sci. Tech.Press, Shanghai, China, (Chinese).
4. Lectures on Linear Functional Analysis, Vol.1 (with Lin Y.Q.),1987; Vol.2 (with Guo M.Z.),1990, Peking University Press, Beijing, China, (Chinese).
5. Infinite Dimensional Morse Theory and Multiple Solution Problems, 1993, Birkhauser.
6. Nonlinear Analysis and Microlocal Analysis (edited by K.C. Chang, Y.M. Huang, T.T. Li) World Scientific, (1992).
7. Variational Methods in Nonlinear Analysis (edited by A. Ambrosetti and K.C. Chang) Gordon and Beach Publishers (1993).
8. Nonlinear Functional Analysis and Applications to. Differential Equations (edited by A. Ambrosetti, K.C. Chang, I. Ekeland) World Scientific (1998).
9. Progress in Nonlinear Analysis, (edited by K. C. Chang and Long Yiming) World Scientific Co. (2000).

Articles:

1. A Proof of Dispersion Relations Based on the Theory of Distributions, Acta Math. Sinica,12 (1962), (English translation: Chinese Math.1963).
2. Theory of Distribution of S Type and Pansions, ibid, (1963), (Chinese Math. 1964).
3. On the General Theory of Eigenfunction Expansions, Chinese Math. Progress, 7(1964).
4. On the Interpolation Properties of a Class of Functional Spaces, Acta Sci. Natur. Univ. Pekin, (1964).
5. On the L estimates of Higher Order Parabolic Differential Equations, Report on National Conference on Functional Analysis, Aug. 1964.
6. On Envolution Equations in Hilbert Spaces, ibid. (1964).
7. On the Kernel Characterization of Unitary Operators, ibid. (1964).
8. On the L Continuity of Pseudo Differential Operators, Scientia Sinica, 7, (1974).
9. Asymptotic Theory of the Composite fields, Acta Math. Sinica, 19, (1976).
10. A Free Boundary Problem for the Flux Equation in Plasma Physics, Bull. of Science, 21(1976), 225-227.
11. On Multiple Solutions of an Elliptic Differential Equation with Discontinuous Nonlinear Terms, Scientia Sinica, 21, (1978), 139-158.
12. A Fixed Point Index for Set-valued Mappings and Multiplicity of Solution of Elliptic Equations with Discontinuous Nonlinearities, (with B.J. Jiang), Acta Math. Sinica, 21, (1978).

13. Free Boundary Problems for the Stationary Water Cone, (with L. S. Jiang), Bull. of Science 23 (1978), 647-650.
14. Free Boundary Problems for the Stationary Water Cone, (with L. S. Jiang), Acta Sci. Natur. Univ. Pekin, (1978).
15. WKB-Maslov Methods, National PDE Conference, (1978).
16. Partial Differential Equations with Discontinuous Nonlinearities and Multiple Solutions, Report of the 4th National Conference of Chinese Mathematical Society, Nov. 1978.

17. Multiple Solutions for Asymptotically Linear Operators, (with B. J. Jiang), Bull. of Science, 23 (1978), 340-343.
18. Multiple Solutions for Asymptotically Linear Operators, (with B. J. Jiang), Scientia Sinica, 2, (1979).
19. The Obstacle Problem and Partial Differential Equations with Discontinuous Nonlinear Term, Comm. Pure & Appl. Math. 3, (1980).
20. Remarks on Some Free Boundary Problems for the Equilibrium Equation of Plasmas, Comm. in PDE, 5(1980).
21. Free Boundary Problems & the Set-Valued Mappings, J. Diff. Equations, 49 No. 1 (1983).
22. Differential Equations with Discontinuous Nonlinearities, Nonlinear Phenomena in Math. Sci. (Editor Lakshmikantham), Acad. Press, (1982).
23. Some Free Boundary Problems in Math. Physics, Report on National Applied Math. Conference, (1982).
24. Remarks on Non-expansive Operators, (with Li Shujie), PAMS (1982).
25. Solutions of Asymptotically Linear Operator Equations Via Morse Theory, Comm. Pure Appl. Math. (1981), 693-712.
26. Morse Theory on Banach Space and Its Applications to PDE, Chinese Annales of Math. (1983), 381-399.
27. Morse Theory and PDE, Symp. on DD1, Beijing, 1980, (Editor S. S. Chern), Vol. 3, 115-1121, (1982), Science Press.
28. Variational Methods for Non-differentiable Functionals, J. Math. Anal. Appl. 80 (1981), 102-128.
29. Multiple Periodic Solutions for an Asymptotically Linear Wave Equation, (with Wu S. P. & Li S. J.), Indiana Math. J. (1982). 721-731.
30. A New Proof and an Extension of a Theorem of P. Rabinowitz Concerning Nonlinear Wave Equations, (with Li S. J. & Dong G. C.), Nonlinear Analysis, TAM (1982), 139-149.
31. Nontrivial Periodic Solutions of a Nonlinear Beam Equation, (with L. Sanchez), Math. methods in the Appl. Sci. (1982). 194-205.
32. Some Problems in Nonlinear Analysis, National Conference of the Chinese Mathematical Society, 1983.
33. A Variant Mountain Pass Lemma, Scientia Sinica (1983), 1241-1255.

34. Variational Methods And Sub and Super-Solutions, *ibid.* 1256-65.
35. An Extension of Mountain Pass Lemma, *Notices Abstract AMS*, 1983.
36. An Extension of Mountain Pass Lemma, *Proc. Symp. on DD3 Changchun*, 1982, (Editor S.S. Chern et al.) 271-282, (1986). Science Press.
37. Morse Theory on Banach Space & Its Applications to PDE, *ibid.* 283-288.
38. A Bifurcation Theorem, *System Sci. & Math. Sci.* (1984) 191-195.
39. Periodic Solutions of the Semilinear Spherical Wave Equation, (with Hong C.W.), *Acta Math. Sinica, New Series*, (1985), 87-96.

40. Applications of Homology Theory to Some Problems in Differential Equations, *Nonlinear Functional Analysis and Appl.* 1983, Berkeley, *Proceedings Symposium on Pure Mathematics*, 45, (F.E. Browder ed.)AMS, Providence, (1986), 253-262.
41. *New Progress in the Calculus of Variations*. National Conference of the Chinese Mathematical Society, 1985.
42. Harmonic Maps and Minimal Surface Coboundaries, (with J. Eells), *Proc. Lefschetz Centenary, Mexico*, 1984, *Contemporary Math. AMS*, Vol.58, Part 3, (1987), 11-18.
43. Unstable Minimal Surface Coboundaries, (with J. Eells), *Acta Math. Sinica*. 1986, Vol.2, No.3, 233-247.
44. On the Mountain Pass Lemma, *Proc. Equadiff. 6*, Brno, 1985, *Lect. Notes in Math.* 1192 (1986) 203-208, Springer Verlag.
45. A Local Minimax Theorem Without Compactness, (with S.C. Shi), *Proc. in honor of Ky Fan*, Santa Barbara, 1985, *Nonlinear and Convex Analysis*, *Lect. Notes in Pure and Appl. Math.* 107, Dekker, (1987), 211-234.
46. Remarks on Saddle Points in the Calculus of Variations, *Nonlinear Diffusion Equations and Their Equilibrium States*, 1, 1986, Berkeley, *MSRI Publications* 12, (1988), 217-236, Springer Verlag.
47. The Existence of Infinitely Many Solutions for the Semilinear Wave Equations, (with J.Q. Liu).
48. On the Nash Point Equilibria in the Calculus of Variations, *J. Math. Analysis and Appl.* (1990), Vol.146, 72-88.
49. On the Periodic Nonlinearity and Multiplicities of Solutions, *Nonlinear Analysis TMA*, (1989), Vol.13, 527-537.
50. Heat Flow and Boundary Value Problems for Harmonic Maps. *Analyse Non lineaire*, *Ann. Inst. H. Poincare*, (1989), Vol.6, 363-395.
51. Morse Theory for Harmonic Maps, *Variational Methods*, Edit. H. Berestycki, etc. Birkhauser, PNLDE, 4, (1990), 431-446.
52. Forced Oscillations for the Triple Pendulum, (with Y.M. Long & E. Zehnder), *Analysis, et cetera*, Acad.Press, 177-208.
53. A Strong resonance Problem, (with J.Q. Liu), *Chinese Annales of Math.* 11 B.2 (1990), 191-210.
54. Morse Theory under General Boundary Conditions, (with J.Q. Liu), *J. System Science and Math. Sciences*, Vol.4 (1991), 78-83.

55. Heat Flow for Harmonic Maps from D^2 to S^2 , (with W.Y. Ding), *Nematics Math. & Phys. Aspects*, (Edit. J.M. Coron etc.) NATO ASI series (1990), 37-48.
56. The Lagrange intersections for (CP^n, RP^n) , (with M.Y. Jiang), *Manuscripta Math.* 68 (1990), 89-100.
57. Critical Groups, Morse Theory, and Applications to Semilinear Elliptic boundary value problems, *Chinese Math. into the 21st Century*, (Edit. Wu W. T. & Cheng M. D.), (1991), 41-66.
58. A Remark on the Perturbation of Critical Manifolds, *Acta Scientia Sinica*, (1991), 3, 298-300.
59. A Remark on the Homoclinic Orbits for Hamiltonian Systems, (with J.Q. Liu), *Nonlinear Analysis And Microlocal Analysis*, (1992), World Sci. Press, 130-141.
60. Finite Time Blow-up of the Heat Flow of Harmonic Maps, (with W.Y. Ding, R. Ye), *JDG.* (1992), 36, 507-515.
61. On the Homology Method in the Critical Point Theory, *Pitman Research Notes in Math. Series, Partial Differential Equations and Related Subjects*, (Ed. M. Miranda), (1992), 59-77.
62. A Morse Theoretic Approach to the Prescribing Gaussian Curvature Problem, (with J.Q. Liu) *Variational Methods in Nonlinear Analysis*, (edit. A. Ambrosetti & K.C. Chang), Gordon & Breach, (1993), 55-62.
63. On Nirenberg's Problem, (with J.Q. Liu), *International Journal of Mathematics* Vol. 4, No. 1 (1993), 35-58. World Scientific Publishing Company.
64. A Prescribing Geodesic Curvature Problem, (with J.Q. Liu), *MZ*, 223, (1996), 343-365.
65. A Cohomology Complex for Manifolds with boundary (with J.Q. Liu), *TMNA*, 5(1995), 325-340.
66. H^1 Versus C^1 Isolated Critical Points, Preprint (1993). *Paris. t. 319, Ser. 1*, (1994), 441-446.
67. Remarks on Multiple Solutions for Asymptotically Linear Elliptic BVPs, (with Li, S., Liu, J.Q.), *Topological Methods in Nonlinear Analysis*. Vol. 3, (1994), 179-187.
68. Nontrivial Periodic Solutions for Strong Resonance Hamiltonian Systems, (with J.Q. Liu), *Analyse nonlineaire, Ann. Inst. H. Poincare* (1997).
69. Morse Theory in Differential Equations, *Proceedings of the International Congress of Mathematicians, Zurich*, Birkhauser Verlag (1995) 1065-1076.
70. The Conley Index and the Critical Groups via an Extension of Gromoll-Meyer Theory (with N. Ghoussoub), *Topological Methods in Nonlinear Analysis* (1997).
71. Infinite Dimensional Morse Theory and Applications to PDE, *Proceedings Symp. HLHL, Beijing* (1996).
72. Morse Theory in Nonlinear Analysis, *Nonlinear Functional Analysis and Applications to Differential Equations* (Edited by A. Ambrosetti, K.C. Chang and

I. Ekeland) P.60-101 (1998).

73. An extension of the Hess-Kato theorem to elliptic systems and applications to multiple solution problems. *Acta Mathematica Sinica (English series)* 15, 439-454 (1999).
74. On the Morse indices on sign changing solutions of nonlinear elliptic problems (with T. Bartsch and Z. Q. Wang) *MZ* 233, 655-677, (2000).
75. Parabolic equations. Feynman-Kac formula on general domains (with. M.Y. Jiang), *Science in China*.
76. On the positive periodic solutions of semilinear periodic-parabolic system, *Control Theory and application*, 16 14-19 (1999).
77. Prof. Cheng M. T. (with Q. Y. Shi and D. G. Deng), *Approximation Theory and its Applications*, 15 1-3 (1999).
78. ICM and We, *Advances in Mathematics*, 28, 556-562, (1999).
79. Principal eigenvalue for weight matrix in elliptic systems, to appear in *Nonlinear Analysis TMA*,
80. On the principal eigenvalue of elliptic system with indefinite weight and applications, *Progress in Nonlinear Analysis*, (edited K. C. Chang and Yiming Long) 11-23, (2000).
81. Ambrosetti-Prodi type results in elliptic systems, to appear in *Nonlinear Analysis TMA*.
82. A review of the critical point theory, preprint Institute of Mathematics, Peking University (2000).
83. Heat flow for the minimal surface with Plateau boundary condition, (with Liu J. Q.,) Preprint no. 45, Institute of Mathematics, Peking University, (2000).
84. Boundary flow for the minimal surfaces in \mathbb{R}^n with plateau boundary condition, (with Liu J. Q.), Preprint no. 8, Institute of Mathematics, Peking University, (2001).