

# CURRICULUM VITA

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## 1 Education

<i>Degree</i>	<i>From</i>	<i>To</i>	<i>Major</i>	<i>University</i>
B. S.	March, 1978	Jan., 1982	Physics	Wuhan University, P. R. of China
M. S.	Sept., 1982	May, 1985	Applied Mathematics	Columbia University, USA
Ph. D.	Sept., 1982	May, 1987	Applied Mathematics	Columbia University, USA

## 2 Academic Appointments

- (1). Professor and Director of Graduate Program, Department of Applied Mathematics and Statistics, SUNY at Stony Brook, 2003 to present.
- (2). Associate Professor, Department of Applied Mathematics and Statistics, SUNY at Stony Brook, 1998 to 2003.
- (3). Assistant Professor, Mathematics Department and Computer Science Department, Indiana University-Purdue University at Indianapolis, 1991 to 1998.
- (4). Assistant Professor, Mathematics Department, New Jersey Institute of Technology, 1989 to 1991.
- (5). Associate Research Scientist, Courant Institute of Mathematical Sciences, 1987 to 1989.

## 3 Professional Societies

- (1). Member of Society of Industrial and Applied Mathematics (SIAM).
- (2). Member of American Physical Society (APS).

## 4 Research Grants of 2008-2009 Academic Year

- (1). Principal Investigator, Department of Energy, “Interoperable Technologies for Advanced Petascale Simulations”, 2006-2011, \$725,000.
- (2). Co-Principal Investigator, Army Research Office, “Mixing, Combustion, and Other Interface Dominated Flows”, 2009-2013, \$398,855.

- (3). Co-Principal Investigator, Army Research Office, “Advanced Parallel Computing Facilities for Interfacial Physics with Defense Interests”, 2010-2011, \$200,111.

## 5 Publications

- (1). *Study of crystal growth and solute precipitation through front tracking method*, X. Li, J. Glimm, X. Jiao, C. Peyser and Y. Zhao, *Acta Mathematica Scientia*, 20, 377-390, 2010.
- (2). *Chaos, Transport, and Mesh Convergence for Fluid Mixing*, H. Lim, Y. Yu, J. Glimm, X.-L. Li and D. H. Sharp, *Acta Mathematicae Applicatae Sinica*, 24, 355-368, 2008.
- (3). *Multi Scale Models for Fluid Mixing*, H. Lim, Y. Yu, H. Jin, D. Kim, H. Lee, J. Glimm, X.-L. Li and D. H. Sharp, *Compu. Methods Appl. Mech. Engrg.*, 197, 3435-3444, 2008.
- (4). *Simulation of pellet ablation for tokamak fuelling with ITAPS front tracking*, R. Samulyak, T. Lu, P. Parks, J. Glimm and X. Li, *Journal of Physics: Conf. Series*, 125, 2008.
- (5). *Transonic Shock Formation in a Rarefaction Riemann Problem for the 2D Compressible Euler Equations*, J. Glimm, X. Ji, J. Li, X. Li, P. Zhang, T. Zhang and Y. Zheng, *SIAM J. of Applied Math*, 69, 720-742, 2008.
- (6). *Subgrid models in turbulent mixing*, H. Lim, Y. Yu, J. Glimm, X. L. Li and D. H. Sharp, *ASTRONUM proceedings*, 2008.
- (7). *Verification and Validation of FronTier Code and Application to Fluid Interfacial Instabilities*, B. Fix, J. Glimm, R. Kaufman, X. L. Li, and L. L. Wu, *Proceedings of World Conference on Turbulence Mixing and Beyond*, Accepted for publication, *Physica Scripta*, 2008.
- (8). *FronTier and Applications to Scientific, Engineering Problem*, W. Bo, B. Fix, J. Glimm, X. L. Li, X. T. Liu, R. Samulyak and L. L. Wu, *Proceedings of International Congress of Industrial, Applied Mathematics*, 2008, accepted.
- (9). *Recent Progress in the Stochastic Analysis of Turbulent Mixing*, W. Bo, B. Cheng, J. Du, B. Fix, E. George, J. Glimm, J. Grove, X. Jia, H. Jin, H. Lee, Y. Li, X. Li, X. Liu, D. H. Sharp, L. Wu, and Yan Yu, *Contemporary Mathematics*, 429, 33-44, 2007.
- (10). *Front Tracking under TSTT*, J. Glimm, B. Fix, X.-L. Li, J.-J. Liu, X.-F. Liu, T.-S. Liu, R. Samulyak, and Z.-L. Xu, *Proceedings of the IGPP-CalSpace Conference*, *Astronomical Society of the Pacific*, 359, 15, 2007.
- (11). *A Front Tracking Algorithm For Limited Mass Diffusion*, X. F. Liu, Y. H. Li, J. Glimm, and X. L. Li, *J. of Comp. Phys.*, 222, 644-653, 2007.
- (12). *A Conservative Front Tracking Method in N-Dimensions*, Jinjie Liu and Hyun-Kyun Lim, James Glimm, and Xiaolin Li, *J. of Sci. Comp.*, 31, 213-236, 2007.

- (13). *A Simple Package for Front Tracking*, Jian Du, Brian Fix, James Glimm, Xiaolin Li, Yunhua Li, Lingling Wu, *J. Comp. Phys.*, 213, pp. 613–628, 2006.
- (14). *A TSTT integrated FronTier code and its applications in computational fluid physics*, B. Fix, J. Glimm, X. Li, Y. Li, X. Liu, R. Samulyak, and Z. Xu, *Journal of Physics: Conf. Series*, 16, pp. 471–475, 2005.
- (15). *Shock Wave Interactions in Spherical and Perturbed Spherical Geometries*, S. Dutta, E. George, J. Glimm, J. Grove, H. Jin, T. Lee, X. Li, D. H. Sharp, K. Ye, Y. Yu, Y. Zhang and M. Zhao, *Nonlinear Analysis*, 63, pp. 644–652, 2005, In Press.
- (16). *Jet Simulation in a Diesel Engine*, James Glimm, M.-N. Kim, X.-L. Li, R. Samulyak and Z.-L. Xu, *MIT Conference on Computational Fluid and Solid Mechanics*, Elsevier Science, In press, 2004.
- (17). *Front Tracking Algorithm Using Adaptively Refined Meshes*, J. Glimm, X.-L. Li and Z.-L. Xu, *Proceedings of the 2003 Chicago Workshop on adaptive Mesh Refinement Methods*, the Lecture Notes in Computational Science and Engineering, 2004.
- (18). *The Influence of Scale Breaking Phenomena on Turbulent Mixing Rates*, E. George, J. Glimm, X. L. Li, Y. H. Li and X. F. Liu, *Phys. Rev. E*, 73, pp. 056301-1–8, 2006.
- (19). *Errors in Numerical Solutions of Spherically Symmetric Shock Physics Problems* J. Glimm, J. W. Grove, Y. Kang, T. Lee, X. Li, D. H. Sharp, Y. Yu, K. Ye and M. Zhao, *Contemporary Mathematics*, 371, pp. 163–179, 2005.
- (20). *A Conservative Front Tracking Method*, J.-J. Liu, J. Glimm and X.-L. Li, *Proceedings of the Tenth International Conference on Hyperbolic Problems: Theory, Numerics, and Applications*, Yokohama Publishers, Osaka, Japan, pp.57-62, 2006.
- (21). *An Enhanced Front Tracking Method for Computation of Discontinuous Structures in Fluid Dynamics*, J. Glimm, X. L. Li, Y. H. Li, and Z. L. Xu, *Proceedings of WCCM-6*, Edited by Z. H. Yao, M. W. Yuan and W. X. Zhong, Springer, pp. 340-344, 2004.
- (22). *Statistical Riemann Problems and a Composition Law for Errors in Numerical Solutions of Shock Physics Problems*, J. Glimm, J. W. Grove, Y. Kang, T. Lee, X. Li, D. H. Sharp, Y. Yu, K. Ye and M. Zhao, *SISC*, 26, pp. 666–697, 2004.
- (23). *Unstructured Grids in 3D and 4D for a Time-dependent Interface in Front Tracking with Improved Accuracy*, J. Glimm, J. W. Grove, X. L. Li, Yingjie Li, Zhiliang Xu, *Proceedings of the 8th International Symposium of Grid Generation in Comp. Field Simulations*, Edited by B. K. Soni et al., pp. 179-188, 2003.
- (24). *Simplification, Conservation and Adaptivity in the Front Tracking Method*, E. George, J. Glimm, J. W. Grove, X. L. Li, Y. J. Liu, Z. L. Xu and N. Zhao, *Hyperbolic Problems: Theory, Numerics and Applications*, Edited by T. Hou and E. Tadmor, pp. 175-184, Springer Verlag, Berlin and New York, 2003.

- (25). *All Isomorphic Distinct Cases for Multi-component Interfaces in a Block*, L. Li, J. Glimm, X. L. Li, J. Comp. Appl. Math, 152, pp.263-276, 2003.
- (26). *Jet Breakup and Spray Formation in a Diesel Engine*, J. Glimm, X. L. Li, W. Oh, A. Marchese, M.-N. Kim, R. Samulyak and C. Tzanos, Proceedings of the Second MIT Conference on Computational Fluid and Solid Mechanics, Edited by K. J. Bathe, pp. 912-914, Elsevier, 2003.
- (27). *Simulation of Fluid Mixing in Acceleration Driven Instabilities*, E. George, J. Glimm, X. L. Li and Z. L. Xu, Proceedings of the Second MIT Conference on Computational Fluid and Solid Mechanics, Edited by K. J. Bathe, pp. 908-911, Elsevier, 2003.
- (28). *Conservative Front Tracking with Improved Accuracy*, J. Glimm, X.-L. Li, Y.-J. Liu, Z. L. Xu and N. Zhao, SIAM J Sci. Comp., 41, pp. 1926-1947, 2003.
- (29). *Numerical methods for the determination of mixing*, S. Dutta, E. George, J. Glimm, X. L. Li, A. Marchese, Z. L. Xu, Y. Zhang, J. Grove and D. Sharp, Laser and Particle Beams, 21, pp.437-442, 2003.
- (30). *A Comparison of Experimental, Theoretical, and Numerical Simulation Rayleigh-Taylor Mixing Rates*, E. George, J. Glimm, X. L. Li, A. Marchese, and Z. L. Xu, Proc. National Academy of Sci., Vol. 99, 5, pp. 2587-2592, 2002.
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- (32). *Conservative Front Tracking in Higher Space Dimensions*, Transactions of Nanjing University of Aeronautics and Astronautics, edited by Dewang Liang, Vol. 18, pp. 1-15, 2001.
- (33). *Subgrid Models and DNS Studies of Fluid Mixing*, B. Cheng , J. Glimm, X. L. Li and D. H. Sharp, Proceedings of the 7th International Conference on the Physics of Compressible Turbulent Mixing, Edited by E. Meshkov, Y. Yanilkin and V. Zhmailo, RFNC-VNIIEF, Russia, pp. 385-390, 2001.
- (34). *High Resolution Numerical Methods for Multiphase Flows*, J. W. Grove, J. Glimm, and X. L. Li, Modelisation Numerique des Couplages Thermiques, Mecaniques et Chimiques dan les Ecoulements Industriels, Institut Universitaire des Systems Thermiques Industriels, Universite Marseille, 2000, (LANL Report LA-UR-00-2639).
- (35). *Conservative Front Tracking and Level Set Algorithms*, J. Glimm, X.-L. Li, Y.-J. Liu and N. Zhao, Proc. National Academy of Sci., Vol. 98, 25, pp. 14198-14201, 2001.
- (36). *Nonuniform approach to terminal velocity for single mode Rayleigh-Taylor instability*, J. Glimm, X.-L. Li and A.-D. Lin, ACTA MATHEMATICAE APPLICATAE SINICA, 18, pp. 1-8, 2002.
- (37). *A Critical Analysis of Rayleigh-Taylor Growth Rates*, J. Glimm, J. Grove, X. L. Li, W. Oh and D. Sharp, Journal of Comp. Phys., 169, pp. 652-677, 2000.

- (38). *Simulation of 3D Fluid Jets with Application to the Muon Collider Target Design*, J. Glimm, H. Kirk, X. L. Li, J. Pinezich, R. Samulyak and N. Simos, *Advances in Fluid Mechanics III*, Edited M. Rahman, C.A. Brebbia, WIT Press, Southampton, Boston, pp. 191-200, 2000.
- (39). *Simple Front Tracking*, J. Glimm, J. Grove, X. L. Li and N. Zhao, *Nonlinear Partial Differential Equations*, Contemporary Mathematics, Edited by G.-Q. Chen and E. DiBenedetto, American Mathematical Society, 238, pp. 133-150, 1999.
- (40). *Robust Computational Algorithms for Dynamic Interface Tracking in Three Dimensions*, J. Glimm, J. Grove, X. L. Li and D. C. Tan, *SIAM Journal of Scientific Computing*, 21, 6, pp. 2240-2256, 2000.
- (41). *Three Dimensional Front Tracking*, J. Glimm, J. Grove, X. L. Li, K. Shyue, Y. Zeng, and Q. Zhang, *SIAM J. of Sci. Comp.*, 19, pp. 703-727, 1998.
- (42). *Front Tracking in Two and Three Dimensions*, J. Glimm, M. J. Graham, J. Grove, X. L. Li, T. M. Smith, D. Tan, F. Tangerman, Q. Zhang, *J. Comp. Math.* (7), pp. 1-12, 1998.
- (43). *A Comparative Numerical Study of the Richtmyer-Meshkov Instability with Nonlinear Analysis in Two and Three Dimensions*, X. L. Li and Q. Zhang, *Phys. Fluids* 9 (10), pp. 2719-2727, 1997.
- (44). *A Comparative Numerical Study of the Richtmyer-Meshkov Instability with Nonlinear Analysis Three Dimensions* X. L. Li and Q. Zhang, *Proceedings of the 6th International Workshop on the Physics of Compressible Turbulent Mixing*, pp. 325-330, Edited by Ed. G. Jourdan and L. Houas, Imprimerie Caractere, France, 1997.
- (45). *Numerical Study for the Three Dimensional Rayleigh-Taylor Instability through the TVD/AC Scheme and Parallel Computation*, X. L. Li, B. X. Jin, and J. Glimm, *J. of Comp. Phys*, 126, pp. 343-355, 1996.
- (46). *A Parallelized Approach for Internal Boundaries and Interfaces*, J. Glimm, J. Grove, X. L. Li, R. Young, Q. Zhang, Y. Zeng, *Applied Parallel Computing*, Lecture Notes in Computer Science, 1041, pp. 257-266, Springer Verlag, 1996.
- (47). *A Numerical Study of 3-D Bubble Merger in the Rayleigh-Taylor Instability*, X. L. Li, *Phys. Fluids*, vol 8, 2, pp. 322-335, 1996.
- (48). *A Characteristic Based Numerical Method with Tracking for Nonlinear Wave Equations*, B. Bukiet, J. Pelesko, X. L. Li, P. L. Sachdev, *Computer and Math. Applic.*, vol. 31, 7 pp. 75-99, 1996.
- (49). *A Numerical Study of the Richtmyer-Meshkov Instability in Three Dimensions*, X. L. Li, and J. Glimm, *Proceedings of the Second Asia CFD Conference*, 2, pp.87-92, 1996.

- (50). *Parallel Computation of Rayleigh-Taylor Instability through High Resolution Scheme for Contact Discontinuity*, X. L. Li and B. X. Jin, Proceedings of First Asia Conference of Computational Fluid Dynamics, Vol. 2 pp. 811-817, 1995.
- (51). *Parallel Computation of Three Dimensional Rayleigh-Taylor Instability in Compressible Fluids through Front Tracking and Level Set Methods*, X. L. Li, J. Grove, and Q. Zhang, Proceedings of 4th International Workshop on Compressible Turbulent Mixing, pp. 94-104, Cambridge, UK, 1994.
- (52). *Study of Three Dimensional Rayleigh-Taylor Instability in Compressible Fluids through Level Set Method and Parallel Computation*, X. L. Li, Phys. Fluids A 5 (8), pp. 1904-1913, 1993.
- (53). *Parallel Computation of 3D Interface Instabilities in Compressible Fluids Using Lagrangian and Eulerian Approaches*, X. L. Li, Proceedings Conference on Scientific and Engineering Computing, Academia Sinica, China, pp. 235-241, 1993.
- (54). *Statistical Theories of Rayleigh-Taylor Instability for Compressible Fluids*, J. Glimm, X. L. Li, Q. Zhang, R. Menikoff and D. Sharp, Advances in Compressible Turbulent Mixing, U.S. Department of Commerce, pp. 85-94, Springer-Verlag, 1992.
- (55). *The growth and Interaction of bubbles in Rayleigh-Taylor Unstable Interface*, J. Glimm, X. L. Li, R. Menikoff, D. Sharp and Q. Zhang, The IMA Volumes in Mathematics and Its Applications, Vol. 29, pp. 107-122, Springer-Verlag, 1991.
- (56). *Chaotic Mixing at Unstable Interfaces*, J. Glimm, J. Grove, Y. Chen and X. L. Li, 3rd International Workshop on the Physics of Compressible Turbulent Mixing, pp. 19-28, 1991.
- (57). *A Numerical Study of Bubble Interaction in Rayleigh-Taylor Instability for Compressible Fluids*, J. Glimm, X. L. Li, Q. Zhang, R. Menikoff and D. Sharp, Phys. Fluids A 2 (11), pp. 2046-2054, November 1990.
- (58). *On Validation of the Sharp-Wheeler Bubble Model from Experimental and Computational Data*, J. Glimm and X. L. Li, Phys. Fluids 31, pp. 2077-2085 1988.
- (59). *Front Tracking and The Interaction of Nonlinear Hyperbolic Waves*, F. Furtado, J. Glimm, J. Grove, X. L. Li, B. Lindquist, R. Menikoff, D. H. Sharp and Q. Zhang, Lecture Notes in Engineering, 43, pp. 99-111, Springer-Verlag, 1989.
- (60). *Three Remarks on Front Tracking Method*, J. Glimm, J. Grove and X. L. Li, Proceedings of Torimina Conference, Italy, 1988.
- (61). *Plasma Formation and Equilibrium in a High  $\beta$  Tokamak*, A. V. Deniz X. L. Li and T. C. Marshall, Phys. Fluids 30, pp. 2527-2537, (1987).
- (62). *Transition of a Low  $\beta$  Tokamak to a High  $\beta$  State*, A. V. Deniz, T. Ivers, T. C. Marshall, X. L. Li and M. Mauel, Phys. Fluids 29, pp. 4119-4122 1986.

## 6 Research Presentations (last 3 years)

- (1). *Front tracking and applications to physics and engineering problems*, Departmental colloquium, Math Department, Wichita State University, April 2, 2009.
- (2). *Front tracking on crystal formation and subsurface problem*, IMACS World Congress, Athens, GA, August 4, 2009.
- (3). *Front tracking on fluid structure interaction*, AMS Sectional Meeting, New Jersey Institute of Technology, Newark, NJ, May 20, 2010
- (4). *Application of front tracking, hyperbolic and beyond*, HYP-10, Beijing, China, June 17, 2010.
- (5). *Front tracking on convection dominated problems*, SIAM Annual Meeting, Pittsburg, PA, June 15, 2010.
- (6). *Physics of fluid interface instabilities and computation*, TD Lee Lecture, Graduate School of Academia Sinica, Beijing, China, June 17, 2010.
- (7). *Recent development of the front tracking method and some new applications*, Institute of Applied Physics and Computational Mathematics, Beijing, China, July 16, 2010.
- (8). *Front tracking on Convection Dominated Problems*, Peking University, Beijing, China, June 16, 2010.
- (9). *Supercomputing and front tracking method*, Wuhan University, Wuhan, China, June 21, 2010.
- (10). *Front tracking and interfacial physics*, Wuhan Institute of Physics, Academia Sinica, Wuhan, China, June 22, 2010.
- (11). *Partial differential equations and free boundary problems*, Linyi Normal University, Linyi, China, June 28, 2010.
- (12). *Front tracking and convection dominated problems*, Zhejiang University, HangZhou, China, July 8, 2010.
- (13). *FronTier and Applications Under ITAPS*, Minisymposium, SIAM CSE, Miami, Florida, March 2-6, 2009.
- (14). *A crashing tutorial of FronTier library*, Minisymposium, SIAM CSE, Miami, Florida, March 2-6, 2009.
- (15). *FronTier and Application to Stefan Problems, Precipitation, Phase Transition, and Pricing of American Options*, Minisymposium, SIAM CSE, Miami, Florida, March 2-6, 2009.
- (16). *FronTier and Applications to Simulations offficiant engine with bio-fuels*, Advanced Energy Conference, Hauppauge, NY, November, 19, 2008.

- (17). *FronTier and Applications in PDE solutions*, 10th US National Congress on Computational Mechanics, Columbus, OH, July, 16-19, 2009.
- (18). *Parallel bottle-neck of FronTier in petascale computation*, Lake Tahoe, CA, July, 27-31, 2009.
- (19). *FronTier and Applications to Fluid and Other Physics Problems*, Marine Science Department, Stony Brook University, May 11, 2009.
- (20). *FronTier under ITAPS*, SIAM Annual Meeting, July 7-11, 2008.
- (21). *Load Balancing in FronTier/AMR Computation*, SIAM Conference on Parallel Processing for Scientific Computing, Atlanta, Math 12-14, 2008.
- (22). *FronTier and Applications to Simulations of Hyperbolic Conservation Law and Beyond*, 12th International Conference on Hyperbolic Problems, Theory, Numerics and Applications, College Park, MD, June 9-13, 2008.
- (23). *FronTier and Its Coupling with PDEs*, International Conference On Spectral and High Order Methods, Institute of Computational Mathematics Chinese Academy of Sciences, Beijing, June 18-22, 2007.
- (24). *FronTier and Applications to Fluid Interface Instabilities*, Colloquium, Institute of Applied Physics and Computational Mathematics, Beijing, June 19, 2007.
- (25). *FronTier and Applications to Scientific, Engineering Problem*, 6th International Congress on Industrial and Applied Mathematics, Zurich, Switzerland, July 16-20, 2007.
- (26). *Verification and Validation of FronTier Code and Application to Fluid Interfacial Instabilities*, World Conference on Turbulence Mixing and Beyond, The Abdus Salam Center for Theoretical Physics, Trieste, Italy, August 18-26, 2007.
- (27). *FronTier and Application in Simulation of Fluid Dynamics Problems*, Colloquium, Nanjing University of Aeronautics and Astronautics, October, 26, 2007.