CURRICULUM VITAE

ZHILIN LI

Department of Mathematics
North Carolina State University
Raleigh, NC 27695 USA
Tel: (919)-515-3210(office), (919)-859-6824(home) Fax: (919)-515-1636
e-mail: zhilin@math.ncsu.edu http://www4.ncsu.edu/~zhilin/

Education and Degrees earned

1991–1994	**Ph.D** degree in *Applied Mathematics*, August, 1994. University of Washington, Seattle, Washington. Advisor: Professor **Randall J. LeVeque**.
1989–1991	**M.S.** degree in *Applied Mathematics*, December, 1991. University of Washington, Seattle, Washington.
1985–1988	**M.S.** degree in *Mathematics*, June, 1988. Nanjing Normal University, Nanjing, China.
1978–1982	**B.S.** degree in *Mathematics*. Nanjing Normal University, Nanjing, China.

Employment

1997–present,	***Full, Associate, and Assistant Professor,*** Department of Mathematics, North Carolina State University, USA.
1996–1997,	***Assistant Professor (tenure track),*** Department of Mathematics & Statistics, Mississippi State University, USA.
9/94–8/96	***Hendrick/CAM (Computational and Applied Mathematics) Assistant Professor***, University of California at Los Angeles, three-year position.
3/82–7/89	***Assistant Professor, Lecturer***, a position between assistant professor and associate professor in China, Nanjing Normal University, Nanjing, China.

Awards & Honors

The Most Successful Paper Award, 2007, IMACS.

Oak Ridge Associated Universities Faculty Enhancement Award, 1997. Oak Ridge Associated Universities (more than 200 US Universities).

Boeing Excellence Award, 1991. University of Washington, Seattle, Washington.

Dean's Scholarship, 1991 – 1992. University of Washington, Seattle, Washington.

Professional Affiliations: SIAM (Society of Industrial and Applied Mathematics); AMS (American Mathematical Society).

Research Grants:

AFOSR — **co-PI**, Applications of Sharp Interface Methods For Flows, Scattering and Control Problems, 2009–2012, $450,000, K. Ito (PI), North Carolina State University

ARO — **PI**, Simulation, control, and applications for flow and scattering problems, ARO-56349-MA, 2009–2013, $400,000, Co-PI, K. Ito, North Carolina State University.

NSF — **PI**, Augmented methods for Navier-Stokes equations involving free boundaries/moving interfaces and applications, DMS-0911434, **2009–2012**, $360,000.

NSF — **PI**, Multiscale Finite-Element Level Set Methods for Stress-driven Interface Dynamics Problems and Applications, DMS-0413183, **2004–2008**, $66,000.

ARO — **PI**, Theoretical and Numerical Analysis for Non-linear Interface Problems and Applications, ARO-43751-MA, 2002–2009, $229,237, Co-PI, K. Ito, North Carolina State University.

AFOSR — **co-PI**, Sharp Interface Methods for Moving Interface/Free Boundary Problems and Applications, 2006–2009, $250,000, K. Ito (PI), North Carolina State University

NSF/NIGMS — **Co-PI**, Biological Fluid Dynamics in Morphogenesis, DMS-0201094, 2002–2007, $821,273, PI, S. Lubkin, North Carolina State University.

NSF — New numerical methods and analysis for the Navier Stokes equations involving interfaces and simulation of electro-migration of voids, 2000–2003, DMS-0073403, $92,000.

ARO — **PI**, Finite Element Methods and Iterative Refinement Techniques for Interfaces Problems and Applications, ARO-39676-MA, 1999–2003, $86,961, Co-PI, K. Ito, North Carolina State University.

NSF — High Order Accurate Numerical Methods for Interface Problems, 1996–2000, DMS-9626703, $60,000, UCLA Faculty Sponsor: Stanley Osher.

DOD/ARO — **PI**, Defense University Research Instrumentation Program (DURIP), DOD/ARO, 2002-2003, $95,443, Co-PI, P. Gremaud and T. Kelley, North Carolina State University.

NSF	**Co-PI**, Industrial Mathematics Modeling Workshop for Graduate Students, $40,000, 2002-2003, PI. R. Smith, Other Co-PIis, P. Gremaud, and H. Tran. **Co-PI**, Industrial Mathematics Modeling Workshop for Graduate Students, $40,000, 1999-2000, PI. R. Smith, Other Co-PIis, P. Gremaud, and H. Tran. **Co-PI**, Industrial Mathematics Modeling Workshop for Graduate Students, $36,500, 2000-2001, PI. R. Smith, Other Co-PIis, P. Gremaud, and H. Tran.
NCSU	Faculty Research and Professional Development Fund, 1998-1999, $5,000.
MSU	Research Initiation Program Awards, 1996-1997, $6,000.
ERC/NFS at MSU	Computational Problems Involving Phase Transitions, 1996-1997, $6,000.
NCSU	International Research Collaboration Seed Grant, 2007-2008, $5,000.

Contracting Service:

CFD Research Corporation, Huntsville, AL 35805 USA: IIM for UAV/MAV, Phase I, US Air Force, July, 2010 – June 2012.

Ph.D students graduated: 7

Shaozhong Deng (2000), UNC-Charlotte, NC; Guo Chen (2003), ZM Financial System, Inc., Chapel Hill; Xingzhou Yang (2004), Mississippi State Universtiy; Xiaohai Wan (2005), Lily Company, Indiana; Yan Gong (2007), Limestone College, SC; Qunlei Jiang (2008), New York; Hui Xie (2009), U. of Minnesota.

MS students graduated: 4

S. Hu (2000); D. Chandru (2002); Y. Chen (2003); H. Bae (2006).

Ph.D students current: 5

Sidong Zhong; Elgaddafi Elamami; Guangyu Chen; Peng Song (OR); Shijun Yin (OR)

Postdocs and Visitors: Dr. Yun-qiu Shen, Western Washington University, January–May, 1999; Dr. Caraus Iurie, State University of Moldova, visited as a postdoc supported by U.S. Civilian and Development Foundation for the Independent States of The Former Soviet Union, 2003; Dr. Jianjun Xu, UC-Irvine, 2002; Vita Rutka, University of Kaiserslautern, 2003; Zhongqiao Qiao, Hong Kong Baptist University, Fall semester, 2004, 2006-2008; Jinru Chen, Nanjing Normal University, 2007-2008; Yushun Wang, Nanjing Normal University, 2008; Xiufang Feng, Ningxia University, China, 2009-2010; Li Wang, Nanjing Normal University, 2009-2010; Juan Ruiz Alvarez, Juan Carlos Trillo, Sergio Amat, Universidad Politcnica de Cartagena, Span, 2009.

Books, Special Issues, and Proceedings

[1] The Immersed Interface Method: Numerical Solutions of PDEs Involving Interfaces and Irregular Domains, ***SIAM Frontier Book Series***, FR33, ISBN: 0-89971-609-8, 2006.

[2] Moving Interface Problems and Application in Fluid Dynamics, AMS Contemporary Mathematics, Vol. 466, 2008, B-C. Khoo, Z. Li, and P. Ling, Editors.

[3] Interface Problems and Methods in Biological and Physical Flows, Lecture Notes Series, Vol. 17, IMS, Singapore, World Scientific, 2008, B-C. Khoo, Z. Li, and P. Ling, Editors.

[4] Special issue of Applied Numerical Mathematics for the International Conference on Scientific Computing, Nanjing, China, June 4 – June 8, 2005, Vol. 57, issues 5-7, 2007, Z. Li, Y. Song, and T. Tang, editors.

[5] Numerical Analysis and Its Applications, Edited by **Zhilin Li**, Lubin Vulkov, Jerzy Was'niewski, *Lecture Notes in Computer Science*, Springer-Verlag GmbH, Volume 3401 / 2005, ISBN: 3-540-24937-0.

[6] Industrial Mathematics, ***SIAM Publisher***, *Philadelphia, ISBN O-89871-467-2*, 2000, P. Gremaud, Zhilin Li, R. Smith, and H. Tran.

Publications

[1] An augmented method for free boundary problems with moving contact lines, Computers & Fluids, 39 (2010) 1033-1040, Zhilin Li, M. Lai, G. He, and H. Zhao.

[2] Immersed Interface Finite Element Methods for Elasticity Interface Problems with Nonhomogeneous Jump Conditions, Numer. Math. Theo. Meth. Appl., Vol. 3, 2010, pp. 23-39, Y. Gong and Z. Li.

[3] A well-conditioned augmented system for solving Navier-Stokes equations in irregular domains, J. Comput. Phys., Volume 228, 2009, Pages 2616-2628, K. Ito, M. Lai, and Z. Li.

[4] An additive Schwartz preconditioner for the mortar-type rotated Q1 FEM for elliptic problems with discontinuous coefficients, Applied Numerical Mathematics, Vol 59, Issue 7, 2009, Pages 1657-1667, F. Wang, J. Chen, W. Xu, Z. Li.

[5] Introduction to Immersed Boundary/Interface Method, Robert Dillion and Zhilin Li, Lecture Notes Series, Vol. 17, 2009, World Scientific Publisher, ISBN-13-981-283-784-1.

[6] A smoothing technique for discrete delta functions with application to immersed boundary method in moving boundary simulations, J. Comput. Phys. Vol. 228, 2009, Pages 7821-7836, X. Yang, X. Zhang, Z. Li, and G. He

[7] Numerical Study of Surfactant-Laden Drop-Drop Interactions, CiCP, in press, J. Xu, Z. Li, J. Lowengrub, and H. Zhao.

[8] Achieving energy conservation in Poisson-Boltzmann molecular dynamics: Accuracy and precision with finite-difference algorithms, Chemical Physics Letters, Volume 468, Issues 4-6, 22 January 2009, Pages 112-118, Jun Wang, Qin Cai, Zhilin Li, Hong-Kai Zhao, and Ray Luo.

[9] Immersed-Interface Finite-Element Methods for Elliptic Interface Problems with Non-homogeneous Jump Conditions, *SIAM J. Numer. Anal.*, Vol. 46, 472-495, 2008, Y. Gong, B. Li, and Z. Li.

[10] An Implicit-forcing Immersed Interface Method for the Incompressible Navier-Stokes Equations, AMS Contemporary Mathematics, Vol. 466, 2008, 73-94, D-V. Le, B-C. Khoo, and Z. Li.

[11] An Immersed Interface Method for Solving Incompressible Viscous Flows with Piecewise Constant Viscosity Across a Moving Elastic Membran, J. of Comput. Physics, Vol. 227 Issue 23, p9955-9983, 2008, Z. Tan, D. V. Le, Z. Li, K. M. Lim, and B. C. Khoo.

[12] An augmented approach for Stokes equations with a discontinuous viscosity and singular forces, *Computers and Fluids*, Vol. 36, 622-635, 2007, K. Ito, M-C. Lai, and Z. Li

[13] Pressure Jump Conditions for Stokes Equations with Discontinuous Viscosity in 2D and 3D, *Methods and Applications of Analysis*, Vol. 13, 199-214, 2006, K. Ito, Z. Li, and X. Wan.

[14] A fast finite difference method for biharmonic equations on irregular domains, Advances in Comput. Math., on-line, DOI 10.1007/s10444-007-9043-6, Vol. 29, 113-133, 2008, G. Chen, Z. Li, and P. Lin.

[15] Theoretical & numerical analysis for a fluid mixure model of tissue deformation, Q. Jiang, Z. Li, and S. Lubkin., Comm. in Comput. Phy. Vol. 3, 620-634, 2009.

[16] Mechanics of mesenchymal contribution to clefting force in branching morphogenesis, Biomechanics and Modeling in Mechanobiology, Vol. 7, 417-426, 2008, X. Wan, Z. Li, and S. Lubkin.

[17] A study of numerical methods for the level set approach, Appl. Numer. Math., 837-846, 2006, P. Gremaud, C. Kuster, and Z. Li

[18] An Explicit Jump Immersed Interface Method for Two-Phase Navier Stokes Equations with Interfaces, Computer Methods in Applied Mechanics and Engineering, Vol. 197, 2317-2328, 2008, with V. Rutka.

[19] An augmented IIM-level set method for Stokes equations with discontinuous viscosity, Electron. J. Diff. Eqns., 193-210,2007

[20] A level-set method for interfacial flows with surfactant, J. of Comput. Physics, Vol. 212, 590-616, 2006, with Jian-Jun Xu, John Lowengrub, and Hongkai Zhao

[21] An augmented approach for the pressure boundary condition in a Stokes flow, Comm. in Comp. Physics, Vol. 1, (2006), pp. 874-885., Z. Li, X. Wan, K. Ito and S. R. Lubkin

[22] A Finite Difference Method and Analysis for 2D Nonlinear Poisson-Boltzmann Equations, Journal of Scientific Computing, 1573-7691 (Online) DOI: 10.1007/s10915-005-9019-y, With C.V. Pao and Z. Qiao.

[23] Augmented Strategies for Interface and Irregular Domain Problems, invited paper in *Lecture Notes in Mathematics and Computer Sciences*, Springer-Verlag, pp. 66-79, 2005.

[24] The numerical solution of singular integro-differential equations by reduction method using the Faber-Laurent polynomials, Iurie Caraus, Zhilin Li, and V. A. Zolotarevskii, *Differential Equations*, Vol. 40, No. 12, 2004, pp. 1764-1769.

[25] Error estimates of an immersed finite element method for interface problems, *Numerical Methods of PDEs*, Published online 12 Feb. 2004, pp. 338-367, DOI 10.1002/num.10092, Zhilin Li, T. Lin, Y. Lin and R.C. Rogers.

[26] A fast finite difference method for solving Navier-Stokes Equations on irregular domains, *J. of Commu. in Math. Sci.*, Vol. 1, pp. 180-196, 2003, Z. Li, C. Wang.

[27] The Immersed Interface Method for Elasticity Problems with Interface, *Dynamics of Continuous, Discrete and Impulsive Systems, Part A*, Vol.10, No.5, 783-808 , 2003, with X. Yang and B. Li.

[28] New Cartesian grid methods for interface problems using the finite element formulation, *Numerische Mathematik*, 96:61-98, 2003, Z. Li, T. Lin, and X. Wu.

[29] New Formulations for Interface Problems in Polar coordinates *SIAMJ. Sci. Comput.*, *SIAM J. Sci. Comput.*, 25, No 1, 224-245, (2003), Z. Li, W-C. Wang, I-L Chern, and M-C. Lai.

[30] Generalized Snell's law for weighted minimal surface, *Methods and Applications of Analysis*, Vol. 10, pp. 199-214, 2003, Z. Li , X. Lin, M. Torres, and H. Zhao.

[31] Three dimensional elliptic solvers for interface problems and applications, *J. of Comput. Physics,* Vol. **184**, pp. 215-243, 2003, with S. Deng and K. Ito.

[32] Solving a Nonlinear Interface Problems in Magneto-Rheological Fluids using the Immersed Interface Method, *Journal of Scientific Computing*, Vol. **19**, pp. 253-266, 2003, with K. Ito.

[33] An overview of the immersed interface method and its applications, *Taiwanese J. Mathematics*, Vol. **7**, No. 1, pp. 1-49, 2003.

[34] Autophobic Spreading of Drops, *J. of Comput. Physics*, Vol. **183**, No. 2, pp. 335-366, 2002, with J. K. Hunter, and H. Zhao

[35] The immersed interface/multigrid methods for interface problems, *SIAMJ. Sci. Comput.*, Vol. **24**, No.2, pp. 463-479, 2002, with L. Adams.

[36] Force and Deformation on Branching Rudiments: Cleaving Between Hypotheses. *Biomechanics and Modeling in mechanobiology*, Vol. **1**, pp. 5-16, 2002, with Sharon Lubkin.

[37] Maximum Principle Preserving Schemes for Interface Problems with Discontinuous Coefficients, *SIAM J. of Sci. Comput.*, Vol. **23**, No.1, pp. 339-361, 2001, with K. Ito.

[38] The Immersed Interface Method for the Navier-Stokes Equations with Singular Forces, *J. Comput. Physics*, Vol. **171**, 822-842 (2001), with M. Lai.

[39] Numerical Analysis of Interfacial 2D Stokes Flow with Discontinuous Viscosity and Variable Surface Tension, *Inter. J. Numer. Methods in Fluids*, Vol. **37**, 525-540, 2001, with S. Lubkin.

[40] The Level-Set Function Approach to an Inverse Interface Problem, *Inverse Problems*, Vol. **17**, No. 5, 2001, pp. 1225-1242, with K. Ito and K. Kunish.

[41] A remark on jump conditions for the three-dimensional Navier-Stokes equations involving an immersed moving membrane, *Applied Math. Letters*, **Vol.** 14, pp. 149-154, 2000, with M. Lai

[42] Numerical Method for Simulation of Bubbles Flowing Through Another Fluid, *Advances in Scientific Computing*, pp. 74-81, 2000, edited by Z. Shi, W. Xue, M. Mu, and J. Zou.

[43] A Level Set Boundary Element Method for Simulation of Dynamic Powder Consolidation of Metals, *in Numerical Analysis and Its Application*, Springer-Verlag, edited by L. Vulkov, J. Wasniewski, and P. Yalamov, pp. 27-534, 2001, with W. Cai

[44] The immersed finite volume element method for the elliptic interface problems, *Mathematicsand Computers In Simulation*, **Vol.** 50, pp. 43-61, 1999, with R.E. Ewing, T. Lin, and Y. Li.

[45] A numerical method for solving heat equations involving interfaces, *Electron. J. Diff. Eqns.*, pp. 100-108, 2000, with Y. Shen.

[46] Numerical Study of Two Dimensional Electro-migration, *Journal of Comput. Physics*, **Vol.** 152, pp. 281-304, 1999, with H. Zhao and H. Gao.

[47] Crack jump conditions for elliptic problems, *Applied Math. Letters, with A. Wiegmann and R. LeVeque.* , Vol 12, No. 6, pp 81-88, 1999.

[48] Convergence analysis of the immersed interface method. *IMA J. Numer. Anal.* **Vol.** 19, pp. 583-608, 1999, with H. Huang.

[49] Fast and Accurate Numerical Approaches for Stefan Problems and Crystal Growth. *Numerical Heat Transfer, Part B, with B. Soni*, 1999, in press.

[50] A fast iterative algorithm for elliptic interface problems.
SIAM J. Numer. Anal., Vol. 35, No. 1, pp. 230-254, 1998

[51] Theoretical and numerical analysis for a thermo-elastic system with discontinuities.
J. of Comput. App. Math., Vol. 91, pp. 1–22, 1998, with J. Zou

[52] The immersed interface method using a finite element formulation.
Applied Numer. Math., 27:253–267, 1998

[53] An Inverse Problem in a Parabolic Equation, *Electronic Journal of Differential Equations, with K. Zheng.*, Conference 01, 1997, pp. 193–199, Published November 12, 1998.

[54] Immersed interface method for Stokes flow with elastic boundaries or surface tension.
SIAM J. Sci. Compt., Vol. 18, pp 709-735, (1997) with R. J. LeVeque.

[55] A hybrid method for moving interface problems with application to the Hele-Shaw flow.
Journal of Comput. Physics, Vol. 134, pp. 236-2523, 1997, with T. Hou, S. Osher, H. Zhao

[56] Front fixing vs. front tracking for diffusive transport with moving boundaries.
Int. J. Numer. & Anal. Methods in Geomechanics, Vol. 21, pp. 653-662, 1997, with D. F. McTigue and J. T. Heine

[57] The immersed interface method for 1D moving interface problem.
Numerical Algorithms, Vol. 14, pp. 269-293, 1996

[58] A note on immersed interface method for three dimensional elliptic equations. *Computers and Mathematics with Applications, volume 31, (1996), pp 9-17.*

[59] Simulation of bubbles in creeping flow using the immersed interface method. *Proc. sixth international symposium on computational fluid dynamics, 1995, pp 688-693, with R. J. LeVeque.*

[60] The Immersed Interface Method for Elliptic Equations with Discontinuous Coefficients and Singular Sources. *SIAM J. Numer. Anal., Vol. 31, No. 4, (1994), pp 1019-1044, with R. J. LeVeque.*

[61] The Immersed Interface Method — A Numerical Approach for Partial Differential Equations with Interfaces. *PhD thesis, University of Washington, 1994.*

[62] ADI methods for heat equations with discontinuities along an arbitrary interface. *Proc. Symp. in Appl. Math.,* W. Gautschi, editor, *volume 48. AMS, 1993, pp 311-315 with A. Mayo.*

[63] A generalized conjugate gradient method for solving real skew-symmetric systems. *J. on Numer. Methods & Comput. Appl., 8(1987), No.4, pp. 31–37.*

[64] An equivalent theorem on the numerical stability for an algorithm. *Numer. Math., a Journal of Chinese Universities, 9(1987), No. 1, pp. 59–65,* with K. Huang

[65] *The uniform treatment for linear system — Algorithm and numerical stability.* J. on Numer. Methods & Comput. Appl., 10(1989), No. 2.

[66] *Roundoff error analysis for polynomial interpolation.* Research and Review in Mathematics, 1989, No. 2, with K. Huang.

[67] *Perturbation theorems of eigenvectors.* Numer. Math., a Journal of Chinese Universities, 12(1990), No.3, pp. 284–289, with K. Huang.

[68] *On the relation between the behavior and the distribution of the zeros of a polynomial.* J. of Nanjing University, Mathematics Biquarterly, 2(1985), No. 1, pp. 53–59, with K. Huang.

[69] *Optimal conjugate gradient method for solving arbitrary linear equations.* J. of Nanjing Normal University (Natural Science), 1988, No. 3, pp. 28–34.

[70] Book review: *Generalized Difference Methods for Differential Equations*, by R. Li, Z. Chen, and W. Wu, SIAM Review, **43**, No.1, pp. 203-205, 2001.

Invited Conference and Workshop Presentations:

- August 30 - September 3, 2010, Plenary speaker in "International Workshop on Immersed boundaries and fictitious domain methods: theory and applications", CIRM in Marseille, France.
- August 25-29, 2010, Invited speaker in International Workshop on Numerical Methods: Theory, Methods and Applications, Nanjing China.
- August 9-13, 2010, Plenary speaker in Workshop on Fluid Motion Driven by Immersed Structures, Toronto, Canada
- June 7-11, Invited speaker in International Conference on Applied Mathematics, City University, Hong Kong.
- March, 2010, Invited speaker in the conference "Numerical algebra and high performance in scientific computating", Guangzhou, China.
- January, 2010, Plenary speaker in Singapore MIT alliance symposium, National University of Singapore.
- December 2009, Plenary speaker at Workshop on Interface Problems in Fluids and Materials, National Chiao Tung University, Taiwan.
- May 27-29, 2009, Keynote speaker in International Conference on Engineering and Computational Mathematics, Hong Kong.
- June 2008, Plenary speaker in *Korea Society of Industrial and Applied Mathematics (KSIAM)*, Pohan, Korea.
- January, 2007, Plenary speaker in *Moving Interface Problems and Applications in Fluid Dynamics,* Institute for Mathematical Sciences (IMS) at the National University of Singapore.
- July, 2006, Keynote speaker in *WCCM symposium of Immersed Boundary Method and Its Extensions in honoring of Charles Peskin,* Los Angeles, CA.
- December, 2006, Invited speaker at Taiwan Annual Mathematics Meeting, Taipei.
- June, 2005, Invited speaker in *International Conference on Multiscale Modeling and Scientific Computing*, on occasion of Bjorn Engquist 60th birthday.
- July, 2004, Plenary speaker in *Third International Conference on Numerical Analysis and Applications*, Rouse, Bulgaria.
- May, 2004, Invited speaker in the conference: *Recent Advances in Adaptive Computation*, Hangzhou, P.R. China.
- August, 2003, Invited speaker in workshop: *Computational Techniques for Moving Interfaces*, Pacific Institute for the Mathematical Sciences (PIMS), Banff, Alberta, Canada.
- May, 2002, Invited speaker in *Progress in Partial Differential Equations and Applications*, Washington State University, Pullman, Washington.
- November, 2001, Invited speaker of Southeast Conference in Applied Mathematics.

- May-June, 2001, Invited speaker for the mini-course: *Numerical Method for Interface Problems and Applications*, Taiwan National Center for Theoretical Sciences and Tsing-Hua University.
- November, 2000, Invited speaker at *Workshop on Mesh-free Methods*, University of Iowa, Iowa City.
- Invited speaker at *Workshop on Scientific Computing 99*, Hong Kong, June 27-30, 1999.
- Invited main speaker at Workshop on *Modeling of Pattern Formation and Material Interfaces*, Beijing International Center for Computational Physics, July 19-24, 1999, Beijing.
- June, 1998, Invited speaker at *A Symposium on Adaptive Methods for Partial Differential Equations*, Salt Lake City, Utah, 1998.
- August, 1993, Vancouver, Canada: Mathematics of Computation, 50th anniversary meeting.
- June, 1996, Hong Kong, Sixth International Hyperbolic conference.
- Invited mini-symposium speaker of SIAM annual meeting, 1997, 2001, 2002.
- October, 1997, Schlumberger-Doll Research.
- November, 1997, Albuquerque: Invited speaker of a symposium of Albuquerque, New Mexico, AMS Western Meeting.
- June, 1998, University of California, Berkeley, on occasion of A. Chorin's birthday. .
- 4th Symposium on Overset Composite Grid & Solution Technology, Army Research Laboratory, Aberdeen Proving Ground, Maryland, September 23-25, 1998.
- Interfaces for the Twenty-First Century, August 16-18, 1999, Monterey, CA.
- May, 2000, Philadelphia, Invited speaker of a mini-symposium at Third SIAM Conference on Mathematical Aspects of Materials Science.

Invited Talks at Institutions

Princeton University, October, 2002, University of California at Irvine, June, 2002, University of North Carolina at Charlotte, 1998, 2002, SUNY at Stony Brook, New York, 2001, Virginia Tech (VPI), Blacksburg, Virginia, 2001, University of North Carolina at Chapel Hill, 2001, Taiwan National University, May, 2001, Courant Institute, New York University, March, 2000, Western Washington University, October, 2000, Montana State University, September, 1999, Duke University, October, 1999, Stanford University, April, 1999, University of Louisiana, Lafayette, November, 1999, University of Maryland, College Park, December, 1999, University of Utah, Salk Lake City, Utah, University, University of British Columbia, Vancouver, Canada, Simon Fraser University, Burnaby, Canada, University of California at Davis, University of Florida, Chinese University of Hong Kong, Hong Kong University, June, 1999, Qin Hua University (Beijing), July, 1999, Taiwan Tsing-Hua University, May-June (short course), 2001, Taiwan Chung Cheng University, June, 2001, Taiwan National Center for High-performance Computing, June 2001, Washington State University, May, 2002,

Illinois Inst. of Technology, March, 2003, University of Wisconsin at Madison, March, 2003. National University, Taiwan, April, 2004, National Chiao Tung University, Taiwan, March, 2004, University of West Virginia, November, 2003, University of California at San Diego, October, 2004, University of Washington, November, 2004, Syracuse University, December 3, 2004, Duke University, February 7, 2005, University of Notre Dam, 2006, Shanghai Jiao-Tong (Transportation) University, July 4, 2006, Nanyang Technological University, Singapore, 2007, Zhejiang University, China, 2007; Purdue University, West Lafayette, IN, 2008; Sourthern Methodist University, Dallas, TX, 2008; University of Alabama, 2008; Mississippi State University, 2008; University of Montreal, Canada, 2009; Jilin University, China, 2009; Shanghai Jiaotong University, China, 2009; University of Massachusetts, Dartmouth, 2009; National University of Singapore, 2010; South-East University, Nanjing, China, 2009; Hong Kong City University, 2010; Hong Kong Polytechnic University, 2010; Hong Kong Baptist University, 2010; University of Macau 2010; Harbin University in Shenzhen, Hunan Normal University, Xiangtan University, National Defence University, China, 2010.

Invited and supported collaborate research visit:

- California Technology Institute, July 1997.
- University of California, Los Angeles, July 1997.
- Stanford University, July-August, 1997, March 1998, April 1999.
- University of Washington, July 1997, January and October, 2000.
- University of North Carolina at Charlotte, March 1998.
- Chinese University of Hong Kong, June 15-July 15, 1999; May-June, 2004.
- Taiwan National Center for Theoretical Sciences and Tsing-Hua University, May 8-June 9, 2001; March-April, 2004.
- University of California at Irvine, June, 2002, May 2003, June 2008.
- National University of Singapore, January 15-February 25, 2004.
- University of Kaiserslautern and ITWM, Germany, June-July, 2004.
- Nanjing Normal University, China, May 15-June 16, 2004.
- Institute of Computational Physics, Beijing, China, June, 2004.
- Institute of High Performance Computing, Singapore, March 5-19, 2005.
- Institute of Mathematical Sciences (IMS), Singapore, 2007.
- Chinese Academy of Sciences (computational mathematics), 2006, 2008; (mechanics).
- National Jiao-Tong University, Taiwan, 2005, 2006, 2007, 2008, 2009.
- Hong Kong Baptist University, January-June, 2010.
- Institute of Numerical Simulations, University of Bonn, Germany, January-June, 2011 (planed).

Professional Activities (selected):

- Associated editor of Journal of Numerical Mathematics: Theory, Methods and Applications.
- One of organizers of the Fields Workshop on Immersed Boundary Problems, Fields Insitute, Toronto, CA, Aug. 9-13, 2010.
- One of organizers of the conference, "Fluid dynamics, Analysis, and Numerics(FAN2010)", June 28-30, 2010, Duke University.
- Organizer of the Special Session on Numerical Solution of Partial Differential Equations and Applications, AMS Sectional meeting, Raleigh, NCSU, April 4-5, 2009.
- Editor of a special issue of the journal of "Applied Numerical mathematics, Vol. 57, 2007
- Editor of a special issue of Contemporary Mathematics, AMS, in process.
- One of main organizers for the SAMSI program on Random Media, September 2007-May 2008, RTP, NC.
- Main and only international organizer of 'Moving Interface Problems and Applications in Fluid Dynamics', 1/8-3/31/2007, Institute for Mathematical Sciences (IMS) at the National University of Singapore.
- Chair and organizer of International Conference on Scientific Computing, Nanjing, China, June 4 – June 8, 2005.
- Invited organizer of SIAM sponsored mini-symposium at ICIAM, 2003, Sydney, Australia.
- Co-organizer and faculty advisor of Industrial Mathematics Modeling Workshop for Graduate Students, North Carolina State University, 1998, 1999, 2000, 2001, and 2002, faculty advisor: 2003, 2004.
- Faculty advisor of REU program, 2010.
- One of founders of The Confucius College at NCSU, Raleigh; Memeber of board of trustees and faculty adviser commette.