CURRICULUM VITAE

Jie Shen

Current Address

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Professional Preparation

Peking University	Computational Mathematics	B.S. 1982
Université de Paris-Sud	Numerical Analysis	Ph.D. 1987 (Adviser: R. Temam)

Professional Appointments

Aug. 1987 – Jul. 1991	Postdoc/Visiting Assistant Professor, Department of Mathematics, Indiana University.
Aug. 1991 – Jun. 1997	Assistant Professor, Department of Mathematics, Penn State University.
Jul. 1997 – Jun. 2001	Associate Professor, Department of Mathematics, Penn State University.
Jul. 2001 – Aug. 2001	Professor, Department of Mathematics, Penn State University.
Aug. 2001 – July 2002:	Professor, Department of Mathematics, University of Central Florida.
Aug. 2002 – :	Professor, Department of Mathematics, Purdue University.
Jan. 2012 – :	Director, Center for Computational and Applied Mathematics, Purdue University.

Guest Professorships

July 2002 – : Guest Professor, School of Mathematical Science, Xiamen University, China.

Selected Visiting Professorship ($\geq$ one month): Centre National de la Recherche Scientifique in France, Université de Bordeaux in France (three times), National University of Singapore, Hong Kong University of Science and Technology, Hong Kong Baptist University, Université de Poitiers in France, Universitat Politecnica de Catalunya in Spain, University of Texas at Austin, IMA at University of Minnesota, Chinese Academy of Sciences, McGill University.

Honors and Awards

- Fulbright Award: *McGill University Research Chair in Computational Methods for Partial Differential Equations*, 2008.
- Changjiang Chair Professorship, Ministry of Education of China, 2009.
- (Inaugural) Research Award, College of Science, Purdue University, 2013.
- Elected Fellow of the American Mathematical Society, 2017.

Current Research Grants

- NSF DMS-1620262: Fast Spectral Methods and their Applications, July. 2016 – June 2019. PI: J. Shen. Total amount $180,000.
- NSF grant DMS-1720442: Collaborative Research: Efficient, Stable and Accurate Numerical Algorithms for a Class of Gradient Flow Systems and their Applications, July 2017 – June 2020. PI: J. Shen. Total amount $130,000.
- AFOSR grant: Accurate and Efficient Spectral Methods for Higher-dimensional and Fractional Differential Equations. Jan. 1, 2016 – Dec. 31, 2018. PI: J. Shen. Total amount $330,772.55.
- NSF DMS-1722535: International Conference on Current Trends and Challenges in Numerical Solution of Partial Differential Equations. PI: J. Shen. Total amount $15,000.
- IMA grant for International Conference on Current Trends and Challenges in Numerical Solution of Partial Differential Equations. PI: J. Shen. Total amount $3,000.
- 2017-2018 Purdue Research Foundation (PRF): Spectral Solvers for PDEs in Irregular Domains–Student: Gu, Yiqi.

Past Research Grants

- NSF grant DMS-1419053: Collaborative Research: Phase-field models, algorithms and simulations for multiphase complex fluids, July 2014 – June 2017. PI: J. Shen. Total amount $150,000.
- Grant from Rolls-Royce: Interpolative Chemical Equilibrium Surrogate Model, 01/01/2015-12/24/2015. PI: Jie Shen; Co-PI: Suchuan Dong. Total amount $60,788.24.
- Grant from Rolls-Royce: Improvement on interpolative Chemical Equilibrium Surrogate Model, 12/25/2015-03/31/2016. PI: Jie Shen; Co-PI: Suchuan Dong. Total amount $\approx$ $8000.
- NSF grant DMS-1217066: Fast Spectral Methods and their Applications, Aug. 2012 – July 2015. PI: J. Shen. Total amount $180,000.

- Subcontract from Argonne National Lab for the "High-Order Algorithms and Modeling for Electromagnetics Systems", PI: Jie Shen, $53,000, Feb.-Sep. 2014.
- AFOSR grant FA9550-11-1-0328: Sparse Spectral Methods and Applications to Kinetic Equations Sep 30, 2011 – Mar. 31 2014. PI: J. Shen. Total amount $320,000.
- Subcontract from Argonne National Lab for the "Computational Materials and Chemical Sciences Network (CMCSN) Program", PI: Jie Shen, $60,000, Sep. 2011-Aug. 2014.
- IMA grant for "Nidwest Numerical Analysis Day", May 7-8, 2011. PI: J. Shen, Co-PIs: Peijun Li and Jianlin Xia. Total amount $5,000.
- NSF grant DMS-1002618: International Conference on Advances in Partial Differential Equations and their Applications, June 1, 2010-May 31, 2011. PI. Shouhong wang, Co-PIs: Jie Shen and Xiaoming Wang. Total amount $27,000.
- NSF grant DMS-0915066: Fast Spectral Methods and their Applications, Sep. 2009 – Aug. 2012. PI: J. Shen. Total amount $329,052.
- AFOSR grant FA9550-08-1-0416: Solving Boltzmann and Fokker-Planck equations using sparse representation May. 1 2008 – Nov. 30 2010. PI: J. Shen. Total amount $306,879.
- NSF grant DMS-0610646: Fast Spectral Methods and their Applications, Sep. 2006 – Aug. 2009. PI: J. Shen. Total amount $302,372.
- NSF grant DMS-0722502: NSF Scientific Computing Research Environments for the Mathematical Sciences (SCREMS), 08/01/2007 — 07/31/2008. PI: Jie Shen, Co-PIs: Steven Dong, Juan Santos, Dongbin Xiu. Total amount: $99,409.
- 2007-2008 *Purdue Provost Faculty Fellowship* for Study in a Second Discipline, one semester of teaching release plus $3,500.
- NSF DMS-0509665, Collaborative research: Multiphase interfacial hydrodynamics, PI. Jie Shen. July 2005 — Nov. 2008. Total amount: $92,942.18.
- NSF DMS-0456286, Collaborative Research: FRG: Ferroelectric phenomena in soft matter systems, PI. Dan Phillips, Co-PIs: Patricia Bauman and Jie Shen. Aug. 2005 — Jul. 2008, $329,346.
- *Purdue Computer Research Institute* Special Incentive Research Grant: Numerical Investigation of the Leray-Alpha Turbulence Model for Large Eddy Simulations, PI: Steven Frankel, Co-PI: J. Shen. One-year graduate support (7/1/06 – 6/30/07).
- *Purdue Research Foundation Grant:* Innovative Numerical Methods for Forward-Backward Stochastic Differential Equations, PIs: Jin Ma and Jie Shen. Twelve-month support for a graduate student (6/1/06 – 5/31/07).

- NSF grant DMS-0311915: Fast Spectral Methods and their Applications, Aug. 2003 – July 2006. PI: J. Shen. Total amount $180,482.
- *Purdue Computer Research Institute* Special Incentive Research Grant: Efficient and Stable Time Discretization Methods: Applications to Neutronics Thermal-Hydraulics Reactor Analysis and Multiphase Monolayers, PI: J. Shen, Co-PI: Tom Downar (School of Nuclear Engineering) (7/1/04 – 6/30/06). Total amount: $25,878.
- AMS Fan Fund Award, Apr. 2006, $5,000.
- NSF grant DMS-0074283: Fast Spectral Methods and their Applications, Aug. 2000 – July 2003. PI: J. Shen. Total amount $130,000.
- NSF-INT "US-Spain Cooperative Research INT 9732637: Dynamic control and parametric resonance in hydrodynamic systems, July 1998 – June 2001. PIs: J. Lopez and J. Shen. Total amount: $16,000.
- Research Grant from Air Product, Inc: Computer simulation of bubble growth and foam structures. Oct. 1997–Dec. 2000. PIs: Long-Qing Chen and Jie Shen. Total amount: ∼$170,000.
- NSF "Interdisciplinary Grants in Mathematical Sciences" DMS-9721413: Numerical Simulation of Materials Microstructural Evolution, Jan. 1999 – Sep. 2000. PI: J. Shen. Total amount: $75,000.
- NSF grant DMS-9706951: Dynamic control and parametric resonance in hydrodynamic systems: a theoretical, computational and experimental investigation. Aug. 1997 – July 2000. PIs: John Lopez and Jie Shen. Total amount: $94,000.
- NSF grant DMS-9623020: Fast Spectral-Galerkin Algorithms for Elliptic Problems and Efficient Solution Techniques for Unsteady Navier-Stokes Equations, Aug. 1996 – July 1999. PI: J. Shen. Total amount $58,000.
- NSF grant INT-9423693: US-China workshop on inertial manifolds and approximate inertial manifolds and related numerical algorithms, May 1995 – Apr. 1996. PI: J. Shen. Total amount $17,996.
- NSF grant DMS-9205300: Numerical solution of differential equations in mechanics, Sep. 1992 – Feb. 1996. PIs: D. Arnold and J. Shen. Total amount: $255,000.
- NSF SCREMS grant DMS-9206985: Mathematical Sciences Computing Research Environments, July 1992 – Dec. 1994. PIs: G. Andrews, D. Arnold, W. Pritchard, J. Shen, S. Tavener and J. Xu. Award amount: $30,793.

Selected Professional Services

Member of the editorial boards:

- Co-editor-in-chief: *Journal of Mathematical Study*, 2014 —
- *Applied Numerical Mathematics*, 2015 —
- *Communications in Mathematical Science*, 2015 —
- *Journal of Scientific Computing*, 2009 —
- *Mathematics of Computation*, Jan. 2005 — Jan. 2016
- *Communications in Computational Physics*, 2005 —
- *International Journal of Numerical Analysis and Modeling*, 2004 —
- *Discrete and Continuous Dynamical Systems, Series B*, 2001 —

Professional appointments:

- Member of the Scientific Committee on the conference series: International Conference on High-Order and Spectral Methods (ICOSAHOM), 2014 —
- Vice-Chair of the Advisory Committee of Chinese Computational Mathematics Society, 2016—
- Vice-President of the International Association of Mathematics and Computers in Simulation (IMACS), 2016—

Conference/Workshop Organizations (as one of main organizers):

- International Workshop on Inertial Manifolds, Approximate Inertial Manifolds and Related Numerical Algorithms, Xian, China, June 1995.
- Workshop Series on "Recent Advances in Spectral Methods and their Approximations":
  - First Workshop, Xiamen University, China, June 14-16, 2007.
  - Second Workshop, WuYiShan, China, May 29-31, 2008.
  - Third Workshop, Shanghai Normal University, July 14-16, 2011.
  - Fourth Workshop, Xiamen University, Nov 2-4, 2013.
  - Fifth Workshop, JiangSu Normal University, Oct. 9-11, 2015.
  - Sixth Workshop, Hunan Normal University and Zhongnan University, May 13-14, 2017.
- American Institute of Mathematics workshop on "Ferroelectric Phenomena in Soft Matter Systems", Palo Alto, May, 12-16, 2008.

- International Conference on "Advances in Partial Differential Equations and Their Applications", Fudan University, Shanghai, May 31-June 4, 2010.
- The First Cross-Straight workshop on Scientific Computing, Xiamen University, Xiamen, China, Aug. 2-5, 2010.
- 2011 Midwest Numerical Analysis Day, Purdue University, May 7-8, 2011.
- International Conference on Computational Sciences, Shanghai, China, July 16-20, 2012.
- International Conference on Modeling, Analysis and Computation, Xiamen, China, July 21-25, 2012.
- International Workshop on High-Dimensional Problems and Applications, Sun Yeh-San University, China, Nov 16-17, 2013.
- Indiana-Illinois Workshop on Scientific Computing, Apr 26, 2014.
- International Workshop on the Finite Element/Spectral Methods (IWFSM2014), Shanghai Normal University, May 16-18, 2014.
- Sino-French Conference on Computational and Applied Mathematics, Xiamen University, China, June 2-5, 2014.
- Sanya Workshop on nonlinear wave equations, July 6-10, 2015, Sanya, China.
- Second China-Japan-Korea (A3) Foresight Workshop, Xiamen, China, Nov. 26-29, 2015.
- Workshop on Recent Advance on Computational Mathematics, Jinjiang University, China, July 15-17, 2016.
- IMACS 2016 World Congress, Xiamen, China, Dec 10-14, 2016.
- Sino-French Conference on Modeling, Mathematical Analysis and Computation, Jun 9-12, 2017.
- Banff workshop on Mathematical Approaches to Interfacial Dynamics in Complex Fluids, Banff, Canada, June 25-30, 2017.
- International Conference on Current Trends and Challenges in Numerical Solution of Partial Differential Equations, Purdue University, USA, July 7-8, 2017.
- ICERM workshop on Fractional PDEs: Theory, Algorithms and Applications, ICERM, Providence, RI, June 18-22, 2018.

Member of the organizing committees:

- Seventh International Conference on Domain Decomposition Methods in Scientific and Engineering Computing, October 1993, The Pennsylvania State University.
- International Conference on Scientific & Engineering Computing, March 19-23, 2001, Beijing, China.
- International Symposium on Computational and Applied PDEs, July 2-7, 2001, Zhangjiajie, China.

Member of the scientific committees:

- Applied Mathematics Workshop for Materials Studies and Industrial Applications, Oct. 24–26, 1996, The Pennsylvania State University.
- Second International Conference on Scientific and Engineering Computing for Young Chinese Scientists, July 1–4, 1999, Beijing, China.
- International Conference on Computational Mathematics, July 2-6, 2001, Pohang, South Korea.
- Third International Workshop on Scientific Computing and Applications in January 6-9, 2003, City University of Hong Kong.
- Summer School on Applications of Advanced Mathematical and Computational Methods to Atmospheric and Oceanic Problems, July 14–26, 2003.
- International Conference on Numerical and Applied PDEs, Jilin University, June 23-28, 2004.
- International Conference on Scientific Computing (ICSC05) Nanjing, China, June 4-8, 2005.
- International Conference on Partial Differential Equations and Numerical Methods Kunming, China, Dec. 17-22, 2005.
- International Conference on Partial Differential Equations and Numerical Analysis, Changsha, Hunan, 22-26 June, 2006.
- "Workshop on "Ferroelectric phenomena in liquid crystals", Kent State University, June 19-28, 2007.
- Program on "Mathematical Theory and Numerical Methods for Computational Materials Simulation and Design", Institute of Mathematical Sciences, National University of Singapore, July 1 – Aug. 31, 2009.
- IMACS 2013 World Congress, El Escorial, Spain, Aug 26-30, 2013.
- Ninth International Conference on Scientific Computing and Applications, Xi'an Jiaotong University, China, June 11-15, 2014.

- The third international symposium on phase-field method, State College, PA, Aug 26-29, 2014.
- Tenth International Conference on Scientific Computing and Applications, Fields Institute, Toronto, June 6-10, 2016.

Advising and Mentoring

Ph.D students graduated:

- Xiaofeng Yang (2007): Associate Professor, South Carolina University
- Yanhong Zhao (2007): Senior Analyst at a bank
- Yuen-Yick Kwan (2008): Research Scientist at an oil company in Texas
- Qirong Fang (2009): Trader at a financial firm
- Feng Chen (2012): Assistant Professor, City University of New York
- Jing An (2013, Xiamen University): Professor, Guizhou Normal University, China
- Ying He (2013): Visiting Assistant Professor, University of California at Davis
- Lina Ma (2014): Assistant Professor, Trinity College
- Zhiping Mao (2015, Xiamen University): Postdoc at Brown University
- Heejun Choi, Working at a private firm
- Sheng Chen (2017, Xiamen University): Assistant Professor at Jiangsu Normal University.
- Yingwei Wang (2017): Postdoc at University of Wisconsin

Co-advised Ph.D students with foreign scholarships:

- Qingqu Zhuang (2005-2006, Xiamen University, China)
- Qingfang Liu (2008-2009, Xi'an Jiaotong University, China)
- Lizhen Chen (2009-2010, Xiamen University, China)
- Lina Song (2010-2011, Xi'an Jiaotong University, China)
- Fei Liu (2010-2012, Zhejiang University, China)
- Mohammad Nasir (2012, Quaid-e-Azam university, Pakistan)

- Juan Wen (2013-2014, Xi'an Jiaotong University, China)
- Jilian Wu (2016-2017, Xinjiang University, China)

Current Ph.D students:

Duo Cao, Yiqi Gu, Fukeng Huang, Xinyu Liu, Ziyao Yu (joint with Changyou Wang).

Past postdocs and visiting scientists:

- Xin Yu (1998-2000): Associate Professor at Chinese Academy of Sciences
- Li-Lian Wang (2002-2006): Associate Professor at Nanyang Technological University, Singapore
- Jae-Hong Pyo (2002-2005): Associate Professor at Kangwon National University, Korea
- Haijun Yu (2008-2011): Associate Professor at Chinese Academy of Sciences
- Taylan Sengul (2012-2014): Assistant Professor, Yeditepe University, Turkey
- Jianwei Zhou (2013-2015): Professor, Linyi University, China
- Ting Cheng (2010-2012): Associate Professor at Huangzhong Normal University, China
- Ying Chen (2013-2015): Postdoc at Duke University
- Yongyong Cai (2013-2016): Assistant Professor at Computational Science Research Center, Beijing, China
- Jiang Yang (Fall 2016): Assistant Professor at South University of Science and Technology, China
- Haydar Alici (2016-2017): Associate Professor at Harran University, Turkey
- Hongtao Chen (2016-2017): Associate Professor at Xiamen University, China

Current Postdocs:

Jie Xu (2016-)

Undergraduate advising: Steven Mussmann (2015), Sam Sharkey (2015), Wanxue Dong (2016)

PUBLICATIONS

Citations:

- In Google Scholar: ≥ 11000
- In MathSciNet: ≥ 3500

H-index:

- In Google Scholar: 54
- In MathSciNet: 30

Books:

1. Jie Shen, Tao Tang & Li-Lian Wang. *Spectral Methods: Algorithms, Analysis and Applications*, Springer Series in Computational Mathematics, Vol. 41, **Springer**, Aug. 2011.
2. Jie Shen & Tao Tang. *Spectral and High-Order Methods with Applications*, **Chinese Science Press**, 2006.

Papers Published in Refereed Journals:

[1] Jie Shen. A spectral-tau approximation for the Stokes and Navier-Stokes equations. *Math. Model. Numer. Anal.*, 22(4):677–693, 1988.

[2] Jie Shen. Dynamics of regularized cavity flow at high Reynolds numbers. *Appl. Math. Lett.*, 2(4):381–384, 1989.

[3] B. Michaux, J. M. Rakotoson, and Jie Shen. On the existence and regularity of solutions of a quasilinear mixed equation of Leray-Lions type. *Acta Appl. Math.*, 12:287–316, 1989.

[4] B. Michaux, J. M. Rakotoson, and Jie Shen. On the approximation of a quasilinear equation. *Math. Model. Numer. Anal.*, 24(2):211–234, 1989.

[5] Jie Shen and R. Temam. A new fractional scheme for the approximation of incompressible flows. *Mat. Aplic. Comput.*, 8(1):3–22, 1989.

[6] Jie Shen. Convergence of the approximate attractors for a fully discrete scheme for the reaction-diffusion equations. *Numer. Func. Anal. Opt.*, 10(11-12):1213–1234, 1989.

[7] Jie Shen. On an unconditionally stable scheme for the unsteady Navier-Stokes equations. *J. Comput. Math.*, 8(3):276–288, 1990.

[8] Jie Shen. Numerical simulation of the regularized driven cavity flows at high Reynolds numbers. *Comput. Methods in Appl. Mech. Eng.*, 80:273–280, 1990.

[9] Jie Shen. Long time stability and convergence for fully discrete nonlinear Galerkin methods. *Appl. Anal.*, 38:201–229, 1990.

[10] Jie Shen. Hopf bifurcation of the unsteady regularized driven cavity flows. *J. Comput. Phys.*, 95:228–245, 1991.

[11] Jie Shen. Projection schemes for the Navier-Stokes equations. *Appl. Math. Let.*, 5:35–37, 1992.

[12] Jie Shen. On error estimates of the projection methods for the Navier-Stokes equations: first-order schemes. *SIAM J. Numer. Anal.*, 29:57–77, 1992.

[13] Jie Shen. On error estimates of some higher order projection and penalty-projection methods for Navier-Stokes equations. *Numer. Math.*, 62:49–73, 1992.

[14] Jie Shen. A remark on the projection-3 method. *Intern. J. Numer. Methods in Fluids*, 16:249–253, 1993.

[15] Jie Shen. Remarks on the pressure error estimates for the projection methods. *Numer. Math.*, 67:513–520, 1994.

[16] Jie Shen. Efficient spectral-Galerkin method I. direct solvers for second- and fourth-order equations by using Legendre polynomials. *SIAM J. Sci. Comput.*, 15:1489–1505, 1994.

[17] Jie Shen and R. Temam. Nonlinear Galerkin methods using Chebyshev or Legendre polynomials I. one dimensional case. *SIAM J. Numer. Anal.*, 32:215–234, 1995.

[18] Jie Shen. Efficient spectral-Galerkin method II. direct solvers for second- and fourth-order equations by using Chebyshev polynomials. *SIAM J. Sci. Comput.*, 16:74–87, 1995.

[19] Jie Shen. On error estimates of the penalty method for the unsteady Navier-Stokes equations. *SIAM J. Numer. Anal.*, 32:386–403, 1995.

[20] Jie Shen. On fast Poisson solver, inf-sup constant and iterative Stokes solver by Legendre-Galerkin method. *J. Comput. Phys.*, 116:184–188, 1995.

[21] Jie Shen. On error estimates of projection methods for the Navier-Stokes equations: second-order schemes. *Math. Comp*, 65:1039–1065, July 1996.

[22] Jie Shen. A new pseudo-compressibility method for the Navier-Stokes equations. *Appl. Numer. Math.*, 21:71–90, 1996.

[23] W. B. Liu and Jie Shen. A new efficient spectral Galerkin method for singular perturbation problems. *J. Sci. Comput.*, 11:411–437, 1996.

[24] Jie Shen. Efficient spectral-Galerkin methods III. polar and cylindrical geometries. *SIAM J. Sci. Comput.*, 18:1583–1604, 1997.

[25] J.M. Lopez and Jie Shen. An efficient spectral-projection method for the Navier-Stokes equations in cylindrical geometries I. axisymmetric cases. *J. Comput. Phys.*, 139:308–326, 1997.

[26] J.M. Lopez and Jie Shen. Numerical simulation of incompressible flows in cylindrical geometries using a spectral projection method. *Intern. J. of Appl. Sciences & Comput.*, 5:25—40, 1998.

[27] L.Q. Chen and Jie Shen. Applications of semi-implicit Fourier-spectral method to phase-field equations. *Comput. Phys. Comm.*, 108:147–158, 1998.

[28] Jie Shen. Efficient spectral-Galerkin methods IV. spherical geometries. *SIAM J. Sci. Comput.*, 20:1438–1455, 1999.

[29] Jie Shen and Shouhong Wang. A fast and accurate numerical scheme for the primitive equations of the atmosphere. *SIAM J. Numer. Anal.*, 36:719–737, 1999.

[30] J. Zhu, L.Q. Chen, Jie Shen and V. Tikare. Coarsening kinetics from a variable mobility Cahn-Hilliard equation - application of semi-implicit Fourier spectral method. *Phys. Review E.*, 60:3564–3572, 1999.

[31] Jie Shen, T. Tachim Mejdo and Shouhong Wang. On a wind-driven, double-gyre, quasi-geostrophic ocean model: Numerical simulations and structural analysis. *J. Comput. Phys*, 155:387–409, 1999.

[32] Jie Shen, Feng Wang, and Jinchao Xu. An optimal finite element multigrid preconditioner for Chebyshev-collocation method. *Appl. Numer. Math.*, 33:471-477, 2000.

[33] Jie Shen. A new fast Chebyshev-Fourier algorithm for the Poisson-type equations in polar geometries. *Appl. Numer. Math.*, 33:183-190, 2000.

[34] J.M. Lopez, F. Marques and Jie Shen. Endwall effects in a periodically forced centrifugally unstable flows. *Fluid Dyn. Rev.*, 27:91-108, 2000.

[35] Benyu Guo and Jie Shen. Laguerre-galerkin method for nonlinear partial differential equations on a semi-infinite interval. *Numer. Math.*, 86:635–654, 2000.

[36] Jie Shen. Stable and efficient spectral methods in unbounded domains using Laguerre functions. *SIAM J. Numer. Anal.*, 38:1113-1133, 2000.

[37] Benyu Guo, Jie Shen and Zhongqing Wang. A rational approximation and its applications to differential equations on the half line. *J. Sci. Comp. 15:117-147, 2000.*

[38] J. Zhu, L.Q. Chen, Jie Shen and V. Tikare. Microstructure dependence of diffusional transport. *Computational Materials Science*, 20:37-47, 2001.

[39] Chun Liu and Jie Shen. On liquid crystal flows with free-slip boundary conditions. *Discrete and Continuous Dynamical Systems*, 7:307-318, 2001.

[40] J. Zhu, L.Q. Chen, Jie Shen and V. Tikare. Computing the effective diffusivity using a spectral method. *Materials Science and Engineering A*. 311:135-141, 2001.

[41] J.M. Lopez, F. Marques and Jie Shen. A periodically forced flow displaying symmetry breaking via a three-tori gluing bifurcation and two-tori resonances. *Physica D*, 156:81-97, 2001.

[42] Qiang Du, Benyu Guo and Jie Shen. Fourier-spectral approximation to a dissipative system modeling the flow of liquid crystals. *SIAM J. Numer. Anal.* 39:735–762, 2001. A Corrigendum for this paper is published in *SIAM J. Numer. Anal.*, 41:796-798, 2003)

[43] Benyu Guo and Jie Shen. On Spectral Approximations Using Modified Legendre Rational Functions: Application to Korteweg-de Vries Equation on the Half Line. *Indiana J. Math.* 50:181-204, 2001.

[44] J. Zhu, L.Q. Chen, Jie Shen. Morphological evolution during phase separation and coarsening with strong inhomogeneous elasticity. *Modelling Simul. in Mater. Sci. Eng.*, 9:499-511, 2001.

[45] J.L. Guermond and Jie Shen. Quelques résultats nouveaux sur les méthodes de projection. *C. R. Aacd. Sci., Paris, Sér. I.* t.333:1111-1116, 2001.

[46] Benyu Guo, Jie Shen and Zhongqing Wang. Chebyshev rational spectral and pseudospectral method on a semi-infinite interval. *Int. J. Numer. Methods Eng.* 53:65-84, 2002.

[47] F. Marques, J. M. Lopez and Jie Shen. Mode interactions in an enclosed swirling flow: a double Hopf between azimuthal wavenumbers 0 and 2. *J. Fluid Mech.*, 455:263-281, 2002.

[48] J.M. Lopez, F. Marques, and Jie Shen. An efficient spectral-projection method for the Navier-Stokes equations in cylindrical geometries II. Three dimensional cases *J. Comput. Phys.* 176:384-401, 2002.

[49] J.M. Lopez, J.E. Hart, F. Marques, S. Kittelman and Jie Shen. Instability and mode interactions in a differentially-driven rotating cylinder. *J. Fluid Mech.* 462:383-409, 2002.

[50] J.L. Guermond and Jie Shen. Velocity-correction projection methods for incompressible flows. *SIAM J. Numer. Anal.* 41:112-134, 2003.

[51] Benyu Guo, Jie Shen and Chenglong Xu. Spectral and pseudospectral approximations using Hermite functions: application to the Dirac equation. *Advances in Comp. Math.* 19:35-55, 2003.

[52] Chun Liu and Jie Shen. A Phase Field Model for the Mixture of Two Incompressible Fluids and its Approximation by a Fourier-Spectral Method. *Physica D.* 179:211-228, 2003.

[53] D. J. Seol, S. Y. Hu, Y. L. Li, J. Shen, L. Q. Chen and K. H. Oh. Three-dimensional phase-field modeling of spinodal decomposition in constrained films. *Metals and Materials International*, 9:61-66, 2003.

[54] Jie Shen. A New Dual-Petrov-Galerkin Method for Third and Higher Odd-order Differential Equations: Application to the KDV Equation. *SIAM J. Numer. Anal.*, 41:1595-1619, 2003.

[55] J.L. Guermond and Jie Shen. A class of truly consistent splitting schemes for incompressible flows. *J. Comput. Phys.*, 192:262-276, 2003.

[56] D. J. Seol, S. Y. Hu, Y. L. Li, J. Shen, L. Q. Chen and K. H. Oh. Computer simulation of spinodal decomposition in constrained films *Acta Materialia*, 51:5173-5185, 2003.

[57] J.M. Lopez, F. Marques and Jie Shen. Complex dynamics in a short Taylor-Couette annulus with the top endwall stationary and the bottom rotating. in *J. Fluid Mech.* 501:327-354, 2004.

[58] Jie Shen and Li-Lian Wang. Error analysis for mapped Legendre spectral and pseudospectral methods. *SIAM J. Numer. Anal.* 42:326-349, 2004.

[59] J.L. Guermond and Jie Shen. On the error estimates of rotational pressure-correction projection methods. *Math. Comp.* 73:1719-1737, 2004.

[60] Pengtao Yue, James J. Feng, Chun Liu and Jie Shen. A diffuse-interface method for simulating two-phase flows of complex fluids. *J. Fluid Mech.* 515:293-317, 2004.

[61] Benyu Guo, Jie Shen and Chenglong Xu. Generalized Laguerre approximation and its applications to exterior problems. *J. Comp. Math.*, 23:113-130, 2005.

[62] J.L. Guermond, P. Minev and Jie Shen. Error analysis of pressure-correction schemes for the Navier-Stokes equations with open boundary conditions. *SIAM J. Numer. Anal.*, 43:239-258, 2005.

[63] Jie Shen and Li-Lian Wang. Spectral Approximation of the Helmholtz equation with high wave numbers. *SIAM J. Numer. Anal.*, 43:623-644, 2005.

[64] Weizhu Bao and Jie Shen. A Fourth-order time-splitting Laguerre-Hermite pseudospectral method for Bose-Einstein condensates. *SIAM J. Sci. Comput.*, 26:2010-2028, 2005.

[65] Jae-Hong Pyo and Jie Shen. Normal Mode Analysis of Second-Order Projection Methods for Incompressible Flows. *Dis. Cont. Dyn. Sys. B.*, 5:817-840, 2005.

[66] Jie Shen and Li-Lian Wang. Error analysis for mapped Jacobi spectral methods. *J. Sci. Comput.*, 24:183-218, 2005.

[67] Pengtao Yue, James J. Feng, Chun Liu and Jie Shen. Interfacial Forces and Marangoni Flow on a Nematic Drop Retracting in an Isotropic Fluid. *Journal of Colloid and Interface Science*, 290:281-288, 2005.

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Papers Accepted in Refereed Journals:

[183] Lina Ma, Jie Shen, Li-Lian Wang and Zhiguo Yang. Wavenumber explicit analysis of spectral-Galerkin methods for time-harmonic Maxwell equations in exterior domains. To appear in *IMA J. Numer. Anal.*

[184] Zhijian Rong, Jie Shen and Haijun Yu. A Nodal Sparse Grid Spectral Element Method for Multi-Dimensional Elliptic Partial Differential Equations. To appear in Inter. J. Numer. Anal. Model.

[185] Zhiwei Fang, Jie Shen and Haiwei Sun. Preconditioning techniques in Chebyshev collocation method for elliptic equations To appear in Inter. J. Numer. Anal. Model.

[186] Yongyong Cai and Jie Shen. Error estimates for a fully discretized scheme to a Cahn-Hilliard phase-field model for two-phase incompressible flows. To appear in *Math. Comp.*

[187] Sheng Chen, Jie Shen and Li-Lian Wang. Solving tempered fractional differential equations on unbounded domains using generalized Laguerre functions. To appear in *J. Sci. Comput.*

[188] Jie Shen, Jie Xu and Pingwen Zhang. Approximations on $SO(3)$ by Wigner D-matrix and applications. To appear in J. Sci. Comput.

[189] Zhiping Mao and Jie Shen. Spectral Element Method with Geometric Mesh for Two-sided Fractional Differential Equations. To appear in *Adv. Comput. Math.*

Papers Submitted to Refereed Journals:

[190] Jie Shen, Yingwei Wang and Jianlin Xia. Fast structured Jacobi-Jacobi transforms. Submitted to *Math. Comp.*

[191] Haydar Alici and Jie Shen. Highly efficient and accurate spectral approximation of the angular Mathieu equation for any parameter values q. Submitted to *ACM Trans. Math. Soft.*

[192] Ying Chen, John Lowengrub, Jie Shen, Cheng Wang and Steven Wise. Efficient energy stable schemes for isotropic and strongly anisotropic Cahn-Hilliard systems with the Willmore regularization. Submitted to *J. Comp. Phys.*

[193] Jie Shen, Jie Xu and Jiang Yang. The scalar auxiliary variable (SAV) approach for gradient flows. Submitted to *J. Comp. Phys.*

[194] Jie Shen and Jie Xu. Stabilized predictor-corrector schemes for gradient flows with strong anisotropic free energy. Submitted to *Comm. Comp. Phys.*

[195] Changtao Sheng and Jie Shen. A space-time spectral Petrov-Galerkin spectral method for time fractional diffusion equation. Submitted to Inter. J. Numer. Anal. Model.

[196] Jie Shen, Jie Xu and Jiang Yang. A new class of efficient and robust energy stable schemes for gradient flows. Submitted to *SIAM Reviews*

Book Chapters:

1. Chun Liu, Jie Shen, James J. Feng, Pengtao Yue. Variational Approach in Two-Phase Flows of Complex Fluids: Transport and Induced Elastic Stress, Chapter 11 in "Mathematical models and methods in phase transitions", edited by A. Miranville, Nova publications, 2005.

2. James J. Feng, Chun Liu, Jie Shen, Pengtao Yue. A Phase-Field Formulation for Interfacial Dynamics of Complex Fluids: Advantages and Challenges. p. 1-26 in *Modeling of Soft Matter*, IMA Volume 141, Springer New York, edited by M. T. Calderer and E. M. Terentjev, 2005.

3. Jie Shen. Modeling and numerical approximation of two-phase incompressible flows by a phase-field approach, in Lecture Note Series v.22, IMS, National University of Singapore, edited by W. Bao and Q. Du, 2011.

LIST of CONFERENCE and SEMINAR TALKS

Invited Conference Talks:

1. IMACS First International Conference on Computational Physics: Boulder, Co, June 1990. *"Hopf bifurcation of the regularized driven cavity flow".*

2. Second International Conference on Industrial and Applied Mathematics: Washington DC, July 1991. *"On the error estimates of the projection methods for the Navier-Stokes equations".*

3. 7th IMACS International Conference on Computer Methods for Partial Differential Equations: New Brunswick, NJ, June 1992. *"Projection method and pressure stabilization method for the Navier-Stokes equations".*

4. SIAM Annal Meeting, Los Angeles, CA, July 1992. *"Nonlinear Galerkin method using Chebyshev and Legendre polynomials".*

5. One of the Principal Lecturers at "Summer Workshop on Partial Differential Equations and Numerical Analysis", Nan Kai University, June 1 – June 12, 1993. *"On the approximation of Stokes and Navier-Stokes equations".*

6. International Conference on Nonlinear Evolution Equations, Beijing, June 1993. *"Nonlinear Galerkin method using Chebyshev and Legendre polynomials".*

7. Three Rivers Applied Math Colloquium, Carnegie Mellon University, April 9-10, 1994. *"On a class of pseudo-compressibility methods for the Navier-Stokes equations".*

8. International Conference on Nonlinear Evolution Equations and Infinite Dimensional Dynamical Systems, Beijing, June 15-22, 1994. *"Pseudo-compressibility methods for the Navier-Stokes equations".*

9. Workshop on theoretical and applied fluid dynamics, Computing Center, Beijing, June 20-July 1, 1994. *"Numerical solution of viscous incompressible flow."*

10. International Workshop on Inertial Manifolds and Approximate Inertial Manifolds and Related Numerical Algorithms, Xian, June 19-22, 1995. *"On the stability and accuracy of the nonlinear Galerkin methods".*

11. 1995 SIAM Annual Meeting, Charlotte, NC, Oct. 23-26, 1995. *"Pseudo-compressibility methods for the computation of incompressible flows."*

12. Fifth workshop on numerical solutions of fluid flow in spherical geometries, Brekenridge, Colorado, June 12-16, 1996. *"Efficient spectral–Galerkin algorithms for the primitive equations of the atmosphere".*

13. Workshop on Dynamical Systems Approach to Ocean/Atmosphere Sciences, Issac Newton Institute in Cambridge University, Aug. 26-30, 1996. *"A new solution technique for the Primitive equations of the Atmosphere".*

14. IMA Workshop on "Parallel Solution of PDE", University of Minnesota, June 9–13, 1997. *"Fast spectral-Galerkin method and its applications".*

15. First Conference of Young Chinese Mathematicians in North America, University of California at Berkeley, June 28–July 2, 1997. *"Fast spectral-Galerkin method and its applications".*

16. IMA Workshop on "Large Scale Dynamical Systems", University of Minnesota, Sept. 29–Oct. 3, 1997. *"Numerical simulation of incompressible flows in enclosed cylinder(s) using a spectral-projection method".*

17. Material Research Society Annual Spring Meeting, San Francisco, Apr. 13–17, 1998. *"Application of semi-implicit Fourier spectral methods for phase field equations".*

18. Joint meeting of 19th Annual CAMS and 13th CSFD, Vancouver, May 27–31, 1998. *"Numerical simulation of incompressible flows in enclosed cylinder(s) using a spectral-projection method".*

19. Workshop on "Mathematical Problems in Meteorology and Oceanography", Indiana University at Bloomington, Nov. 9–12, 1998. *"A fast spectral-Galerkin method for the primitive equations of atmosphere".*

20. Workshop on Scientific Computing, Hong Kong City University, Dec. 7–10, 1998. *"Spectral-projection method for Incompressible Flows".*

21. Workshop on "Incompressible fluid flows: numerical methods and applications", Los Alamos, April 12–14, 1999. *"A survey on pseudo-compressibility methods for incompressible flows".*

22. SIAM Third Conference on Mathematical Aspects of Materials Science, Philadelphia, May 22-24, 2000. *"Elastic effects during ordering and phase transition".*

23. p and hp finite element methods: mathematics and engineering practice, St. Louis, May 31–June 2, 2000. *"Spectral methods for problems in unbounded domains".*

24. Workshop on Penalty Method, Bordeaux, France, June 5-6, 2000. *"Fast spectral method and a first attempt at using a penalty formulation with spectral discretization".*

25. One of the principal speakers at the Summer School on "Advances in Partial Differential Equations and Applications", El Escorial, Spain July 17–21, 2000.

26. Conference on Nonlinear Problems in Applied Sciences, Bloomington, IN, Sept. 15-17, 2000. *"Some new developments on projection methods: pressure-correction and velocity-correction schemes".*

27. International workshop on scientific and engineering computing, Singapore, July 2nd, 2001.

28. One of the principle lecturers at the Summer School in Beijing University, Beijing, China, July 9-July 20, 2001.

29. International Workshop on Numerical Linear Algebra, Numerical Methods for PDES and Optimization, Curritiba, Brazil, Aug. 20-23, 2001.

30. EUROMEC/ERCOFTAC Colloquium: Spectral Methods and Timestepping Schemes for Incompressible Flows in Complex Geometries, Toulouse, France, Oct. 18-19, 2001.

31. AMS-MAA Joint Annual Meeting at San Diego, CA, Jan. 5-9, 2002.

32. Summer school for Applied Mathematics in Dalian, July, 2002.

33. AMS regional meeting in Orlando, FL, Nov. 9-10, 2002.

34. Workshop on Numerical Methods for PDEs in Beijing University, Jan. 4-5, 2003.

35. Third International Workshop on Scientific Computing in City University of Hong Kong, Jan. 6-9, 2003.

36. AMS reginal meeting in Bloomington, IN, Apr. 4-6, 2003.

37. Workshop on Perspectives on incompressible flows. Comparison of different computational strategies, University of Maryland, Apr. 7-11, 2003.

38. Workshop on "Ondes de Surface", Universite de Bordeaux, France, May 27-28, 2003.

39. Two mini-symposium talks at the 5th International Congress on Industrial and Applied Mathematics, Sydney, July 7-11, 2003.

40. Workshop on Mathematical Aspects of Computational Fluid Dynamics at Oberwalfach Institute, Nov. 9-15, 2003.

41. Workshop on "Multiscale computational methods", University of Florida, Feb 29–Mar 2, 2004.

42. 6th International Conference on Spectral and High Order Methods, Brown, June 21-25, 2004.

43. Workshop on "Developments in Navier-Stokes Equations & Turbulence Research", National Singapore University, Dec. 13-16, 2004.

44. Tutorial on "Nanoscale Material Interfaces: Experiment, Theory and Simulation", National Singapore University, Dec. 17-21, 2004.

45. International Conference on Scientific Computing, Nanjing, China, June 4-8, 2005.

46. International Conference of Nonlinear Evolution Equations and Infinite Dimensional Dynamical Systems, Nanjing, China, June 2-6, 2005.

47. Organizer and principle lecturer, "Workshop on numerical simulation of complex fluids", Academia Sinica, June – Aug. 2005.

48. International conference on "Mathematics: opportunity and Challenge", Weihai, China, July 25-29, 2005.

49. The 2nd International Conference on Scientific Computing and Partial Differential Equations & The First East Asia SIAM Conference, Hong Kong, Dec. 12-16, 2005. (Plenary Speaker)

50. International Conference on Partial Differential Equations and Numerical Methods, Kuming, China, Dec. 17-22, 2005. (Plenary Speaker)

51. Banff Workshop on Advances in Computational Scattering, Feb. 19-23, 2006.

52. Spring 2006 Midwest PDE Seminar, Univ. of Illinois at Chicago, Apr. 21-23, 2006. (Plenary Speaker)

53. Banff Workshop on Interfacial Dynamics in Complex Fluids, May 27-June 01, 2006.

54. International Conference on Applied Mathematics and Interdisciplinary Research, Nankai University, June 12-15, 2006.

55. International Conference on Recent Advances in Scientific Computation, Beijing University, June 18-19, 2006.

56. International Conference on Applicable Harmonic Analysis: Approximation and Computation, Beijing, June 17-21, 2006.

57. International Conference on Partial Differential Equations and Numerical Analysis, Changsha, June 22-26, 2006, China. (Plenary Speaker)

58. International Workshop on Scientific Computing, National Taiwan University, Taiwan, June 26–30, 2006.

59. International Workshop on nonlinear problems and their numerical approximations, Jilin University, July 10-11, 2006.

60. Workshop on Scientific Computing, Tsinghua University, July 13-14, 2006.

61. Second International Workshop on Analysis and Numerical Approximation of Singular Problems, Karlovassi, Greece, Sep. 6-9, 2006. (Plenary Speaker)

62. Workshop on Theory and Applications of Fluid Mechanics, University of Cincinnati, Dec. 9-10, 2006.

63. Workshop on on PDEs and Scientific Computing, National University of Singapore, Dec. 15, 2006.

64. International conference on "Multiscale Analysis and Applications", Nanyang Technical University, Singapore, Dec. 18–22, 2006.

65. Mini-symposium on "Recent Advances in Computational Scattering", AMS/MAA Joint Meeting at New Orleans, Jan. 5-8, 2007.

66. Mini-symposium on "Recent Developments in Analysis and Numerics of Geophysical Fluid Dynamics Problems", AMS/MAA Joint Meeting at New Orleans, Jan. 5-8, 2007.

67. SIAM Conference on Computational Science & Engineering, Orange County, Feb. 19-23, 2007.

68. Frontiers in Applied and Computational Mathematics, New Jersey Institute of Technology, May 13-16, 2007.

69. International workshop on Recent Advances on Spectral Methods and Related Applications, Xiamen, June 14-16, 2007.

70. The International Conference On Spectral and High Order Methods (ICOSAHOM'07), Beijing, June 18-22, 2007. (Plenary Speaker)

71. Workshop on Ferroelectric Phenomena in Liquid Crystals, Kenn State, June 18–28, 2007.

72. International workshop on computational methods in geosciences, Xi'an Jiaotong University, China, July 5-7, 2007.

73. International Conference on Theoretical and Numerical Fluid Dynamics, III, Vancouver, Aug. 13-17, 2007.

74. Workshop on Bose-Einstein condensation: modeling, analysis, computation and applications, Institute of Mathematical Science, National Singapore University, Nov. 12-16, 2007.

75. Workshop on Multiscale Modeling, Analysis and Simulations, Michigan State, Mar. 27-28, 2008.

76. AMS sectional meeting, Bloomington, IN, Apr. 5-6, 2008.

77. AIM Workshop on "Ferroelectric phenomena in soft matter systems", Paolo Alto, CA, May 12-16, 2008.

78. Huxang International Mathematics Workshop, May 21-25, 2008.

79. Sixth International Conference on Scientific Computing and Applications, Pusan, Korea, June 2-5, 2008. (Plenary Speaker)

80. Eighth International Conference on Monte Carlo and Quasi-Monte Carlo Methods in Scientific Computing, Montreal, Canada, July 6-11, 2008.

81. AFOSR Computational Mathematics Program Annual Review Workshop, Arlington, VA, Aug 12-15, 2008.

82. AMS-MAA joint meeting, Washington, D.C., Jan 5-9, 2009 (two minisymposium talks).

83. SIAM CS&E meeting, Miami, Florida, Mar 2-6, 2009 (two minisymposium talks).

84. Midwest Numerical Analysis Day, Detroit, Apr 17-18, 2009. (Plenary Speaker)

85. The 8th International Conference On Spectral and High Order Methods (ICOSA-HOM), Trondheim, Norway, June 22-26, 2009 (two minisymposium talks).

86. International Conference on Applied Analysis and Scientific Computation June 25-28, 2009, Shanghai Normal University, Shanghai, China. (Plenary Speaker)

87. Workshop on "Challenges and Advances in Computational Materials Simulations and Design", National University of Singapore, July 20-24, 2009.

88. Tutorial speaker for the Workshop on "Challenges and Advances in Computational Materials Simulations and Design", National University of Singapore, July 26-31, 2009.

89. One of the two main instructors at the Summer School on Numerical PDEs at the Institute of Computational Mathematics and Scientific/Engineering Computing, Beijing China, Aug 3-16, 2009.

90. 14th Chinese Conference on Numerical Methods for Fluid Dynamics, Nanchang, China, Aug 4-7, 2009.

91. SIAM conference on Mathematics for Industry, San Francisco, Oct. 9-10, 2009.

92. AMS-MAA joint meeting, San Francisco, Jan 13-16, 2010.

93. AMS sectional meeting at University of Kentucky, Mar. 27-28, 2010.

94. AMS sectional meeting at Saint Paul, Minnesota, Apr. 10-11, 2010.

95. SIAM annual meeting, Pittsburgh, July 12-16, 2010.

96. AFOSR Computational Mathematics Program Review Meeting, Arlington, July 27-30, 2010.

97. Summer School Lecturer (a two-credit course) at Beijing University, Aug. 10-19, 2010.

98. NSF workshop on soft materials, Colorado State University, Sep. 13-17, 2010.

99. IMA Tuturial on Numerical Solutions of Partial Differential Equations: Novel Discretization Techniques, Oct. 30-31, 2010.

100. IMA workshop on Numerical Solutions of Partial Differential Equations: Novel Discretization Techniques, Nov. 1-5, 2010.

101. Workshop on Nonstandard Discretizations for Fluid Flows, Banff, Canada, Nov. 22-26, 2010.

102. Fourth International Congress of Chinese Mathematicians, Beijing, China, Dec. 17-22, 2010.

103. SIAM CSE conference, Reno, Nevada, Feb. 28-Mar 3, 2011.

104. 2011 International Conference on Applied Mathematics and Interdisciplinary Research, June 13-15, 2011, Nankai University, Tianjin, China.

105. International Conference on Interdisciplinary Applied and Computational Mathematics, Zhejiang University, Hangzhou, China, June 17-21, 2011.

106. ICIAM conference, Vancouver, Canada, July 18-22, 2011 (two mini-symposium talks).

107. International Conference on PDEs and Numerical Analysis, Guiyang, Aug. 22-24, 2011.

108. Annual meeting of the Chinese Computational Mathematics, Zhenzhou, Sep 18-21, 2011.

109. Workshop on High Dimensional Problems in Materials Science, Acedemy of Sciences, China, Oct. 14, 2011.

110. Workshop on Mathematical Theory and Simulation of Phase Transitions, Beijing International Center for Mathematical Research, Nov. 7-11, 2011.

111. Workshop on Challenge and Modeling of Multiscale Problems in Mechanics and Materials, National University of Singapore, Nov. 14-18, 2011.

112. The Second International Conference on Scientific Computing (ICSC12) Nanjing, China, May 22-25, 2012.

113. AMSS-PolyU Joint Research Institute Second Workshop on Computational Mathematics, Hong Kong, May 25th-26th, 2012.

114. International Conference on Applied Mathematics 2012: Modeling, Analysis and Computation, Hong Kong, May 28-June 1, 2012.

115. Workshop on Scientific Computing, Lanzhou University, June 1-2, 2012.

116. The 9th International Conference on Spectral and High Order Methods (ICOSA-HOM), Tunis, Tunisia, June 25-29, 2012 (two minisymposium talks).

117. Sparse Grid 2012, Munich, Germany, July 2-6, 2012.

118. International Conference on Computational Sciences, Shanghai, China, July 16-20, 2012.

119. Second Cross-Straight Workshop on Computational Mathematics, Kaohsieung, Taiwan, July 27-30, 2012.

120. AFOSR Program Review, July 30-Aug. 2, 2012.

121. Chebfun and Beyond, Oxford University, UK, Sep 17-19, 2012.

122. AMS/MAA Joint meeting, San Diego, Jan. 9-12, 2013.

123. Two mini-symposium talks at the SIAM CSE conference, Boston, Feb. 25-28, 2013.

124. South African Symposium on Numerical and Applied Mathematics, Stellenbosch University, South Africa, Apr 3-5, 2013.

125. Workshop on "Current Research in Numerical Analysis", City University of New York, Apr. 25, 2013.

126. Forum on Scientific Computing, LSEC, Beijing, June 3-4, 2013.

127. International Conference on Mathematical Modeling and Computation, May 16-19, Wuhan University, China.

128. 2nd International Conference on Interdisciplinary Applied Mathematics and Computational Mathematics June 19-22, 2013, Hangzhou, China.

129. ICERM workshop on "Issues in Solving the Boltzmann Equation for Aerospace Applications", Providence, June 3-7, 2013.

130. SIAM Materials conference, Philadelphia, June 9-12, 2013.

131. Numerical mathematics and applications to some challenging problems, Loyola university, Sevilla, June 24-26, 2013.

132. Workshop on "Quantized vortices in superfluidity and superconductivity and related problems" at the Wolfgang Pauli Institute (WPI), Vienna, Austria, July 1-5, 2013.

133. Workshop on Mathematical Issues in Liquid Crystals, Peking University, July 6, China, 2013.

134. AFOSR Computational Mathematics Annual Review Meeting, July 29-Aug 1, 2013.

135. The Second International Conference on Engineering and Computational Mathematics (ECM2013), Polytechnic University, Hong Kong, Dec 16-18, 2013.

136. International Workshop on theFinite Element/Spectral Methods(IWFSM2014), Shanghai Normal University, China, May 16-18, 2014.

137. Sino-Germany Workshop on Computational Fluid Dynamics, Beijing, China, May 21-27, 2014.

138. Third International Conference on Interdisciplinary Applied and Computational Mathematics, Zhejiang University, Hangzhou, China, June 7-10, 2014.

139. 9th Workshop on Scientific Computing and Applications, Xi'an, China, June 12-15, 2014.

140. ICOSAHOM'14 (two talks), June 23-27, 2014, Salk Lake City, USA.

141. Annual Meeting of Academy of Engineering Physics of China, Aug 19-20, 2014.

142. Korean SIAM Annual Meeting, Jeju, Korea, Nov 20-13, 2014.

143. 5th International Conference on Scientific Computing and PDEs (SCPDE14), Hong Kong, Dec 8-12, 2014.

144. IAS Focused Program on Multiscale Modeling and Simulation of Defect Problems in Materials Science, Hong Kong, Dec 15-19, 2014.

145. 9th International Conference on Computational Physics (two talks), Singapore, Jan 7-11, 2015.

146. Workshop on numerical methods for fractional PDEs, University of Macau, May 22-23, 2015, Macau, China.

147. International Conference on Numerical Partial Differential Equations and Their Applications, May 25-29, 2015, Wuhan University, Wuhan, China.

148. International Conference on Computational Mathematics and Sciences at Xi'an Jiaotong University, China, June 6-8, 2015.

149. Sanya Workshop on nonlinear wave equations, July 6-10, 2015, Sanya, China.

150. ICIAM 2015 (three talks), Aug 10-14, 2015, Beijing, China.

151. Second joint workshop of China-Japan-Korea A3 Foresight Program, Xiamen, China, Nov 26-29, 2015.

152. Sanya Workshop on Numerical Methods of Nonlinear Problems, Sanya, China, January 11-15, 2016.

153. Principal lecturer at the Spring School on Spectral/Spectral-Element Methods, Beijing Computational Science Research Center, Apr 10-15, 2016.

154. Workshop on Multiscale Modeling and its Applications: From Weather and Climate Models to Models of Materials Defects, Fields Institute, Canada, Apr 25-29, 2016.

155. 10th International Conference on Scientific Computing and Applications, Fields Institute, Canada,, June 6-10, 2016.

156. ICOSAHOM'16 (two talks), Rio de Janeiro, Brazil, June 27-July 1, 2016.

157. The 11th AIMS Conference on Dynamical Systems, Differential Equations and Applications, Orlando, Florida, USA, July 1 - July 5, 2016.

158. Workshop on Nonlinear Partial Differential Equations and Scientific Computing, Beijing, China, July 5-10, 2016.

159. Summer School on Computational Mathematics (two talks) at Sichuan University, July 20, 2016.

160. Fourth Cross-Strait Workshop on Computational Mathematics, National Chengkong University, Taiwan, July 25-28, 2016.

161. AFOSR Computational Mathematics Program Review, Arlington, VA, Aug 9-12, 2016.

162. International Workshop on Advances in Numerical PDEs and Fast Solvers, Wuhan University, Dec 16-18, 2016.

163. The 10th International Conference on Computational Physics, Macau, China, Jan 16-20, 2017.

164. AMS Sectional Meeting, Indiana University, Apr 1-2, 2017.

165. Workshop to celebrate Yvon Maday's 60th birthday, Roscoff, France, Mar 2-5, 2017.

166. Workshop on Numerical Methods for Fractional-derivative Problems: Singularities and Fast Algorithms, Beijing Computational Science Center, May 19-21, 2017.

167. Third International Conference on Engineering and Computational Mathematics (ECM2017), Hong Kong Polytechnic University, May 31-June 2, 2017.

168. Mathematical and Computational methods for Quantum and Kinetic Problems, Beijing Computational Science Center, June 11-14, 2017.

169. Workshop on Mathematical Approaches to Interfacial Dynamics in Complex Fluids, Banff, Canada, June 25-30, 2017.

170. Summer School on Spectral Methods (16 hours), Harbin Institute of Technology, China, July 14-20, 2017.

171. AFOSR program review, Arlington, Virginia, Aug 14-18, 2017.

172. IAS focused workshop on Scientific Computing, Hong Kong University of Science and Technology, Dec 4-8, 2017.

173. Workshop on Computational Mathematics, Hong Kong Polytechnic University, Dec 9-11, 2017.

Invited Colloquium/Seminar Talks since 1991:

1. Math. Dept., Penn State Univ., Jan. 13, 1991. *"Projection methods for the Navier-Stokes equations".*

2. Math. Dept., Purdue Univ., Jan. 29, 1991. *"On error estimates of projection methods".*

3. Math. Dept., Univ. of Colorado at Boulder, Feb. 8, 1991. *"Hopf bifurcation for driven cavity flow".*

4. Math. Dept., Univ. of British Columbia, Feb. 11, 1991. *"Projection methods for the Navier-Stokes equations".*

5. Math. Dept., Iowa State Univ., Feb. 25, 1991. *"Projection methods for the Navier-Stokes equations".*

6. Comp. Sci. Dept., Stanford Univ., Feb. 28, 1991. *"On some efficient algorithms for the Navier-Stokes equations".*

7. Math. Dept., Cincinnati Univ., Mar. 4, 1991. *"Higher order projection and penalty-projection methods".*

8. Center for Innovative Computing Applications, Indiana Univ., Apr. 10, 1991. *"Hopf bifurcation for driven cavity flow".*

9. Math. Dept., Univ. of Maryland, Mar. 5, 1992. *"Pressure stabilization and projection methods".*

10. Math. Dept., Univ. of Maryland at Baltimore County, Apr. 30, 1993. *"Efficient spectral method for some elliptic problems".*

11. Institute of Applied Physics and Computational Mathematics, China, June 15, 1993. *"Approximate inertial manifolds and nonlinear Galerkin methods".*

12. Computing Center, Academia Sinica, June 16, 1993. *"Pressure stabilization and projection methods".*

13. Math. Dept., Beijing University, June 17, 1993. *"Nonlinear Galerkin method using Chebyshev and Legendre polynomials".*

14. Institute of Mathematics, Academia Sinica, June 18, 1993. *"On a class of quasi-compressibility methods for Navier-Stokes equations".*

15. Institute of System Sciences, Academia Sinica, June 19, 1993. *"Approximate inertial manifolds and nonlinear Galerkin methods".*

16. Department of Mathematics and Statistics, Simon Fraser University, August 13, 1993. *"Efficient spectral-Galerkin methods for some elliptic problems".*

17. Department of Mathematics, Hong Kong University of Science and Technology, May 26, 1994. *"Pseudo-compressibility methods for the Navier-Stokes equations".*

18. Department of Applied Mathematics, Dalian Institute of Technology, June 9, 1994. *"Some topics in computational fluid dynamics."*

19. Department of Mathematics, Beijing University, July 1, 1994. *"Efficient implementation of spectral Galerkin method."*

20. Institute of Mathematics and Institute of System Sciences, Academia Sinica, July 6, 1994. *"Pseudo-compressibility Methods for the Navier-Stokes Equations".*

21. Institute of Scientific Computing and Applied Mathematics, Indiana University, Dec. 2, 1994. *"Spectral-Galerkin method for scientific computation".*

22. Department of Mathematics, Huadong Normal University, June 15, 1995. *"New developments in the theory of inertial manifold and approximate inertial manifold.*

23. Research Center for Applied Mathematics, Xian Jiaotong University, June 17, 1995. *"Efficient spectral-Galerkin method for scientific computation".*

24. Beijing Institute of Applied Physics and Computational Mathematics, June 27, 1995. *"Stability and accuracy of the nonlinear Galerkin method".*

25. Institute of Mathematics, Academia Sinica, June 28, 1995. *"New developments in the theory of inertial manifold and approximate inertial manifold".*

26. Center for Turbulence Research, Stanford University and NASA Ames Center, June 25, 1996. *"Incremental Unknowns — A Multilevel Scheme for Turbulence Simulation".*

27. Program in Scientific Computing and Computational Mathematics, Stanford University, July 3, 1996. *"Fast spectral-Galerkin methods for elliptic equations".*

28. Institute of Mathematics and Statistics, University of Kent at Canterbury, U.K. Aug. 12, 1996. *"Efficient spectral-Galerkin methods for Scientific Computing".*

29. Department of Mathematics, Indiana University, Oct. 21, 1996. *"Pseudo-compressibility methods for the incompressible flows".*

30. Division of Applied Mathematics, Brown University, Dec. 12, 1997. *"Fast spectral-Galerkin method and its applications".*

31. Department of Mathematics, Beijing University, Dec. 24, 1997. *"Fast spectral-Galerkin method and its applications".*

32. Institutt for Informatikk, University of Bergen, Norway, Mar. 5, 1998. *"Fast spectral-Galerkin method and its applications".*

33. Courant Institute, New York University, May 1, 1998. *"Fast spectral-Galerkin method and its applications in fluid dynamics".*

34. Texas Institute of Computational and Applied Mathematics, University of Texas at Austin, Sept. 17, 1998. *"Fast spectral-Galerkin methods: applications in fluid dynamics".*

35. Department of Mathematics, Arizona State University, Dec. 29, 1998. *"Fast spectral-Galerkin methods: applications in fluid dynamics".*

36. Department of Mathematics, Hong Kong Baptist University, Jan. 28, 1999. *"Fast spectral-Galerkin methods: applications in fluid dynamics".*

37. Department of Mathematics, Hong Kong University of Science and Technology, Feb. 10, 1999. *"Fast spectral-Galerkin methods: applications in fluid dynamics".*

38. Texas Institute of Computational and Applied Mathematics, University of Texas at Austin, Apr. 6, 1999. *"Pseudo-compressibility methods for incompressible flows".*

39. Institute of Mathematical Sciences, Chinese University of Hong Kong, May. 13, 1999. *"Pseudo-compressibility methods for incompressible flows".*

40. Institut de Mathématique, Université de Bordeaux 1, June 24, 1999. *"Pseudo-compressibility methods for incompressible flows".*

41. LIMSI, University de Paris-Sud, June 28, 1999. *"Fast spectral-Galerkin methods: applications in fluid dynamics".*

42. Department of Mathematics, University of Poitiers, France, March 16, 2000. *"Fast spectral-Galerkin methods: algorithms and applications".*

43. Department of Mathematics, Georgia Institute of Technology, Apr. 12, 2000. *"Pseudo-compressibility methods for incompressible flows".*

44. Institut de Mathématique, Université de Bordeaux 1, June 12, 2000. *"Spectral-Galerkin methods: algorithms and applications".*

45. Department of Mathematics, University of Maryland, Sept. 28, 2000. *"Some new developments on projection methods: pressure-correction and velocity-correction schemes".*
46. Department of Mathematics, University of Minnesota, Nov. 28, 2000.
47. Department of Mathematics, University of Delaware, Dec. 4, 2000.
48. Department of Mathematics, Oklahoma State University, Jan. 26, 2001.
49. Department of Mathematics, Michigan State University, Jan. 30, 2001.
50. Department of Mathematics, University of Kentacky, Feb. 1, 2001.
51. Department of Mathematics, University of Central Florida, Feb. 13, 2001.
52. Department of Mathematics, Purdue University, Feb. 15, 2001.
53. Department of Mathematics, IUPUI, Feb. 16, 2001.
54. Department of Mathematics, Georgia Tech, Feb. 21, 2001.
55. Department of Mathematics, University of Southern California, Feb. 23, 2001.
56. Département de Mathématique, Université de Picardie Jules Verne, France, June 2001.
57. Department of Mathematics, Xiamen University, July 16, 2001.
58. Department of Mathematics, Purdue University, Nov. 29, 2001.
59. Department of Mathematics and Statistics, Texas Tech University, Feb 7, 2002.
60. Department of Mathematics, Shanghai Normal University, Aug. 2, 2002.
61. Department of Mathematics, Indiana University, Sep. 27, 2002.
62. Department of Mathematical Sciences, University of Illinois at Chicago, Nov. 13, 2002.
63. Department of Mathematics, University of Winsconsin, Nov. 15, 2002.
64. Department of Mathematics, Oklahoma State University, Mar. 25, 2003.
65. Division of Applied Mathematics, Brown University, Apr. 25, 2003.
66. Department of Computational Sciences, National University of Singapore, Jul. 3, 2003.
67. Department of Mathematics, Arizona State University, Oct. 9, 2003.
68. Department of Mathematics, McMaster University, Oct. 17, 2003.

69. Department of Mathematics, Penn State University, Oct. 20, 2003.
70. Department of Mathematics and CSIT, Florita State University, Mar. 3, 2004.
71. Department of Mathematics, University of Notre Dame, Oct. 11, 2004.
72. Department of Mathematics, Indiana University, Oct. 29, 2004.
73. Department of Mathematical Sciences, Worcester Polytechnic Institute, Nov. 8, 2004.
74. Department of Mathematics, Wayne State University, March. 21, 2005.
75. Department of Mathematics, University of Manitoba, March. 31, 2005.
76. Department of Mathematics, Michigan State University, Apr. 28, 2005.
77. Institute of Scientific and Engineering Computing, Academia Sinica, June 23, 2005.
78. Institute of Atmosphere Sciences, Academia Sinica, June 27, 2005.
79. Department of Computational Mathematics, Peking University, June 28, 2005.
80. Department of Mathematics, Texas A&M University, Nov. 3, 2005.
81. Department of Mathematics, Chinese University of Hong Kong, Dec. 22, 2005.
82. Institute of Mechanics, Academia Sinica, June 20, 2006.
83. Department of Applied Mathematics, Providence University, Taiwan, July 3, 2006.
84. Department of Applied Mathematics, National ChiaoTung University, Taiwan, July 6, 2006.
85. Department of Mathematics, Beijing Normal University, July 12, 2006.
86. Institute of Applied Physics and Computational Mathematics, Beijing, July 14, 2006.
87. Department of Mathematics, North Carolina State University, Sep. 28, 2006.
88. Department of Mathematics, University of North Carolina, Sep. 29, 2006.
89. Institute of Scientific Computing, Indiana University, Nov. 28, 2006.
90. Department of Mathematics, University of California at Santa Barbara, Feb. 23, 2007.
91. Short course on "Selected Topics in Spectral Methods and CFD" at Universitat Politecnica de Catalunya, May 2–May 11, 2007.
92. Department of Applied Physics, Universitat Politecnica de Catalunya, May 10, 2007.
93. Department of Mathematics, Wayne State University, Oct. 10, 2007.

94. Department of Mathematics, Michigan State University, Oct. 12, 2007.
95. Department of Mathematics, Illinois Institite of Technology, Oct. 29, 2007.
96. Department of Mathematical Sciences, Rensselaer Polytechnic Institute, March 18, 2008.
97. CRM Applied Mathematics Seminar, McGill University, Sep. 29, 2008.
98. Department of Physics, McGill University, Oct. 9, 2008.
99. Department of Mathematics, University of South Carolina, Oct. 16, 2008.
100. Department of Mathematics, York University, Oct. 20, 2008.
101. Department of Mathematics, McMaster University, Oct. 21, 2008.
102. Department of Mathematics, University of Alberta, Oct. 24, 2008.
103. Scientific Computing and Applied & Industrial Mathematics, University of Britich Columbia, Oct. 29, 2008.
104. Department of Mathematics Colloquium, University of Britich Columbia, Oct. 31, 2008.
105. Department of Computational Mathematics, Peking University, Nov. 11, 2008.
106. Institute of Computational Mathematics, Chinese Academy of Sciences, Nov. 25, 2008.
107. Institute of Physics, Chinese Academy of Sciences, Dec. 1, 2008.
108. School of Mathematical Sciences, Nanjing Normal University, Dec. 3, 2008.
109. Nanyang University of Technology, Singapore, Dec. 10, 2008.
110. City University of Hong Kong, Dec. 11, 2008.
111. CRM-ISM Colloquium, Centre de Recherche Mathematique, Université de Montreal, Dec. 19, 2008.
112. Department of Mathematics, UC Irvine, March 30, 2009.
113. Department of Mathematics, UNC at Charlotte, Apr. 10, 2009.
114. Department of Mathematics, East China Normal University, June 30, 2009.
115. Department of Mathematics, Shanghai University, July 1, 2009.
116. School of Mathematics, Xinjiang University, July 4, 2009.

117. Department of Mathematics, Statistics and Computer Science, University of Illinois at Chicago, Sep. 9, 2009.

118. Department of Mathematics, Iowa State University, Apr. 26, 2010.

119. Department of Mathematics, IUPUI, Sep. 3, 2010.

120. Department of Applied Mathematics, University of Colorado at Boulder, Sep. 17, 2010.

121. Department of Scientific Computing, Florida State University, Oct. 6, 2010.

122. Department of Applied Mathematics, State University of New York at Stony Brook, Oct. 27, 2010.

123. Department of Mathematics, University of British Columbia, Nov. 24 and Nov. 25, 2010.

124. Department of Mathematics, University of Nevada at Las Vegas, Apr. 26, 2011.

125. Department of Mathematics, Hong Kong University of Science and Technology, Oct. 3, 2011.

126. Department of Mathematics, Hong Kong Baptist University, Oct. 4, 2011.

127. Department of Mathematics, Georgia Tech., Oct. 31, 2011.

128. Institute of Applied Physics and Computational Mathematics, China, Nov. 9, 2011.

129. Department of Mathematics, Indiana University, Jan. 27, 2012.

130. Air Force Institute of Technology, Dayton, Apr. 26, 2012.

131. Department of Mathematics, University of South Carolina, Apr 30, 2012.

132. Beijing Center for Computational Science, Aug. 17, 2012.

133. Department of Mathematics, University of Dundee, UK, Sep 20, 2012.

134. Department of Mathematics, University of Maryland, Feb 26, 2013.

135. School of Mathematical Science, HuaZhong Normal University, China, May 17, 2013.

136. Department of Mathematics, Penn State University, Oct. 16, 2013.

137. School of Mathematical and Computational Science, Sun Yeh-San University, China, Nov 15, 2013.

138. Department of Mathematics, University of Macau, Dec 13, 2013.

139. School of Mathematical Science, Xi'an Jiaotong University, June 13, 2014.

140. Pacific Northwest National Laboratory, Aug 11, 2014.

141. Department of Mathematics, Duke University, Sep 29, 2014.

142. Department of Mathematics, Texas A&M University, Oct 8, 2014.

143. Department of Mathematics, University of Texas at Arlington, Oct 10, 2014.

144. Department of Mathematics, Indiana University, Oct 17, 2014.

145. Department of Mathematics, Auburn University, Oct 31, 2014.

146. Department of Mathematics, Nanyang Technological University, Singapore, Jan 15, 2015.

147. Institute de Mécaniques et Industries, University of Bordeaux, France, Feb. 13, 2015.

148. Department of Mathematics, Southern Methodist University, Feb 16, 2015.

149. Department of Mathematics, University of Poitiers, France, Feb 19, 2015.

150. Department of Mathematics, University of Torino, Italy, Feb. 24, 2015.

151. Department of Mathematics, University of California at Berkeley and Lawrence Berkeley Lab, Mar 11, 2015.

152. Department of Mathematics, Harbin Institute of Technology, July 17, 2015.

153. Department of Mathematics, University of Nevada at Las Vegas, Mar 15, 2016.

154. Department of Mathematics, Hong Kong University of Science and Technology, Mar 24, 2016.

155. Department of Mathematics, Central South University, Apr 1, 2016.

156. Frontier Lecture at Beijing Computational Science Research Center, Apr 11, 2016.

157. Department of Mathematics, University of Minnesota, Oct 21, 2016.

158. School of Mathematical Science, Huazhong University of Science and Technology, Dec 15, 2016.

159. School of Mathematical Science, Peking University, Jan 4, 2017.

160. Department of Mathematics, Harbin Institute of Technology, Jan. 8, 2017.

161. Department of Mathematics, University of Central Florida, Mar 3, 2017.

162. Ingram lecture series, Department of Mathematics, Missouri University of Science and Technology, Mar 6-7, 2017.

163. Department of Mathematics, University of Pittsburgh, Sep 15, 2017.

164. Institute of Computational Mathematics, Chinese Academy of Science, Sep 26, 2017.

165. Department of Mathematics, Wayne State University, Oct 9, 2017.

166. Department of Mathematics, University of Maryland, Oct 25, 2017.

167. Department of Mathematics, University of Tennessee, Nov 3, 2017.