# Curriculum Vitae

**Jing-Mei Qiu**

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## Education

- Ph.D. in Applied Mathematics, May 2007.
  Division of Applied Mathematics, Brown University, Providence, RI, USA

  *Thesis Title:* High order schemes: convergence for hyperbolic conservation laws and applications in computational cosmology.

  *Advisor:* Professor Chi-Wang Shu

- B.Sc. in Mathematics, June 2003.
  University of Science and Technology of China, Hefei, Anhui, P.R. China.

## Professional Appointments

- Professor, Department of Mathematical Sciences, University of Delaware, Aug. 2019 - present.
- Associate Professor, Department of Mathematical Sciences, University of Delaware, Aug. 2017 - Aug. 2019.
- Associate Professor, Department of Mathematics, University of Houston, Sep. 2014 - Aug. 2017.
- Assistant Professor, Department of Mathematics, University of Houston, August 2011 - August 2014.
- Assistant Professor, Mathematical and Computer Science, Colorado School of Mines, August 2008 - August 2011.
- Visiting research associate, June 2007 - July 2008. Michigan State University, East Lansing, MI. *Mentor:* Professor Andrew Christlieb

## Research Interests

- Low rank tensor approach and high order multi-scale numerical methods for kinetic-hydrodynamic simulations with local conservation and structure preservation.
- High order semi-Lagrangian method for kinetic and transport equations with applications in astrophysics, plasma Physics and meteorology.
- High order methods for temporal multi-scale problems: implicit-explicit Runge-Kutta method and integral deferred correction method for singular perturbation problems.

## Awards and Honors

- Award for Excellence in Research, Scholarship or Creative Activity, University of Houston, 2017.
- Air Force Office of Scientific Research, Young Investigator Award, 2012-2015.
- Ostrach Fellowship, Division of Applied Mathematics, Brown University, 2006.

## Research Grants

### Active

- Sole PI: NSF-DMS-2111253, *Eulerian-Lagrangian Runge-Kutta Discontinuous Galerkin Methods for Nonlinear Kinetics and Fluid Models* $304,624, National Science Foundation, Division of Mathematical Science, 2021-2024.
- Sole PI: NSF-DMS-1818924, *High Order Multi-Scale Numerical Methods for All-Mach Number Flows* $262,410, National Science Foundation, Division of Mathematical Science, 2018-2021.
- Sole PI: FA9550-18-1-0257,
  - *A Highly Efficient Multi-Dimensional Semi-Lagrangian Discontinuous Galerkin Method for Vlasov Simulations,* $379,404, Air Force Office of Scientific Research, 2018-2021.
  - *A Low Rank Tensor Representation for Nonlinear Vlasov Dynamics*, $43,721, Air Force Office of Scientific Research, 2020-2021. A subcontract is issued to Texas Tech University.

### Completed

- Sole PI: FA9550-16-1-0179, *A high order truly multi-dimensional semi-Lagrangian approach for Vlasov simulations.* $299,253, Air Force Office of Scientific Research, Computational Mathematics Program, 2016-2019.
- Sole PI: NSF-DMS-1522777, *A High Order Discontinuous Galerkin Multi-scale Approach for Kinetic-hydrodynamic Simulations* $235,826, National Science Foundation, Division of Mathematical Science, 2015-2018.
- Sole PI: NSF-DMS-1217008, *A High Order Semi-Lagrangian Approach for the Vlasov Equation* $185,500, National Science Foundation, Division of Mathematical Science, 2012-2016.
- Sole PI: FA9550-12-0318, *A High Order Multi-scale Numerical Approach for Kinetic Simulations,* $359,760, Air Force Office Scientific Research, Computational Mathematics, Young Investigator Research Program (YIP), 2012-2015.
- Sole PI: NSF-DMS-0914852, *A High Order Adaptive Semi-Lagrangian WENO Method for the Vlasov Equation,* $253,981, National Science Foundation, Division of Mathematical Science, 2009-2012.

- Sole PI: FA-9550-09-1-0344, *A High Order Essentially Non-Oscillatory Method for Temporal Multi-scale Problems in Plasma Physics,* $25,777, Air Force Office Scientific Research, Computational Mathematics, 2009.

## Students/Postdoc Mentoring

- Current Ph.D. student: Mr. Jiajie Chen, Mr. Aidan Hamilton, Mr. Joseph Nakao.
- Past Ph.D. Students:
  - Dr. Linjin Li (Ph.D. 2021. First job: Temporary Assistant Professor at University of Delaware)
  - Dr. Mingchang Ding (Ph.D. 2020. First job: postdoc in Computational Mathematics Science and Engineering, Michigan State University)
  - Dr. Wei Guo (Ph.D. 2014. First job: postdoc in Department of Mathematics, Michigan State University)
  - Dr. Pei Yang (Ph.D. 2015. First job: geoscience company in Houston)
- Past postdoc: Dr. Tao Xiong (Aug. 2012-Aug. 2015, currently Professor in Xiamen University), Dr. Xiaofeng Cai (July 2016- July 2021, currently Associate Professor at Beijing Normal University), Dr. Xue Hong (Sep. 2021-Nov. 2021, currently postdoc at INRIA, University of Rennes, France)
- Past visiting scholar: Dr. Hongqiang Zhu (Aug. 2014-Aug. 2015, from Nanjing University of Posts and Telecommunications)
- Past Visiting Student: Dr. Tan Ren (Aug. 2012-Aug. 2014, from Beijing Institute of Technology), Dr. Xiaofeng Cai (Jan. 2015-June. 2016, from Xiamen University).

## Travel Awards

1. Collaborate@ICERM: High Order Semi-implicit IMEX WENO Schemes for Isentropic Euler System with All-Mach Number, Institute for Computational and Experimental Research in Mathematics, Brown University, Providence, RI, July 23-27, 2018.
2. Research in Pairs at Mathematisches Forschungsinstitut Oberwolfach, Germany, June 24 - July 7, 2012
3. ICERM long program: Kinetic Theory and Computation, September 7- December 9, 2011, Institute for Computational and Experimental Research in Mathematics, Brown University, Providence, RI.
4. IPAM long program: Quantum and Kinetic Transport: Analysis, Computations, and New Applications, March 9 - June 12, 2009, IPAM, UCLA.
5. AWM-NSF Travel Grant, 2008.

6. Institute for Pure and Applied Mathematics, University of California-Los Angeles, Spring 2007.

7. Theoretical Astrophysics Program (TAP) Research Visitor Grant, Department of Physics, University of Arizona, Spring 2006.

## Publications in Peer Reviewed Journals

*(Superscripts $^s$ and $^p$ stands for 'students' and 'postdocs' working with Dr. Qiu)*

1. A fourth-order conservative semi-Lagrangian finite volume WENO scheme without operator splitting for kinetic and fluid simulations, N. Zheng, X. Cai, J.-M. Qiu, J. Qiu, submitted.

2. A conservative low rank tensor method for the Vlasov dynamics, W. Guo and J.-M. Qiu, submitted.

3. Eulerian-Lagrangian Runge-Kutta discontinuous Galerkin method for transport simulations on unstructured meshes, X. Cai and J.-M. Qiu, submitted.

4. High Order Semi-implicit WENO Schemes for All Mach Full Euler System of Gas Dynamics, B. Sebastiano, J.-M. Qiu, G. Russo, T. Xiong, submitted.

5. Semi-Lagrangian nodal discontinuous Galerkin method for the BGK Model, M. Ding and J.-M. Qiu, submitted.

6. A Generalized Eulerian-Lagrangian Discontinuous Galerkin Method for Transport Problems, X. Hong and J.-M. Qiu, submitted.

7. A Low Rank Tensor Representation of Linear Transport and Nonlinear Vlasov Solutions and Their Associated Flow Maps, W. Guo and J.-M. Qiu, submitted.

8. Accuracy and stability analysis of the Semi-Lagrangian method for stiff hyperbolic relaxation systems and kinetic BGK model, M. Ding and J.-M. Qiu, SIAM Multiscale Modeling and Simulation, in revision.

9. A High Order Semi-Lagrangian Finite Difference Method for nonlinear Vlasov and BGK Models, L. Li, J.-M. Qiu and G. Russo, **Communications on Applied Mathematics and Computation**, (2022), Pages 1-29.

10. A conservative semi-Lagrangian hybrid Hermite WENO scheme for linear transport equations and the nonlinear Vlasov-Poisson system, N. Zheng, X. Cai, J.-M. Qiu, J. Qiu, **SIAM Journal of Scientific Computing**, v43 (2021), Pages 3580-3606.

11. An Eulerian-Lagrangian discontinuous Galerkin method for transport problems and its application to nonlinear dynamics , X. Cai, J.-M. Qiu, and Yang Yang, **Journal of Computational Physics**, 2021.

12. High Order Semi-Lagrangian Discontinuous Galerkin Method Coupled with Runge-Kutta Exponential Integrators for Nonlinear Vlasov Dynamics, X. Cai, S. Boscarino, and J.-M. Qiu, **Journal of Computational Physics**, v427 (2021), Pages 110036.

13. Stability-enhanced AP IMEX1-LDG method: energy-based stability and rigorous AP property, Z. Peng, Y. Cheng, J.-M. Qiu, and F. Li, **SIAM Journal on Numerical Analysis**, v59 (2021), Pages 925-954.

14. Adaptive Order WENO Reconstructions for the Semi-Lagrangian Finite Difference Scheme for advection problem, J. Chen, X. Cai, J. Qiu, J.-M. Qiu, **Communications in Computational Physics**, v30(2021), Pages 67-96.

15. Comparison of semi-Lagrangian discontinuous Galerkin schemes for linear and nonlinear transport simulations, X. Cai, W. Guo and J.-M. Qiu, **Communications on Applied Mathematics and Computation**, 2020, Pages 1-31.

16. A three-phase fundamental diagram from three-dimensional traffic data, Maria Laura Delle Monachea, Karen Chi, Yong Chen, Paola Goatinc, Ke Han, Jing-Mei Qiu, Benedetto Piccoli, Axioms, v10 (2021), Pages 17.

17. A semi-Lagrangian discontinuous Galerkin (DG) - local DG method for solving convection-diffusion-reaction equations, M. Ding$^s$, X. Cai$^p$, W. Guo and J.-M. Qiu, **Journal of Computational Physics**, v409(2020), Pages 109-295.

18. Stability-enhanced AP IMEX-LDG schemes for linear kinetic transport equations under a diffusive scaling, Z. Peng, Y. Cheng, J.-M. Qiu, and F. Li, **Journal of Computational Physics**, v415 (2020), Pages 109-485.

19. Optimal convergence and superconvergence of semi-Lagrangian discontinuous Galerkin methods for linear convection equations in one space dimension, Y. Yang, X. Cai, and J.-M. Qiu, **Mathematics of Computation**, v89 (2020), Pages 2113-2139.

20. A High Order Semi-implicit IMEX WENO Scheme for the all-Mach Isentropic Euler System, B. Sebastiano, J.-M. Qiu, G. Russo, T. Xiong, **Journal of Computational Physics**, v392 (2019), Pages 594-618.

21. A high order semi-Lagrangian discontinuous Galerkin method for the two-dimensional incompressible Euler equations and the guiding center Vlasov model without operator splitting, X. Cai$^p$, W. Guo and J.-M. Qiu, **Journal of Scientific Computing**, v79(2019), Pages 1111-1134.

22. Conservative Multi-Dimensional Semi-Lagrangian Finite Difference Scheme: Stability and Applications to the Kinetic and Fluid Simulations, T. Xiong, G. Russo and J.-M. Qiu, **Journal of Scientific Computing**, v79 (2019), Pages 1241 - 1270.

23. A high order semi-Lagrangian discontinuous Galerkin method for Vlasov-Poisson simulations without operator splitting, X. Cai$^p$, W. Guo and J.-M. Qiu, **Journal of Computational Physics**, v354 (2018), Pages 529-551.

24. High Order Multi-dimensional Characteristics Tracing for the Incompressible Euler Equation and the Guiding-center Vlasov Equation, T. Xiong, G. Russo and J.-M. Qiu, **Journal of Scientific Computing**, v77 (2018), pp 263-282.

25. Implicit-Explicit Integral Deferred Correction Methods for Stiff Problems and Applications to Partial Differential Equations, B. Sebastiano, J.-M. Qiu and G. Russo, **SIAM Journal of Scientific Computing**, v40 (2018), Pages A787-A816.

26. Finite volume HWENO schemes for nonconvex conservation laws, X. Cai[p], J. Qiu and J.-M. Qiu, **Journal of Scientific Computing**, v75 (2018), Pages 65-82.

27. A high order conservative semi-Lagrangian discontinuous Galerkin method for two-dimensional transport simulations, X. Cai[p], W. Guo and J.-M. Qiu, **Journal of Scientific Computing**, v73 (2017), Pages 514-542.

28. An h-adaptive RKDG method for the two-dimensional incompressible Euler equations and the guiding center Vlasov model, H. Zhu, J. Qiu and J.-M. Qiu, **Journal of Scientific Computing**, v73 (2017), Pages 1316-1337.

29. High Order Hierarchical Asymptotic Preserving Nodal Discontinuous Galerkin IMEX Schemes For The BGK Equation, T. Xiong[p] and J.-M. Qiu, **Journal of Computational Physics**, v336 (2017), Pages 164-191.

30. A High Order Multi-Dimensional Characteristic Tracing Strategy for the Vlasov-Poisson System, J.-M. Qiu and G. Russo, **Journal of Scientific Computing**, v71 (2017), Pages 414-434.

31. An $h$-adaptive RKDG method for the Vlasov-Poisson system, H. Zhu, J. Qiu and J.-M. Qiu, **Journal of Scientific Computing**, v69 (2016), Pages 1346-1365.

32. High Order Mass Conservative Semi-Lagrangian Methods for Transport Problems, J.-M. Qiu, **Handbook of Numerical Methods for Hyperbolic Problems**: Part A, Chapter 16.

33. Numerical methods for hyperbolic nets and networks, S. Canic, M.L. Delle Monache, B. Piccoli, J.-M. Qiu and J. Tambaca, **Handbook of Numerical Methods for Hyperbolic Problems**.

34. An Adaptive WENO Collocation Method for Differential Equations with Random Coefficients, W. Guo[s], G. Lin, A. Christlieb and J.-M. Qiu, MDPI, **Special Issue "New Trends in Applications of Orthogonal Polynomials and Special Functions"**, v4(2016), Pages 29.

35. A conservative semi-Lagrangian HWENO method for the Vlasov equation, X. Cai[s], J. Qiu and J.-M. Qiu, **Journal of Computational Physics**, v323 (2016), Pages 95-114.

36. Notes on RKDG methods for shallow-water equations in canal networks, M. Briani, B. Piccoli, J.-M. Qiu, **Journal of Scientific Computing,** v68(2016), Pages 1101-1123.

37. Parametrized Positivity Preserving Flux Limiters for the High Order Finite Difference WENO Scheme Solving Compressible Euler Equations, T. Xiong$^p$, J.-M. Qiu, Z. Xu, **Journal of Scientific Computing**, v67(2016), Pages 1066-1088.

38. Error Estimate of Integral Deferred Correction Implicit Runge-Kutta method for Stiff Problems, S. Boscarino and J.-M. Qiu, **Mathematical Modelling and Numerical Analysis**, v50(2016), Pages 1137-1166.

39. High Order Maximum Principle Preserving Finite Volume Method for Convection Dominated Problems, P. Yang$^s$, T. Xiong$^p$, J.-M. Qiu and Z. Xu, **Journal of Scientific Computing**, v67(2016), Pages 795-820.

40. High Order Asymptotic Preserving Nodal Discontinuous Galerkin IMEX Schemes for the BGK Equation, T. Xiong$^p$, J. Jang, F. Li and J.-M. Qiu, **Journal of Computational Physics**, v284 (2015), Pages 70-94.

41. High Order Maximum Principle Preserving Discontinuous Galerkin Method for Convection Diffusion Equations, T. Xiong$^p$, J.-M. Qiu and Z. Xu, **SIAM Journal of Scientific Computing**, v37 (2015), Pages 583-608.

42. A New Lax-Wendroff Discontinuous Galerkin Method with Superconvergence, W. Guo$^s$, J.-M. Qiu and J.-X. Qiu, **Journal of Scientific Computing**, v65 (2015), Pages 299-326.

43. Runge-Kutta Discontinuous Galerkin Method for Traffic Flow Model on Networks, S. Canic, B. Piccoli, J.-M. Qiu and T. Ren$^s$, **Journal of Scientific Computing**, v63 (2015), Pages 233-255.

44. High Order Asymptotic Preserving Discontinuous Galerkin Schemes for Discrete-Velocity Kinetic Equations in the Diffusive Scaling, J. Jang, F. Li, J.-M. Qiu, T. Xiong$^p$, **Journal of Computational Physics**, v281 (2015), Pages 199-224.

45. Runge-Kutta Central Discontinuous Galerkin BGK Method for the Navier-Stokes Equations, T. Ren$^s$, J. Hu, T.Xiong$^p$ and J.-M. Qiu, **Journal of Computational Physics**, v274 (2014), Pages 592-610.

46. High Order Maximum Principle Preserving Semi-Lagrangian Finite Difference WENO schemes for the Vlasov Equation, T. Xiong$^p$, J.-M. Qiu, Z. Xu, A. Christlieb, **Journal of Computational Physics**, v273 (2014), Pages 618-639.

47. Analysis of High Order Asymptotic Preserving Discontinuous Galerkin Schemes for Discrete-Velocity Kinetic Equations in the Diffusive Scaling, J. Jang, F. Li, J.-M. Qiu, T. Xiong$^p$, **SIAM Journal of Numerical Analysis**, v52 (2014), Pages 2048-2072.

48. A High Order Time Splitting Method Based on Integral Deferred Correction for Semi-Lagrangian Vlasov Simulations, A. Christlieb, W. Guo$^s$, M. Morton, J.-M. Qiu, **Journal of Computational Physics**, v267 (2014), Pages 7-27.

49. A Conservative Semi-Lagrangian Discontinuous Galerkin Scheme on the Cubed-Sphere, W. Guo[s], R. Nair and J.-M. Qiu, **Monthly Weather Review**, v142 (2014), Pages 457-475.

50. A Parametrized Maximum Principle Preserving Flux Limiter for Finite Difference RK-WENO Schemes with Applications in Incompressible Flows, T. Xiong[p], J.-M. Qiu and Z. Xu, **Journal of Computational Physics**, v252(2013), Pages 310-331.

51. Superconvergence of Discontinuous Galerkin and Local Discontinuous Galerkin Methods: Eigen-structure Analysis Based on Fourier Approach, W. Guo[s], X.-H. Zhong and J.-M. Qiu, **Journal of Computational Physics**, v235 (2013), Pages 458-485.

52. Hybrid Semi-Lagrangian Finite Element Finite Difference Methods for the Vlasov Equation, W. Guo[s] and J.-M. Qiu, **Journal of Computational Physics**, v234 (2013), Pages 108-132.

53. Positivity Preserving Semi-Lagrangian Discontinuous Galerkin Formulation: Theoretical Analysis and Application to the Vlasov-Poisson System, J.-M. Qiu and C.-W. Shu, **Journal of Computational Physics**, v230 (2011), Pages 8386-8409.

54. Adaptive Mesh Refinement Based on High Order Finite Difference WENO Scheme for Multi-scale Simulations, C.-P. Shen, J.-M. Qiu and A. Christlieb, **Journal of Computational Physics**, v230 (2011), Pages 3780-3802.

55. Conservative Semi-Lagrangian Finite Difference WENO Formulations with Applications to the Vlasov Equation, J.-M. Qiu and C.-W. Shu, **Communications in Computational Physics**, v10 (2011), Pages 979-1000.

56. Conservative High Order Semi-Lagrangian Finite Difference WENO Methods for Advection in Incompressible Flow, J.-M. Qiu and C .-W. Shu, **Journal of Computational Physics**, v230 (2011), Pages 863-889.

57. Semi-implicit Integral Deferred Correction Constructed with High Order Additive Runge-Kutta Methods, A. Christlieb, M. Morton, B. Ong and J.-M. Qiu, **Communications in Mathematical Sciences**, v9 (2011), Pages 879-902.

58. Integral Deferred Correction Methods Constructed with High Order Runge-Kutta Integrators, A. Christlieb, B. Ong and J.-M. Qiu, **Mathematics of Computation**, v79 (2010), Pages 761-783.

59. A Conservative High Order Semi-Lagrangian WENO Method for the Vlasov Equation, J.-M. Qiu and A. Christlieb, **Journal of Computational Physics**, v229 (2010), Pages 1130-1149.

60. Comments on High Order Integrators Embedded within Integral Deferred Correction Methods, A. Christlieb, B. Ong and J.-M. Qiu, **Communications in Applied Mathematics and Computational Science**, v4 (2009), Pages 27-56.

61. Time Evolution of Wouthuysen-Field Coupling, I. Roy, W. Xu, J.-M. Qiu, C.-W. Shu and L.-Z. Fang, **The Astrophysical Journal**, v694 (2009), Pages 1121-1130.

62. A WENO Algorithm for Radiative Transfer with Resonant Scattering and the Wouthuysen-Field Coupling, I. Roy, J.-M. Qiu, C.-W. Shu and L.-Z. Fang, **New Astronomy**, v14 (2009), Pages 513-520.

63. Wouthuysen-Field Coupling in 21 cm Region Around High Redshift Sources, I. Roy, W. Xu, J.-M. Qiu, C.-W. Shu and L.-Z. Fang, **The Astrophyiscal Journal**, v 703 (2009), Pages 1992-2003.

64. Convergence of Godunov-type Schemes for Scalar Conservation Laws under Large Time Steps, J.-M. Qiu and C.-W. Shu, **SIAM Journal on Numerical Analysis**, v46 (2008), Pages 2211-2237.

65. A WENO Algorithm for the Growth of Ionized Regions at the Reionization Epoch, J.-M. Qiu, C.-W. Shu, J. -R. Liu and L.-Z. Fang, **New Astronomy**, v13 (2008), Pages 1-11.

66. Convergence of High Order Finite Volume Weighted Essentially Non-oscillatory Scheme and Discontinuous Galerkin Method for Nonconvex Conservation Laws, J.-M. Qiu and C .-W. Shu, **SIAM Journal on Scientific Computing**, v31 (2008), Pages 584-607.

67. A WENO Algorithm of the Temperature and Ionization Profiles Around a Point Source, J.-M. Qiu, L.-L. Feng, C.-W. Shu and L.-Z. Fang, **New Astronomy**, v12 (2007), Pages 398-409.

68. 21 cm Signals From Early Ionizing Sources, J. Liu, J.-M. Qiu, L.-L. Feng, C.-W. Shu, L.-Z. Fang, **The Astrophysical Journal**, v663 (2007), Pages 1-9.

69. A WENO Algorithm for the Radiative Transfer and Ionized Sphere at Reionization, J.-M. Qiu, C.-W. Shu, L.-L. Feng and L.-Z. Fang, **New Astronomy**, v12 (2006), Pages 1-10.

## Conferences/Workshops

- Organization of week-long workshops
  - "Holistic Design of Time-Dependent PDE Discretizations", ICERM, Providence, RI, USA, January 2022.
  - Workshop on "Recent development in numerical kinetic theory", zoom hosted by University of Wisconsin, Madison, June 2021.
  - A workshop in Tsinghua Sanya International Mathematics Forum on the topic of "High Order Structure-Preserving Numerical Methods: Algorithm, Analysis, and Applications" in January 14-18, 2019.
- Organizer/Co-organizer of mini-symposiums:

1. Advanced development on computational methods for kinetic theory, SIAM CSE, 2021.
2. Advances in Numerical Approximation of Partial Differential Equations, AMS Sectional Meeting at the University of Delaware in Newark, DE, Sep. 29-30th, 2018.
3. High order numerical methods for hyperbolic problems with emphasis on applications, ICOSAHOM 2018, London, UK, July 9th - 13th, 2018.
4. Computational Methods for Kinetic Equations and Related Models and Hybrid and Multilevel Approaches to Kinetic Equations, SIAM Computational Science and Engineering, Salt Lake City, UT, March 14-18, 2015.
5. High order numerical methods for hyperbolic and kinetic equations, SIAM Conference on Analysis of Partial Differential Equations, Orlando, FL, December 7-10, 2013.
6. The Second Workshop on Development and Application of High-Order Numerical Methods, Xiamen, China, May 18-21, 2013.
7. Computational Methods for Kinetic Equations and Related Models, SIAM Computational Science and Engineering, Boston, MA, February 25, 2013.
8. Vlasov Models in Kinetic Theory, Institute for Computational and Experimental Research in Mathematics, Brown University, Providence, RI, September 12-16, 2011.
9. Advanced Numerical Methods for Kinetic Simulations and Their Applications, International Congress on Applied and Industrial Mathematics Vancouver, Canada, July 19, 2011.
10. Numerical Methods for Kinetic Equations and Related Models, SIAM annual meeting, Pittsburgh, PA, July 12, 2010.
11. Advanced Numerical Simulations for Kinetic Equations, Joint SIAM/RSME-SCM-SEMA meeting, Barcelona, Spain, May 31, 2010.
12. Advanced Numerical Methods for Kinetic Equations (I, II), SIAM annual meeting, Denver, CO, July 8, 2009.

- Short Courses:

1. Lecture on "Semi-Lagrangian discontinuous Galerkin methods", University of Science and Technology of China, July 29th, 2020.
2. Short course on "Conservation laws and numerical methods", University of Science and Technology of China, May 15-17, 2019.
3. Short course on "Advanced Topics in CFD", Southern University of Science and Technology, Shenzhen, China, January 2019.

- Invited Talks:

1. Seminar, Mississippi State University, virtual, April 2022 (scheduled).
2. Seminar, Carnegie Mellon University, March 29th, 2022 (scheduled).

3. Seminar, Department of Applied mathematics at UC Santa Cruz, virtual, Feb. 2022.
4. Seminar, Michigan Tech University, virtual, Feb. 2022.
5. Modelling and Numerical Simulation of Non-Equilibrium Processes Part 2, Institute for Mathematical Sciences, National University of Singapore, virtual, Jan. 2022.
6. Holistic Design of Time-Dependent PDE Discretizations, ICERM, Providence, RI, USA, virtual, Jan. 2022.
7. Seminar, Xiamen University, China, virtual, Dec. 2021.
8. Numerical analysis and PDE Seminar, University of Delaware, Dec. 2021.
9. Kinetic & mean field problems, University of Ferrara, Italy, virtual, Oct. 25-28, 2021.
10. Program Review, Air Force Office of Scientific Research Computational Mathematics, Arlington, VA, August, 2021.
11. Advances and Challenges in Hyperbolic Conservation Laws (virtual), ICERM workshop, May 2021.
12. Finite element Circus, Virtual, April 2021.
13. Recent Advances on Discontinuous Galerkin Finite Element Methods: Analysis and Computation, SIAM CSE, Virtual, March 2021.
14. Applied Math Seminar, Texas Tech University, virtual, Feb. 2021.
15. 14th World Congress in Computational Mechanics and ECCOMAS Congress, virtual, Jan. 2021.
16. Workshop on WENO schemes new development and applications, Xiamen University, Nov. 16th, virtual, 2020.
17. Program Review, Air Force Office of Scientific Research Computational Mathematics, Arlington, VA, August 12th, virtual 2020.
18. Seminar, Department of Mechanical Engineering, Beijing Institute of Technology, Beijing, Dec. 13th, 2019.
19. Seminar, Center for nonlinear studies, Los Alamos National Lab, Oct. 14th, 2019.
20. Program Review, Air Force Office of Scientific Research Computational Mathematics, Arlington, VA, August 14th, 2019.
21. The 11th international conference on scientific computing and applications, Xiamen, May 29th, 2019.
22. Workshop on DG methods and related problems, Zhejiang University, May 24th, 2019.
23. Plenary speaker, Efficient high-order time discretization methods for PDEs, Capri, Italy, May 9th, 2019.
24. Seminar, Department of Mathematics, Purdue University, March 4th, 2019.

25. Seminar, Department of Mathematical Sciences, Xiamen University, December 13, 2018.
26. Multiscale Computations for Kinetic and Related Problems, Ki-Net/NCSU Conference, November 7-10, 2018.
27. Computational Methods for Waves in Complex Media, SIAM TEX-LA sectional meeting, Louisiana State University, October 5-7, 2018.
28. Program Review, Air Force Office of Scientific Research Computational Mathematics, Arlington, VA, August 16th, 2018.
29. Seminar, School of Mechatronical Engineering, Beijing Institute of Technology, Beijing, China, July 2nd, 2018.
30. Seminar, School of Mathematical Sciences, Xiamen University, Xiamen, China, June 26th, 2018.
31. Seminar, School of Mathematical Sciences, Minnan Normal University, Zhangzhou, China, June 15th, 2018.
32. Seminar, Department of Mechanics and Aerospace Engineering, Southern University of Science and Technology, Shenzhen, China, June 13th, 2018.
33. Seminar, School of Mathematical Sciences, University of Science and Technology of China, Hefei, China, June 4th, 2018.
34. The Fourth International Workshop on the Development and Application of High-Order Numerical Methods, Nanjing, China, June 2nd, 2018.
35. DelMar Numerics Day 2018, University of Delaware, Newark, DE, May 5th, 2018.
36. Colloquium, Department of Mathematical Sciences, Rensselaer Polytechnic Institute (RPI), NY, April 30th, 2018.
37. Numerical Aspects of Hyperbolic Balance Laws and Related Problems, University of Ferrara, Italy, April 17th, 2018.
38. Scientific Computing seminar, Temple University, Philadelphia, Jan. 31st, 2018.
39. AWM and SIAM New Faculty Speaker Series, University of Delaware, Dec. 11th, 2017.
40. The workshop on Kinetic Theory and Fluid Mechanics: theoretical and computational aspects, University of Toulouse, Nov. 8th, 2017.
41. AMS Sectional meeting, Denton, TX, Sep. 9th, 2017.
42. Seminar, Department of Physics and Astronomy, University of Delaware, Newark, DE, August 25th, 2017.
43. Seminar, Department of Physics and Astronomy, University of Delaware, Newark, DE, August 11th, 2017.
44. Program review, Air Force Office of Scientific Research Computational Mathematics, Arlington, VA, August 16th, 2017.

45. Scientific Computing seminar, University of Delaware, Newark, DE, May 18th, 2017.
46. Seminar, Department of Mathematics, Rutgers University, Camden, April 24th, 2017.
47. Seminar, Department of Mechanic Engineering, Rice University, Houston, TX, April 19th, 2017.
48. Scientific Computing seminar, University of Delaware, Newark, DE, January 6th, 2017.
49. Program review, Air Force Office of Scientific Research Computational Mathematics, Arlington, VA, August 8th, 2016.
50. KI-net Conference, University of Wisconsin-Madison, WI, April 21st, 2016.
51. Seminar, Drexel University, Philadelphia, PA, November 19th, 2015.
52. Scientific Computing Seminar, Brown University, Providence, RI, October 23rd, 2015.
53. Colloquium, Rutgers University Camden, Camden, NJ, October 20th, 2015.
54. Program review, Air Force Office of Scientific Research Computational Mathematics, Arlington, VA, August 5th, 2015.
55. Colloquium, Michigan State University, East Lansing, MI, March 4th, 2015.
56. Colloquium, Indiana University at Bloomington, Bloomington, IN, Febury 26th, 2015.
57. Graduate colloquium, University of Houston, Houston, TX, February 20th, 2015.
58. Scientific Computing Seminar, Texas A&M University, College State, TX, January 28th, 2015.
59. Program review, Air Force Office of Scientific Research Computational Mathematics, Arlington, VA, July 31st, 2014.
60. Numerical methods for stiff problems in partial differential equations, ECMI 2014 - European Consortium for Mathematics in Industry, Taormina, Italy, June 9 - 13, 2014.
61. Algorithm and Model Verification and Validation For Kinetic and Gyrokinetic Plasma Simulation Codes, Garching, Germany, April 8-10, 2014.
62. Undergraduate colloquium, University of Houston, Houston, TX, January 29th, 2014.
63. Asymptotically Preserving Numerical Methods for Time-Dependent PDEs, SIAM Conference on Analysis of Partial Differential Equations, Orlando, FL, December 7-10, 2013.
64. High order numerical methods for hyperbolic and kinetic equations, SIAM Conference on Analysis of Partial Differential Equations, Orlando, FL, December 7-10, 2013.

65. Program review, Air Force Office of Scientific Research Computational Mathematics, Arlington, VA, July 29, 2013.
66. The Mathematics of Finite Elements and Applications, Brunel University, England, June 11-14, 2013.
67. Colloquium, University of Science and Technology of China, Hefei, China, May 28, 2013.
68. The Second Workshop on Development and Application of High-Order Numerical Methods, Xiamen, China, May 18-21, 2013.
69. AMS Spring Central Section at Iowa State University (ISU), IA, April 28, 2013.
70. Colloquium, Rice University, Houston, TX, November 26, 2012.
71. 2012 Young Researchers Workshop: Kinetic Description of Model Scale phonomena, Department of Mathematics, University of Wisconsin-Madison, Madison, WI, October 10-13, 2012.
72. Program review, Air Force Office of Scientific Research Computational Mathematics, Arlington, VA, July 30, 2012.
73. 2012 AMS Spring Southeastern Section Meeting, Tampa, FL, March 10-11, 2012.
74. Graduate student seminar, University of Houston, TX, February 24, 2012.
75. AWM Anniversary Conference: 40 Years and Counting: AWM's Celebration of Women in Mathematics, Brown University, Providence, RI, September 17, 2011.
76. Colloquium, Institute for Computational and Experimental Research in Mathematics, Brown University, Providence, RI, September 12-16, 2011.
77. Weighted Essentially Non-Oscillatory Schemes - Part III of IV, International Congress on Applied and Industrial Mathematics Vancouver, Canada, July 19, 2011.
78. Advanced Numerical Methods for Kinetic Simulations and Their Applications, International Congress on Applied and Industrial Mathematics Vancouver, Canada, July 19, 2011.
79. Colloquium, Beijing Institute of Technology, Beijing, China, July 4, 2011.
80. Colloquium, Department of Mathematics, Xiamen University, Xiamen, China, June 23, 2011.
81. Workshop on Development and Application of High-Order Numerical Methods, Xiamen University, Xiamen, China, June 20, 2011.
82. Program review, Air Force Office of Scientific Research Computational Mathematics, Arlington, VA, June 1, 2011.
83. IPAM Kinetic Transport: Reunion Conference I, Lake Arrowhead, CA, December 12, 2010.

84. Colloquium, Department of Mathematics, University of Houston, Houston, TX, September 23, 2010.
85. Mini-symposium on numerical Methods for Kinetic Equations and Related Models, SIAM annual meeting, Pittsburgh, PA, July 12, 2010.
86. Mini-symposium on numerical methods for kinetic equations, Joint SIAM/RSME-SCM-SEMA meeting, Barcelona, Spain, June 4, 2010.
87. Mini-symposium on discontinuous Galerkin method, Joint SIAM/RSME-SCM-SEMA meeting, Barcelona, Spain, June 3, 2010.
88. Mini-symposium on high order time stepping, Joint SIAM/RSME-SCM-SEMA meeting, Barcelona, Spain, June 3, 2010.
89. Colloquium, Department of Mathematics, Colorado State University, Fort Collins, CO, October 29, 2009.
90. Kinetic Description of Multiscale Phenomena, University of Maryland, College Park, MD, September 22, 2009.
91. Program review, Air Force Office of Scientific Research Computational Mathematics, Arlington, VA, July 29, 2009.
92. Colloquium, Department of Mathematics, Nanjing University, Nanjing, P.R. China, June 29, 2009.
93. Colloquium, Department of Mathematics, University of Science and Technology, Hefei, P.R. China, June 25, 2009.
94. Colloquium, Department of Mathematics, Xiamen University, Xiamen, P.R. China, June 10, 2009.
95. Colloquium, Institute of Pure and Applied Mathematics, University of California at Los Angeles, Los Angeles, CA, March 25, 2009.
96. SIAM Conference on Computational Science and Engineering (CSE09), Miami, FL, March 5, 2009.
97. Colloquium, Division of Applied Mathematics, Brown University, Providence, RI, February 27, 2009.
98. Seminar, Department of Applied Mathematics, University of Colorado at Boulder, Boulder, CO, February 24, 2009.
99. Colloquium, Department of Mathematical and Computer Sciences, Colorado School of Mines, Golden, CO, January 30, 2009.
100. Mini-Symposium on Advances in Numerical Methods for PDEs and Their Applications - Part II of II, SIAM Annual meeting, San Diego, CA, July 7-11, 2008.
101. Colloquium, Department of Mathematical and Computer Sciences, Colorado School of Mines, Golden, CO, April 11, 2008.
102. Special Colloquium, Department of Mathematical and Computer Sciences, Colorado School of Mines, Golden, CO, March 07, 2007.

103. Special Colloquium, Department of Mathematics, Old Dominion University, Norfolk, VA, February 09, 2007.
104. Special Colloquium, Department of Mathematics, Michigan State University, East Lansing, MI, December 12, 2006.
105. Mini-Symposium on Computational Quantum and Kinetic Transport Phenomena, SIAM Conference on Analysis of Partial Differential Equations, Boston, MA, July 10-12, 2006.

- Contributed Talks:

1. Finite element Rodeo, Rice University, Houston, TX, March 2-3, 2012.
2. 2009 International Conference on Scientific Computation and Differential Equations (SciCADE09), Beijing, P.R. China, May 25, 2009
3. The $50^{th}$ DPP (division of plasma physics) annual meeting, Dallas, TX, November 2008.

- Posters:

1. Frontiers in Applied and Computational Mathematics, Brown University, Providence, RI, January, 2017.
2. International Conference on Advances in Scientific Computing, Brown University, Providence, RI, December, 2009.
3. Multi-Scale Modeling, Analysis, and Simulations, East Lansing, MI, March, 2008.
4. 49th Annual Meeting of the Division of Plasma Physics, Orlando, FL, November 2007.

- Participant:

1. Numerical Analysis Day, Temple University, November 3rd, 2017.
2. Numerical Analysis Day, Temple University, November 13th, 2015.
3. Stan Osher's 70th Birthday Conference, Institute for Pure & Applied Mathematics, University of California at Los Angeles, April 4-6, 2012
4. Air Force Office of Scientific Research Computational Mathematics Program Review, Arlington, Virginia, August 13-15, 2008.
5. Recent Developments in Numerical Methods for Nonlinear Hyperbolic Partial Differential Equations and their Applications, Banff International Research Station for Mathematical Innovation and Discovery, Banff, Canada, Aug. 31 - September 5, 2008.
6. 2007-08 Program on Random Media, Research Triangle Park, NC, September 23-26, 2007.
7. Small Scales and Extreme Events: The Hurricane, Institute for Pure & Applied Mathematics, University of California at Los Angeles, CA, February 12-16, 2007.

8. Advances and Challenges in the Solution of Stochastic Partial Differential Equation, Brown University, Providence, RI, October 20-22, 2006.
9. The Third MIT Conference on Computational Fluid and Solid Mechanics, Cambridge, MA, June 14-17, 2005.
10. International Conference on the Research Trend for PDE Modeling and Computation, on the Occasion of David Gottlieb's 60th birthday, Brown University, November 7-8, 2004.