

CURRICULUM VITAE

BAO, Weizhu Professor
Department of Mathematics
Center for Computational Science and Engineering
National University of Singapore

EDUCATIONAL BACKGROUND:

PhD & Msc, Computational Mathematics, 1995, Tsinghua University

Bsc, Applied Mathematics, 1992, Tsinghua University

EMPLOYMENT HISTORY:

a). Regular Positions

- Professor (2009–), Associate Professor (2005–2009) and Assistant Professor (2001–2004), National University of Singapore, Singapore.
- Van Vleck Visiting Assistant Professor (08/2000–12/2000), Department of Mathematics, University of Wisconsin-Madison, USA.
- Visiting Assistant Professor (1998–2000), School of Mathematics, Georgia Institute of Technology, USA.
- EPSRC Postdoc Research Associate (1996–1997), Department of Mathematics, Imperial College, UK.
- Associate Professor (1998–2000), Lecturer (1995–1998) and Teaching Assistant (1992–1995), Department of Mathematics, Tsinghua University, China.

b). Visiting Positions (> One month)

- Visiting Professor, School of Mathematical Sciences, Peking University, China, June – July 2010.
- Visiting Professor, Department of Electrical Engineering, Tsinghua University, China, July – August 2008 (Delivered 20 hours lecture to 25 graduate students during the visit).
- Program Participant, The Institute for Pure and Applied Mathematics (IPAM), University of California Los Angeles (UCLA), USA, May – June, 2008.
- Visiting Associate Professor, Department of Mathematics, University of California Irvine, USA, January – April, 2008.
- Visiting Scholar, Department of Applied Physics and Applied Mathematics, Columbia University, USA, October – November 2007.
- Shapiro Visitor, Department of Mathematics, Penn State University, USA, August – September 2007.

- Visiting Professor, Department of Mathematical Sciences, Tsinghua University, China, June – July 2007 (Delivered 16 hours lecture to 20 graduate students during the visit).
- Visiting Professor, CNRS & Institute of Mathematics, University of Paul Sabatier, Toulouse, France, May – June 2007.
- Visiting Professor, Department of Mathematics, Capital Normal University, Beijing, China, July – August 2006.
- Visiting Professor, Wolfgang Pauli Institute, University of Vienna, Vienna, Austria, May – June 2006.
- Visiting Professor, Department of Mathematics, Capital Normal University, Beijing, China, June – July 2005.
- Visiting Professor, Department of Mathematics, Fudan University, China, May – June 2004 (Delivered about 20 hours lecture to 50 students in Shanghai Summer School on “Analysis and Numerics in Modern Sciences” during the visit).
- Visiting Scientist, Ewin Schrödinger Institute, Vienna, Austria, May – June 2001.

CURRENT FIELDS OF INTEREST:

- Bose-Einstein condensation
- Computational fluid dynamics
- Computational quantum physics and chemistry
- Hyperbolic conservation laws
- Multiscale modeling, simulation and application
- Quantized vortices in superfluidity and superconductivity
- Numerical methods for problems in unbounded domains
- Finite element method for some nonlinear problems
- Computational methodology and computer software
- Numerical analysis and scientific computing
- Computational and applied mathematics in general

REFEREED JOURNAL PUBLICATIONS:

a). Already published:

- [75] Dynamical laws of the coupled Gross-Pitaevskii equations for spin-1 Bose-Einstein condensates (with Yanzhi Zhang), *Methods and Applications of Analysis*, Vol. **17** (2010), pp. 49-80.

- [74] Singular limits of Klein-Gordon-Schrödinger equations to Schrödinger-Yukawa equations (with Xuanchun Dong and Shu Wang), *Multiscale Modeling and Simulation: a SIAM Interdisciplinary Journal*, Vol. **8** (2010), pp. 1742-1769.
- [73] Mean-field regime of trapped dipolar Bose-Einstein condensates in one and two dimensions (with Yongyong Cai, Matthias Rosenkranz and Zhen Lei), *Phys. Rev. A*, Vol. **82** (2010), article 043623.
- [72] Ground states of two-component Bose-Einstein condensates with an interanl atomic Josephson junction (with Yongyong Cai), *East Asia Journal on Applied Mathematics*, Vol. **1** (2010), pp. 49-81.
- [71] Efficient numerical methods for computing ground states and dynamics of dipolar Bose-Einstein condensates (with Yongyong Cai and Hanquan Wang), *J. Comput. Phys.*, Vol. **229** (2010), pp. 7874-7892.
- [70] Comparisons between sine-Gordon equation and perturbed nonlinear Schrodinger equations for modeling light bullets beyond critical collapse (with Xuanchun Dong and Jack Xin), *Physica D: Nonlinear Phenomena*, Vol. **239** (2010), pp. 1120-1134.
- [69] A generalized-Laguerre-Fourier-Hermite pseudospectral method for computing the dynamics of rotating Bose-Einstein condensates (with Hailiang Li and Jie Shen), *SIAM J. Sci. Comput*, Vol. **31** (2009), pp. 3685-3711.
- [68] Symmetry breaking and self-trapping of a dipolar Bose-Einstein condensate in a double-well potential (with Bo Xiang, Jiangbin Gong, Han Pu and Baowen Li), *Phys. Rev. A*, Vol. **79** (2009), article 013626.
- [67] Numerical methods for computing the ground state of spin-1 Bose-Einstein condensates in uniform magnetic field (with F. Y. Lim), *Phys. Rev. E*, Vol. **78** (2008), article 066704.
- [66] A generalized-Laguerre-Hermite pseudospectral method for computing symmetric and central vortex states in Bose-Einstein condensates (with Jie Shen), *J. Comput. Phys.*, Vol. **227** (2008), pp. 9778-9793.
- [65] Quantized vortex stability and interaction in the nonlinear wave equation (with R. Zeng and Y.Z. Zhang), *Physica D*, Vol. **237** (2008), pp. 2391-2410.
- [64] Dynamical self-trapping of Bose-Einstein condensates in shallow optical lattices (with M. Rosenkranz, D. Jaksch and F. Y. Lim), *Phys. Rev. A*, Vol. **77** (2008), article 063607.
- [63] Computing ground states of spin-1 Bose-Einstein condensates by the normalized gradient flow (with F. Y. Lim), *SIAM J. Sci. Comput.*, Vol. **30** (2008), No. 4, pp. 1925-1948.
- [62] Self-trapping of impurities in Bose-Einstein condensates: Strong attractive and repulsive coupling (with M. Bruderer and D. Jaksch), *Europhys. Lett.*, Vol. **82** (2008), No. 3, article 30004.
- [61] A uniformly convergent numerical method for constrained singularly perturbed nonlinear eigenvalue problems (with Ming-Huang Chai), *Commun. Comput. Phys.*, Vol. **4** (2008), No. 1, pp. 145-160.

- [60] Convergence rate of dimension reduction in Bose-Einstein condensates (with Y.Y. Ge, D. Jaksch, P. A. Markowich and R. M. Weishäupl), *Comput. Phys. Comm.*, Vol. **177** (2007), No. 11, pp. 832-850.
- [59] Dynamics of vortices in weakly interacting Bose-Einstein condensates (with Alexander Klein, Dieter Jaksch and Yanzhi Zhang), *Phys. Rev. A*, Vol. **76** (2007), article 043602.
- [58] The Dynamics and Interaction of Quantized Vortices in Ginzburg-Landau-Schrödinger equations (with Q. Du and Y.Z. Zhang), *SIAM J. Appl. Math.*, Vol. **67** (2007), No. 6, pp. 1740-1775.
- [57] Numerical simulation of vortex dynamics in Ginzburg-Landau-Schrodinger equation (with Q. Du and Y.Z. Zhang), *Eur. J. Appl. Math.*, Vol. **18** (2007), pp. 607-630.
- [56] Dynamics of rotating two-component Bose-Einstein condensates and its efficient computation (with H. Li and Y.Z. Zhang), *Physica D*, Vol. **234** (2007), pp. 49-69.
- [55] A mass and magnetization conservative and energy diminishing numerical method for computing ground state of spin-1 Bose-Einstein condensates (with H. Wang), *SIAM J. Numer. Anal.*, Vol. **45** (2007), No. 5, pp. 2177-2200.
- [54] Efficient and accurate numerical methods for the Klein-Gordon-Schrodinger equations (with L. Yang), *J. Comput. Phys.*, Vol. **225** (2007), No. 2, pp. 1863-1893.
- [53] Energy and chemical potential asymptotics for the ground state of Bose-Einstein condensates in the semiclassical regime (with F. Y. Lim and Y.Z. Zhang), *Bulletin of the Institute of Mathematics, Academia Sinica*, Vol. **2** (2007), No. 2, pp. 495-532.
- [52] Dynamics of the center of mass in rotating Bose-Einstein condensates (Y.Z. Zhang), *Appl. Numer. Math.*, 57 (2007), pp. 697-709.
- [51] A time-splitting spectral method for three-wave interactions in media with competing quadratic and cubic nonlinearities (with C. Zheng), *Commun. Comput. Phys.*, Vol. **2** (2007), No. 1, pp. 123-140.
- [50] Efficient and Spectrally Accurate Numerical Methods for Computing Ground and First Excited States in Bose-Einstein Condensates (with I-L. Chern and F. Y. Lim), *J. Comput. Phys.*, Vol. **219** (2006), No. 2, pp. 836-854.
- [49] An efficient and spectrally accurate numerical method for computing dynamics of rotating Bose-Einstein condensates (with H. Wang), *J. Comput. Phys.*, Vol. **217** (2006), No. 2, pp. 612-626.
- [48] Dynamics of rotating Bose-Einstein condensates and their efficient and accurate numerical computation (with Q. Du and Y.Z. Zhang), *SIAM J. Appl. Math.*, Vol. **66** (2006), No. 3, pp. 758-786.
- [47] Dynamics of the ground state and central vortex states in Bose-Einstein condensation (with Y.Z. Zhang), *Math. Mod. Meth. Appl. Sci.*, Vol. **15** (2005), No. 12, pp. 1863-1896.
- [46] A fourth-order time-splitting Laguerre-Hermite pseudo-spectral method for Bose-Einstein condensates (with J. Shen), *SIAM J. Sci. Comput.*, Vol. **26** (2005), No. 6, pp. 2010-2028.

- [45] On the Gross-Pitaevskii Equation with Strongly Anisotropic Confinement: Formal Asymptotics and Numerical Experiments (with P. A. Markowich, C. Schmeiser and R. M. Weishaupl), *Math. Mod. Meth. Appl. Sci.*, Vol. **15** (2005), No. 5, pp. 767-782.
- [44] Continuous configuration time-dependent self-consistent field method for polyatomic quantum dynamical problems (with D.H. Zhang, M.H. Yang and S.-Y. Lee), *J. Chem. Phys.*, Vol. **122** (2005), No. 9, pp. 1101-1104.
- [43] Ground, symmetric and central vortex states in rotating Bose-Einstein condensates (with H.Q. Wang and P.A. Markowich), *Comm. Math. Sci.*, Vol. **3** (2005), No. 1, pp. 57-88.
- [42] Explicit and unconditionally stable numerical methods for generalized and vector Zakharov System (with F.F Sun), *SIAM J. Sci. Comput.*, Vol. **26** (2005), No. 3, pp. 1057-1088.
- [41] Numerical methods for nonlinear Schrödinger equation under nonzero far-field conditions, *Methods and Applications of Analysis*, Vol. **11** (2004), No. 3, pp. 367-388.
- [40] An efficient and stable numerical method for the Maxwell-Dirac system (with X.-G. Li), *J. Comput. Phys.*, Vol. **199** (2004), pp. 663-687.
- [39] Ground states and dynamics of multi-component Bose-Einstein condensates, *Multiscale Modeling and Simulation, a SIAM Interdisciplinary journal*, Vol. **2** (2004), No. 2. pp. 210-236.
- [38] Computing the ground state solution of Bose-Einstein condensates by a normalized gradient flow (with Q. Du), *SIAM J. Sci. Comput.*, Vol. **25** (2004), No. 5. pp. 1674-1697.
- [37] Three dimensional simulation of jet formation in collapsing condensates (with D. Jaksch and P.A. Markowich), *J. Phys. B: At. Mol. Opt. Phys.*, Vol. **37** (2004), No. 2, pp. 329-343.
- [36] Effective one particle quantum dynamics of electrons: a numerical study of the Schrödinger-Poisson- X_α model (with N.J. Mauser and H.P. Stimming), *Comm. Math. Sci.*, Vol. **1** (2003), No. 4, pp. 809-828.
- [35] Numerical study of time-splitting spectral discretization of nonlinear Schrödinger equations in the semi-classical regimes (with S. Jin and P.A. Markowich), *SIAM J. Sci. Comput.*, Vol. **25** (2003), No. 1, pp. 27 - 64.
- [34] Approximation and comparison for motion by mean curvature with intersection points, *Computers & Math. Comp.*, Vol. **46** (2003), pp. 1211-1228.
- [33] An explicit unconditionally stable numerical method for solving damped nonlinear Schrödinger equations with a focusing nonlinearity, (with D. Jaksch), *SIAM J. Numer. Anal.* (2003), Vol. **41**, No. 4, pp. 1406 - 1426.
- [32] Numerical methods for the generalized Zakharov system (with F. Sun and G.W. Wei), *J. Comput. Phys.*, Vol. **190** (2003), No. 1, pp. 201 - 228.
- [31] Numerical solution of the Gross-Pitaevskii equation for Bose-Einstein condensation (with D. Jaksch and P.A. Markowich), *J. Comput. Phys.*, Vol. **187** (2003), No. 1, pp. 318 - 342.

- [30] Ground state solution of Bose-Einstein condensation by directly minimizing the energy functional (with W. Tang), *J. Comput. Phys.*, Vol. **187** (2003), No. 1, pp. 230 - 254.
- [29] Error bounds for the finite element approximation of the exterior Stokes equations in two dimensions, *IMA J. Numer. Anal.*, Vol. **23** (2003), No. 1, pp. 125-148.
- [28] Error bounds for the finite element approximation of an incompressible material in an unbounded domain (with H. Han), *Numer. Math.*, Vol. **93** (2003), No. 3, pp. 415-444.
- [27] High-order I-stable central difference schemes for viscous compressible flows (with S. Jin), *J. Comput. Math.*, Vol. **21** (2003), No. 1, pp. 101-112.
- [26] Error estimates on the random projection methods for hyperbolic conservation laws with stiff reaction terms (with S. Jin), *Appl. Numer. Math.*, Vol. **43** (2002), No. 4, pp. 315-333.
- [25] An economical finite element approximation of a generalized Newtonian flow, *Comput. Methods Appl. Mech. Engrg.*, Vol. **191**, No. **33** (2002), pp. 3637-3648.
- [24] The random projection method for stiff multi-species detonation capturing (with S. Jin), *J. Comput. Phys.*, Vol. **178** (2002), No. 1, pp. 37-57.
- [23] On time-splitting spectral approximation for the Schrödinger equation in the semiclassical regime (with S. Jin and P.A. Markowich), *J. Comput. Phys.*, Vol. **175** (2002), pp. 487-524.
- [22] The random projection method for stiff detonation waves (with S. Jin), *SIAM J. Sci. Comput.*, Vol. **23** (2001), No. 3, pp. 1000-1026.
- [21] Error estimates for the finite element approximation of linear elastic equations in an unbounded domain (with H. Han), *Math. Comp.*, Vol. **70** (2001), pp. 1437-1459.
- [20] On inf-sup conditions of mixed finite element formulations for acoustic fluids (with X. Wang and K.J. Bathe), *Math. Models Methods Appl. Sci.*, Vol. **11** (2001), No. 5, pp. 883-901.
- [19] Numerical simulations of fracture problems by coupling the FEM and the direct method of lines (with H. Han and Z. Huang), *Comput. Methods Appl. Mech. Engrg.*, Vol. **190** (2001), pp. 4831-4846.
- [18] Weakly compressible high-order I-stable central difference schemes for incompressible viscous flows (with S. Jin), *Comput. Methods Appl. Mech. Engrg.*, Vol. **190** (2001), pp. 5009-5026.
- [17] The random projection method for hyperbolic conservation laws with stiff reaction terms (with S. Jin), *J. Comput. Phys.* (2000), Vol. **163**, pp. 216-248.
- [16] Artificial boundary conditions for incompressible Navier-Stokes equations: A well-posed result, *Comput. Methods Appl. Mech. Engrg.*, Vol. **188** (2000), pp. 595-611.
- [15] The artificial boundary conditions for computing the flow around a submerged body (with. Wen X.), *Comput. Methods Appl. Mech. Engrg.*, Vol. **188** (2000), pp. 473-482.

- [14] High-order local artificial boundary conditions for problems in unbounded domains (with H. Han), *Comput. Methods Appl. Mech. Engrg.*, Vol. **188** (2000), pp. 455-471.
- [13] Error estimates for the finite element approximation of problems in unbounded domains (with H. Han), *SIAM J. Numer. Anal.*, Vol. **37** (2000), No. 4, pp. 1101-1119.
- [12] The discrete artificial boundary condition on a polygonal artificial boundary for the exterior problem of Poisson equation by using the direct method of lines (with H. Han), *Comput. Methods Appl. Mech. Engrg.*, Vol. **179** (1999), pp. 345-360.
- [11] The direct method of lines for the problem of infinite elastic foundation (with H. Han), *Comput. Methods Appl. Mech. Engrg.*, Vol. **175** (1999), pp. 157-173.
- [10] A priori and posteriori error bounds for nonconforming linear finite element approximation of a non-Newtonian flow (with J. W. Barrett), *M²AN Math. Model. Numer. Anal.*, Vol. **32** (1998), pp. 843-858.
- [9] The approximations of the exact boundary condition at an artificial boundary for linearized incompressible viscous flows, *J. Comput. Math.*, Vol. **16** (1998), pp. 239-256.
- [8] The artificial boundary conditions for incompressible materials on an unbounded domain (with H. Han), *Numer. Math.*, Vol. **77** (1997), pp. 347-363.
- [7] Numerical simulation for the problem of infinite elastic foundation (with H. Han and T. Wang), *Comput. Methods Appl. Mech. Engrg.*, Vol. **147** (1997), pp. 369-385.
- [6] Artificial boundary conditions for two-dimensional incompressible viscous flows around an obstacle, *Comput. Methods Appl. Mech. Engrg.*, Vol. **147** (1997), pp. 263-273.
- [5] Local artificial boundary conditions for the incompressible viscous flow in a slip channel (with H. Han), *J. Comput. Math.*, Vol. **15** (1997), pp. 335-344.
- [4] Nonlocal artificial boundary conditions for the incompressible viscous flow in a channel using spectral techniques (with H. Han), *J. Comput. Phys.*, Vol. **126** (1996), pp. 52-63.
- [3] An artificial boundary condition for the incompressible viscous flows using the method of lines (with H. Han), *Int. J. Numer. Methods Fluids*, Vol. **22** (1996), pp. 483-493.
- [2] An artificial boundary condition for the incompressible viscous flows in a no-slip channel (with H. Han), *J. Comput. Math.*, Vol. **13** (1995), pp. 51-65.
- [1] A discrete artificial boundary condition for steady incompressible viscous flows in a no-slip channel using a fast iterative method (with H. Han and J. Lu), *J. Comput. Phys.*, Vol. **114** (1994), pp. 201-208.

c). Submitted:

- [76] Analysis and comparison of numerical methods for the Klein-Gordon equation in the nonrelativistic limit regime (with Xuanchun Dong), preprint.
- [77] Optimal error estimates of finite difference methods for the Gross-Pitaevskii equation with angular momentum rotation (with Yongyong Cai), preprint.

- [78] Numerical methods for computing ground state and dynamics of nonlinear relativistic Hartree equation for boson stars (with Xuanchun Dong), preprint.
- [79] Gross-Pitaevskii-Poisson equations for dipolar Bose-Einstein condensate with anisotropic confinement (with Yongyong Cai), preprint.

REFEREED CONFERENCE PROCEEDINGS AND CHAPTERS IN BOOKS:

- [7] Analysis and computation for the semiclassical limits of the ground and excited states of the Gross-Pitaevskii equation (with Fong Yin Lim), Proc. Sympos. Appl. Math., Amer. Math. Soc., Vol. **67** (2009), pp. 195–215.
- [6] Analysis and Efficient Computation for the Dynamics of Two-Component Bose-Einstein Condensates, Contemporary Mathematics, American Mathematical Society, Vol. **473** (2008), pp. 1-26.
- [5] The Nonlinear Schrödinger Equation and Applications in Bose-Einstein Condensation and Plasma Physics, Chapter 3 in Dynamics in Models of Coarsening, Coagulation, Condensation and Quantization (IMS Lecture Notes Series Volume 9), World Scientific (2007), pp. 141-240.
- [4] Ground States and Dynamics of Rotating Bose-Einstein Condensates, Chapter 10, Transport Phenomena and Kinetic Theory, Series: Modeling and Simulation in Science, Engineering and Technology, Birkhauser (2006), pp. 216-255.
- [3] Quantum kinetic theory: modeling and numerics for Bose-Einstein condensation (with P.A. Markowich and L. Pareschi), Chapter 10, Modeling and Computational Methods for Kinetic Equations, Series: Modeling and Simulation in Science, Engineering and Technology, Birkhauser (2004), pp. 287-321.
- [2] The random projection method for stiff multi-species detonation computation (with S. Jin), Proceedings of Hyperbolic Problems: Theory, Numerics, Applications, Birkhauser-Verlag, Berlin (2001), pp 139-148.
- [1] The random projection method (with S. Jin), Advances in Scientific Computing (Proceeding of the Workshop on Scientific Computing 99 in Hong Kong), Science Press, Beijing/New York (2001), pp.1-11.

BOOKS EDITED OR PUBLISHED:

- [1] Dynamics in Models of Coarsening, Coagulation, Condensation and Quantization, IMS Lecture Notes Series Volume 9 (edited with J.-G. Liu), World Scientific, 2007.

AWARD:

- Young Scientist Award, Faculty of Science, National University of Singapore, 2008.

- Young Researchers' Grant, ORGANIZING COMMITTEE OF HYP2004: Tenth International Conference on Hyperbolic Problems Theory, Numerics, Applications, 2004 (AWARDED TO VERY ACTIVE YOUNG RESEARCHERS WITH FINANCIAL SUPPORT UP TO 100,000JPY TO GO HYP2004 IN JAPAN).
- Beijing Science and Technology Award, 2003 (AWARDED TO RESEARCHER FOR SIGNIFICANT ACHIEVEMENT IN SCIENCE AND TECHNOLOGY PROGRESS IN BEIJING).
- The Young Researcher Fellowship Award, 2001, The First M.I.T. Conference on Computational Fluid and Solid Mechanics, Massachusetts Institute of Technology, USA.
- Tsinghua Alumni Award, Tsinghua University, 1995, 1997
- Luokeng Hua Scholarship, Tsinghua University, 1994 (AWARDED ANNUALLY TO THE TOP RESEARCH STUDENT IN APPLIED MATHEMATICS IN School of Science at Tsinghua)
- C. C. Lin Scholarship, Tsinghua University, 1995 (AWARDED ANNUALLY TO THE TOP RESEARCH STUDENT IN APPLIED MATHEMATICS IN TSINGHUA UNIVERSITY)

GRANT SUPPORT:

- Principal Investigator, Ministry of Education, 2009-2012, S\$806,020 for “Analysis & Simulation for Quantized Vortices in Superfluidity & Superconductivity”.
- Principal Investigator, Ministry of Education & National University of Singapore, 2007-2009, S\$137,200 for “Theoretical Study of Bose-Einstein Condensates” (with B. Li).
- Principal Investigator, Ministry of Education & National University of Singapore, 2006-2008, S\$93,300 for “Efficient and Stable Numerical Methods for Coupled Systems in Quantum and Plasma Physics”.
- Principal Investigator, Ministry of Education & National University of Singapore, 2005-2007, S\$70,000 for “Modelling and Simulation of Trapped Bose Gases at Finite Temperature by Quantum Kinetic Theory”.
- Principal Investigator, Ministry of Education & National University of Singapore, 2003-2005, S\$33,800 for “Quantized Vortex States and Dynamics in Bose-Einstein Condensate”.
- Principal Investigator, Ministry of Education & National University of Singapore, 2002-2004, S\$83,000 for “Numerical Simulation for Bose-Einstein Condensation (BEC)”.
- OAP (Fellow-Inbound) grant, NSTB & National University of Singapore, July 2003, S\$5,000 for Prof. J. Shen's visit.
- Principal Investigator, Ministry of Education & National University of Singapore, 2001-2003, S\$55,500 for “Numerical Methods for Problems with Multiscale Phenomena”.
- OAP (Fellow-Inbound) grant, NSTB & National University of Singapore, 2002, S\$9,200 for Prof. H. Han's visit.

- Principal Investigator, Climbing Program of National Key Project of foundation in China, 1997-1999, 60,000 yuan for “Finite Element Methods for Non-Newtonian/Viscoelastic flows”
- Principal Investigator, Cao Guang-Biao’s Higher Science and Technology Grant at Tsinghua University, 1998-1999, 50,000 yuan for “High-order Local Artificial Boundary Conditions for Partial Differential Equations in Unbounded Domains”.
- Co-Principal Investigator (with H. Han and J. Lu), National Natural Science Foundation in China, 1998-2000, 75,000 yuan for “Artificial Boundary Conditions for Incompressible Viscous Flows”
- Principal Investigator, The Scientific Research Foundation for the Returned Oversea’s Chinese Scholars, 1997-1999, 25,000 yuan for “Numerical Simulations of Non-Newtonian/Viscoelastic flows”.

COLLOQUIA AND SEMINARS:

- 2011: Institute of Physics, Chinese Academy of Sciences, China (February); Institute of Mathematics, Chinese Academy of Sciences, China (February).
- 2010: Department of Mathematics, National Taiwan University, Taiwan (October); National Center of Theoretical Sciences, National Tsinghua University, Taiwan (October); Center for Mathematical Modeling and Scientific Computing, National Chiao Tung University, Taiwan (October); Department of Applied Mathematics, National Chung Hsing University, Taiwan (October); School of Electronic Engineering and Computer Science, Peking University, China (July); School of Mathematical Sciences, Soochow University, China (July); School of Mathematical Sciences, Fudan University, China (July); Department of Mathematics, Northeastern China Normal University, China (July); School of Mathematical Sciences, Jilin University, China (July); Institute of Computational Mathematics & Scientific/Engineering Computing, Chinese Academy of Sciences, China (July); School of Mathematical Sciences, Tsinghua University, China (July); School of Mathematical Sciences, Capital Normal University, China (July); Department of Physics, National University of Singapore, Singapore (February); Division of Mathematical Sciences, Nanyang Technological University, Singapore (March).
- 2009: School of Mathematical Sciences, Peking University, China (December); Beijing Institute of Applied Physics and Computational Mathematics, China (December); Department of Physics, National University of Singapore, Singapore (November); Department of Mathematics, Capital Normal University, China (April); Department of Mathematics, University of Sussex, UK (January).
- 2008: School of Mathematical Sciences, Peking University, China (December); School of Mathematical and Physical Sciences, Beijing Technology University, China (December); School of Mathematical Sciences, Beijing Normal University, China (December); Department of Mathematics, East China Normal University, China (December); E-Institute, Shanghai Jiao-Tong University, China (December); School of Mathematics, Fudan University, China (December); Department of Mathematics, National University of Singapore (August); Institute of Physics, Chinese Academy of Sciences, China (July); Institute of Applied Mathematics, Chinese Academy of Sciences, China (July); Department of Mathematics, University of California Santa Barbara, USA (May); Applied and Computational

Mathematics Division, California Institute of Technology, USA (May); Institute for Pure and Applied Mathematics (IPAM), University of California Los Angeles (UCLA), USA (May); Department of Mathematics, Illinois Institute of Technology, USA (April); Department of Mathematics, Iowa State University, USA (April); Department of Mathematics, Florida State University, USA (April); Department of Mathematics, University of Nevada at Las Vegas, USA (March); Department of Mathematics, Stanford University, USA (March); School of Mathematics, Georgia Institute of Technology, USA (March); Department of Mathematics, University of North Carolina at Charlotte, USA (March); Department of Mathematics and Statistics, Arizona State University, USA (February); Department of Mathematics, University of California Irvine, USA (February).

- 2007: School of Applied Mathematics and Physics, Beijing University of Technology, China (December); Department of Mathematical Sciences, Tsinghua University, China (December); Institute for Mathematics, University of Vienna, Austria (December); Department of Mathematics, New Jersey Institute of Technology, USA (October); Department of Mathematics, Purdue University, USA (October); Department of Mathematics, Indiana University, USA (October); Department of Mathematics, University of Wisconsin-Madison, USA (September); Department of Mathematics, Wayne State University, USA (September); Department of Mathematics, Michigan State University, USA (September); Department of Mathematics, Penn State University, USA (August); School of Electronic Engineering and Computer Science, Peking University, China (August); Speaker (4 hours lecture), NUS-Peking Summer Program on Mathematical Modeling, National University of Singapore, Singapore (July); School of Mathematics and Computer Sciences, University of Greenwich, UK (July); Department of Physics, Oxford University, UK (July); Institute of Mathematics, Chinese Academy of Science, Beijing, China (June); Institute of Mechanics, Chinese Academy of Science, Beijing, China (June); Beijing Institute of Applied Physics and Computational Mathematics, Beijing, China (June); Department of Mathematics, Beijing Institute of Technology, Beijing, China (June); Institute of Computational Mathematics & Scientific/Engineering Computing, Chinese Academy of Science, Beijing, China (June); Department of Mathematics, Nanjing University of Aeronautics and Astronautics, Nanjing, China, (June); Department of Mathematics, Nanjing Normal University, Nanjing, China (June 2007); Department of Mathematics, Nanjing University, China (June); Department of Mathematics, University of Science and Technology of China, China (June); Institute of Mathematics, University Paul Sabatier, France (May).

- 2006: Department of Mathematics, National University of Singapore, Singapore (August); Institute of Computational Mathematics & Scientific/Engineering Computing, Chinese Academy of Science, Beijing, China (July); Beijing Institute of Applied Physics and Computational Mathematics, Beijing, China (July); Speaker (4 hours lecture), NUS-Peking Summer Program on Mathematical Modeling, National University of Singapore, Singapore (July); Johann Radon Institute for Computational and Applied Mathematics (RICAM), University of Linz, Austria (June); Summer School in “Random Graphs and Large-Scale Real-World Networks”, Institute for Mathematical Sciences, National University of Singapore, Singapore (May); Department of Mathematics, Providence University, Taiwan (May); Department of Mathematics & National Center of Theoretical Sciences, National Tsinghua University, Taiwan (May); College of Science, National Chiao Tung University, Taiwan (May); Department of Mathematics, National Chiao Tung University, Taiwan (May); Department of Mathematics (3 hours lectures), National Taiwan University, Taiwan (May); IHPC Science and Engineering Colloquium, Institute of High Performance Computing,

Singapore (April); Department of Mathematics, ZhongSan University, Guangdong, China (February); Institute of Mathematical Sciences (2 hours lectures), Chinese University of Hong Kong, Hong Kong (February).

- 2005: Lunchtime talk, Faculty of Science, National University of Singapore, Singapore (November); Beijing Institute of Applied Physics and Computational Mathematics, Beijing, China (July); School of Electronic Engineering and Computer Science, Peking University, Beijing, China (July); Institute of Physics, Chinese Academy of Sciences, Beijing, China (July); Department of Mathematics, Capital Normal University, Beijing, China (June); Center for Scientific and Engineering Computing, Peking University, Beijing, China (June); Institute of Computational Mathematics & Scientific/Engineering Computing, Chinese Academy of Science, Beijing, China (June); MIP, University of Paul Sabatier, France (May).

- 2004: Department of Mathematics, North Carolina State University, USA (November); Department of Mathematics, University of North Carolina at Chapel Hill, USA, (November); Department of Mathematics, University of Maryland, USA (November); School of Mathematics, Georgia Institute of Technology, USA (November); Department of Mathematics, University of Ferrara, Italy (July); MIP, University of Paul Sabatier, France (July); Department of Mathematics, University of North Carolina at Charlotte, USA (June); Institute of Computational Mathematics & Scientific/Engineering Computing, Chinese Academy of Science, Beijing, China (May); Department of Mathematics, Purdue University, USA (February); Department of Mathematics, University of Central Florida, USA (February).

- 2003: Department of Mathematics, Indiana University, USA (December); Department of Mathematics, Purdue University, USA (December); Department of Mathematics, University of Maryland, USA (December); Institute of Mathematical Sciences, Chinese University of Hong Kong, Hong Kong (November); Department of Mathematics, Hong Kong University of Science and Technology, Hong Kong (November).

- 2002: Institute of Computational Mathematics & Scientific/Engineering Computing, Chinese Academy of Science, Beijing, China (December); Beijing Institute of Applied Physics and Computational Mathematics, Beijing, China (December); Department of Mathematical Science, Tsinghua University, Beijing, China (December); Department of Mathematics, Hong Kong University of Science and Technology, Hong Kong (September); Wolfgang Pauli Institute, Vienna, Austria (July); Department of Applied Mathematics, National Sun Yat-sen University, Taiwan (June); Department of Mathematics, National Cheng Kung University, Taiwan (June); Department of Mathematics, National Chung Cheng University, Taiwan (June); Department of Mathematics, National Taiwan University, Taiwan (June); Department of Mathematics, National University of Singapore, Singapore (March).

- 2001: Institute of Mathematics, Chinese Academy of Science, Beijing, China (December) Beijing Institute of Applied Physics and Computational Mathematics, Beijing, China (December); Department of Scientific and Engineering Computing, Peking University, Beijing, China (December); Department of Mathematical Science, Tsinghua University, Beijing, China (December); Tamesek laboratory, National University of Singapore, Singapore (November).

- 2000: Department of Computational Science, National University of Singapore, Singapore (July); Department of Mathematics, Emory University, USA (February).

- Before 2000: School of Mathematics, Georgia Institute of Technology, USA (December 1998); Department of Applied Mathematics, Tsinghua University, Beijing, China (March 1998); Department of Mathematics, Peking University, Beijing, China (September 1997); Department of Applied mathematics, Tsinghua University, Beijing, China (April 1997); Department of Applied Mathematics, Tsinghua University, Beijing, China (April 1995).

MEETINGS AND SYMPOSIA:

a). Invited

- A four-month program on “Mathematical Theory and Simulation of Phase Transitions”, September 1 – December 31, 2011, Beijing International Center for Mathematical Research (BICMR), Peking University, Beijing, China.
- 2011 International Conference on Applied Mathematics and Interdisciplinary Research, June 13–15, 2011, Nankai University, Tianjin, China.
- KAM theory and Geometric Integration, June 5–10, 2011, Banff International Research Station (BIRS) for Mathematical Innovation and Discovery, Canada
- Workshop on “Recent Developments in Nonlinear Partial Differential Equations: Part II”, May 15–21, 2011, Croucher Foundation Advanced Study Institute, The Chinese University of Hong Kong.
- International conference on “Kinetic models of classical and quantum particle systems” — a conference in the memory of Naoufel Ben Abdallah, March 14–18, 2011, University Paul Sabatier, Toulouse, France.
- inisymposium on “High-Order Numerical Methods for the Nonlinear Schrödinger Equations and Applications”, SIAM Conference on Computational Science and Engineering (CSE11), February 28–March 4, 2011, Grand Sierra Resort and Casino, Reno, Nevada, USA.
- The International Congress of Chinese Mathematicians (ICCM2010), December 17 – 22, 2010, Tsinghua University, Beijing, China.
- Long program on “Partial Differential Equations in Kinetic Theories”, August 16 – December 22, 2010, Isaac Newton Institute for Mathematical Sciences, University of Cambridge, UK
- The First Cross-straits Workshop on Computational Mathematics, August 2-5, 2010, Xiamen University, China.
- International Workshop on Scientific Computing and Nonlinear Partial Differential Equations, June 8-11, 2010, Jiuzhaigou National Park, Sichuan Province, P.R. China.
- Workshop on PDE’s in Engineering Nanoscience and Biology, May 17-21, 2010, Hotel Le Royal Hammamet, Tunis, Tunisia.
- Nonlinear phenomena in quantum degenerate gases, April 12-16, 2010, Universidade de Vigo, Ourense, Spain.

- Two Days Workshop on “Splitting Methods for Evolution Equations”, April 7–10, 2010, Innsbruck, Austria.
- The 5th Cross-Trait and International Conference on Quantum Manipulation, 18 – 20 December 2009, Institute of Physics, Chinese Academy of Sciences, Beijing, China.
- 7th East Asia Conference on Partial Differential Equations, December 14-18, 2009, The Chinese University of Hong Kong, Hong Kong.
- International Conference on “Mathematical Theory and Applications of Liquid Crystal, Ferromagnetism and Related Topics”, June 29 – July 3, 2009, South China Normal University, Guangzhou, China.
- Workshop on “Modern Topics in Nonlinear Kinetic Equations”, April 20 – 22, 2009, Department of Applied Mathematics and Theoretical Physics (DAMTP), University of Cambridge, UK.
- Workshop on “Quantum Systems and Semiconductor Devices: Analysis, Simulations, Applications”, April 20-24, 2009, Peking University, Beijing, China.
- International Conference on “Engineering and Computational Mathematics (ECM2009)”, May 27 – 29, 2009, The Hong Kong Polytechnic University, Hong Kong.
- Third international workshop on ”Nonlinear Partial Differential Equations: Analysis, Computation and Applications”, December 28-31, 2008, Northwest University, Xi’an, China.
- Workshop on “Computational Methods for Quantum, High Frequency and Seismic Waves”, December 19-22, 2008, Tsinghua University, Beijing, China.
- International Conference on “Conservation Laws and Kinetic Equations”, December 12 - 15, 2008, Shanghai Jiao-Tong University, Shanghai, China.
- 9th Frontier Science Symposium, October 15 - 17, 2008, Faculty of Science, National University of Singapore, Singapore.
- Workshop on “Control of (Nonlinear) Schrödinger Equations”, September 24 - 27, 2008, Wolfgang Pauli Institute (WPI), Vienna, Austria.
- Tutorial (6 hours) on “Numerical Methods for the Nonlinear Schrödinger equations”, September 22 - 23, 2008, Wolfgang Pauli Institute (WPI), Vienna, Austria.
- 12th International Conference on “Hyperbolic Problems: Theory, Numerics and Applications (HYP2008)”, June 9 - 13, 2008, University of Maryland, USA.
- Workshop on “Kinetic Equations: Direct and Inverse Problems”, May 15-18, 2008, Mantova, Italy.
- International Conference on ”Nonlinear phenomena in quantum degenerate gases”, April 1-5, 2008, Universidad de Castilla-La Mancha Toledo, Spain.
- IPAM Program on “Optimal Transport”, March 10 - June 13, 2008, Institute for Pure and Applied Mathematics (IPAM), University of California at Los Angeles (UCLA), USA.

- Workshop on “Recent Advances in Numerical Methods for Eigenvalue Problems (RAN-MEP2008)”, 4 – 8 January 2008, National Center for Theoretical Sciences, National Tsing-Hua University, Hsinchu, Taiwan.
- Workshop on “Quantized vortices in superfluidity and superconductivity and kinetic theory”, December 10 – 14, 2007, Institute for Mathematical Sciences, National University of Singapore, Singapore.
- Workshop on “Bose-Einstein condensation: modeling, analysis, computation and applications”, November 12 – 16, 2007, Institute for Mathematical Sciences, National University of Singapore, Singapore.
- Tutorial (6 hours) in a two-month program on “Bose-Einstein Condensation and Quantized Vortices in Superfluidity and Superconductivity”, 1 November – 31 December 2007, Institute for Mathematical Sciences, National University of Singapore, Singapore.
- Workshop on “Modeling and computational methods in fluid dynamics and material science: towards the challenge of the nanoscales”, 19 – 22 December 2007, Bressanone, Italy.
- International Conference on Conservation Laws and Kinetic Equations, 24 – 29 November 2007, Shanghai Jiao-Tong University, Shanghai, China.
- SAMSI Program on “Random Media”, Fall 2007 – Spring 2008, SAMSI, Research Triangle Park, NC, USA.
- Minisymposium on “Mathematical analysis and numerical simulation for Bose-Einstein condensation”, 6th International Congress on Industrial and Applied Mathematics (ICIAM 2007), 16-20 July, 2007, Zurich, Switzerland.
- A six-month program on “Highly Oscillatory Problems: Computation, Theory and Application”, Isaac Newton Institute for Mathematical Sciences, University of Cambridge, UK, 15 January - 6 July 2007.
- Minisymposium on “Multiphase and multiphysics problems with interface”, International Conference On Spectral and High Order Methods (ICOSAHOM07), June 18- 22, 2007, Institute of Computational Mathematics Chinese Academy of Sciences, Beijing, China.
- Minisymposium on “Emerging Applications in Quantum and Plasma Physics”, International Conference On Spectral and High Order Methods (ICOSAHOM07), June 18-22, 2007, Institute of Computational Mathematics Chinese Academy of Sciences, Beijing, China.
- Workshop on “Recent Advances on Spectral Methods and Related Applications”, June 14- 16, 2007, Xiamen University, China.
- Second Workshop on “Nonlinear Partial Differential Equations: Analysis, Computation and Application”, May 31 - June 2 2007, Seoul National University, Korea.
- Workshop on “Dispersive nonlinear long-wave PDE’s and applications in physics”, May 21 - 26, 2007, Wolfgang Pauli Institute (WPI), Vienna, Austria.

- Workshop on “Multiphase Physical Flows and Applications”, March 12 – 16, 2007, Institute for Mathematical Sciences, National University of Singapore, Singapore.
- Intentional Conference on “Partial Differential Equations and Numerical Analysis”, South China Normal University, Guangzhou, China, December 28 2006 – January 2, 2007.
- Joint Workshop (between Departments of Mathematics of National University of Singapore and Zhejiang University) on “Computational Mathematics”, Department of Mathematics, National University of Singapore, Singapore, December 21-22, 2006.
- International Workshop on “Multiscale Analysis and Applications”, Institute of Advanced Study, Nanyang Technology University, Singapore, December 18-22, 2006.
- Workshop on “Partial Differential Equations and Scientific Computing”, Department of Mathematics, National University of Singapore, Singapore, December 15, 2006.
- Tutorial (4 hours) in the Summer School on “Gross-Pitaevskii equations for superfluids and Bose-Einstein condensates”, Wolfgang Pauli Institute (WPI), Vienna, Austria, 18 - 22 September 2006.
- International Conference on “Nonlinear Evolutionary Partial Differential Equations”, Xining, Qinghai, China, August 1-6, 2006.
- Workshop on “Scientific Computing”, Tsinghua University, Beijing, China, 13 - 14 July 2006.
- NCTS International Workshop on “Scientific Computing”, National Taiwan University Taipei, Taiwan, 26 - 30 June 2006.
- International Conference on “Nonlinear PDEs: Homogenization and Kinetic Equations”, Kreisky Forum, Vienna, Austria, 26 - 30 June 2006.
- Workshop on “The Gross-Pitaevskii and related equations with non-zero boundary conditions at infinity”, Wolfgang Pauli Institute (WPI), Vienna, Austria, 12 - 14 June 2006.
- Minisymposium on “Advances in Spectral Methods and their Applications”, The 2nd International Conference on Scientific Computing and Partial Differential Equations & The First East Asia SIAM Symposium, Hong Kong Baptist University, Hong Kong, December 12-16, 2005.
- Minisymposium on “Analysis and Computation for the Nonlinear Schrödinger and Quantum Boltzmann Equations”, The 2nd International Conference on Scientific Computing and Partial Differential Equations & The First East Asia SIAM Symposium, Hong Kong Baptist University, Hong Kong, December 12-16, 2005.
- The First Mathematics and Physical Science Graduate Congress, Chulalongkorn University, Bangkok, THAILAND, December 6-8, 2005.
- 6th Frontier Science Symposium, National University of Singapore, Singapore, November 7-11, 2005.
- International Conference on “Partial Differential Equations and Their Applications”, Xiamen University, Xiamen, China, October 7 – 11, 2005.

- The International Workshop on “Computational Science and its Education”, Capital Normal University, Beijing, China, August 29 – September 2, 2005.
- Workshop on “Ginzburg-Landau Theory and Related Topics”, Beijing, China, June 26-30, 2005.
- Workshop on “Mathematical and Numerical Modeling of Nanoscale Devices”, Center for Computational Science and Engineering, Peking University, China, Jun1 1 – July 30, 2005.
- International Conference on “Scientific Computing (ICSC05)”, Nanjing, China, June 4 – June 8, 2005.
- Workshop on “KINETIC EQUATIONS: DIRECT AND INVERSE PROBLEMS”, MANTOVA, Italy, May 15-17, 2005.
- Workshop on “Nonlinear Partial Differential Equations: Analysis, Computation and Applications”, The Institute of Mathematical Sciences, National University of Singapore, May 3-6, 2005.
- Workshop on “Mathematical and Computational Aspects for Nanoscale Material Interfaces: Experiment, Theory and Simulation”, January 10 – 14, 2005, The Institute of Mathematical Sciences, National University of Singapore, Singapore.
- First Singapore Workshop on “PDE and Scientific Computing”, Department of Mathematics, National University of Singapore, 23 - 24 Dec 2004.
- Workshop on “Developments in Navier-Stokes Equations & Turbulence Research”, The Institute of Mathematical Sciences, National University of Singapore, 13 - 17 Dec 2004.
- The Sixth International Workshop on “Mathematical Aspects of Fluid and Plasma Dynamics (6th MAFPD)”, Kyoto University, Kyoto, Japan, September 19 - 23, 2004.
- Minisymposium on “Efficient and Stable Spectral Methods: Algorithms and Emerging Applications”, ICOSAHOM2004: The 6th International Conference on Spectral and High Order Methods, Brown University, USA, June 21-25, 2004.
- International Workshop on “Nonlinear Waves”, The Institute of Mathematical Sciences, The Chinese University of Hong Kong, June 1 - June 4, 2004.
- Tutorial (20 hours) in the Shanghai Summer School on “Analysis and Numerics in Modern Sciences”, Fudan University, China, May – June 2004.
- Workshop on “Recent Advances in Adaptive Computation”, Hangzhou, China, May 24-28, 2004.
- Minisymposium on “Discrete Singular Convolution for Solving PDEs”, ICIAM 2003: The 5th International Congress on Industrial and Applied Mathematics, Sydney, Australia July 7-11, 2003.
- Minisymposium on “The Nonlinear Schroedinger Equations: Analysis, Numerics and Applications”, ICIAM 2003: The 5th International Congress on Industrial and Applied Mathematics, Sydney, Australia July 7-11, 2003.

- Minisymposium on “Numerical solutions of partial differential equations”, ICM2002-Beijing Satellite Conference on Scientific Computing, Xi’an Jiaotong University, Xi’an, China, Aug. 15–18, 2002.
- Minisymposium on “Modeling and Numerical Issues in Multi-scale Problems”, SIAM 50th Anniversary and 2002 Annual Meeting, July 8-12, 2002, Philadelphia, USA.
- Workshop on “Multiscale Analysis and Computation”, Center for Theoretical Studies (CTS), National Tsinghua University, Taiwan, June 24-28, 2002.
- Workshop on “Semiclassical limits: WKB methods vs Wigner transform methods”, Vienna, Austria, November 22 - 27, 2001.
- 2nd NUS-IHPC Workshop on “Computational Methods in Science and Engineering”, National University of Singapore, 25 September 2001.
- Minisymposium on “Instability Analysis of Fluid-Solid Systems”, First M.I.T. Conference on Computational Fluid and Solid Mechanics, Massachusetts Institute of Technology, USA, June 12-15, 2001.
- Minisymposium on “The Direct Method of Lines in DDM and related topics”, 12th International Conference on Domain Decomposition Methods, Chiba University, Chiba, Japan, October 25-29, 1999.
- Workshop on “Scientific Computing 99”, Baptist University, Hong Kong, June 27-30, 1999
- Minisymposium on “Numerical Methods on Multiscale partial Differential Equations”, 1999 SIAM Annual Meeting, Atlanta, May 12-15, 1999
- Workshop of the members of the Climbing Program of National Key Project of Foundation in China: The Finite Element Methods and its Theory, Beijing Institute of Applied Physics and Computational Mathematics, Beijing, April 1998.

b). Contributed

- HYP2004: Tenth International Conference on Hyperbolic Problems Theory, Numerics, Applications, HOTEL OSAKA SUN PALACE, Osaka, Japan September 13-17, 2004.
- Dynamics Days Asia Pacific (DDAP3), National University of Singapore, June 30, 2004 - July 2, 2004.
- Workshop on “Future Directions in Applied Mathematics”, Henri Poincare Institute, Paris, June 18-20, 2003.
- Workshop on “Emerging Applications of the Nonlinear Schroedinger Equations”, IPAM, Los Angeles, USA, February 3-7, 2003.
- International Conference on “Scientific & Engineering Computation (IC-SEC) 2002”, Singapore, December 3-5, 2002.
- International Conference on “Scientific & Engineering Computing”, Peking University, Beijing, China, March 19-23, 2001.

- Workshop on “Nonlinear Analysis: 2000”, Courant Institute, New York University, May 28-June 2, 2000.
- Eighth International Conference on “Numerical Combustion”, Amelia Island, Florida, March 5-8, 2000.
- 99 International Conference on “Scientific and Engineering Computing for Young Chinese Scientists”, Beijing, July 1-4, 1999.
- Workshop on “Nonlinear PDE and Applications to Materials”, University of Minnesota, Minneapolis, April 30-May 2, 1999
- Workshop on “Computation of Incompressible Viscous Flows”, Beijing Institute of Applied Physics and Computational Mathematics, August 1998
- Workshop on “Multiscale Analysis and Applications”, Academia Sinica, Beijing, August 1997
- Workshop on “Grid Adaptation in Computational PDEs: Theory & Applications”, ICMS (International Centre for Mathematics Sciences), Edinburgh, Scotland, July 1996.
- International conference on “Mathematics of Finite Element methods and Applications (MAFLAP96)”, Brunel University, London, June 1996.

c). **Organized**

- Co-chair of the Organizing Committee, The three-month program on “Multiscale Modeling, Simulation, Analysis and Applications”, November 1, 2011 – January 20, 2012, Institute for Mathematical Sciences, National University of Singapore, Singapore.
- Member of the Scientific Committee, International conference on “Kinetic models of classical and quantum particle systems” — a conference in the memory of Naoufel Ben Abdallah, March 14–18, 2011, University Paul Sabatier, Toulouse, France.
- Member of the Organizing Committee, SIAM Conference on Computational Science and Engineering (CSE11), February 28–March 4 2011, Grand Sierra Resort and Casino, Reno, Nevada, USA.
- Organizer of the Minisymposium on “High-Order Numerical Methods for the Nonlinear Schrödinger Equations and Applications”, SIAM Conference on Computational Science and Engineering (CSE11), February 28–March 4, 2011, Grand Sierra Resort and Casino, Reno, Nevada, USA.
- Member of the Scientific Committee, Applied Mathematics International Conference 2010 (AMIC 2010) & The Sixth East Asia SIAM Conference, 22–24 June 2010, Institute of Mathematical Sciences, Faculty of Science, University of Malaya, 50603 Kuala Lumpur, Malaysia.
- Member of the Organizing Committee, Fourth Workshop on “Nonlinear Partial Differential Equations: Analysis, Computation and Applications”, June 11-14, 2010, NCTS, Taipei, Taiwan.

- Member of the Organizing Committee, International Workshop on Scientific Computing and Nonlinear Partial Differential Equations, June 8-11, 2010, Jiuzhaigou National Park, Sichuan Province, P.R. China.
- Co-chair of the Organizing Committee, The two-month program on “Mathematical Theory and Numerical Methods for Computational Materials Simulation and Design”, July 1 – August 31, 2009, Institute for Mathematical Sciences, National University of Singapore, Singapore.
- Organizer of the Minisymposium on “Spectral and High Order Methods for Dispersive Wave Equations” (with J Shen and L. Wang, there are 16 speakers), International Conference On Spectral and High Order Methods (ICOSAHOM09), June 22–26, 2009, Trondheim, Norway.
- Member of the Organizing Committee, Spring School on “Fluid Mechanics and Geophysics of Environmental Hazards”, April 19 – May 2, 2009, Institute for Mathematical Sciences, National University of Singapore, Singapore.
- Member of the Scientific Committee, Third international workshop on ”Nonlinear Partial Differential Equations: Analysis, Computation and Applications”, December 28-31, 2008, Northwest University, Xi’an, China.
- Member of the Organizing Committee, 9th Frontier Science Symposium , October 15 - 17, 2008, Faculty of Science, National University of Singapore, Singapore.
- Co-chair of the Organizing Committee, The two-month program “Bose-Einstein condensation and quantized vortex in superconductivity and superfluidity”, The Institute of Mathematical Sciences, National University of Singapore, 1 November - 31 December 2007.
- Organizer of the Minisymposium on “Mathematical Analysis and Numerical Simulation for Bose-Einstein Condensation” (with H.L. Li, there are 16 speakers), 6th International Congress on Industrial and Applied Mathematics (ICIAM 2007), Zurich, Switzerland, 16-20 July, 2007.
- Organizer of the Minisymposium on “Emerging Applications in Quantum and Plasma Physics” (with A.H. Zhou, there are 12 speakers), International Conference On Spectral and High Order Methods (ICOSAHOM07), June 18- 22, 2007, Institute of Computational Mathematics Chinese Academy of Sciences, Beijing, China.
- Member of the Organizing Committee, The three-month program on “Moving Interface Problems and Applications in Fluid Dynamics”, Institute for Mathematical Sciences, National University of Singapore, Singapore, 8 January – 31 March 2007.
- Member of the Scientific Committee, Intentional Conference on “Partial Differential Equations and Numerical Analysis”, South China Normal University, Guangzhou, China, December 28 2006 – January 2, 2007.
- Organizer of the Joint Workshop (between Departments of Mathematics of National University of Singapore and Zhejiang University) on “Computational Mathematics”, Department of Mathematics, National University of Singapore, Singapore, December 21-22, 2006.

- Organizer of the Workshop on “Partial Differential Equations and Scientific Computing”, Department of Mathematics, National University of Singapore, Singapore, December 15, 2006.
- Member of the Organizing Committee, The Second Mathematics and Physical Science Graduate Congress, National University of Singapore, Singapore, December 10-13, 2006.
- Organizer of the Minisymposium on “Analysis and Computation for the Nonlinear Schrödinger and Quantum Boltzmann Equations” (with H.L. Li, there are 12 speakers), The 2nd International Conference on Scientific Computing and Partial Differential Equations & The First East Asia SIAM Symposium, Hong Kong Baptist University, Hong Kong, December 12-16, 2005.
- Organizer of the Workshop on “Nonlinear PDEs and Applications”, Department of Mathematics, Capital Normal University, Beijing, China, July 14, 2005.
- Organizer of the Workshop on “Nonlinear Partial Differential Equations: Analysis, Computation and Applications”, The Institute of Mathematical Sciences, National University of Singapore, May 3-6, 2005.
- Co-chair of the Organizing Committee, The two-month program “Nanoscale Material Interfaces: Experiment, Theory and Simulation”, The Institute of Mathematical Sciences, National University of Singapore, 24 Nov 2004 - 23 Jan 2005.
- Organizer of the First Singapore Workshop on “PDE and Scientific Computing”, Department of Mathematics, National University of Singapore, 23 - 24 Dec 2004.
- Organizer of the Minisymposium on “The Nonlinear Schroedinger Equations: Analysis, Numerics and Applications” (with X.-P. Wang, there are 4 speakers), ICIAM 2003: The 5th International Congress on Industrial and Applied Mathematics, July 7-11, 2003, Sydney, Australia.
- Organizer of the Minisymposium on “Modeling and Numerical Issues in Multi-scale Problems” (with J.F. Huang, there are 12 speakers), SIAM 50th Anniversary and 2002 Annual Meeting, July 8-12, 2002, Philadelphia, USA.
- Organizer of the International Workshop on “Computational Science and Engineering”, 2 July 2001, National University of Singapore, Singapore.

PROFESSIONAL SERVICES:

- Member of Search Committee (2008 –), Deputy Director of the Graduate Programme Committee (2010–), Member of Curriculum Committee (2008 –2009), Coordinator of Applied and Computational Mathematics (ACM) seminar (2006 – 07, 2010–), Member of Graduate Programme Committee (GPC) (2006 – 07), Department of Mathematics; Department Colloquium Coordinator (2001 – 04), UROPS Coordinator (2001 – 06); Honours Coordinator (2003 – 06), Department of Computational Science; National University of Singapore.
- Member of International Collaboration Committee (2006 – 07), Member of the 75th Faculty Anniversary Committee (March – November, 2004), Faculty of Science, National University of Singapore.

- Associate Editor, **SIAM Journal on Scientific Computing**, 2009 –
- Member of Editorial Board, *Advances in Numerical Analysis*, 2008 –
- Member of Editorial Board, *East Asia Journal on Applied Mathematics*, 2010 –
- Mathematical Review Reviewer, April 2001 –
- Member of Editorial Board, *Chinese Journal of Numerical Methods and Applications*, July 2000 –

Research Students Supervised:

At National University of Singapore:

- Zhao Xiaofei, Graduate, August 2010 – .
- Wang Nan, Graduate, August 2009 – .
- Huang Mengmin, PhD thesis, August 2009 – .
- Tang Qinglin, PhD Thesis, August 2008 – .
- Dong Xuanchun, PhD Thesis, August 2007 – .
- Cai Yongyong, PhD Thesis, August 2007 – .
- Xu Weibiao, Msc Thesis, August 2008 – January 2011.
- Lim Fong Yin, PhD Thesis, January 2005 – April 2009.
- Sit Wing Yee, MSc Thesis, January 2007 – May 2009.
- Chai Ming Huang, MSc Thesis, January 2004 – March 2007.
- Yang Li, MSc Thesis, July 2004 – October 2006.
- Zhang Yanzhi, PhD Thesis, January 2003 – August 2006.
- Wang Hanquan, PhD Thesis, July 2002 – August 2006.
- Ge Yunyi, MSc Thesis, July 2002 – October 2004.
- Sun Fangfang, Msc Thesis, July 2001 – June 2003.

At Other Universities:

- Yong Zhang, PhD Thesis, Tsinghua University, September 2008 – , co-supervised with H Jian.
- Wenjun Ying, MSc Thesis, Tsinghua University, September 1997 – June 2000, co-supervised with H. Han.
- Xin Wen, BSc Thesis, Tsinghua University, September 1997 – June 1998.

REFEREEING SERVICES:

- SIAM Journal on Scientific Computing
- SIAM Journal on Numerical Analysis
- SIAM Journal on Applied Mathematics
- Journal of Computational Physics
- SIAM Review
- Physical Review A
- Physical Review E
- SIAM Journal on Mathematical Analysis
- Mathematics of Computation
- Inverse Problems
- Foundation of Computational Mathematics
- Discrete and Continuous Dynamical System – Series B
- Physics Letters A
- Computers & Mathematics in Simulation
- Applied Numerical Mathematics
- Zentralblatt MATH
- Bulletin of the Belgian Mathematical Society
- Journal of Physics A: Mathematics and General
- Multiscale Modelling and Simulation
- Applied Mathematics and Modelling
- Journal of Hyperbolic Differential Equations
- Transport Theory and Statistics Physics
- Journal of Computational and Applied Mathematics
- Communications in Computational Physics
- Science in China
- Computing in Science & Engineering
- International Journal of Heat and Mass Transfer
- Nonlinearity

- Computational Materials Science
- Numerical Methods for Partial Differential Equations
- Communications in Mathematical Sciences
- IMA Journal on Numerical Analysis
- Mathematical Models and Methods in Applied Sciences
- Applied Mathematics Letters
- Advances in Computational Mathematics
- Journal of Computational Mathematics
- Chinese Journal of Computational Physics
- International Journal of Numerical Methods in Fluids
- Journal of Scientific Computing
- Journal of Physics B: Atomic and Molecular Physics

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