Curriculum Vitae

Qiao, Zhonghua

Contact Information

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	The Hong Kong Polytechnic University
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Education

Ph.D. Computational Mathematics, Hong Kong Baptist University, Hong Kong, 2006
Thesis: Numerical solution for nonlinear Poisson-Boltzmann equations and numerical simulations for spike dynamics. Thesis adviser: Prof. Tao Tang.
M.S. Computational Mathematics, Zhengzhou University, China, 2003
B.S. Applied Mathematics, Zhengzhou University, China, 2000

Research Interests

Numerical analysis and scientific computing in general. Topics include adaptive grid methods, high-order methods, numerical solutions of nonlinear diffusion equations, computational fluid dynamics.

Working Experience

7/2021 - present	Professor
	Department of Applied Mathematics
	The Hong Kong Polytechnic University
7/2017 - 6/2021	Associate Professor
	Department of Applied Mathematics
	The Hong Kong Polytechnic University
12/2011 - 6/2017	Assistant Professor
	Department of Applied Mathematics
	The Hong Kong Polytechnic University
8/2008 - 12/2011	Research Assistant Professor
	Department of Mathematics
	& Institute of Computational Mathematics
	Hong Kong Baptist University
7/2006 - 7/2008	Postdoctoral Research Fellow
	Center for Research in Scientific Computation
	North Carolina State University

Teaching Experience

The Hong Kong Polytechnic University

9/2020–12/2020	AMA 524 Scientific Computing
1/2020–5/2020	AMA 1120 Basic Mathematics II - Calculus and linear algebra
9/2019–12/2019	AMA 612 Numerical Methods for Partial Differential Equations
1/2019–5/2019	AMA 1120 Basic Mathematics II - Calculus and linear algebra
9/2018–12/2018	AMA 524 Scientific Computing

1/2018–5/2018	AMA 1120 Basic Mathematics II - Calculus and linear algebra
9/2017–12/2017	AMA 612 Numerical Methods for Partial Differential Equations
1/2017–5/2017	AMA 1120 Basic Mathematics II - Calculus and linear algebra
9/2016–12/2016	AMA 612 Numerical Methods for Partial Differential Equations
1/2016–5/2016	AMA 1120 Basic Mathematics II - Calculus and linear algebra
9/2015–12/2015	AMA 524 Scientific Computing
	AMA 1120 Basic Mathematics II - Calculus and linear algebra
1/2015–5/2015	AMA 1100 Basic mathematics - An introduction to algebra and differential calculus
	AMA 1120 Basic Mathematics II - Calculus and linear algebra
9/2014–12/2014	AMA 524 Scientific Computing
1/2014–5/2014	AMA 201 Mathematics I
	AMA 2891 Mathematics for Scientists and Engineers II
9/2013–12/2013	AMA 1101 Calculus I
	AMA 1103 Introductory Linear Algebra
1/2013–5/2013	AMA 201 Mathematics I
	AMA 2891 Mathematics for Scientists and Engineers II
9/2012–12/2012	AMA 1101 Calculus I
	AMA 1103 Introductory Linear Algebra
1/2012–5/2012	AMA 201 Mathematics I
	AMA 2891 Mathematics for Scientists and Engineers II
	AMA 303 Mathematics and Statistics

Hong Kong Baptist University

1/2011–5/2011	Math 1130 Discrete Structures
9/2010–12/2010	Math 1570 Advance Calculus
	SCI 1710 Science in Today's Society
	SCI 3530 Numerical methods for partial differential equations
1/2010–5/2010	Math 1130 Discrete Structures
	Math 0022 Foundation of Mathematics (Science)
1/2009–5/2009	Math 1130 Discrete Structures
9/2008–12/2008	Math 2140 Numerical Methods I

Awards

- Faculty Award for Outstanding Achievement 2021–Research and Scholarly Activities: Outstanding Researcher, Faculty of Applied Science and Textiles, The Hong Kong Polytechnic University, 2021

- RGC Research Fellow, The Research Grants Council of Hong Kong, 2020

- Departmental Best Paper Award, Department of Applied Mathematics, The Hong Kong Polytechnic University, 2019

- Hong Kong Mathematical Society Award for Young Scholars, The Hong Kong Mathematical Society, 2018

- The 2013-2014 Early Career Award, The Research Grants Council of Hong Kong, 2013

Research Funds

External funds:

- 1/2023–12/2025, Principal Investigator, GRF grant, 'High order energy stable numerical schemes with variable time steps for time fractional phase field equations [PolyU 153021/22P]' (HK\$771,600).

- 1/2022–12/2024, Principal Investigator, GRF grant, 'Convergence and stability analysis of energy stable and bound-preserving numerical schemes for binary fluid-surfactant phase-field equations [PolyU 153031/21P]' (HK\$598,015).

- 1/2021–12/2025, Principal Investigator, RGC Research Fellow Scheme (RFS), 'L-infinity stability of exponential time differencing numerical schemes for phase field models with high-order dissipations

[PolyU/RFS2021-5S03]' (HK$5,155,380).

- 1/2020-12/2022, Principal Investigator, GRF grant, 'Maximum principle preserving time integration methods for Allen-Cahn type phase field equations [PolyU 153029/19P]' (HK$502,444).

- 12/2019-12/2021, Principal Investigator, Hong Kong Scholars Program, 'Structure Preserving Schemes for Nonlinear Differential Equations [G-YZ2Y]' (HK$360,000).

- 1/2018-12/2020, Principal Investigator, GRF grant, 'Stability analysis and error estimates of exponential time differencing schemes for nonlocal phase field equations [PolyU 153004/17P]' (HK$472,351).

- 1/2017-12/2019, Principal Investigator, GRF grant, 'L-infinity stability of semi-implicit schemes for phase field equations [PolyU 153258/16P]' (HK$326,811).

- 10/2014-9/2016, Principal Investigator, GRF grant, 'Error estimates for numerical solutions of epitaxy growth equations [PolyU 153022/14P]' (HK$409,815).

- 1/2014-12/2017, Principal Investigator, ECS grant, 'Adaptive numerical methods for the Boltzmann equation [PolyU 5092/13P]' (HK$1,000,800 including HK$100,000 ECS Award for educational activities).

- 10/2012-9/2014, Principal Investigator, GRF grant, 'Numerical solution of a nonlinear fourth-order parabolic equation for epitaxial growth [PolyU 2021/12P]' (HK$490,800).

- 1/2013-12/2016, Co-Investigator, NSFC/RGC joint grant as a Co-I 'Mathematical Modeling and High Performance Computing of Complex Fluids [N HKBU204/12]' (Hong Kong team: PI: Prof Tao Tang/HKBU, Co-I: Dr. Zhonghua Qiao/HKPolyU; China team: PI: Prof Li Yuan/Chinese Academy of Sciences, Co-I: Prof. Hui Zhang/Beijing Normal University) (HK$1,004,783 from RGC and 800,000 RMB from NSFC, and HK$200,000 has been injected to my research grant account 3-ZG1V (PI)).

- 10/2010-9/2012, Principal Investigator, GRF grant, 'Moving mesh methods for reaction-diffusion systems on growing domains [PolyU 2017/10P]' (HK$544,640).

Internal funds:

- 1/2022-1/2025, Principal Investigator, Research and Scholarly Grant for Faculty Award for Outstanding Achievement 2021, 'Efficient Numerical Schemes for Some Gradient Flow Systems [1.63.xx.9BCT]' (HK$400,000).

- 3/2021-12/2022, Principal Investigator, Financial support for Editorship of Journals, [1.63.xx.9B7B], (HK$198,000).

- 1/2021-12/2025, Principal Investigator, Voluntary Matching Fund for RFS scheme (teaching relief), 'L-infinity stability of exponential time differencing numerical schemes for phase field models with high-order dissipations [1-ZEBL]' (HK$2,910,000.00).

- 1/2021-12/2025, Principal Investigator, Voluntary Matching Fund for RFS scheme (Postdoctoral fellow matching), 'L-infinity stability of exponential time differencing numerical schemes for phase field models with high-order dissipations [1-W00D]' (HK$771,000.00).

- 1/2021-12/2023, Principal Investigator, Internal grant of The Hong Kong Polytechnic University, 'High Order Numerical Schemes for Phase Field Equations [4-ZZLS]' (HK$78,722.77).

- 12/2019-12/2021, Principal Investigator, Mandatory Matching Fund for Hong Kong Scholars Program, 'Structure Preserving Schemes for Nonlinear Differential Equations [G-YZ2Y]' (HK$378,000.00).

- 12/2018–11/2021, Principal Investigator, Departmental General Research Fund, 'Numerical Methods for Deterministic and Stochastic Allen-Cahn Equations [G-UAEY]' (HK$261,738.86).

- 7/2016-7/2018, Principal Investigator, Postdoctoral Fellowships Scheme, 'Numerical Study of Multiphysics Coupling Chemotaxis-fluid Problem [1-YW1D]' (HK$645,000).

- 4/2016-3/2019, Principal Investigator, Internal grant of The Hong Kong Polytechnic University, 'Numerical Solutions of the Steady-state Boltzmann Equation [G-YBKP]' (HK$270,000.00).

- 11/2014-10/2017, Principal Investigator, Internal grant of The Hong Kong Polytechnic University, 'Stability Analysis for Some Efficient Numerical Schemes of Phase-field Models [1-ZE33]' (HK$250,000).

- 3/2012-2/2014, Principal Investigator, Internal grant of The Hong Kong Polytechnic University, 'An Adaptive Time-stepping Strategy and Moving Mesh Methods for Phase Field Models [A-PL61]' (HK$110,000).

- 5/2012-4/2013, Principal Investigator, Starting grant of The Hong Kong Polytechnic University, 'Numerical Solution of the Nonlinear Epitaxial Growth Model [1-ZV9Y]'(HK$40,000).

- 3/2010-8/2011, Principal Investigator, FRG grant of Hong Kong Baptist University, 'High order finite difference schemes for electromagnetic cavity problems [FRG2/09-10/034]' (HK$120,000).

- 3/2009-2/2010, Principal Investigator, FRG grant of Hong Kong Baptist University, 'A time-splitting and high-order compact MAC finite difference scheme for Navier-Stokes Equations [FRG/08-09/II-35]' (HK$147,000).

Publications

1904 citations with an H-index of 25 (Scopus).
ORCID iD: 0000-0002-0553-1404
Scopus Author ID: 57211086559
ResearcherID at Web of Knowledge: B-5308-2009

Papers published in refereed Journals:

1. D. HOU AND **Z. Qiao**. A linear adaptive second-order backward differentiation formulation scheme for the phase field crystal equation. To appear in Numerical Methods for Partial Differential Equations, 2023.

2. X. LI, **Z. Qiao** AND C. WANG. Double stabilizations and convergence analysis of a second-order linear numerical scheme for the nonlocal Cahn-Hilliard equation. To appear in Science China Mathematics, 2023.

3. C. LIU, **Z. Qiao** and Q. ZHANG. An Active Contour Model with Local Variance Force Term and Its Efficient Minimization Solver for Multiphase Image Segmentation. SIAM Journal on Imaging Sciences, 16 (2023), 144-168.

4. X. LI, **Z. Qiao** AND C. WANG. Stabilization parameter analysis of a second-order linear numerical scheme for the nonlocal Cahn–Hilliard equation. IMA Journal of Numerical Analysis, 43 (2023), pp. 1089-1114.

5. **Z. Qiao**, Z. XU, Q. YIN AND S. ZHOU. Structure-preserving numerical method for Maxwell-Ampére Nernst-Planck model. Journal of Computational Physics, 2023, 475, 111845.

6. **Z. Qiao**, Z. XU, Q. YIN AND S. ZHOU. A Maxwell-Ampére Nernst-Planck framework for modeling charge dynamics. SIAM Journal on Applied Mathematics, 2023, 83(2), pp. 374–393

7. X. FENG, **Z. Qiao**, S. SUN AND X. WANG. An energy-stable Smoothed Particle Hydrodynamics discretization of the Navier-Stokes-Cahn-Hilliard model for incompressible two-phase flows Journal of Computational Physics, 2023, 479, 111997.

8. D. HOU AND **Z. Qiao**. An implicit–explicit second-order BDF numerical scheme with variable steps for gradient flows. Journal of Scientific Computing, 2023, 94(2), 39.

9. Y. DONG, X. LI **Z. Qiao** AND Z. ZHANG. Stability and convergence analysis of the exponential time differencing scheme for a Cahn–Hilliard binary fluid-surfactant model. Applied Numerical Mathematics, 2023, 190, pp. 321–343.

10. C. LIU, **Z. Qiao**, Q. ZHANG. Multi-phase image segmentation by the Allen–Cahn Chan–Vese model. Computers and Mathematics with Applications, 2023, 141, pp. 207–220.

11. **Z. Qiao** AND Q. ZHANG. Two-phase image segmentation by the Allen–Cahn equation and a nonlocal edge detection operator. Numerical Mathematics: Theory, Methods and Applications, 15 (2022), pp. 1147-1172.

12. C. Liu, **Z. Qiao** and Q. Zhang. Two-phase segmentation for intensity inhomogeneous images by the Allen–Cahn local binary fitting model. SIAM Journal on Scientific Computing, 44 (2022), pp. B177-B196.

13. L. Ju, X. Li and **Z. Qiao**. Generalized SAV-exponential integrator schemes for Allen–Cahn type gradient flows. SIAM Journal on Numerical Analysis, 60 (2022), pp. 1905–1931.

14. L. Ju, X. Li and **Z. Qiao**. Stabilized exponential-SAV schemes preserving energy dissipation law and maximum bound principle for the Allen–Cahn type equations. Journal of Scientific Computing, 92 (2022): 66.

15. S. Li and **Z. Qiao**. Meshless collocation method with a global refinement strategy for reaction-diffusion systems on evolving domains. Discrete and Continuous Dynamical Systems Series B, 27 (2022), pp. 601-617.

16. L. Ju, X. Li, **Z. Qiao** and J. Yang. Maximum bound principle preserving integrating factor Runge-Kutta methods for semilinear parabolic equations. Journal of Computational Physics, 439 (2021): 110405.

17. Q. Du, L. Ju, X. Li and **Z. Qiao**. Maximum bound principles for a class of semilinear parabolic equations and exponential time differencing schemes. SIAM Review, 63 (2021), pp. 317-359.

18. X. Li, **Z. Qiao** and C. Wang. Convergence analysis for a stabilized linear semi-implicit numerical scheme for the nonlocal Cahn-Hilliard equation. Mathematics of Computation, 90 (2021), pp. 171-188.

19. Z. Liu and **Z. Qiao**. Strong approximation of monotone stochastic partial differential equations driven by multiplicative noise. Stochastics and Partial Differential Equations: Analysis and Computations, 9 (2021), pp. 559-602.

20. **Z. Qiao**, X. Yang and Y. Zhang. A Novel Lattice Boltzmann Model for Fourth Order Nonlinear Partial Differential Equations. Journal of Scientific Computing, 87 (2021): 51.

21. Z. Liu and **Z. Qiao**. Strong approximation of monotone stochastic partial differential equations driven by white noise. IMA Journal of Numerical Analysis, 40 (2020), pp. 1074-1093.

22. T. Tang and **Z. Qiao**. Efficient numerical methods for phase-field equations (in Chinese). SCIENTIA SINICA Mathematica, 50 (2020), pp. 775-794.

23. **Z. Qiao** and X. Yang. A multiple-relaxation-time lattice Boltzmann method with Beam-Warming scheme for a coupled chemotaxis-fluid model. Electronic Research Archive, 28 (2020), pp. 1207-1225.

24. X. Fan, **Z. Qiao** and S. Sun. Unconditionally stable, efficient and robust numerical simulation of isothermal compositional grading by gravity. Journal of Computational Science, 43 (2020), 101109.

25. Y. Li, **Z. Qiao**, S. Sun and T. Zhang. Thermodynamic modeling of CO2 solubility in saline water using NVT flash with the cubic-Plus-association equation of state. Fluid Phase Equilibria, 520 (2020), 112657.

26. K. Cheng, **Z. Qiao** and C. Wang. A third order exponential time differencing numerical scheme for no-slope-selection epitaxial thin film model with energy stability. Journal of Scientific Computing, 81 (2019), pp. 154-185.

27. Q. Du, L. Ju, X. Li and **Z. Qiao**. Maximum principle preserving exponential time differencing schemes for the nonlocal Allen-Cahn equation. SIAM Journal on Numerical Analysis, 57 (2019), pp. 875-898.

28. **Z. Qiao**, X. Yang and Y. Zhang. Thermodynamic-consistent multiple-relaxation-time lattice Boltzmann equation model for two-phase hydrocarbon fluids with Peng-Robinson equation of state, International Journal of Heat and Mass Transfer, 141 (2019), pp. 1216-1226.

29. Z. Liu and **Z. Qiao**. Wong-Zakai approximations of stochastic Allen-Cahn equation. International Journal of Numerical Analysis and Modeling, 16 (2019), pp. 681-694.

30. **Z. Qiao**, S. Sun, T. Zhang and Y. Zhang. A new multi-component diffuse interface model with Peng-Robinson equation of state and its scalar auxiliary variable (SAV) Approach. Communications in Computational Physics, 26 (2019), pp. 1597-1616.

31. Y. Fan, J. Li, R. Li and **Z. Qiao**. Resolving Knudsen layer by high-order moment expansion. Continuum Mechanics and Thermodynamics, 31 (2019), pp. 1313-1337.

32. L. Ju, X. Li, **Z. Qiao** and H. Zhang. Energy stability and error estimates of exponential time differencing schemes for the epitaxial growth model without slope selection. Mathematics of Computation, 87 (2018), pp. 1859-1885.

33. Q. Du, L. Ju, X. Li and **Z. Qiao**. Stabilized linear semi-implicit schemes for the nonlocal Cahn–Hilliard equation. Journal of Computational Physics, 363 (2018), pp. 39-54.

34. **Z. Qiao**, X. Yang and Y. Zhang. Mass conservative lattice Boltzmann scheme for a three-dimensional diffuse interface model with Peng–Robinson equation of state. Physical Review E, 98 (2018), 023306.

35. X. Li, **Z. Qiao** and H. Zhang. Convergence of a fast explicit operator splitting method for the epitaxial growth model with slope selection. SIAM Journal on Numerical Analysis, 55 (2017), pp. 265-285.

36. D. Li, **Z. Qiao** and T. Tang. Gradient bounds for a thin film epitaxy equation. Journal of Differential Equations, 262 (2017), pp. 1720-1746.

37. X. Fan, J. Kou, **Z. Qiao** and S. Sun. A componentwise convex splitting scheme for diffuse interface models with Van Der Waals and Peng-Robinson equations of state. SIAM Journal on Scientific Computing, 39 (2017), pp. B1-B28.

38. D. Li and **Z. Qiao**. On second order semi-implicit Fourier spectral methods for 2D Cahn–Hilliard equations. Journal of Scientific Computing, 70 (2017), pp. 301-341.

39. X. Li, **Z. Qiao** and H. Zhang. A second-order convex splitting scheme for a Cahn–Hilliard equation with variable interfacial parameters. Journal of Computational Mathematics, 35 (2017), pp. 693-710.

40. Q. Peng, **Z. Qiao** and S. Sun. Stability and convergence analysis of second-order schemes for a diffuse interface model with Peng–Robinson equation of state. Journal of Computational Mathematics, 35 (2017), pp. 737-765.

41. D. Li and **Z. Qiao**. On the stabilization size of semi-implicit Fourier-spectral methods for 3D Cahn–Hilliard equations. Communications in Mathematical Sciences , 15 (2017), pp. 1489-1506.

42. **Z. Qiao**, C. Wang, S.M. Wise and Z. Zhang. Error analysis of a finite difference scheme for the epitaxial thin film model with slope selection with an improved convergence constant. International Journal of Numerical Analysis and Modeling, 14 (2017), pp. 283-305.

43. Z. Hu, R. Li and **Z. Qiao**. Acceleration for microflow simulations of high-order moment models by using lower-order model correction. Journal of Computational Physics , 327 (2016), pp. 225-244.

44. D. Li, **Z. Qiao** and T. Tang. Characterizing the stabilization size for semi-implicit Fourier-spectral method to phase field equations. SIAM Journal on Numerical Analysis , 54 (2016), pp. 1653-1681.

45. Z. Hu, R. Li and **Z. Qiao**. Extended hydrodynamic models and multigrid solver of a Silicon diode simulation, Communications in Computational Physics , 20 (2016), pp. 551-582.

46. X. Li, **Z. Qiao** and H. Zhang. An unconditionally energy stable finite difference scheme for a stochastic Cahn-Hilliard equation, Science China Mathematics, 59 (2016), pp. 1815-1834.

47. **Z. Qiao**, T. Tang and H. Xie. Error analysis of a mixed finite element method for the molecular beam epitaxy model. SIAM Journal on Numerical Analysis , 53 (2015), pp. 184-205.

48. **Z. Qiao**, Z. Sun and Z. Zhang. Stability and convergence of second-order schemes for the nonlinear epitaxial growth model without slope selection. Mathematics of Computation , 84 (2015), pp. 653-674.

49. H. Dong, **Z. Qiao**, S. Sun and T. Tang. Adaptive moving grid methods for two-phase flow in porous media. Journal of Computational and Applied Mathematics , 265 (2014), pp. 139-150.

50. Z. Cai, Y. Fan, R. Li and **Z. Qiao**. Dimension-Reduced Hyperbolic Moment Method for the Boltzmann Equation with BGK-Type Collision. Communications in Computational Physics , 15 (2014), pp. 1368-1406.

51. **Z. Qiao** and S. Sun. Two-phase fluid simulation using a diffuse interface model with Peng-Robinson equation of state. SIAM Journal on Scientific Computing , 36 (2014), pp. B708-B728.

52. S. Chen, L. Dong and **Z. Qiao**. Uniformly convergent H(div)-conforming rectangular elements for Darcy- Stokes problem. Science China-Mathematics, 56 (2013), pp. 204-215.

53. Z. Zhang, Y. Ma and **Z. Qiao**. An adaptive time-Stepping strategy for solving the phase-field crystal model. Journal of Computational Physics , 249 (2013), pp. 204-215.

54. Z. Cai, R. Li and **Z. Qiao**. Globally hyperbolic regularized moment method with applications to microflow simulation. Computers & Fluids, 81 (2013), pp. 95-109.

55. H. Chen, S. Chen and **Z. Qiao**. C^0-nonconforming triangular prism elements for the three-dimensional fourth order elliptic problem. Journal of Scientific Computing , 55 (2013), pp. 645-658.

56. H. Chen, S. Chen and **Z. Qiao**. C^0-nonconforming tetrahedral and cuboid elements for the three-dimensional fourth order elliptic problem. Numerische Mathematik , 124 (2013), pp. 99-119.

57. C. Li and **Z. Qiao**. A fast preconditioned iterative methods for the scattering problem from a large cavity. Journal of Scientific computing , 53 (2012), pp. 435-450.

58. Z. Cai, R. Li and **Z. Qiao**. NRxx Simulation of microflows with Shakhov Model. SIAM Journal on Scientific Computing , 34 (2012), pp. A339-A369.

59. **Z. Qiao**, Z. Sun and Z. Zhang. The stability and convergence analysis of linearized finite-difference schemes for the nonlinear epitaxial growth model. Numerical Methods for Partial Differential Equations, 28 (2012), pp. 1893-1915.

60. Z. Zhang and **Z. Qiao**. An adaptive time-stepping strategy for the Cahn-Hilliard equation. Communications in Computational Physics ,11 (2012), pp. 1261-1278.

61. G. Hu, **Z. Qiao** and T. Tang. Moving finite element simulations for reaction-diffusion systems. Advances in Applied Mathematics and Mechanics, 4 (2012), pp. 365-381.

62. K. Ito, Z. Li and **Z. Qiao**. The sensitivity analysis for the flow past obstacles problem with respect to the Reynolds number. Advances in Applied Mathematics and Mechanics, 4 (2012), pp. 21-35.

63. **Z. Qiao**, Z. Zhang and T. Tang. An adaptive time-stepping strategy for the molecular beam epitaxy models. SIAM Journal on Scientific Computing , 33 (2011), pp. 1395-1414.

64. **Z. Qiao**, C. Yao and S. Jia. Superconvergence and extrapolation analysis of a nonconforming mixed finite element approximation for the time-harmonic Maxwell's equations. Journal of Scientific Computing , 46 (2011), pp. 1-19.

65. C. Yao and **Z. Qiao**. Extrapolation of mixed finite element approximations for the Maxwell eigenvalue problem. Numerical Mathematics-Theory, Methods and Applications, 4 (2011), pp. 382-398.

66. H. Xie, Z. Li and **Z. Qiao**. A finite element method for elasticity interface problems with locally modified triangulations. International Journal of Numerical Analysis and Modeling, 8 (2011), pp. 189-200.

67. X. Feng, Z. Li and **Z. Qiao**. High order compact finite difference schemes for Helmholtz equation with discontinuous coefficient. Journal of Computational Mathematics, 29 (2011), pp. 324-340.

68. M. Zhao, **Z. Qiao** and T. Tang. A Fast High Order Method for Electromagnetic Scattering by Large Open Cavities. Journal of Computational Mathematics, 29 (2011), pp. 287-304.

69. S. Chen, M. Liu and **Z. Qiao**. An anisotropic nonconforming element for fourth order elliptic singular perturbation problem. International Journal of Numerical Analysis and Modeling, 7 (2010), pp. 766-784.

70. J. Cai, Y. Wang and **Z. Qiao**. Multisymplectic Preissman scheme for the time-domain Maxwell's equations, Journal of Mathematical Physics, 50, 033510 (2009).

71. K. Ito, **Z. Qiao** and J. Toivanen. A domain decomposition solver for acoustic scattering by elastic objects in layered media, Journal of Computational Physics , 227 (2008), pp. 8685-8698.

72. K. Ito and **Z. Qiao**. A high order compact MAC finite difference scheme for the Stokes equations: Augmented variable approach, Journal of Computational Physics , 227 (2008), pp. 8177-8190.

73. **Z. Qiao**. Numerical Investigations of the Dynamical Behaviors and Instabilities for the Gierer-Meinhardt System, Communications in Computational Physics , 3 (2008), pp. 406-426.

74. Z. Li, C. Pao, **Z. Qiao**. A Finite Difference Method and Analysis for 2D Nonlinear Poisson-Boltzmann Equations, Journal of Scientific Computing , 30 (2007), pp. 61-81.

75. **Z. Qiao**, Z. Li, T. Tang. Efficient numerical methods for the 2D nonlinear Poisson-Boltzmann equation modeling charged spheres, Journal of Computational Mathematics, 24 (2006), pp. 252-264.

Book:

Zhilin Li, Zhonghua Qiao and Tao Tang. Numerical Solution of Differential Equations: Introduction to Finite Difference and Finite Element Methods, Cambridge University Press, 2018.

Editorship

- 2023-present, Associate Editor of Journal of Computational Physics
- 2022-present, Editorial Board Member of Numerical Methods for Partial Differential Equations
- 2022-present, Editorial Board Member of Advances in Continuous and Discrete Models: Theory and Modern Applications
- 2022-present, Editorial Board Member of Mathematical and Computational Applications
- 2019-present, Managing Editor of Advances in Applied Mathematics and Mechanics (2014-2018, Associate Editor).
- 2017-present, Associate Editor of International Journal of Numerical Analysis and Modeling.

Supervision of graduate student

- Chief Supervisor of Qiujin Peng (Ph.D) at PolyU, obtained her Ph.D degree in April, 2016.
- Chief Supervisor of Yuze Zhang (Ph.D) at PolyU, obtained his Ph.D degree in November, 2019.
- Chief Supervisor of Chaoyu Liu (Ph.D Candidate) at PolyU, Under Supervision Since August 2019.
- Chief Supervisor of Haoran Guan (Ph.D Candidate) at PolyU, Under Supervision Since August 2021.
- Chief Supervisor of Gaohang Chen (Ph.D Candidate) at PolyU, Under Supervision Since August 2022.
- Chief Supervisor of Jiayi Duan (Ph.D Candidate) at PolyU, Under Supervision Since August 2022.

Supervision of Postdoctoral Fellow

- July, 2014-July, 2015, Zhicheng Hu
- July, 2016-July, 2018, Xuguang Yang (University postdoctoral fellow of PolyU)
- August, 2016-August, 2018, Xiao Li (Joint supervision with Prof. Qiang Du at Beijing computational science research center)
- August, 2017-August, 2018, Zhihui Liu
- August, 2019-July, 2020, Xiao Li
- January, 2020-June, 2022, Qian Zhang (Hong Kong Scholar)
- August, 2021-present, Dianming Hou
- November, 2021-present, Yonghui Bo
- August, 2022-present, Nan Zheng
- February, 2023-present, Yaping Chen (Hong Kong Scholar)
- February, 2023-present, Caixia Nan

Conferences and workshops attended

9/2022	**Plenary Speaker.** International Conference on Computational Partial Differential Equations and Applications (ICCPDEA-2022), BML Munjal University, India
3/2022	**Symposium Invited speaker.** SIAM Conference on Imaging Science, Virtual Conference.
2/2022	**Invited speaker.** Workshop I: Computation, Analysis and Applications of PDEs with Nonlocal and Singular Operators, Singapore.
9/2020	**Invited speaker.** International Conference on Computational Sciences : Modelling, Computing and Soft Computing, National Institute of Technology Calicut, Kerala, India.
7/2020	**Invited speaker.** International workshop on analysis, algorithm and simulation of phase filed models, Xiamen, China.
6/2020	**Invited speaker.** Recent Progress in Nonlocal Modeling, Analysis, and Computation (NMAC20), Shenzhen, China.
1/2020	**Invited Speaker.** Recent Advances on Phase-field Models and Simulations Bordeaux, France.
9/2019	**Mini-symposium Invited speaker.** CSIAM 2019 Annual Meeting, Foshan, China.
7/2019	**Mini-symposium Invited speaker.** ICIAM 2019, Valencia, Spain.
6/2019	**Invited Speaker.** Advanced Numerical Methods for Scientific Computation, Shenzhen, China.
6/2019	**Invited Speaker.** EASIAM2019, Wuhan, China.
5/2019	**Invited Speaker.** International Conference on Mathematical Modeling and Numerical Methods, Qingdao, China.
9/2018	**Mini-symposium Invited speaker.** CSIAM 2018 Annual Meeting, Chengdu, China.
9/2018	**Invited Speaker.** The 9th International Conference on Partial Differential Equations & Numerical Analysis, Changsha, China.
7/2018	**Mini-symposium Invited speaker.** International Conference on Spectral and High Order Methods, London, United Kingdom.
7/2018	**Mini-symposium Invited speaker.** The 12th AIMS Conference on Dynamical Systems, Differential Equations and Applications, Taipei.
6/2018	**Invited Speaker.** Workshop on Numerical Analysis for Partial Differential Equations, Matsuyama, Japan.
6/2018	**Invited Speaker.** The Fourth International Workshop on the Development and Application of High-Order Numerical Methods, Nanjing, China.

10/2017	**Mini-symposium Invited speaker.** 15th Annual Meeting of China Society for Industrial and Applied Mathematics, Qingdao, China.
7/2017	**Mini-symposium Invited speaker.** 11th Annual Meeting of China Society for Computational Mathematics, XiAn, China.
6/2017	**Invited speaker.** *Tongji University International Young Scholar Forum on Computational Mathematics 2017, Shanghai, China.*
9/2016	**Invited speaker.** *Young Scholar Workshop on Scientific and Engineering Computing 2016, Beijing, China.*
7/2016	**Invited speaker.** *Special Session: Numerical methods for phase-field models at The 11th AIMS Conference on Dynamical Systems, Differential Equations and Applications, Orlando, USA.*
6/2016	**Invited speaker.** *Symposium on Numerical Methods for PDEs, Changchun, China.*
1/2016	**Invited speaker.** *Workshop on Numerical Methods of Nonlinear Problems, Tsinghua Sanya International Mathematics Forum, Sanya, China.*
12/2015	**Invited speaker.** *Numerical Simulation and Theoretical Analysis in Computational Physics, Beijing, China.*
12/2015	**Invited speaker.** *Workshop of Computational and Applied Mathematics, Macau.*
8/2015	**Mini-symposium organizer and invited speaker.** *The International Congress on Industrial and Applied Mathematics (ICIAM) 2015, Beijing, China.*
12/2015	**Invited speaker.** *The 2015 Workshop on Finite Element Methods, Beijing, China.*
7/2015	**Invited speaker.** *The 3rd International Workshop on Numerical Mathematics and Applications to Some Challenging Problems, Xiamen, China.*
1/2015	**Mini-symposium organizer.** *The 9th International Conference on Computational Physics, Singapore.*
11/2014	**Invited speaker.** *Mathematical and Computational methods for transport equation, Shanghai, China.*
9/2014	**Invited speaker.** *The 3rd Cross-straits workshop on Computational Mathematics, Xiangtan, China.*
7/2014	**Mini-symposium organizer.** *2014 SIAM Annual Meeting (AN14) Chicago, USA.*
6/2014	**Invited speaker.** *The Hong Kong Mathematical Society Annual General Meeting 2014, Hong Kong.*
7/2013	**Invited speaker.** *SJTU-INS Workshop on Fluid-Structure Interaction Problems, Shanghai, China.*
6/2013	*The Second International Conference on Interdisciplinary Applied and Computational Mathematics, Hangzhou, China.*
5/2013	**Invited speaker.** *The 1st Chongqing Workshop on Computational and Applied Mathematics (CQWCAM1), Chongqing, China.*
5/2013	**Invited speaker.** *International Workshop on Computational and Applied Mathematics, Huangshan, China.*
6/2012	*The 8th East Asia SIAM Conference (EASIAM 2012), Taipei, Taiwan.*
5/2012	**Invited speaker.** *International Conference on Applied Mathematics 2012, Modeling, Analysis & Computation, Hong Kong.*
8/2011	**Invited speaker.** *International Conference on Frontiers of Numerical PDEs, Guangzhou, China.*
6/2011	**Invited speaker.** *International Conference on Interdisciplinary Applied and Computational Mathematics, Hangzhou, China.*
6/2010	**Invited speaker.** *The First Workshop on Interdisciplinary Applied and Computational Mathematics, Hangzhou, China.*
5/2010	*The Seventh International Conference on Computational Physics, Beijing, China.*

8/2009	*The 19th International Conference on Domain Decomposition Methods (DDM19), Zhang Jiajie, China.*
12/2008	*The 3rd International Conference on Scientific Computing and Partial Differential Equations, Hong Kong.*
3/2008	*2007-08 Education and Outreach Program—SAMSI Two-Day Undergraduate Workshop, Raleigh, NC, USA.*
12/2005	*The 2nd International Conference on Scientific Computing and Partial Differential Equations & The First East Asia SIAM Symposium, Hong Kong.*

Contribution to PolyU service

- 7/2020-present, Chairman of Departmental Computer and Equipment Committee

- 5/2020-present, Founding Member of Research Institute for Smart Energy, PolyU

- 2018-present, Associate director of CAS AMSS-POLYU Joint laboratory of applied mathematics

- 2017-2018, Department Management Committee member in Department of Applied Mathematics

- 2012-present, Deputy Service Teaching Coordinator in Department of Applied Mathematics

- 2015-present, Assistant director of AMSS-PolyU Joint Research Institute

- 2012-present, Committee member in the Departmental Learning & Teaching Committee

- 2012-2014, Colloquium Liaison Officer in Department of Applied Mathematics

- 2014-2015, Chairman of Mentorship Programme in Department of Applied Mathematics

Contribution to professional/community service

- 5/2020-present, Treasurer, The Hong Kong Mathematical Society

- 1/2019-present, Secretary-General, Hong Kong Society for Industrial and Applied Mathematics

- 5/2016-present, Council member of The Hong Kong Mathematical Society

- 3/2020-present, Director, International Mathematical Modeling Challenge Committee (Zhonghua) Limited

- 11/2019-2/2022, Independent Non-executive Director of Suoxinda Holdings Limited

- 5/2017, Local Organizing Committee co-chair of The 3rd International Conference on Engineering and Computational Mathematics (ECM2017), Hong Kong.

- Conference/Workshop organizing committee member:

12/2014	*The 5th Intl. Conference on Scientific Computing and Partial Differential Equations, Hong Kong.*
12/2013	*The 2nd International Conference on Engineering and Computational Mathematics (ECM2013), Hong Kong.*
1/2013	*The 8th International Conference on Computational Physics (ICCP8), Hong Kong.*
5/2012	*2nd Workshop on Computational Mathematics, Hong Kong.*
12/2011	*The 4th Intl. Conference on Scientific Computing and Partial Differential Equations, Hong Kong.*

- 4/2015, Expert Panel member of The International Mathematical Modeling Challenge-Hong Kong

- 4/2016, Expert Panel member of The International Mathematical Modeling Challenge-Zhonghua

- Member of SIAM: Society for Industrial and Applied Mathematics

- Faculty Advisors (with Prof. Xiaojun Chen at the Hong Kong Polytechnic University): The Hong Kong Polytechnic University Chapter of SIAM

- SIAM Representative in The 2nd International Conference on Engineering and Computational Mathematics (ECM2013), Hong Kong.

- 2010-2020, Editors-in-Chief (with Prof. Yuesheng Xu at Sun Yat-sen University): CAM Digest, which is a collection of articles on topics related to computational and applied mathematics and those who practice it. It is distributed bi-weekly to members of the CAM-Net. Up to now there are thousands of members in this society. It is also one of my contributions to promote HKPolyU in the applied mathematics community.

- Referee–Journals:
  SIAM Journal on Numerical Analysis
  SIAM Journal on Scientific Computing
  SIAM Journal on Applied Mathematics
  Numerische Mathematik
  Mathematics of Computation
  Journal of Scientific Computing
  Journal of Computational Physics
  Communications in Mathematical Sciences
  Computers & Fluids
  Discrete and Continuous Dynamical Systems - Series B
  Applied Mathematics and Computation
  Communications in Computational Physics
  Chinese Physics Letter
  International Journal of Computational Fluid Dynamics
  International Journal of Computer Mathematics
  Journal of Computational Mathematics
  Journal of Computational and Applied Mathematics
  Science China Mathematics