Xiaoming He
Curriculum Vitae

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Education

- Ph.D. in Mathematics; Virginia Tech (08/05—05/09).
  Advisor: Prof. Tao Lin.

- M. S. in Mathematics; Virginia Tech (08/05—05/07).
  Advisor: Prof. Tao Lin.

- M. S. in Computational Mathematics; Sichuan University (08/02—06/05).
  Advisor: Prof. Tao Lü.

- B. S. in Computational Mathematics; Sichuan University (08/98—06/02).
  Thesis Advisor: Prof. Xiaoping Xie.

Positions

- Professor; Department of Mathematics and Statistics, Missouri University of Science and Technology (09/21–present).

- Faculty Fellow; Office of Vice Chancellor of Research and Innovation, Missouri University of Science and Technology (07/21–present).

- Associate Professor; Department of Mathematics and Statistics, Missouri University of Science and Technology (09/16–08/21).

- Assistant Professor; Department of Mathematics and Statistics, Missouri University of Science and Technology (09/10–08/16).

- Postdoctoral research associate (supervised by Prof. Max Gunzburger); Department of Scientific Computing, Florida State University (05/09—08/10).

Research Interests

- Interface problems, multi-phase problems, computational fluid dynamics, computational plasma physic, data assimilation, stochastic PDEs, boundary integral equations, feedback control

- Finite element methods, domain decomposition methods, lattice Boltzmann methods, extrapolations

Awards and Fellowships

- Faculty Research Award, Missouri University of Science and Technology, 2023.

- Faculty Excellence Award, Missouri University of Science and Technology, 2022.

- Faculty Innovative Teaching Award, College of Arts, Sciences, and Business, Missouri University of Science and Technology, 2022.

- Faculty Research Award, Missouri University of Science and Technology, 2019.

- Affordable and Open Educational Resources Initiative Award, University of Missouri System, 2019.

- Humboldt Research Fellowship for Experienced Researchers, Alexander von Humboldt Foundation (visiting Friedrich-Alexander University Erlangen-Nürnberg), 2018.

- Faculty Research Award, Missouri University of Science and Technology, 2014.

Funding

- National Science Foundation, DMS-2309733, "Collaborative Research: Models, algorithms, simulations and applications for dendritic solidifications of two-phase multi-component alloys in the mushy zone", August 2023 - July 2026, Xiaoming He (PI), total amount for Missouri University of Science and Technology: $157,956, shared credit 100%. (The collaborative NSF grants for this collaborative research: DMS-2309731, Xiaofeng Yang (PI), University of South Carolina (leading institute of this collaborative research); DMS-2309732, Pengtao Yue (PI), Virginia Tech)

- National Science Foundation, DMS-2152609, "Collaborative Research: Laboratory data enabled phase field modeling and data assimilation for coupled two-phase fluid flow and porous media flow", August 2022 - July 2025, Xiaoming He (PI) and Baojun Bai (Co-PI), total amount for Missouri University of Science and Technology (leading institute of this collaborative research): $160,000, shared credit 70%. (The collaborative NSF grant for this collaborative research: DMS-2152623, Leo Rebholz (PI), Clemson University)

- National Science Foundation, DMS-2111039, "Collaborative Research: Lab-data-enabled modeling, numerical methods, and validation for a three-dimensional interface inverse problem for plasma-material interactions", August 2021 - July 2024, Daoru Han (PI) and Xiaoming He (co-PI), total amount for Missouri University of Science and Technology: $169,156, shared credit 30%. (The collaborative NSF grant for this collaborative research: DMS-2110833, Xu Zhang (PI), Oklahoma State University (leading institute of this collaborative research))

- National Science Foundation, DMS-1818642, "Collaborative Research: Models, algorithms, simulations, and applications for two-phase ferrofluid flows in contact with a solid surface", August 2018 - July 2022, Xiaoming He (PI) and Cheng Wang (Co-PI), total amount for Missouri University of Science and Technology (leading institute of this collaborative research): $160,000, shared credit 70%. (The collaborative NSF grant for this collaborative research: DMS-1818783, Xiaofeng Yang (PI), University of South Carolina)

- National Science Foundation, DMS-1722647, "Collaborative Research: Data-enabled modeling, numerical method, and data assimilation for coupling dual porosity flow with free flow", August 2017 - July 2021, Xiaoming He (PI), Baojun Bai (Co-PI), and Mingzhen Wei (Co-PI), total amount for Missouri University of Science and Technology (leading institute of this collaborative research): $180,000$, shared credit 70%. (The collaborative NSF grant for this collaborative research: DMS-1722692, Craig Douglas (PI), University of Wyoming)

- National Science Foundation, DMS-1418624, "Non-Iterative Multi-Physics Domain Decomposition Method for the Navier-Stokes-Darcy Model", September 2014 - August 2017, Xiaoming He (PI) and Mingzhen Wei (Co-PI), total amount: $95,500$, shared credit 80%.

- Department of Energy, DE-FE0009843, "Robust Ceramic Coaxial Cable Down-Hole Sensors for Long-Term in Situ Monitoring of Geologic CO_2 Injection and Storage", October 2012 - June 2016, Runar Nygaard (PI), Hai Xiao (Co-PI), and Xiaoming He (Co-PI), total amount: $1,447,193$, sponsor amount: $1,156,668$, shared credit 30%.

- National Science Foundation, DMS-2023264, "Midwest Numerical Analysis Day 2020", April 2020 - March 2022, Xiaoming He (PI) and Jue Yan (Co-PI), total amount: $5,000$.

- NASA-EPSCoR, "PIFE-PIC: A 3D Parallel Immersed-Finite-Element Particle-in-Cell Framework for Kinetic Modeling of Plasma-Material Interaction", Daoru Han (PI) and Xiaoming He (Co-PI), October 2017 - September 2018, total amount: $20,000$, shared credit 50%.

- Simons Foundation, Collaboration Grant for Mathematicians, "Numerical Methods and Mathematical Analysis for Interface Problems", September 2014 - August 2019, Xiaoming He (PI), total amount: $35,000$. (This grant needs to be returned to Simons Foundation before September 2015 since the PI is funded by NSF)

- Department of Transportation, "NUTC/Reliability-based Optimization Design of Geosynthetic Reinforced Road Embankment", May 2013 - December 2013, Ronaldo Luna (PI) and Xiaoming He (Co-PI), total amount: $16,052$, shared credit 50%.

- AMS-Simons Travel Grant, July 2012 - June 2014, Xiaoming He (PI), total amount: $4,800$.

- Missouri University of Science and Technology, High Performance Computing Center Seed Grant, December 2023 - June 2024, Xiaoming He (PI), total amount: $2,000$.

- Missouri University of Science and Technology, The Provost's eFellows Grant, "Blended lectures (pre-recorded) and guided coding (in classroom) for Math 5602 (Mathematical Foundation of Finite Element Methods)", August 2022 - July 2023, Xiaoming He (PI), total amount: $10,000$.

- Missouri University of Science and Technology, Educational Research Mini-Grant, "The conceptualized and interactive guided coding for Math 5601 (Introduction to Numerical Analysis)", August 2021 - July 2022, Xiaoming He (PI), total amount: $2,500$.

- University of Missouri System, Course Sharing Grant, "Finite Element Methods II", June 2018 - May 2019, Xiaoming He (PI), total amount: $9,731$.

- Missouri Research Board Grant, "Coupling dual porosity flow with free flow: modeling, numerical method, and data assimilation", Xiaoming He (PI), January 2017 - January 2018, total amount: $11,200$.

- Missouri Interdisciplinary Intercampus Research Grant, "Development and Application of a Hybrid Material Point and Immersed Finite Element Method (MPM-IFE) to Soil-Water Flow Modeling Considering Hydrophobicity", Zhiqiang Chen (PI for UMKC), Xiaoming He (PI for Missouri S&T), August 2015 - July 2016, total amount: $59,399, amount for Missouri S&T: $25,000.

- Missouri Research Board Grant, "Novel Numerical Methods for a Moving Interface Problem", Xiaoming He (PI), August 2014 - July 2015, total amount: $10,000.

- Missouri University of Science and Technology, Educational Research Mini-Grant, "Development of a conceptualized guided coding for the course of Mathematical Foundation of Finite Element Methods", June 2014 - May 2015, Xiaoming He (PI), total amount: $4,732.

- University of Missouri System, Course Sharing Grant, "Mathematical Foundation of Finite Element Methods", June 2014 - May 2015, Xiaoming He (PI), total amount: $7,769.

- Missouri Research Board Grant, "Parallel Numerical Methods for Realistic Coupled Stokes-Darcy Model", Xiaoming He (PI), January 2011 - January 2012, total amount: $13,000.

Editorship

- Managing editor, International Journal of Numerical Analysis & Modeling, 2022-present.

- Editorial board, Electronic Research Archive, 2023-present.

- Editorial board, Numerical Methods for Partial Differential Equations, 2022-present.

- Associate editor, International Journal of Numerical Analysis & Modeling, 2016-2021.

- Associate editor, International Journal of Numerical Analysis & Modeling, Series B, 2013-2015.

- Guest editor, the special issue of **Electronic Research Archive** on recent advances in numerical analysis.

- Guest editor, the special issue of **Electronic Research Archive** on PDEs in fluid flow problems.

- Guest editor, the special issue of **Applied Numerical Mathematics** for the 20th IMACS World Congress.

- Guest editor, the special issue of **Discrete and Continuous Dynamical Systems - Series B** for SIAM Central States Section.

- Managing guest editor, the special issue of **Computers and Mathematics with Applications** for the 2nd Annual Meeting of SIAM Central States Section.

- Managing guest editor, the special issue of **Journal of Computational and Applied Mathematics** for the 1st Annual Meeting of SIAM Central States Section.

- Guest editor, the special issue of **International Journal of Numerical Analysis and Modeling** for 2013 International Conference on Engineering and Computational Mathematics.

Graduate Students

- Xuejian Li, Ph.D., graduated in 2022;
  Dissertation title: Variational data assimilation for two interface problems

- Changxin Qiu, Ph.D., graduated in 2019;
  Dissertation title: Decoupling methods for the time-dependent Navier-Stokes-Darcy interface model

- Lioba Bovenoth, M.S., graduated in 2020;
  Thesis title: Decoupled finite element methods for general steady two-dimensional Boussinesq equations

- Wenqiang Feng, M.S., graduated in 2013;
  Thesis title: Immersed finite element method for interface problems with algebraic multigrid solver

- Yafang Hei, Ph.D., 2023-current

- Lin Du, Ph.D., 2022-current

- Guy Brawley, Ph.D., 2022-current

- Lucas Delibas, Ph.D., 2020-current

- Youxin Yuan, Ph.D., 2020-current

- Mahdi Gharehbaygloo, Ph.D., 2019-current

Journal Publications

1. Guodong Zhang, Xiaoming He, and Xiaofeng Yang. A unified framework of the SAV-ZEC method for a mass-conserved Allen-Cahn type two-phase ferrofluid flow model, ***SIAM Journal on Scientific Computing***, accepted for publication.

2. Siyu Wu, Jinwei Bai, Xiaoming He, Ren Zhao, and Yong Cao. An immersed selective discontinuous Galerkin method in particle-in-cell simulation with adaptive Cartesian mesh and polynomial preserving recovery, ***Journal of Computational Physics***, accepted for publication.

3. Xuejian Li, Xiaoming He, Wei Gong, and Craig Douglas. Variational data assimilation with finite element discretization for second order parabolic interface equation, ***IMA Journal of Numerical Analysis***, accepted for publication.

4. Xuejian Li, Wei Gong, Xiaoming He, and Tao Lin. Variational data assimilation and its decoupled iterative numerical algorithms for Stokes-Darcy model, ***SIAM Journal on Scientific Computing***, doi: 10.1137/22M1492994.

5. Chunjie Zhang, Changxin Qiu, Xiaofang Zhou, and Xiaoming He. Cell-average based neural network method for Hunter-Saxton equations, ***Advances in Applied Mathematics and Mechanics***, doi: 10.4208/aamm.OA-2022-0278.

6. Yali Gao, Rui Li, Xiaoming He, and Yanping Lin. A fully decoupled numerical method for Cahn-Hilliard-Navier-Stokes-Darcy equations based on auxiliary variable approaches, ***Journal of Computational and Applied Mathematics***, 436: #115363, 2024.

7. Yajie Han, Guangqing Xia, Chang Lu, Xiaoming He. Trilinear immersed finite element method for 3D anisotropic interface problems with applications to plasma thrusters, ***AIAA Journal***, 61(10): 4267-4284, 2023.

8. David Lund, Xiaoming He, and Daoru Han. Kinetic particle simulations of plasma charging at lunar craters under severe conditions, ***Journal of Spacecraft and Rockets***, 60(4): 1176-1187, 2023.

9. Guodong Zhang, Xiaoming He, and Xiaofeng Yang. Reformulated weak formulation and efficient fully-discrete finite element method for a two-phase ferrohydrodynamics Shliomis model, ***SIAM Journal on Scientific Computing***, 45(3): B253-B282, 2023.

10. Yali Gao, Xiaoming He, Tao Lin, and Yanping Lin. Fully decoupled energy-stable numerical schemes for two-phase coupled porous media and free flow with different densities and viscosities, ***ESAIM: Mathematical Modelling and Numerical Analysis***, 57(3): 1323-1354, 2023.

11. Jiangyong Hou, Dan Hu, Xuejian Li, and Xiaoming He. Modeling and a domain decomposition method with finite element discretization for coupled Dual-Porosity flow and Navier-Stokes flow, ***Journal of Scientific Computing***, 95: #67, 2023.

12. Qianqian Ding, Xiaoming He, Xiaonian Long, and Shipeng Mao. Error analysis of a fully discrete projection method for magnetohydrodynamic system, ***Numerical Methods for Partial Differential Equations***, 39(2): 1449-1477, 2023.

13. Yuanyuan Hou, Wenjing Yan, Lioba Boveleth, and Xiaoming He. A decoupled, parallel, iterative finite element method for solving the steady Boussinesq equations, ***International Journal of Numerical Analysis and Modeling***, 19(6): 739-760, 2022.

14. David Lund, Xiaoming He, Xu Zhang, and Daoru Han. Weak scaling of the parallel immersed finite element particle-in-cell (PIFE-PIC) framework with lunar plasma charging simulations, ***Computational Particle Mechanics***, 9: 12791291, 2022.

15. Jianxun Zhao, Xiaoming He, Guirong Yan, and Daoru Han. Kinetic particle simulations of plasma and dust environments at robotic construction sites near the lunar terminator, ***Journal of Aerospace Engineering***, 35(6): #04022095, 2022.

16. Yali Gao, Xiaoming He, and Yufeng Nie. Second-order, fully decoupled, linearized, and unconditionally stable SAV schemes for Cahn-Hilliard-Darcy system, ***Numerical Methods for Partial Differential Equations***, 38(6): 1658-1683, 2022.

17. Xiaofeng Yang and Xiaoming He. Numerical approximations of flow coupled binary phase field crystal system: fully discrete finite element scheme with second-order temporal accuracy and decoupling structure, ***Journal of Computational Physics***, 467: #111448, 2022.

18. Yingzhi Liu, Yassine Boubendir, Xiaoming He, and Yinnian He. New optimized Robin-Robin domain decomposition methods using Krylov solvers for the Stokes-Darcy system, ***SIAM Journal on Scientific Computing***, 44(4): B1068-B1095, 2022.

19. Junchen Liu, Yandong Zhang, Mingzhen Wei, Xiaoming He, and Baojun Bai. Fabrications and applications of micro/nanofluidics in oil and gas recovery: a comprehensive review, ***Energy & Fuels***, 36: 9904-9931, 2022.

20. Yuanyuan Hou, Wenjing Yan, Maojun Li, and Xiaoming He. A decoupled and iterative finite element method for generalized Boussinesq equations, **Computers and Mathematics with Applications**, 115: 14-25, 2022.

21. Zhipeng Yang, Xuejian Li, Xiaoming He, and Ju Ming. A stochastic collocation method based on sparse grid for a stochastic Stokes-Darcy model, **Discrete and Continuous Dynamical Systems - Series S**, 15(4): 893-912, 2022.

22. Yali Gao, Daozhi Han, Xiaoming He, and Ulrich Rüde. Unconditionally stable numerical methods for Cahn-Hilliard-Navier-Stokes-Darcy system with different densities and viscosities, **Journal of Computational Physics**, 454: #110968, 2022.

23. Zhipeng Yang, Ju Ming, Changxin Qiu, Maojun Li, and Xiaoming He. A multigrid multilevel Monte Carlo method for Stokes-Darcy model with random hydraulic conductivity and Beavers-Joseph condition, **Journal of Scientific Computing**, 90(2): #68, 2022.

24. Xiaofeng Yang and Xiaoming He. A fully-discrete decoupled finite element method for the conserved Allen-Cahn type phase-field model of three-phase fluid flow system, **Computer Methods in Applied Mechanics and Engineering**, 389: #114376, 2022.

25. Jiangyong Hou, Dan Hu, Xiaoming He, and Changxin Qiu. Modeling and a Robin-type decoupled finite element method for dual-porosity-Navier-Stokes system with application to flows around multistage fractured horizontal wellbore, **Computer Methods in Applied Mechanics and Engineering**, 388: #114248, 2022.

26. Guodong Zhang, Xiaoming He, and Xiaofeng Yang. A fully decoupled linearized finite element method with second-order temporal accuracy and unconditional energy stability for incompressible MHD equations, **Journal of Computational Physics**, 448: #110752, 2022.

27. Yandong Zhang, Jiaming Geng, Junchen Liu, Baojun Bai, Xiaoming He, Mingzhen Wei, and Wen Deng. Direct pore-level visualization and verification of in-situ oil-in-water pickering emulsification during polymeric nanogel flooding for EOR in a transparent three-dimensional micromodel, **Langmuir**, 37: 13353-13364, 2021.

28. Yijia Gu, Xiaoming He, and Daozhi Han, On the phase-field modeling of rapid solidification, **Computational Materials Science**, 199: #110812, 2021.

29. Jianxun Zhao, Xinpeng Wei, Xiaoping Du, Xiaoming He, and Daoru Han. Photoelectron sheath and plasma charging on the lunar surface: semi-analytic solutions and fully-kinetic particle-in-cell simulations, **IEEE Transactions on Plasma Science**, 49(10): 3036-3050, 2021.

30. Daozhi Han, Xiaomin He, Quan Wang, and Yanyun Wu. Existence and weak-strong uniqueness of solutions to the Cahn-Hilliard-Navier-Stokes-Darcy system in superposed free flow and porous media, **Nonlinear Analysis**, 211: #112411, 2021.

31. Yingzhi Liu, Yinnian He, Xuejian Li, and Xiaoming He. A novel convergence analysis of Robin-Robin domain decomposition method for Stokes-Darcy system with Beavers-Joseph interface condition, **Applied Mathematics Letters**, 119: #107181, 2021.

32. Hongyan Liu, Jin Huang, and Xiaoming He. Bivariate barycentric rational interpolation method for two dimensional fractional Volterra integral equations, **Journal of Computational and Applied Mathematics**, 389: #113339, 2021.

33. Daoru Han, Xiaoming He, David Lund, and Xu Zhang. PIFE-PIC: Parallel immersed-finite-element particle-in-cell for 3-D kinetic simulations of plasma-material interactions, *SIAM Journal on Scientific Computing*, 43(3): C235-C257, 2021.

34. Jinwei Bai, Yong Cao, Xiaoming He, and Peng E. An implicit particle-in-cell model based on anisotropic immersed-finite-element method, *Computer Physics Communications*, 261: #107655, 2021.

35. Xinpeng Wei, Jianxun Zhao, Xiaoming He, Zhen Hu, Xiaoping Du, and Daoru Han. Adaptive Kriging method for uncertainty quantification of the photoelectron sheath and dust levitation on the lunar surface, *Journal of Verification, Validation and Uncertainty Quantification*, 6(1): #011006, 2021.

36. Guodong Zhang, Xiaoming He, and Xiaofeng Yang. Decoupled, linear, and unconditionally energy stable fully-discrete finite element numerical scheme for a two-phase ferrohydrodynamics model, *SIAM Journal on Scientific Computing*, 43(1): B167-B193, 2021.

37. Chang Lu, Jie Wan, Yong Cao, and Xiaoming He. A fully decoupled iterative method with three-dimensional anisotropic immersed finite elements for Kaufman-type discharge problems, *Computer Methods in Applied Mechanics and Engineering*, 372: #113345, 2020.

38. Yanan Xing, Lina Song, Xiaoming He, and Changxin Qiu. A generalized finite difference method for solving elliptic interface problems, *Mathematics and Computers in Simulation*, 178: 109-124, 2020.

39. Hongtao Liu, Feng Shi, Jie Wan, Xiaoming He, and Yong Cao. Discrete unified gas kinetic scheme for a reformulated BGK-Vlasov-Poisson system with a wide range of Knudsen number and normalized Debye length, *Computer Physics Communications*, 255: #107400, 2020.

40. Md. Abdullah Al Mahbub, Xiaoming He, Nasrin Jahan Nasu, Changxin Qiu, Yifan Wang, and Haibiao Zheng. A coupled multi-physics model and a decoupled stabilized finite element method for closed-loop geothermal system, *SIAM Journal on Scientific Computing*, 42(4): B951-B982, 2020.

41. Changxin Qiu, Xiaoming He, Jian Li, and Yanping Lin. A domain decomposition method with Lagrange multipliers and implicit schemes for the time-dependent Navier-Stokes-Darcy model with defective boundary condition, *Journal of Computational Physics*, 411: #109400, 2020.

42. Feng Bai, Daozhi Han, Xiaoming He, and Xiaofeng Yang. Deformation and coalescence of ferrodroplets in Rosensweig model using the phase field and modified level set approaches under uniform magnetic fields, *Communications in Nonlinear Science and Numerical Simulation*, 85: #105213, 2020.

43. Chang Lu, Zhi Yang, Jinwei Bai, Yong Cao, and Xiaoming He. Three-dimensional immersed finite element method for anisotropic magnetostatic/electrostatic interface problems with non-homogeneous flux jump, *International Journal for Numerical Methods in Engineering*, 121(10): 2107-2127, 2020.

44. Guodong Zhang, Xiaoming He, and Xiaofeng Yang. Fully decoupled, linear and unconditionally energy stable time discretization scheme for solving the magneto-hydrodynamic equations, *Journal of Computational and Applied Mathematics*, 369: #112636, 2020.

45. Rui Li, Yali Gao, Jie Chen, Li Zhang, Xiaoming He, and Zhangxin Chen. Discontinuous finite volume element method for a coupled Navier-Stokes-Cahn-Hilliard phase field model, *Advances in Computational Mathematics*, 46: #25, 2020.

46. Xiaoming He, Nan Jiang, and Changxin Qiu, An artificial compressibility ensemble algorithm for a stochastic Stokes-Darcy model with random hydraulic conductivity and interface conditions, *International Journal for Numerical Methods in Engineering*, 121(4): 712-739, 2020.

47. Yandong Zhang, Chuanle Zhou, Chuang Qu, Mingzhen Wei, Xiaoming He, and Baojun Bai. Fabrication and verification of a glass-silicon-glass micro-/nanofluidic model for investigating multi-phase flow in shale-like unconventional dual-porosity tight porous media, *Lab on a Chip*, 19: 4071-4082, 2019.

48. Jin Lu, Botao Zhou, Md. Motiur Rahman, and Xiaoming He. New solution to the pressure transient equation in a two-layer reservoir with crossflow, *Journal of Computational and Applied Mathematics*, 362: 680-693, 2019.

49. Fubiao Lin, Xiaoming He, and Xiaoxia Wen. Fast, unconditionally energy stable large time stepping method for a new Allen-Cahn type square phase-field crystal model, *Applied Mathematics Letters*, 98: 248-255, 2019.

50. Jinjin Yang, Shipeng Mao, Xiaoming He, Xiaofeng Yang, and Yinnian He. A diffuse interface model and semi-implicit energy stable finite element method for two-phase magnetohydrodynamics flows, *Computer Methods in Applied Mechanics and Engineering*, 356: 435-464, 2019.

51. Guodong Zhang, Xiaoming He, and Xiaofeng Yang. A fully decoupled, linear and unconditionally energy stable scheme with finite element discretization for magneto-hydrodynamic equations, *Journal of Scientific Computing*, 81: 16781711, 2019.

52. Md. Abdullah Al Mahbub, Xiaoming He, Nasrin Jahan Nasu, Changxin Qiu, and Haibiao Zheng. Coupled and decoupled stabilized mixed finite element methods for non-stationary dual-porosity-Stokes fluid flow model, *International Journal for Numerical Methods in Engineering*, 120(6): 803-833, 2019.

53. Chen Xu, Chuanjun Chen, Xiaofeng Yang, and Xiaoming He. Numerical approximations for the hydrodynamics coupled binary surfactant phase field model: second order, linear, unconditionally energy stable schemes, *Communications in Mathematical Sciences*, 17(3): 835-858, 2019.

54. Xiaofeng Yang, Guodong Zhang, and Xiaoming He. Convergence analysis of an unconditionally energy stable projection scheme for magneto-hydrodynamic equations, *Applied Numerical Mathematics*, 136: 235-256, 2019.

55. Xiaofeng Yang, Jia Zhao, and Xiaoming He. Linear, second order and unconditionally energy stable schemes for the viscous Cahn-Hilliard equation with hyperbolic relaxation using

the invariant energy quadratization method, ***Journal of Computational and Applied Mathematics***, 343(1):80-97, 2018.

56. Rui Li, Jian Li, Xiaoming He, and Zhangxin Chen. A stabilized finite volume element method for a coupled Stokes-Darcy problem, ***Applied Numerical Mathematics***, 133: 2-24, 2018.

57. Jinwei Bai, Yong Cao, Xiaoming He, Hongyan Liu, and Xiaofeng Yang. Modeling and an immersed finite element method for an interface wave equation, ***Computers and Mathematics with Applications***, 76(7): 1625-1638, 2018.

58. Xiaoming He, Weiwei Hu, and Yangwen Zhang. Observer based feedback boundary stabilization of the Navier-Stokes equation, ***Computer Methods in Applied Mechanics and Engineering***, 339(1): 542-556, 2018.

59. Qiumei Huang, Xiaofeng Yang and Xiaoming He. Numerical approximations for a smectic-A liquid crystal flow model: first-order, linear, decoupled and energy schemes, ***Discrete and Continuous Dynamical Systems - Series B***, 23(6): 2177-2192, 2018.

60. Daoru Han, Joseph Wang, and Xiaoming He. Immersed-finite-element particle-in-cell simulations of plasma charging at lunar terminator, ***Journal of Spacecraft and Rockets***, 55(6): 1490-1497, 2018.

61. Huijun Cao, Yong Cao, Yuchuan Chu, Xiaoming He, and Tao Lin. A Huygens immersed-finite-element particle-in-cell method for modeling plasma-surface interactions with moving interface, ***Communications in Nonlinear Science and Numerical Simulation***, 59: 132-148, 2018.

62. Max Gunzburger, Xiaoming He, and Buyang Li. On Ritz projection and multi-step backward differentiation schemes in decoupling the Stokes-Darcy model, ***SIAM Journal on Numerical Analysis***, 56(1): 397-427, 2018.

63. Yali Gao, Xiaoming He, Liquan Mei, and Xiaofeng Yang. Decoupled, linear, and energy stable finite element method for the Cahn-Hilliard-Navier-Stokes-Darcy phase field model, ***SIAM Journal on Scientific Computing***, 40(1): B110-B137, 2018.

64. Feng Bai, Xiaoming He, Xiaofeng Yang, Ran Zhou, and Cheng Wang. Three dimensional phase-field investigation of droplet formation in microfluidic flow focusing devices with experimental validation, ***International Journal of Multiphase Flow***, 93: 130-141, 2017.

65. Yuchuan Chu, Daoru Han, Yong Cao, Xiaoming He, and Joseph Wang. An immersed-finite-element particle-in-cell simulation tool for plasma surface interaction, ***International Journal of Numerical Analysis and Modeling***, 14(2): 175-200, 2017.

66. Jiangyong Hou, Meilan Qiu, Xiaoming He, Chaohua Guo, Mingzhen Wei, and Baojun Bai. A dual-porosity-Stokes model and finite element method for coupling dual-porosity flow and free flow, ***SIAM Journal on Scientific Computing***, 38(5): B710-B739, 2016.

67. Daoru Han, Pu Wang, Xiaoming He, Tao Lin, and Joseph Wang. A 3D immersed finite element method with non-homogeneous interface flux jump for applications in particle-in-cell simulations of plasma-lunar surface interactions, ***Journal of Computational Physics***, 321: 965-980, 2016.

68. Daoru Han, Joseph Wang, and Xiaoming He. A non-Homogeneous immersed-finite-element particle-in-cell method for modeling dielectric surface charging in plasmas, *IEEE Transactions on Plasma Science*, 44(8): 1326-1332, 2016.

69. John A. Burns, Xiaoming He, and Weiwei Hu. Feedback stabilization of a thermal fluid system with mixed boundary control, *in honor of Max Gunzburger's 70th birthday*, *Computers and Mathematics with Applications*, 71(11): 2170-2191, 2016.

70. Chong Chen, Xiaoming He, and Jin Huang. Mechanical quadrature methods and their extrapolations for solving the first kind boundary integral equations of Stokes equation, *Applied Numerical Mathematics*, 96: 165-179, 2015.

71. Xiaoming He, Jian Li, Yanping Lin, and Ju Ming. A domain decomposition method for the steady-state Navier-Stokes-Darcy model with Beavers-Joseph interface condition, *SIAM Journal on Scientific Computing*, 37(5): S264-S290, 2015.

72. Chaolang Hu, Xiaoming He, and Tao LLü. Euler-Maclaurin expansions and approximations of hypersingular integrals, *Discrete and Continuous Dynamical Systems - Series B*, 20(5): 1355-1375, 2015.

73. Honghua Jian, Yuchuan Chu, Huijun Cao, Yong Cao, and Xiaoming He. Three-dimensional IFE-PIC numerical simulation of background pressure's effect on accelerator grid impingement current for ion optics, *Vacuum*, 116: 130-138, 2015.

74. Yong Cao, Yuchuan Chu, Xiaoming He, and Tao Lin. An iterative immersed finite element method for an electric potential interface problem based on given surface electric quantity, *Journal of Computational Physics*, 281: 82-95, 2015.

75. Yanzhao Cao, Max Gunzburger, Xiaoming He, and Xiaoming Wang. Parallel, non-iterative, multi-physics domain decomposition methods for time-dependent Stokes-Darcy systems, *Mathematics of Computation*, 83(288): 1617-1644, 2014.

76. Chaolang Hu, Jing Lu, and Xiaoming He. Numerical solutions of a hypersingular integral equation with application to productivity formulae of horizontal wells producing at constant wellbore pressure, *International Journal of Numerical Analysis and Modeling-Series B*, 5(3): 269-288, 2014.

77. Xiaoming He, Tao Lin, and Yanping Lin. A selective immersed discontinuous Galerkin method for elliptic interface problems, *Mathematical Methods in the Applied Sciences*, 37(7): 983-1002, 2014.

78. Wenqiang Feng, Xiaoming He, Yanping Lin, and Xu Zhang. Immersed finite element method for interface problems with algebraic multigrid solver, *Communications in Computational Physics*, 15(4): 1045-1067, 2014.

79. Yong Cao, Yuchuan Chu, Xiaoming He, and Mingzhen Wei. Decoupling the stationary Navier-Stokes-Darcy system with the Beavers-Joseph-Saffman interface condition, *Abstract and Applied Analysis*, vol. 2013, Article ID 136483, 10 pages, 2013.

80. Xiaoming He, Tao Lin, Yanping Lin, and Xu Zhang. Immersed finite element methods for parabolic equations with moving interface, *Numerical Methods for Partial Differential Equations*, 29(2): 619-646, 2013.

81. Wenqiang Feng, Xiaoming He, Zhu Wang, and Xu Zhang. Non-iterative domain decomposition methods for a non-stationary Stokes-Darcy model with Beavers-Joseph interface condition, **Applied Mathematics and Computation**, 219(2): 453-463, 2012.

82. Chaolang Hu, Jing Lu, and Xiaoming He. Productivity formulae of an infinite-conductivity hydraulically fractured well producing at constant wellbore pressure based on numerical solutions of a weakly singular integral equation of the first kind, **Mathematical Problems in Engineering**, vol. 2012, Article ID 428596, 18 pages, 2012.

83. Xiaoming He, Tao Lin, and Yanping Lin. The convergence of the bilinear and linear immersed finite element solutions to interface problems, **Numerical Methods for Partial Differential Equations**, 28(1): 312-330, 2012.

84. Jin Huang, Guang Zeng, Xiaoming He, and Zicai Li. Splitting extrapolation algorithms for first kind boundary integral equations with singularities by mechanical quadrature methods, **Advances in Computational Mathematics**, 36(1): 79-97, 2012.

85. Yuchuan Chu, Yong Cao, Xiaoming He, and Min Luo. Asymptotic boundary conditions for two-dimensional electrostatic field problems with immersed finite elements, **Computer Physics Communications**, 182(11): 2331-2338, 2011.

86. Huilei Han, Xiaoming He, Yaping Liu, and Tao Lü. Extrapolation for solving system of weakly singular nonlinear Volterra integral equations of the second kind, **International Journal of Computer Mathematics**, 88(16): 3507-3520, 2011.

87. Yong Cao, Xiaoming He, and Tao Lü. An algorithm using finite volume element method and its splitting extrapolation for second-order elliptic problems, **Journal of Computational and Applied Mathematics**, 235(13): 3734-3742, 2011.

88. Xiaoming He, Tao Lin, and Yanping Lin. Immersed finite element methods for elliptic interface problems with non-homogeneous jump conditions, **International Journal of Numerical Analysis and Modeling**, 8(2): 284-301, 2011.

89. Yanzhao Cao, Max Gunzburger, Xiaoming He, and Xiaoming Wang. Robin-Robin domain decomposition methods for the steady-state Stokes-Darcy system with the Beaver-Joseph interface condition, **Numerische Mathematik**, 117(4): 601-629, 2011.

90. Xiaoming He, Tao Lin, and Yanping Lin. Interior penalty bilinear IFE discontinuous Galerkin methods for elliptic equations with discontinuous coefficient, *dedicated to Professor David Russell on the occasion of his 70th birthday*, **Journal of Systems Science and Complexity**, 23(3): 467-483, 2010.

91. Lu Pan, Xiaoming He, and Tao Lü. High accuracy combination methods for solving the systems of nonlinear Volterra integral and integro-differential equations with weakly singular kernels of the second kind, **Mathematical Problems in Engineering**, vol. 2010, Article ID 901587, 21 pages, 2010.

92. Xiaoming He and Tao Lü. A finite element splitting extrapolation for second order hyperbolic equations, **SIAM Journal on Scientific Computing**, 31(6): 4244-4265, 2009.

93. Xiaoming He, Tao Lin, and Yanping Lin. A bilinear immersed finite volume element method for the diffusion equation with discontinuous coefficient, *dedicated to Professor Richard E.*

Ewing on the occasion of his 60th birthday, **Communications in Computational Physics**, 6(1): 185-202, 2009.

94. Yong Cao, Xiaoming He, and Tao Lü. A splitting extrapolation for solving nonlinear elliptic equations with d-quadratic finite elements, **Journal of Computational Physics**, 228(1): 109-122, 2009.

95. Joseph Wang, Xiaoming He, and Yong Cao. Modeling electrostatic levitation of dust particles on lunar surface, **IEEE Transactions on Plasma Science**, 36(5): 2549-2466, 2008.

96. Xiaoming He, Tao Lin, and Yanping Lin. Approximation capability of a bilinear immersed finite element space, **Numerical Methods for Partial Differential Equations**, 24(5): 1265-1300, 2008.

97. Xiaoming He and Tao Lü. Splitting extrapolation method for solving second-order parabolic equations with curved boundaries by using domain decomposition and d-quadratic isoparametric finite elements, **International Journal of Computer Mathematics**, 84(6): 767-781, 2007.

Conference Publications

1. Daoru Han, Guy E. Brawley, and Xiaoming He. Development of PIFE-PIC-ESP: Parallel Immersed Finite Element Particle-In-Cell for ElectroSpray Propulsion. $\#AIAA2024 - 1543$, **AIAA SciTech 2023 Forum**, Orlando, Florida, January 8-12, 2024.

2. David Lund, Xiaoming He, and Daoru Han. Charging of irregularly-shaped dust grains near surfaces in space, $\#AIAA2023 - 2616$, **AIAA SciTech 2024 Forum**, National Harbor, Maryland & Virtual Conference, January 23-27, 2023.

3. Jianxun Zhao, Guirong Yan, Xiaoming He, and Daoru Han. Kinetic particle simulations of plasma charging and dust transport near uneven lunar surface terrain, $\#AIAA2022 - 1988$, **AIAA SciTech 2022 Forum**, San Diego, California & Virtual Conference, January 3-7, 2022.

4. Jianxun Zhao, Xinpeng Wei, Xiaoming He, Daoru Han, and Xiaoping Du. Fully-kinetic particle-in-cell simulations of photoelectron sheath on uneven lunar surface, $\#AIAA - 2021 - 1433$, **AIAA SciTech 2021 Forum**, Virtual Conference, January 11-15, 2021.

5. Jianxun Zhao, Xinpeng Wei, Zhangli Hu, Xiaoming He, and Daoru Han. Photoelectron sheath near the lunar surface: fully kinetic modeling and uncertainty quantification analysis, $\#AIAA - 2020 - 1548$, **AIAA SciTech 2020 Forum**, Orlando, Florida, January 6-10, 2020.

6. Craig Douglas, Xiukun Hu, Baojun Bai, Xiaoming He, Mingzhen Wei, Jiangyong Hou. A data assimilation enabled model for coupling dual porosity flow with free flow, DOI: 10.1109/DCABES.2018.00085, **17th International Symposium on Distributed Computing and Applications for Business Engineering and Science (DCABES)**, Wuxi, China, October 19-23, 2018.

7. Daoru Han, Xiaoming He, Joseph Wang. PIFE-PIC: A 3-D parallel immersed finite element particle-in-cell framework for plasma simulations, $\#AIAA - 2018 - 2196$, **2018 AIAA Aerospace Sciences Meeting**, Kissimmee, Florida, January 8-12, 2018.

8. Chaohua Guo, Jiaqi Wang, Baojun Bai, Xiaoming He, and Mingzhen Wei. Multi-stage fractured horizontal well numerical simulation and its application in tight shale reservoirs, SPE-176714, Society of Petroleum Engineers, **SPE Russian Petroleum Technology Conference**, Moscow, Russia, October 26-28, 2015.

9. Daniel Depew, Daoru Han, Joseph Wang, Xiaoming He, and Tao Lin. Immersed-Finite-Element Particle-In-Cell simulations of lunar surface charging, #199, 13th **Spacecraft Charging Technology Conference**, Pasadena, California, June 23-27, 2014.

10. Chaohua Guo, Mingzhen Wei, Haowei Chen, Xiaoming He, and Baojun Bai. Improved numerical simulation for shale gas reservoirs, OTC-24913, **Offshore Technology Conference Asia**, Kuala Lumpur, Malaysia, March 25-28, 2014.

11. Chaohua Guo, Baojun Bai, Mingzhen Wei, Xiaoming He, and Yushu Wu. Study on gas flow in nano pores of shale gas reservoirs, SPE-167179, Society of Petroleum Engineers, **SPE Unconventional Resources Conference-Canada**, Calgary, Canada, November 5-7, 2013.

12. John A. Burns, Xiaoming He, and Weiwei Hu. Control of the Boussinesq equations with implications for sensor location in energy efficient building, **American Control Conference**, pp. 2232-2237, Montréal, Canada, June 27-29, 2012.

13. Huilei Han, Yaping Liu, Tao Lü, and Xiaoming He. New Algorithm for the system of nonlinear weakly singular Volterra integral equations of the second kind and integro-differential equations, **Seventh International Conference on Scientific Computing and Applications**, pp. 1229-1235, Dalian, China, June 13-16, 2010.

14. Joseph Wang, Xiaoming He, and Yong Cao. Modeling spacecraft charging and charged dust particle interactions on lunar surface, 10th **Spacecraft Charging Technology Conference**, Biarritz, France, June 18-21, 2007.

Synergistic Activities

- Committee member of SIAM Committee On Programs and Conferences, January 2021 - present.

- Steering Committee Member of Midwest Numerical Analysis Day, May 2019 - present.

- Founding President of SIAM Central States Section, January 2015 - December 2016.

- Main contact for the petition to create the SIAM Central States Section, 2014.

- Main organizer of Midwest Numerical Analysis Day 2021, Rolla, MO, October 29-30, 2021.

- Advisory committee member of the Fourth Annual Meeting of SIAM Central States Section, Norman, OK, October 5 - 7, 2018.

- Organizing committee member of the Third Annual Meeting of SIAM Central States Section, Fort Collins, CO, September 29 - October 1, 2017.

- Organizing committee chair of the Second Annual Meeting of SIAM Central States Section, Little Rock, AR, September 30 - October 2, 2016.

- Organizing committee chair of the First Annual Meeting of SIAM Central States Section, Rolla, MO, April 11 - 12, 2015.

- Co-Organizer (with Xu Zhang) of the mini-symposium on "Advances in numerical methods for partial differential equations and applications", The 8th Annual Meeting of SIAM Central States Section, Lincoln, NE, October 7-8, 2023.

- Co-Organizer (with Jia Zhao and Xiaofeng Yang) of the mini-symposium on "Numerical analysis, modeling and applications in phase-field its relevant methods", 10th International Congress on Industrial and Applied Mathematics, Tokyo, Japan, August 20-25, 2023.

- Co-Organizer (with Xu Zhang) of the mini-symposium on "Recent advances in numerical methods for partial differential equations", The 6th Annual Meeting of SIAM Central States Section (Virtual Conference), Lawrence, KS, October 2-3, 2021.

- Co-Organizer (with Xiaofeng Yang) of the mini-symposium on "Modeling and numerical methods for coupled PDE systems", SIAM Southeastern Atlantic Section Conference, Auburn, AL, September 18-19, 2021.

- Co-Organizer (with James Liu) of the mini-symposium on "Algorithms, analysis, and applications of numerical PDEs", The Joint Mathematics Meetings, Denver, January 15-18, 2020.

- Co-Organizer (with Nolisa Malluwawadu) of the mini-symposium on "Recent advances in finite element methods", The 5th Annual Meeting of SIAM Central States Section, Ames, IA, October 19-20, 2019.

- Co-Organizer (with Craig Douglas and Joseph V. Keobbe) of the workshop on "Computational sciences", The 1st Annual Meeting of SIAM Northern States Section, Laramie, WY, September 27 - 28, 2019.

- Co-Organizer (with Weiwei Hu and John Singler) of the mini-symposium on "Computational methods for PDE constrained optimization and control ", 2019 SIAM Conference on Control and Its Applications, Chengdu, China, June 19 - 21, 2019.

- Co-Organizer (with Daozhi Han) of the mini-symposium on "Recent advances in numerical methods for subsurface flows", 2018 SIAM Conference on Mathematical & Computational Issues in the Geosicences, Houston, TX, March 11 - 14, 2019.

- Co-Organizer (with Erik Van Vleck) of the mini-symposium on "Recent advances in numerical PDEs", The 4th Annual Meeting of SIAM Central States Section, Norman, OK, October 5 - 7, 2018.

- Co-Organizer (with Craig Douglas) of the mini-symposium on "Numerical methods for multiphysics problems", The 3rd Annual Meeting of SIAM Central States Section, Fort Collins, CO, September 29 - October 1, 2017.

- Co-Organizer (with Timo Heister and Ari Stern) of the mini-symposium on "Recent advances in numerical PDEs", The 3rd Annual Meeting of SIAM Central States Section, Fort Collins, CO, September 29 - October 1, 2017.

- Co-Organizer (with Yassine Boubendir) of the mini-symposium on "Recent advances in domain decomposition methods", 2017 SIAM Conference on Computational Science and Engineering, Atlanta, GA, February 27 - March 3, 2017.

- Co-Organizer (with Yassine Boubendir and Ju Ming) of the mini-symposium on "Recent advances in numerical methods for multi-physics problems", 20th IMACS World Congress, Xiamen, China, December 10 - 14, 2016.

- Co-Organizer (with Huanzhen Chen, Do Y. Kwak and Xu Zhang) of the mini-symposium on "Structured-mesh methods for interface problems", 8th International Congress on Industrial and Applied Mathematics, Beijing, China, August 10 - 14, 2015.

- Co-Organizer (with Xuejun Xu) of the mini-symposium on "Decoupling methods for multi-physics and multi-scale problems", 8th International Congress on Industrial and Applied Mathematics, Beijing, China, August 10 - 14, 2015.

- Co-Organizer (with Xiaolin Li) of the mini-symposium on "Recent advances in numerical methods for interface problems", 2015 SIAM Conference on Computational Science and Engineering, Salt Lake City, UT, March 14 - 18, 2015.

- Co-Organizer (with Yanping Lin) of the stream on "Numerical ordinary and partial differential equations", 2013 International Conference on Engineering and Computational Mathematics, Hong Kong, China, December 16-18, 2013.

- Co-Organizer (with Michael Neilan) of the mini-symposium on "Recent advances in numerical methods for nonlinear partial differential equations", 2013 SIAM Conference on Computational Science and Engineering, Boston, MA, February 25 - March 1, 2013.

- Co-Organizer (with Tao Lin, Xingzhou Yang, and Shan Zhao) of the mini-symposium on "Numerical PDEs for interface problems with applications", 2011 SIAM Conference on Computational Science and Engineering, Reno, NV, February 28 - March 4, 2011.

Selected Invited Talks and Visiting Activities

- Department of Mathematics, Hong Kong Baptist University, Hong Kong, China, August 2023.

- Department of Mathematics, Pennsylvania State University, October 2022.

- Department of Mathematics, University of Notre Dame, October 2022.

- Department of Mathematics, Southern Methodist University, TX, November 2021.

- Department of Mathematics, University of Georgia, GA, October 2021.

- Department of Mathematics, University of Florida, FL, March 2021/December 2022.

- Department of Mathematics, Purdue University, IN, October 2018.

- Department of Mathematics, University of Geneva, Geneva, Switzerland, May 2018.

- Informatik 10, System Simulation, Friedrich-Alexander University Erlangen-Nürnberg, Erlangen, Germany, March-August, 2018.

- Department of Applied Mathematics, Illinois Institute of Technology, October 2017.

- Department of Mathematical Sciences, New Jersey Institute of Technology, NJ, April 2017.

- Department of Mathematics, University of Wyoming, WY, October 2016/September 2017.

- Department of Mathematics, Macau University, Macau, China, July 2015/June 2017.

- Department of Mathematics, University of South Carolina, Columbia, SC, November 2014.

- Department of Mathematics, University of Kansas, Lawrence, KS, March 2014.

- Department of Mathematics and Statistics, University of Missouri - Kansas City, Kansas City, MO, February 2014.

- Department of Applied Mathematics, Hong Kong Polytechnic University, Hong Kong, China, January 2013/December 2013/July 2015/May-August 2017/July 2019/May 2020/February 2022/May-June 2023.

- Department of Mathematics, University of California, Irvine, CA, October 2012.

- Department of Mathematics, Statistics and Physics, Wichita State University, Wichita, KS, October 2011.

- Department of Mathematics and Statistics, University of Maryland, Baltimore County, MD, May 2011.

- Department of Mathematics, Iowa State University, IA, April 2011.

- Department of Mathematics and Statistics, University of Arkansas, Little Rock, AR, March 2011.

- Mathematics Department, University of Arkansas, Fort Smith, AR, March 2011.

- Department of Mathematics and Statistics, Mississippi State University, MS, August 2010.

- Department of Mathematical and Statistical Sciences, University of Alberta, AB, Canada, August 2008.

Conference Presentations

- 2024 SIAM Annual Meeting (virtual/in-person hybrid conference), Spokane, WA, July 8-12, 2024.

- Middle West Numerical Analysis Day 2024, Iowa City, IA, April 13-14, 2024.

- ICERM Workshop: Numerical Analysis of Multiphysics Problems, Providence, February 12-16, 2024.

- Recent Advances in Scientific Computing and Deep Learning, Sanya, China, December 18-22, 2023.

- Finite Element Circus, Notre Dame, IN, October 20-21, 2023.

- The 8th Annual Meeting of SIAM Central States Section, Lincoln, NE, October 7-8, 2023.

- AMS Eastern Sectional Meeting, Buffalo, NY, September 9-10, 2023.

- International Conference on Applied Mathematics, Hong Kong, China, May 30 - June 3, 2023.

- The 7th International Conference on Scientific Computing and Partial Differential Equations, Hong Kong, China, May 22-26, 2023.

- Middle West Numerical Analysis Day 2023, Ames, IA, April 29, 2023.

- AMS Central Sectional Meeting, Cincinnati, OH, April 15-16, 2023.

- The 7th Annual Meeting of SIAM Central States Section, Stillwater, OK, October 1-2, 2022.

- 15th World Congress on Computational Mechanics (virtual conference), Yokohama, Japan, July 31 - August 5, 2022.

- Copper Country Workshop on Applied Mathematics, Statistics, and Data Sciences, Houghton, MI, July 5-7, 2022.

- International Conference on Computational Science (virtual/in-person hybrid conference), London, United Kingdom, June 21-23, 2022.

- Middle West Numerical Analysis Day 2022 (virtual/in-person hybrid conference), Ann Arbor, MI, May 20-21, 2022.

- ICCMAE 2022: The Second International Conference on Computational Methods and Applications in Engineering (virtual/in-person hybrid conference), Starkville, MS, May 7-8, 2022.

- KU Numerical Analysis Day 2022, Lawrance, KS, March 26, 2022.

- SIAM Southeastern Atlantic Section Conference (virtual/in-person hybrid conference), Auburn, AL, September 18-19, 2021.

- SIAM Conference on Mathematical & Computational Issues in the Geosicences (virtual conference), June 21-24, 2021.

- Finite Element Circus (virtual conference), April 9-10, 2021.

- SIAM Conference on Computational Science and Engineering (virtual conference), March 1-5, 2021.

- Finite Element Circus (virtual conference), November 6-7, 2020.

- AMS Eastern Sectional Meeting (virtual conference), October 3-4, 2020.

- The 5th Annual Meeting of SIAM Central States Section, Ames, IA, October 19-20, 2019.

- The 1st Annual Meeting of SIAM Northern States Section, Laramie, WY, September 27-29, 2019.

- The 9th International Congress on International and Applied Mathematics, Valencia, Spain, July 15-19, 2019.

- 2019 SIAM Conference on Control and Its Applications, Chengdu, China, June 19-21, 2019.

- Middle West Numerical Analysis Day 2019, Chicago, IL, April 20, 2019.

- 20th International Conference on Fluid Flow Problems, Chicago, IL, March 31 - April 3, 2019.

- Finite Element Circus, West Lafayette, IN, March 22-23, 2019.

- 2019 SIAM Conference on Mathematical & Computational Issues in the Geosicences, Houston, TX, March 11-14, 2019.

- Finite Element Circus, Newark, DE, November 9-10, 2018.

- AMS Southeastern Sectional Meeting, Fayetteville, AR, November 3-4, 2018.

- AMS Central Sectional Meeting, Ann Arbor, MI, October 20-21, 2018.

- The 4th Annual Meeting of SIAM Central States Section, Norman, OK, October 5-7, 2018.

- The 3rd Annual Meeting of SIAM Central States Section, Fort Collins, CO, September 29 - October 1, 2017.

- Midwest Numerical Analysis Day 2017, Omaha, NE, April 22, 2017.

- AMS Southeastern Sectional Meeting, Charleston, SC, March 10-12, 2017.

- 2017 SIAM Conference on Computational Science and Engineering, Atlanta, GA, February 27 - March 3, 2017.

- 20th IMACS World Congress, Xiamen, China, December 10-14, 2016.

- The 2nd Annual Meeting of SIAM Central States Section, Little Rock, AR, September 30 - October 2, 2016.

- Workshop on Computational Mathematics & Scientific Computing to honor Max Gunzburger's 70th birthday, Jeju Island, South Korea, August 19-22, 2015.

- The 8th International Congress on International and Applied Mathematics, Beijing, China, August 10-14, 2015.

- 2015 Summer Workshop on Finite Element Methods, Beijing, China, August 8-9, 2015.

- Finite Element Circus, Fairfax, VA, March 27-28, 2015.

- 2015 SIAM Conference on Computational Science and Engineering, Salt Lake City, UT, March 14-18, 2015.

- AMS Southeastern Sectional Meeting, Greensboro, NC, November 8-9, 2014.

- International Workshop on Computational Mathematics: Advances in Computational PDEs, Seoul, South Korean, August 9-12, 2014.

- The 13th Copper Mountain Conference on Iterative Methods, Copper Mountain, CO, April 6-11, 2014.

- The 2nd International Conference on Engineering and Computational Mathematics, Hong Kong, China, December 16-18, 2013.

- 2013 SIAM Conference on Computational Science and Engineering, Boston, MA, February 25 - March 1, 2013.

- The 8th International Conference on Computational Physics, Hong Kong, China, January 7-11, 2013.

- Ninth Mississippi State - UAB Conference on Differential Equations & Computational Simulations, Mississippi State University, MS, October 4-6, 2012.

- SIAM Conference on Uncertainty Quantification, Raleigh, NC, April 2-5, 2012.

- The 7th International Congress on International and Applied Mathematics, Vancouver, BC, Canada, July 18-22, 2011.

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

- International Conference on Applied Mathematics and Interdisciplinary Research, Tianjing, China, June 13-16, 2011.

- 2011 SIAM Conference on Computational Science and Engineering, Reno, NV, February 28 - March 4, 2011.

- 30th Southeastern-Atlantic Regional Conference on Differential Equations, Blacksburg, VA, October 1-2, 2010.

- 2010 SIAM Annual Meeting, Pittsburgh, PA, July 12-16, 2010.

- Eighth Mississippi State - UAB Conference on Differential Equations & Computational Simulations, Mississippi State University, MS, May 7-9, 2009.

- SIAM Conference on Computational Science & Engineering, Miami, FL, March 2-6, 2009.

- Second International Conference on Finite Element Methods in Engineering and Science, Lake Tahoe, CA, January 5-9, 2009.

- 2009 Join Mathematics Meetings, Washington, DC, January 5-8, 2009.

- 2008 SIAM Annual Meeting, San Diego, CA, July 7-11, 2008.

- Seventh Mississippi State - UAB Conference on Differential Equations & Computational Simulations, Birmingham, AL, November 1-3, 2007.

Conference and Workshop Participation

- The 6th Annual Meeting of SIAM Central States Section (Virtual Conference, University of Kansas), October 2-3, 2021.

- Joint Meetings in Mathematics 2020, Denver, CO, January 15-18, 2020.

- Annual Meeting of the Alexander von Humboldt Foudnation, Berlin, Germnay, June 27-29, 2018.

- Network Meeting of the Alexander von Humboldt Foundation, Regensburg, Germany, April 25-27, 2018.

- The 3rd International Conference on Engineering and Computational Mathematics, Hong Kong, China, May 31-June 2, 2017.

- Workshop on Numerical Analysis and Mathematical Modeling, Hong Kong, China, May 29-30, 2017.

- IMA Special Workshop: Finite Element Circus, Minneapolis, MN, October 24-25, 2014.

- IMA Special Workshop: Structure-Preserving Discretizations of Partial Differential Equations, Minneapolis, MN, October 22-24, 2014.

- IMA Thematic Year on Simulating Our Complex World: Modeling, Computation and Analysis, Minneapolis, MN:

  - Workshop: Computing with Uncertainty: Mathematical Modeling, Numerical Approximation and Large Scale Optimization of Complex Systems, October 18-22, 2010.
  - Workshop: Numerical Solutions of Partial Differential Equations: Novel Discretization Techniques, November 1-5, 2010.
  - Special Event: Finite Element Circus Featuring a Scientific Celebration of Falk, Pasciak, and Wahlbin, November 5-6, 2010.
  - Workshop: Numerical Solutions of Partial Differential Equations: Fast Solution Techniques, November 19-December 3, 2010.

- 2010 Joint Mathematics Meetings, San Francisco, CA, January 13-16, 2010.

- Opening Workshop of the SAMSI Program on Random Media, Research Triangle Park, NC, September 23-26, 2007.

Referee for Journals and Proceedings

- Abstract and Applied Analysis

- Advances in Applied Mathematics and Mechanics

- Advances in Computational Mathematics

- Advances in Difference Equations

- Applied Mathematical Modeling

- Applied Mathematics and Computation

- Applied Mathematics Letters

- Applied Numerical Mathematics

- Asia-Pacific Journal of Chemical Engineering

- Communication on Applied Mathematics and Computation

- Computational and Applied Mathematics

- Computational Geophysics

- Computational Mechanics

- Computer Methods in Applied Mechanics and Engineering

- Computer Physics Communication

- Computers and Mathematics with Applications

- CSIAM Transactions on Applied Mathematics

- Discrete and Continuous Dynamical Systems - Series B

- Electronic Research Archieve

- Engineering Analysis with Boundary Elements

- ESAIM: Mathematical Modelling and Numerical Analysis (M2AN)

- IEEE Access

- International Journal for Numerical Methods in Fluids

- International Journal of Computer Mathematics

- International Journal of Heat and Mass Transfer

- International Journal of Mathematics and Mathematical Sciences

- International Journal of Numerical Analysis and Modeling

- International Journal of Numerical Methods for Heat and Fluid Flow

- International Journal of Uncertainty Quantification

- Journal of Computational and Applied Mathematics

- Journal of Computational Mathematics

- Journal of Computational Physics

- Journal of Computational Science

- Journal of Numerical Mathematics

- Journal of Scientific Computing

- Mathematical Methods in the Applied Sciences

- Mathematics and Computers in Simulation

- Modeling and Computation for Flow and Transport

- Numerical Algorithms

- Numerical Mathematics: Theory, Methods, and Applications

- Numerical Methods for Partial Differential Equations

- Results in Applied Mathematics

- Science China Mathematics

- SIAM Journal on Numerical Analysis

- SIAM Journal on Scientific Computing

Teaching

- Missouri University of Science and Technology

    - Spring 2024: Math 5602 - Mathematical Foundation of Finite Element Methods
    - Fall 2023: Math 5601 - Introduction to Numerical Analysis
    - Spring 2023: Math 6603 - Mathematical Foundation of Finite Element Methods II
    - Fall 2022: Math 5602 - Mathematical Foundation of Finite Element Methods
    - Spring 2022: Math 5325 - Partial Differential Equations
    - Fall 2021: Math 5601 - Introduction to Numerical Analysis
    - Spring 2021: Math 3304 - Elementary Differential Equations (online asynchronous)
    - Fall 2020: Math 5001 (Experimental Course) - Introduction to Numerical Analysis; Math 6602 - Mathematical Foundation of Finite Element Methods; Math 3304 - Elementary Differential Equations (online asynchronous)
    - Spring 2020: Math 6001 (Experimental Course) - Mathematical Foundation of Finite Element Methods II
    - Fall 2019: Math 5001 (Experimental Course) - Introduction to Numerical Analysis; Math 6602 - Mathematical Foundation of Finite Element Methods
    - Spring 2019: Math 6601 - Numerical Analysis; Math 6001 (Experimental Course) - Mathematical Foundation of Finite Element Methods II
    - Fall 2018: Math 6602 - Mathematical Foundation of Finite Element Methods; Math 3304 - Elementary Differential Equations
    - Fall 2017: Math 6601 - Numerical Analysis; Math 6001 (Experimental Course) - Topics in Partial Differential Equations
    - Spring 2017: Math 6602 - Mathematical Foundation of Finite Element Methods; Math 3304 - Elementary Differential Equations
    - Fall 2016: Math 6601 - Numerical Analysis; Math 3304 - Elementary Differential Equations
    - Spring 2016: Math 6602 - Mathematical Foundation of Finite Element Methods; Math 5325 - Partial Differential Equations
    - Fall 2015: Math 6601 - Numerical Analysis; Math 3304 - Elementary Differential Equations
    - Spring 2015: Math 6602 - Mathematical Foundation of Finite Element Methods
    - Fall 2014: Math 5325 - Partial Differential Equations; Math 3304 - Elementary Differential Equations

- Spring 2014: Math 401 (Experimental Course) - Mathematical Foundation of Finite Element Methods; Math 204 - Elementary Differential Equations
- Fall 2013: Math 401 (Experimental Course) - Numerical Analysis; Math 204 - Elementary Differential Equations
- Spring 2013: Math 401 (Experimental Course) - Mathematical Foundation of Finite Element Methods
- Fall 2012: Math 401 (Experimental Course) - Numerical Analysis; Math 204 - Elementary Differential Equations
- Spring 2012: Math 325 - Partial Differential Equations; Math 204 - Elementary Differential Equations
- Fall 2011: Math 325 - Partial Differential Equations; Math 204 - Elementary Differential Equations
- Spring 2011: Math 204 - Elementary Differential Equations
- Fall 2010: Math 204 - Elementary Differential Equations

- Virginia Tech

  - Fall 2008: Math 1205 - Differential Calculus
  - Summer I 2008: Math 1016 - Elementary Calculus I
  - Fall 2007: Math 1205 - Differential Calculus
  - Summer I 2007: Math 1206 - Integral Calculus
  - Summer II 2006: Pre-calculus

Undergraduate and Graduate Honors

- Ling Scholarship, Virginia Tech, Blacksburg, VA, 2006.

- Graduate Student Scholarship, Sichuan University, Chengdu, China, 2004.

- Undergraduate Thesis Award, Sichuan University, Chengdu, China, 2002.

- Undergraduate Student Scholarship, Sichuan University, Chengdu, China, 2000-2001.