CURRICULUM VITAE

Jie Shen

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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 – June 2010 Guest Professor, School of Mathematical Science, Xiamen University, China.

July 2010 – Guest Chair Professor, and Director of Center for Computational and Applied Mathematics, 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.

- Fellow of the American Mathematical Society, class of 2017.

Selected Distinguished Lectures

- Distinguished Alumni Commencement Speaker, School of Mathematical Science, Peking University, 2015.

- Ingram lecture series, Missouri University of Science and Technology, Spring, 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.

- 2018-2019 Purdue Research Foundation (PRF) award: with student Duo Cao.

Past Research Grants

- 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.

- 2017-2018 Purdue Research Foundation (PRF) award: with student Yiqi Gu.

- 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 Inverse Problems in Scattering and Imaging, Purdue University, April 23, 2016.

- Workshop on Recent Advance on Computational Mathematics, Jiujiang University, China, July 15-17, 2016.

- Workshop on Fast Direct Solvers, Purdue University, Nov 12-13, 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.

- Conference on Scientific Computing and Approximation (in honor of Prof. Walter Gautschi on the occasion of 90th birthday), Purdue University, Mar 30-31, 2018.

- Workshop on Current Trends and Challenges in Data Science and Uncertainty Quantification, Purdue University, Mar 31, 2018.

- 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 (2015), Working at a private firm

- Sheng Chen (2017, Xiamen University): Assistant Professor at Jiangsu Normal University.

- Yingwei Wang (2017): Postdoc at University of Wisconsin

- Changtao Sheng (2018): Postdoc at Nanyang Technological University, Singapore

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).

Postdocs and their current positions:

- 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

- 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

Current Postdocs:
   Jie Xu (2016-current)

Long-term visiting scientists:

- Jianwei Zhou (2013-2015): Professor, Linyi University, China

- Ting Cheng (2010-2012): Associate Professor at Huangzhong Normal University, China

- Haydar Alici (2016-2017): Associate Professor at Harran University, Turkey

- Hongtao Chen (2016-2017): Associate Professor at Xiamen University, China

- Qingqu Zhuang (2017-2018): Associate Professor at Huangqiao University, China

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

PUBLICATIONS

Citations:

- In Google Scholar: ≥ 13000
- In MathSciNet: ≥ 4200

H-index:

- In Google Scholar: 57
- In MathSciNet: 33

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.

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[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.

PUBLICATIONS

[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.

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