

# Xiaofeng Yang

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Jan, 2017

**Research Areas** Computational/Applied Mathematics. (Mathematical modeling, numerical analysis and scientific computing with applications to Soft Matter/Complex Fluids/Bio-Cell Dynamics).

**Education** **Ph.D.**, Mathematics, Purdue University, West Lafayette, Indiana, USA, 2007.

- Thesis Advisor: Professor Jie Shen.
- Thesis title: *Modeling, analysis and simulation of multi-phase flows*.

**M. S.**, Mathematics, University of Science and Technology of China, 2001.

**B. S.**, Mathematics, University of Science and Technology of China, 1998.

**Professional Employments** Aug. 2013–present, **Associate Professor (tenure)**, Department of Mathematics, University of South Carolina, Columbia, SC.

Aug. 2009–Jul. 2013, **Assistant Professor (tenure track)**, Department of Mathematics, University of South Carolina, Columbia, SC.

Jul. 2007–Jul. 2009, **Postdoctoral Research Associate**, Department of Mathematics, University of North Carolina at Chapel Hill (UNC-CH), Chapel Hill, NC.

- Mentor: Professor M. Gregory Forest.

**Awards** Purdue Computer Research Institute (CRI) fellowship, Purdue University, 2004-2006;

Jiuzhang fellowship, Department of Mathematics, University of Science and Technology of China, 1998.

Jiuzhang fellowship, Department of Mathematics, University of Science and Technology of China, 1994.

**Research Grants**

9. Pending: 2017-2020, NSF DMS, Efficient, Stable and Accurate Numerical Algorithms for a class of Gradient Flow Systems and their Applications, PI, \$160,000.
8. **Current: 2014-2017, NSF DMS-1418898**, Phase-field models, algorithms and simulations for multiphase complex fluids, PI, \$100,000.
7. **Current: 2012-2017, NSF DMS-1200487**, Experimentally guided mathematics for the mechanochemistry of cell shape dynamics, Co-PI, \$591,213.

6. 2012-2016, AFOSR, FA9550-12-1-0178, Multiscale Mathematics for Nano-Particle-Endowed Active Membranes and Films, Co-PI, \$405,000.
5. 2013-2014, SC EPSCOR GEAR-CI Fund, Theoretical and Experimental Investigation of Cell-Substrate Interaction and Cell Dielectrophoresis Properties, Co-PI, \$75,000.
4. 2012-2013, USC ASPIRE I Track-I Fund, Efficient modeling and numerical algorithm developments for multiphase complex fluid systems, PI, \$14,924.
3. 2012-2013, SC EPSCOR GEAR Fund, In Silico Analysis of Multicellular Aggregate Fusion Using Field and Agent-Based Models, Co-PI, \$50,000.
2. 2011-2012, SC EPSCOR GEAR Fund, Modeling and Simulation of Organ Biofabrication Processes, Co-PI, \$85,000.
1. 2009-2012, DOD-ARO, W911NF-09-1-0389, Temperature control of flow-processing in Rigid-rod nano-composites, Co-PI, \$225,000.

**Publications** (Listed in *reverse chronological order*. IF: SCI five-year Impact factor in 2014-2015 is used. “\*”: corresponding author.) [\[Google Citations Link\]](#)

### Submitted

13. **X. Yang\*** and Z. Xu, Linear, Second Order, Unconditionally Energy Stable schemes for anisotropic Cahn-Hilliard equation, *J. Comput. Phys.*, 2017.
12. **X. Yang\*** and J. Zhao, Linear, Second Order, Unconditionally Energy Stable schemes for the multicomponents phase field Model for vesicle membranes, submitted to *SIAM J. Sci. Comput.*, 2017.
11. Q. Cheng and **X. Yang** and J. Shen, Efficient Unconditionally Energy Stable schemes for the Molecular Beam Epitaxial Growth Model based on the Generalized Invariant Energy Quadratization approach, submitted to *J. Comput. Phys.*, 2017.
10. **X. Yang\*** and J. Zhao, Linear, Second Order, Unconditionally Energy Stable schemes for the Molecular Beam Epitaxial Growth Model without slope selections, submitted to *J. Comput. Phys.*, 2017.
9. **X. Yang\*** and J. Zhao, Efficient Energy Stable schemes for a three components hydrodynamically coupled phase field Model, submitted to *J. Comput. Phys.*, 2017.
8. Z. Xu, **X. Yang\***, H. Zhang, Error analysis of the decoupled Stabilized Semi-implicit method for Cahn-Hilliard phase-field models of two-phase incompressible flows, submitted to *SIAM. J. Num. Anal.*, 2016.
7. F. Bai, Y. He, **X. Yang**, X. He and C. Wang, A fully energy-based phase field model for two phase ferrodroplet deformation and breakup in an uniform magnetic field, submitted to *J. Fluid Mechanics*, 2016.
6. R. Chen, **X. Yang\*** and H. Zhang, Second Order, linear and unconditionally energy stable schemes for a hydrodynamic model of Smectic-A Liquid Crystals, submitted to *SIAM J. Sci. Comput.*, 2017.

5. **X. Yang\*** and J. Zhao, Linear, Second order and Unconditionally Energy stable schemes for The Viscous Cahn-Hilliard Equation with hyperbolic relaxation, submitted to *J. Comput. Appl. Math.*, 2017.
4. **X. Yang** and H. Yu, Linear, Second order and Unconditionally Energy Stable schemes for a phase-field moving contact line Model, submitted, *Comput. Meth. Appl. Mech. Eng.*, 2016.
3. **X. Yang\*** and J. Shen, Numerical analysis for the Cahn-Hilliard equation with General nonlinear potential using the Invariant Energy Quadratization Approach, submitted to *SIAM. Rev.*, 2016.
2. **X. Yang\*** and J. Zhao, On Linear and unconditionally energy stable Algorithms for Variable Mobility Cahn-Hilliard Type Equation with Logarithmic Flory-Huggins Potential , submitted to *ESAIM: M2AN*, 2016.
1. **X. Yang\*** and A. Brylev, A Decoupled and Energy stable scheme for Smectic-A Liquid Crystal Flows, submitted to *Discrete Conti. Dyn. Sys. B* 2016.

### Accepted and Published

54. Q. Cheng, **X. Yang** and J. Shen, Linear, second order, unconditionally energy stable schemes for hydrodynamics coupled phase field diblock copolymer model, **Journal of Computational Physics**, to appear, 2017. (IF: 2.434) [\[Link\]](#)
53. Y. Gao, X. He, L. Mei and **X. Yang**, Fully decoupled, linearized, and energy stable finite element method for Cahn-Hilliard-Navier-Stokes-Darcy model, **SIAM Journal of Scientific Computing**, to appear, 2017. (IF: 1.949)
52. **X. Yang\***, J. Zhao, Q. Wang and J. Shen, Numerical Approximations for a three components Cahn-Hilliard phase-field Model based on the Invariant Energy Quadratization method, **M3AS: Mathematical Models and Methods in Applied Sciences**, to appear, 2017. (IF: 3.49) [\[Link\]](#)
51. **X. Yang\*** and L. Ju, Linear and Unconditionally Energy Stable Schemes for the binary Fluid-Surfactant Phase field Model, **Computer Methods in Applied Mechanics and Engineering**, 318:1005–1029, 2017. (IF: 3.915) [\[Link\]](#)
50. **X. Yang\***, Numerical Approximations for the Cahn-Hilliard phase field model of the binary fluid-surfactant system, **Journal of Scientific Computing**, to appear, 2017. (IF: 1.946) [\[Link\]](#)
49. F. Bai, X. He, **X. Yang**, R. Zhou and C. Wang, Three dimensional numerical and experimental study of droplet formation in a flow focusing device, **International Journal of Multiphase Flow**, to appear, 2017. (IF: 2.250) [\[Link\]](#)
48. J. Zhao, **X. Yang**, Y. Gong and Q. Wang, A Novel Linear Second Order Unconditionally Energy Stable Scheme for a Hydrodynamic Q-Tensor Model of Liquid Crystals, **Computer Methods in Applied Mechanics and Engineering**, 318:803–825, 2017. (IF: 3.915) [\[Link\]](#)

47. **X. Yang\***, J. Zhao and Q. Wang, Numerical Approximations for the Molecular Beam Epitaxial Growth Model Based on the Invariant Energy Quadratization Method, **Journal of Computational Physics**, 333:104-127, 2017. (IF: 2.434) [\[Link\]](#)
46. **X. Yang\*** and L. Ju, Efficient linear schemes with unconditionally energy stability for the phase field elastic bending energy model, **Computer Methods in Applied Mechanics and Engineering**, 315:691–712, 2017 (IF: 3.915) [\[Link\]](#)
45. **X. Yang\*** and D. Han, Linearly First- and Second-Order, Unconditionally Energy Stable Schemes for the Phase field Crystal Equation, **Journal of Computational Physics**, 330:1116-1134, 2017. (IF: 2.434) [\[Link\]](#)
44. H. Yu and **X. Yang\***, Decoupled Energy stable schemes for phase field model with contact lines and variable densities, **Journal of Computational Physics**, 334:665-686, 2017. (IF: 2.434) [\[Link\]](#)
43. D. Han, A. Brylev, **X. Yang** and Z. Tan, Numerical analysis of second order, fully discrete energy stable schemes for phase field models of two phase incompressible flows, **Journal of Scientific Computing**, 70(3):965-989, 2017. (IF: 1.946) [\[Link\]](#)
42. R. Chen, **X. Yang** and H. Zhang, Decoupled, energy stable scheme for the hydrodynamic Allen-Cahn phase field moving contact line model, accepted, **Journal of Computational Mathematics**, 2017. (IF: 0.731) [\[Link\]](#)
41. L. Ma, R. Chen, H. Zhang and **X. Yang\***, Numerical Approximations for Allen-Cahn type Phase field model of two-phase incompressible fluids with Moving Contact Lines, **Communication in Computational Physics**, 21(3):867-889, 2017. (IF: 2.077) [\[Link\]](#)
40. J. Zhao, H. Li, Q. Wang and **X. Yang\***, A Linearly Decoupled Energy stable scheme for phase-field models of three-phase incompressible flows, **Journal of Scientific Computing**, 70:1367-1389, 2017. (IF: 1.946) [\[Link\]](#)
39. J. Zhao, Q. Wang and **X. Yang\***, Numerical Approximations for a Phase Field Dendritic Crystal Growth Model Based on the Invariant Energy Quadratization approach, 110:279-300, **International Journal for Numerical Methods in Engineering**, 2017. (IF: 2.1) [\[Link\]](#)
38. J. Zhao, **X. Yang**, J. Li, and Q. Wang, Energy stable numerical schemes for a hydrodynamic model of Nematic liquid crystals, **SIAM. Journal of Scientific Computing**, 38, A3264–A3290, 2016. (IF: 1.949) [\[Link\]](#)
37. **X. Yang**, Linear, first and second order and Unconditionally Energy Stable Numerical Schemes for the Phase Field model of Homopolymer blends, **Journal of Computational Physics**, 302:509–523, 2016. (IF: 2.434) [\[Link\]](#)
36. J. Zhao, Q. Wang and **X. Yang\***, Numerical Approximations to a New Phase Field Model for Immiscible Mixtures of Nematic Liquid Crystals and Viscous Fluids, **Computer Methods in Applied Mechanics and Engineering**, 310, 77–97, 2016. (IF: 3.915) [\[Link\]](#)

35. M. Kapustina, D.Tsygakov, J. Zhao, J. Wessler, **X. Yang**, A. Chen, N. Roach, T. C. Elston, Q. Wang, K. Jacobson and M. G. Forest, Modeling the excess cell surface stored in a complex morphology of bleb-like protrusions, **PLOS Computational Biology**, 12(3):e1004841, 2016. (IF: 5.759) [\[Link\]](#)
34. J. Zhao, **X. Yang**, J. Shen and Q. Wang, A Decoupled Energy stable scheme for a Hydrodynamic Phase-Field Model of Mixtures of Nematic Liquid Crystals and viscous Fluids, **Journal of Computational Physics**, 305(15), 539–556, 2016. (IF: 2.434) [\[Link\]](#)
33. R. Chen, G. Ji, **X. Yang** and H. Zhang, Decoupled Energy stable schemes for Fluid vesicle membrane Phase field model, **Journal of Computational Physics**, 302:509–523, 2015. (IF: 2.434) [\[Link\]](#)
32. J. Shen, **X. Yang** and H. Yu, Energy stable scheme and simulation for multiphase fluids system of Navier boundary condition, **Journal of Computational Physics**, 284: 617–630, 2015. (IF: 2.434) [\[Link\]](#)
31. J. Shen and **X. Yang**, Decoupled, Energy stable schemes for phase field models of two phase incompressible flows, **SIAM Journal of Numerical Analysis**, 53:279–296, 2015. (IF: 1.69) [\[Link\]](#)
30. C. Liu, J. Shen and **X. Yang**, Decoupled Energy Stable Schemes for a phase field model of two-phase incompressible flows with variable density, **Journal of Scientific Computing**, 62:601–622, 2015. (IF:1.946) [\[Link\]](#)
29. J. Shen and **X. Yang\***, Decoupled, Linear, and Energy stable schemes for a phase field model of two phase complex fluids, **SIAM Journal of Scientific Computing**, 36(1), B122–B145, 2014. (IF:1.949) [\[Link\]](#)
28. Y. Sun, **X. Yang** and Q. Wang, In-silico analysis on biofabricating vascular networks using kinetic Monte Carlo simulations, **Biofabrication**, 6, 015008, 2014. (IF: 4.289) [\[Link\]](#)
27. **X. Yang**, Y. Sun and Q. Wang, Phase field approach for Multicellular Aggregate Fusion in Biofabrication, **Journal of Biology Medical Engineering**, 135(7): 71005, 2013. (IF: 1.896) [\[Link\]](#)
26. **X. Yang\***, M. G. Forest, H. Li, C. Liu, J. Shen, Q. Wang and F. Chen, Modeling and simulations of drop pinch-off from liquid crystal filament and the leaky liquid crystal faucet immersed in viscous fluids, **Journal of Computational Physics**, 236: 1–14, 2013. (IF: 2.434) [\[Link\]](#)
25. J. Shen, **X. Yang**, Q. Wang, On Mass Conservation in Phase Field Models for Binary Fluids, **Communication in Computational Physics**, 13: 1045–1065, 2013. (IF: 2.077) [\[Link\]](#)
24. M. Gregory Forest, Q. Wang and **X. Yang\***, LCP droplet dispersions: a two-phase, diffuse-interface kinetic theory and global droplet defect predictions, **Soft Matter**, 8(37): 9642–9660, 2012. (IF: 4.7) [\[Link\]](#)
23. **X. Yang**, V. Mironov, Q. Wang, Modeling Fusion of Cellular Aggregates in Biofabrication Using Phase Field Theories, **Journal of Theoretical Biology**, 303: 110–118, 2012. (IF: 2.371) [\[Link\]](#)

22. T. S. Little, V. Mironov, A. Nagy-Mehesz, R. Markwald, Y. Sugi, S. M. Lessner, M. A. Sutton, X. Liu, Q. Wang, **X. Yang**, J. O. Blanchette, and M. Skiles, Engineering a 3D, biological construct: representative research in the South Carolina Project for Organ Biofabrication, **Biofabrication**, 3:030202, 2011. (IF: 1.857) [\[Link\]](#)
21. **X. Yang\***, M. G. Forest, C. Liu and J. Shen, Shell cell rupture of nematic droplets in a viscous fluid, **Journal of Non-Newtonian Fluid Mechanics**, 166: 487–499, 2011. (IF: 2.139) [\[Link\]](#)
20. Q. Wang, **X. Yang**, D. Adalsteinsson, T. C. Elston, K. Jacobson, M. Kapustina and M. G. Forest, Computational and Modeling Strategies for Cell Motility, **Book Chapter: Computational Modeling of Biological systems, Part of the series Biological and Medical Physics, Biomedical Engineering**, Edited by Nzikolay Dokholyan, Spring, New York, 2012, 257–296, 2011. [\[Link\]](#)
19. J. Shen and **X. Yang**, Numerical Approximations of Allen-Cahn and Cahn-Hilliard Equations, **Discrete and Continuous Dynamical System–A**, 28:1669–1691, 2010. (IF: 1.223) **(Remark: —Top 1% citation paper in the field of mathematics since 2014 from the web of science)**. [\[Link\]](#)
18. J. Shen and **X. Yang**, A Phase-field model for two-phase flows with large density ratio and its numerical approximation, **SIAM Journal of Scientific Computing**, 32(3):1159–1179, 2010. (IF: 1.949) **(Remark: —Top 1% citation paper in the field of mathematics since 2014 from the web of science)** [\[Link\]](#)
17. K. Xu, M. G. Forest and **X. Yang**, Shearing the I-N phase transition of liquid crystalline polymers: long-time memory of defect initial data, **Discrete and Continuous Dynamical System–B**, 15(2), 457–474, 2010. (IF: 1.227) [\[Link\]](#)
16. M. G. Forest, S. Heidenreich, S. Hess, **X. Yang** and R. Zhou, Dynamic texture scaling of sheared nematic polymers in the large Ericksen number limit, **Journal of Non-Newtonian Fluid Mechanics**, 165:687–697, 2010. (IF: 2.139) [\[Link\]](#)
15. J. Shen and **X. Yang**, Energy stable schemes for Cahn-Hilliard phase-field model of two-phase incompressible flows, **Chinese Annual Mathematics Series B**, 31:743–758, 2010. (IF: 0.356) [\[Link\]](#)
14. **X. Yang\***, M. G. Forest, W. Mullins and Q. Wang, 2-D lid-driven cavity flow of nematic polymers: an unsteady sea of defects, **Soft Matter**, 6:1138–1156, 2009. (IF: 4.7) [\[Link\]](#)
13. **X. Yang**, M. G. Forest, W. Mullins and Q. Wang, Dynamic defect morphology and hydrodynamics of sheared nematic polymers in two space dimensions, **Journal of Rheology**, 53(3): 589–615, 2009. (IF: 2.119) [\[Link\]](#)
12. **X. Yang**, M. G. Forest, W. Mullins and Q. Wang, Quench sensitivity to defects and shear banding in nematic polymer film flows, **Journal of Non-Newtonian Fluid Mechanics**, 159:115–129, 2009. (IF: 2.139) [\[Link\]](#)

11. J. Shen and **X. Yang**, An efficient moving mesh spectral method for the phase-field model of two-phase flows, **Journal of Computational Physics**, 228: 2978–2992, 2009. (IF:2.434) [[Link](#)]
10. **X. Yang**, Error analysis of Stabilized Semi-implicit method of Allen-Cahn Equation, **Discrete and Continuous Dynamical System–B**, 11(4):1057–1070, 2009. (IF: 1.227) [[Link](#)]
9. S. Heidenreich, S. Hess, S. H. L. Klapp, M. G. Forest, H. Zhou, and **X. Yang**, Oscillating Hydrodynamical Jets in Steady Shear of NanoRod Dispersions, **Proceedings of the XV-th International Congress of Rheology**, AIP Conf. Proc. 168:1027, 2008. [[Link](#)]
8. M. G. Forest, S. Heidenreich, S. Hess, **X. Yang** and R. Zhou, Robustness of pulsating jetlike layers in sheared nano-rod dispersions, **Journal of Non-Newtonian Fluid Mechanics**, 155:130–145, 2008. (IF: 2.139) [[Link](#)]
7. **X. Yang**, Z. Cui, M. G. Forest, Q. Wang and J. Shen, Dimensional Robustness & Instability of Sheared, Semi-Dilute, Nano-Rod Dispersions, **SIAM Multiscale Modeling and Simulations**, 7:622-654, 2008. (IF: 2.473) [[Link](#)]
6. J. L. Guermond, J. Shen and **X. Yang**, Error analysis of fully discrete velocity correction methods for incompressible flows, **Mathematics of Computations**, 77:1387–1405, 2008. (IF: 1.565) [[Link](#)]
5. C. Liu, J. Shen and **X. Yang**, Dynamics of defect motion in nematic liquid crystal flow: modeling and numerical simulation, **Communications in Computational Physics**, 2:1184–1198, 2007. (IF: 2.077) [[Link](#)]
4. J. Shen and **X. Yang**, Error estimates for finite element approximations of consistent splitting schemes for incompressible flows, **Discrete and Continuous Dynamical System-B**, 8:663–676, 2007. (IF: 1.227) [[Link](#)]
3. **X. Yang**, J. J. Feng, C. Liu and J. Shen, Numerical simulations of jet pinching-off and drop formation using an energetic variational phase-field method, **Journal of Computational Physics**, 218:417–428, 2006. (IF: 2.434) [[Link](#)]
2. F. Chen, **X. Yang** and W. Yang, Degree Reduction of Interval B-Spline Curves, **Journal of Software**, 13:490–500, 2002. (Engineering Index Journal) [[Link](#)]
1. F. Chen and **X. Yang**, Merging a pair of Interval Bezier Curves, **Int. Conf. comp. Sci.**, 392–397, 2001. [[Link](#)]

**MiniSymposium Organizer**

7. (MiniSymposium Organizer and invited talk) SIAM Southeastern Atlantic Section Conference (SIAM-SEAS), Tallahassee, FL, Mar, 2017.
6. (MiniSymposium Organizer and invited talk) SIAM-CSE conference, Atlanta, GA, Mar, 2017.
5. (MiniSymposium Organizer and invited talk) 20th IMACS world congress, Xiamen University, Xiamen, China, Dec, 2016.
4. (MiniSymposium Organizer and invited talk) SIAM Central States Section, University of Arkansas at Little Rock, AR, Sep, 2016.

3. (MiniSymposium Organizer and keynote Speaker) ICCP9, the 9th international Conference on Computational Physics, Singapore, Jan, 2015.
2. (MiniSymposium Organizer and invited talk) International Conference on Mathematical modeling, Analysis, and Computation, Xiamen University, Xiamen, China, July, 2012, (2 sessions, 8 talks).
1. (MiniSymposium Organizer and invited talk) SIAM Southeastern Atlantic Section Conference (SIAM-SEAS), Huntsville, AL, Mar, 2012 (3 sessions, 12 talks).

**Invited seminars/talks**

76. (Invited summer lectures, 18 hours) Department of Mathematics, Beijing Normal University, Beijing, China, Jul, 2016.
75. (Invited seminar) Institute of Computational Mathematics, China Academy of Science, Beijing, China, July, 2016.
74. (Invited seminar) Department of Mathematics, University of Science and Technology of China, Hefei, China, July, 2016.
73. (Invited seminar) Department of Mathematics, SunYatSen University, Guangzhou, China, July, 2016.
72. (Invited seminar) Department of Mathematics, Xiamen University, Xiamen, China, July, 2016.
71. (Invited seminar) Department of Mathematics, Beihang University, Beijing, China, April, 2016.
70. (Invited seminar) Institute of Computational Science Research Center, Academy of Science, Beijing, China, April, 2016.
69. (Invited seminar) Department of Mathematics, Beijing University, Beijing, China, Mar, 2016.
68. (Invited seminar) Institute of Computational Mathematics, China Academy of Science, Beijing, China, Feb, 2016.
67. (Invited seminar) Department of Mathematics, Purdue University, Indiana, USA, Nov, 2015.
66. (Invited department colloquium) Department of Mathematics, Missouri Science and Technology University, Missouri, USA, Nov, 2015.
65. (Invited talk) The International Congress on Industrial and Applied Mathematics Science, Beijing, China, Aug, 2015.
64. (Invited summer undergraduate lectures, 15 hours) Department of Mathematics, University of Science and Technology of China, Hefei, China, July, 2015.
63. (Invited seminar) Institute of Computational Science Research Center, Academy of Science, Beijing, China, July, 2015.
62. (Invited seminar) Department of Mathematics, Shandong University, China, Jun, 2015.
61. (Invited seminar) Department of Mathematics, SunYatSen University, China, May, 2015.
60. (Invited talk) SIAM Southeastern Atlantic Section Conference (SIAM-SEAS), University of Alabama, Birmingham, AL, Mar, 2015.
59. (Invited seminar) Institute of Computational Mathematics, China Academy of Science, Beijing, China, Jan, 2015.



58. (Invited seminar) Department of Mathematics, HongKong University of Science and Technology, Hongkong, Jan, 2015.
57. (Invited seminar) Institute of Computational Science Research Center, Academy of Science, Beijing, China, Dec, 2014.
56. (Invited talk) IAS focused program on Multiscale Modeling and Simulation, HongKong, Dec, 2014.
55. (Invited summer undergraduate lectures, 15 hours) Department of Mathematics, University of Science and Technology of China, Hefei, China, July, 2014.
54. (Invited seminar), Department of Mathematics, Shandong University, China, Jun, 2014.
53. (Invited seminar) Institute of Software, Chinese Academy of Science, Beijing, China, Jun, 2014.
52. (Invited talk) International conference on Modeling Complex Biological Systems, Nankai University, China, May, 2014.
51. (Invited talk) International conference on Engineering and Computational Mathematics, The HongKong Polytechnic University, HongKong, Dec, 2013.
50. (Invited seminar) Department of Computer Science, The college of Staten Island, The city University of New York, New York, Oct, 2013.
49. (Invited seminar) Department of Mathematics, Xiamen University, Xiamen, China, Jun, 2013.
48. (Invited seminar) High performance Scientific Computing Research Center, Chinese Academy of Science, Beijing, China, Jun, 2013.
47. (Invited summer undergraduate lectures, 15 hours) Department of Mathematics, University of Science and Technology of China, Hefei, China, Jul, 2013.
46. (Invited seminar) Institute of Computational Science Research Center, Academy of Science, Beijing, China, Jun, 2013.
45. (Invited seminar) Institute of Computational Mathematics and Scientific Computing, Academy of Science, Beijing, China, Nov, 2012.
44. (Invited seminar) High performance Scientific Computing Research Center, Chinese Academy of Science, Beijing, China, July, 2012.
43. (Invited seminar) Department of Mathematics, Peking University, Beijing, China, July, 2012.
42. (Invited seminar) Department of Mathematics, Fudan University, Shanghai, China, July, 2012.
41. (Invited seminar) Department of Mathematics, Beijing normal University, Beijing, China, July, 2012.
40. (Invited seminar) Department of Mathematics, Beijing Beihang University, Beijing, China, July, 2012.
39. (Invited seminar) Department of Mathematics, University of Hokkaido, Sapporo, Japan, June, 2012.
38. (Invited short summer graduate courses, about 10hrs) Department of Mathematics, University of Hokkaido, Sapporo, Japan, June, 2012.
37. (Invited seminar) Department of Material Sciences, University of Hokkaido, Sapporo, Japan, June, 2012.

36. (Invited seminar) Institute of Software, Chinese Academy of Science, Beijing, China, May, 2012.
35. (Invited seminar) Department of Mathematics, University of Science and Technology of China, Hefei, China, May, 2012.
34. (Invited seminar) Department of Mathematics, South China Normal University, Guangzhou, China, May, 2012.
33. (Invited seminar) Department of Mathematics, SunYatSen University, Guangzhou, China, May, 2012.
32. (Invited talk) International conference on Scientific Computation and Analysis, Las Vegas, NV, April, 2012.
31. (Invited seminar) Department of Mathematics, Purdue University, West Lafayette, IN, USA, Mar, 2011.
30. (Invited talk) SIAM Conference on Analysis of Partial Differential Equations, San Diego, CA, Nov, 2011.
29. (Invited talk) International Conference on Applied Mathematics and Interdisciplinary Research, Tianjin, China, June, 2011.
28. (Invited talk) International Conference on Interdisciplinary Applied and Computational Mathematics, Hangzhou, China, June, 2011.
27. (Invited seminar) Institute of Computational Mathematics, Chinese Academy of Science, Beijing, China, July, 2011.
26. (Invited summer graduate lectures) Department of Mathematics, University of Science and Technology of China, Hefei, China, July, 2011.
25. (Invited seminar), Department of Mathematics, University of Suzhou, Suzhou, Jiangsu, China, July, 2011.
24. (Invited talk) NSF workshop on Mathematical Modeling and Computer Simulations, CO, Sep, 2010.
23. (Invited seminar) Institute of Software, Chinese Academy of Science, , Beijing, China, May, 20, 2010.
22. (Invited talk) International Conference on "Advances in Partial Differential Equations and their Applications", Fudan University, Shanghai, China, June, 2010.
21. (Invited seminar) Department of Mathematics, University of Science and Technology of China, Hefei, Anhui, China, June, 2010.
20. (Invited seminar) Department of Mathematics, University of Suzhou, Suzhou, Jiangsu, China, July, 2010.
19. (Invited seminar) Department of Mathematics, South East University, Nanjing, Jiangsu, China, July, 2010.
18. (Poster) Transport and Mixing in Complex and Turbulent Flows, Institute for Mathematics and its applications and Department of Mathematics, University of Minnesota, MN, April, 2010.
17. (Poster) Analysis and Computation of Incompressible Fluid Flow, Institute for Mathematics and its applications and Department of Mathematics, University of Minnesota, MN, Feb, 2010.
16. (Invited talk) SIAM southeastern regional meeting, Columbia, SC, April, 2009.
15. (Invited talk) Nonlinear IMACS conference, Athens, GA, March 2009.

14. (Invited talk) Department of Mathematics, Drexel University, Philadelphia, PA, Feb, 2009.
13. (Invited talk) Department of Mathematics, Temple University, Philadelphia, PA, Feb, 2009.
12. (Invited talk) SIAM Conference on Computational Science and Engineering (CSE09), Miami, FL, March, 2009.
11. (Invited talk) AMS Joint Mathematics Meeting, Washington D. C., Jan, 2009.
10. International conference of Rheology, Monterey, CA, Aug. 2008.
9. (Contributed talk and Chair of the Contributed Session) SIAM Annual Meeting, San Diego, CA, July, 2008.
8. SIAM Conference on Mathematical Aspects of Materials Science, Philadelphia, PA, May, 2008.
7. (Invited talk) NSF workshop on Ferroelectric phenomena in soft matter systems, American institute of mathematics, Palo Alto, CA, May, 2008.
6. (Invited talk) SIAM Southeastern-Atlantic Section Conference, Orlando, FL, March, 2008.
5. (Invited seminar) Computing Research Institute Seminar, Purdue University, April, 2005.
4. (Invited talk) Ferroelectric phenomena in liquid crystals workshop, Liquid Crystal Institute and Department of Mathematical Sciences, Kent State University, June 2007.
3. (Invited talk) John H. Barrett Memorial Lectures, University of Tennessee, April, 2007.
2. Workshop on Mathematics of Materials and Macromolecules: Multiple Scales, Disorder, and Singularities, University of Minnesota, September 20, 2004-Sep. 24, 2004.
1. International Conference on Spectral and High Order Methods, Brown University, Providence, RI. June 21, 2004- June 25, 2004.

**Teaching**                      **At USC**                      Semester(# of Enrollments) & Students Evaluation score/5

- Math344 Applied Linear Algebra (Spr, 2017(41) & —/5)
- Math142 Calculus II (Spr, 2017(62) & —/5)
- Math708 Computational Mathematics I (Fall, 2016(4) & 4.75/5)
- Math242 Ordinary Differential Equations (Fall, 2016(41) & 4.80/5)
- Math514 Financial Mathematics. (Fall, 2015(30) & 4.00/5)
- Math242 Ordinary Differential Equations (Fall, 2015(50) & 4.56/5)
- Math526 Numerical Linear Algebra (Spr, 2015(55) & 4.79/5 & 4.52/5)
- Math 526 Numerical Linear Algebra (Fall, 2014(50) & 4.60/5)
- Math 142 Calculus II (Fall, 2014(55) & 4.35/5)
- Math 526 Numerical Linear Algebra (Spr, 2014(40) & 4.74/5)
- Math 526 Numerical Linear Algebra (Fall, 2013(50) & 4.34/5)
- Math 141 Calculus I (Honored class) (Fall, 2013(20) & 3.66/5)
- Math 526 Numerical Linear Algebra (Spr,2013(52) & 4.80/5)
- Math141 Calculus I (Fall, 2012(62) & 4.19/5)

- Math 514 Financial Mathematics (Fall,2012(25) & 4.13/5)
- Math 709 Computational Mathematics II (Spr,2012(4) & 4.93/5)
- Math 141 Calculus I (Spr, 2012(60) & 4.49/5 & 4.53/5)
- Math 141 Calculus I (Fall, 2011(54) & 4.31/5)
- Math 514 Financial Mathematics (Fall, 2011(25) & 3.93/5)
- Math 242 Ordinary Differential Equations (Spr, 2011(11) & 4.57/5)
- Math 521 Partial Differential Equation (Spr, 2011(7) & 5.00/5)
- Math 142 Calculus II (Fall, 2010(44) & 4.15/5 & 4.02/5)
- Math 526 Numerical Linear Algebra (Fall, 2010(27) & 4.31/5)
- Math 242 Ordinary Differential Equations (Spr, 2010(35) & 3.67/5)
- Math 242 Ordinary Differential Equations (Spr, 2010(36) & 3.06/5)
- Math 241 Vector Calculus (Fall, 2009(48) & 3.94/5)

### UNC-CH

- Math 528 Mathematical Methods/Physics (Fall, 2008, Co-lecturer)
- Math 566 Numerical Analysis (Fall, 2008(20) & 4.0/5)
- Math 232 Calculus II (Spr, 2008(35) & 3.6/5)

### Purdue

- Math 175 Calculus I (Fall, 2006, Recitation Instructor)
- Math 266 Ordinary Differential Equations (Fall 2003,Recitation Instructor)
- Math 261 Multivariate Calculus (Spr, 2003, Recitation Instructor)

### Synergistic Activities

#### Graduate and Undergraduate students

- As thesis advisor for Alex Brylev (Ph.D. student of USC, graduated on Aug 2016): now employed in Tcube solutions (insurance company)
- Advised a master student at USC (Bethany Wentzky)
- Advised an undergraduate student (Nathan Mack) of Voorhees college (HBCU) for SC EPSCOR Biofabrication Project;
- Committee of Ph.D. Defense (Paisa Seeluangsawat, Jia Zhao); Committee of Master student thesis (Xiaodi Deng).

#### Applied and Computational Mathematics Seminar Organizer of Math Department, USC

- Organizing the weekly Applied and Computational Mathematics (ACM) seminar at Department of Mathematics of USC.

#### Minisymposium Organizer of Conferences

- Organizing various workshops and minisymposium on soft matter and complex fluids at National and International conferences and workshops. (See the details in the section “attended conferences”).

#### Editor for Journals

- Guest Editor of a special issue on computational and theoretical modeling of complex fluids/soft matter for: *Discrete and Continuous Dynamical Systems-Series B*, Mar, 2011.
- Guest Editor invited by the second president for a special issue on third annual meeting on SIAM central states session for: *J. Computational and Applied Mathematics*, April, 2017.

#### **Referee for Proposals**

- Reviewer for DOD-ARO proposal.

#### **Referee for Professional Journals** (*around 70s papers for peer reviewed journals since 2008; (#) means quantities*)

- AIMS Proceedings (1); Applied Mathematics and Computation (2); Applied Mathematical Letter (1); Applied Math Modeling (1); Communications in Computational Physics (6); Computers & Mathematics with Applications (1); Computers & Fluids (1); Communications in Mathematical Sciences (1); Computer Methods in Applied Mechanics and Engineering (2); Computer Physics Communication (1); Discrete and Continuous Dynamical systems- B (1); Engineering Applications of Computational Fluid Mechanics (1); International Journal of Computational Methods (2); Journal of Asymptotic Analysis (1); Journal of Computational Physics (14); Journal of Scientific Computing (3); Mathematics of Computations (2); Korean Journal of Mathematics (1); Mathematical Methods in the Applied Sciences (8); Numerische Mathematik (1); Numerical Mathematics: Theory, Methods and Applications (1); Physics A (1); Physics of Fluids (1); SIAM Journal of Scientific Computing (5); SIAM Journal on Numerical Analysis (2); SIAM Journal on Applied Mathematics (1).

#### **Committee For University Services**

##### **2012-2015**

- Faculty Senator

#### **For Department**

##### **2016-2017**

- Computer Committee
- Events Committee:
- Graduate Advisory Council
- High School Mathematics Contest Committee
- Peer Review of Teaching Committees
- SIAM Faculty Advisor
- Qualify Exam Committee

##### **2015-2016**

- High School Mathematics Contest Committee
- Peer Review of Teaching Committees

- SIAM Faculty Advisor:
- Graduate Advisory Council

**2014-2015**

- Computer Committee
- High School Mathematics Contest Committee
- Undergraduate Advisors

**2013-2014**

- Applied and Computational Math Committee
- Computer Committee (chair)
- Hiring Committee
- SIAM Faculty Advisor
- Undergraduate Advisors

**2012-2013**

- Applied and Computational Math Committee
- Computer Committee
- Events Committee
- Hiring Committee
- SIAM Faculty Advisor
- Undergraduate Advisors

**2011-2012**

- Applied and Computational Math Committee
- Computer Committee
- Events Committee
- SIAM Faculty Advisor
- Undergraduate Advisors

**2010-2011**

- Actuarial and Financial Mathematics Committee:
- Applied and Computational Math Committee
- Computer Committee
- Events Committee
- IIME advisors
- Undergraduate Advisors
- Undergraduate Advisory Council

**2009-2010**

- Applied and Computational Math Committee
- Computer Committee
- Events Committee
- High School Mathematics Contest Committee
- Undergraduate Advisors:

## Other Services At USC

- Judge for the SC High School Mathematics Contest, Feb, 2015;
- Volunteer for the Center of Economic Excellence (COEE) chair professor search, Apr-May, 2012;
- Volunteer for the Practice AP Calculus Exam of USC, Apr. 2012;
- Judge for the second Science Fair at Voorhees College, SC, Apr, 2012;
- Judge for the SC High School Mathematics Contest, Jan, 2012;
- Reference letters written for students: 5 undergraduate students, 2010-2012; 1 master student of USC, 2012;

## Outside USC

- Committee member for thesis defense: 1 Ph.D students at Beijing Normal University of China, 2015; 1 master student at CAS institute of Software of China, 2015; chair for 1 Ph.D. student at Beijing normal University, China, (Rui Chen), 2015; chair for 1 master student at Beijing normal University, China, (Xiao Li), 2015; 1 Ph.D student at Nankai University of China May, 2014 (Xiaogang Yang); 1 Ph. D student at Xiamen University, China (Lizhen Chen), 2011; 4 master students at University of Science and Technology of China, 2010.
- Reference letter for scholars: 1 Ph. D. of Missouri University of Science & Technology, 2017; 1 Postdoc of UNC-CH, 2016; 1 Ph.D. of Nankai University, 2014.