Curriculum Vitae

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Education

- *Ph.D.* in Department of Mathematics, University of Science and Technology of China, Hefei, Anhui, P.R. China, June 2008.
  Thesis Title: Development of Discontinuous Galerkin Methods for Nonlinear Problems and Time Discretization Methods
  Advisor: Professor Chi-Wang Shu

- *B.Sc.* School of Mathematical Sciences, Nankai University, Tianjin, P.R. China, June 2001.

Academic Experience

- Associate Professor: School of Mathematics Sciences, University of Science and Technology of China, July, 2010 - present.

- Post-doctoral Research Associate: Division of Applied Mathematics & Department of Geological Sciences, Brown University, Providence, RI, USA, July 2008 - June 2010.

- Research Assistant: Department of Civil Engineering, University of Hong Kong, April 2007 - March 2008.

Short Term Visiting Positions

- Visiting Scholar: Institute of Mathematical Sciences, National University of Singapore, Singapore, December 23, 2019 - January 5, 2020.

- Visiting Professor: Department of Mathematics, University of Cologne, Germany, August 13-30, 2019.

- Visiting Scholar: Department of Mathematics, University Würzburg, August, 2013 - August, 2014

- Visiting Scholar: Department of Civil Engineering, University of Hong Kong, Hong Kong, January 17, 2011 - February 16, 2011, January 13, 2012- January 20, 2012.

Grants (PI: Principal Investigator)

- PI, NSFC grant 12271498, Structure preserving filter for discontinuous Galerkin method for hyperbolic conservation laws, January 1, 2023 - December 31, 2026.

- PI, NSFC grant 11871449, Arbitrary Lagrangian-Eulerian discontinuous Galerkin method for hyperbolic balance laws and well-balanced schemes, January 1, 2019 - December 31, 2022.

- Co-PI, Adaptive discontinuous Galerkin methods, National Numerical Windtunnel grant NNW2019ZT4-B08, November 1, 2019 - December 31, 2021.

- Co-PI, Fast algorithm for the neutron transport problem, Science Challenge Project TZZT2019-A2.3, November 1, 2019 - December 31, 2020.

- PI, NSFC grant 11471306, Numerical simulation and analysis for the conservation laws in moving domain, January 1, 2015 - December 31, 2018.

- Co-PI, NSFC grant 11371342, Numerical simulation and analysis for non-classical hyperbolic equations, January 1, 2014 - December 31, 2017.

- PI, NSFC grant 11101400, High order numerical methods for the gradient flows, January 1, 2012 - December 31, 2014.

Recent Invited Talks (Conference/workshop)

- The Ninth International Congress of Chinese Mathematicians, Nanjing, August 6-11, 2022.

- The Fourth International Consortium of Chinese Mathematicians (ICCM) Annual Meeting, University of Science and Technology of China, Hefei, December 27-29, 2020.

- Workshop on "Nonlinear Problems: Numerics and Applications" -Tsinghua Sanya International Mathematics Forum, Sanya, January 12-16, 2020.

- "Quantum and Kinetic Problems: Modeling, Analysis, Numerics and Applications, Forum 1: Nonlinear PDEs and Related Topics", National University of Singapore, Singapore, December 26-30, 2019.

- Workshop on "High Order Structure-Preserving Numerical Methods Algorithms, Analysis and Applications" -Tsinghua Sanya International Mathematics Forum, Sanya, January 14-18, 2019.

- The Fourth International Workshop on Development and Application of High-Order Numerical Methods, Nanjing University, Nanjing, May 31 - June 4, 2018.

- Chinese Mathematical Society 2017 Annual Meeting, Xiangtan, October 21-23, 2017.

- Workshop on "Recent Advances in Finite Element Methods", City University of Hong Kong, Hong Kong, March 13-15, 2017.

- The Seventh International Congress of Chinese Mathematicians, Beijing, August 6-11, 2016.

- Workshop: Higher Order Numerical Methods for Evolutionary PDEs: Applied Mathematics Meets Astrophysical Applications, Banff International Research Station for Mathematical Innovation and Discovery (BIRS) in Banff, Alberta, Canada, May 10-15, 2015.

Publications

- Journal papers (appeared or accepted)

    1. D. Xiao, J.X. Ma, Y. Li, Y. Xia and M.Y. Yu, *Evolution of nonlinear dust-ion-acoustic waves in an inhomogeneous plasma*, Physics of Plasmas **13** (2006), 052308.

    2. Y. Xia, Y. Xu and C.-W. Shu, *Efficient time discretization for local discontinuous Galerkin methods*, Discrete and Continuous Dynamical Systems - Series B, **8** (2007), pp. 677-693.

    3. Y. Xia, Y. Xu and C.-W. Shu, *Local discontinuous Galerkin method for Cahn-Hiliard type equations*, Journal of Computational Physics, **227** (2007), pp. 472-491.

    4. Y. Xia, S.C. Wong, M.P. Zhang, C.-W. Shu and W.H.K. Lam, *An efficient discontinuous Galerkin method on triangular meshes for a pedestrian flow model*, International Journal for Numerical Methods in Engineering, 76 (2008), pp. 337-350.

    5. Y. Xia, Y. Xu and C.-W. Shu, *Application of the local discontinuous Galerkin method for the Allen-Cahn/Cahn-Hilliard system*, Communications in Computational Physics, **5** (2009), pp. 821-835.

    6. L. Huang, Y. Xia, S.C. Wong, C.-W. Shu, M. Zhang and W.H.K. Lam, *A dynamic continuum model for bi-directional pedestrian flows*, Proceedings of the Institution of Civil Engineers, Engineering and Computational Mechanics, **162** (2009), pp.67-75.

7. Y. Xia, S.C. Wong and C.-W. Shu, *Dynamic continuum pedestrian flow model with memory effect*, Physical Review E, **79** (2009), 066113.

8. Y. Xia, Y. Xu and C.-W. Shu, *Local discontinuous Galerkin methods for the generalized Zakharov system*, Journal of Computational Physics, **229** (2010), pp.1238-1259.

9. X. Zhang, Y. Xia and C.-W. Shu, *Maximum-principle-satisfying and positivity-preserving high order discontinuous Galerkin schemes for conservation laws on triangular meshes*, Journal of Scientific Computing, **50** (2012), pp.29-62.

10. R.-Y. Guo, S. C. Wong; Y. Xia, H.-J. Huang, W. H. K. Lam, and K. Choi, *Empirical Evidence for the Look-Ahead Behavior of Pedestrians in Bi-directional Flows*, Chinese Physics Letter, **29** (2012), 068901.

11. Y.Z.Tao, Y.Q. Jiang, J.Du, S.C.Wong, P.Zhang, Y.H.Xia, K.Choi, *Dynamic system-optimal traffic assignment for a city using the continuum modeling approach*, Journal of Advanced Transportation, **48** (2014), pp. 782-797.

12. W. Zhu, L.-L Feng, Y. Xia, C.-W. Shu, Q. Gu, and L.-Z. Fang, *Turbulence in the intergalactic medium: solenoidal and dilatational motions and the impact of numerical viscosity*, The Astrophysical Journal, 777:48 (2013).

13. Y. Xia, Y. Xu, *A Conservative Local Discontinuous Galerkin Method for the Schrödinger-KdV System*, Commun. Comput. Phys., **15**(2014), pp. 1091-1107.

14. R. Guo, Y. Xia, and Y. Xu *An efficient fully-discrete local discontinuous Galerkin method for the Cahn-Hilliard-Hele-Shaw system*, Journal of Computational Physics, **264** (2014), pp.23-40.

15. Y. Xia, *Fourier spectral methods for Degasperis-Procesi equation with discontinuous solutions* , Journal of Scientific Computing, **61** (2014), pp. 584-603.

16. Y. Xia, *A fully discrete stable discontinuous Galerkin method for the thin film epitaxy problem without slope selection* , Journal of Computational Physics, **280** (2015), pp. 248-260.

17. C. Klingenberg, G. Schnücke, and Y. Xia, *Arbitrary Lagrangian-Eulerian discontinuous Galerkin method for conservation laws: analysis and application in one dimension* , Mathematics of Computation, **86** (2017), pp. 423-442.

18. C. Klingenberg, F. Pörner, and Y. Xia, *An efficient implementation of the divergence free constraint in a discontinuous Galerkin method for magnetohydrodynamics on unstructured meshes*, Communications in Computational Physics, **21** (2017), pp. 423-442.

19. Y. Xia, Y. Xu, *Weighted essentially non-oscillatory schemes for Degasperis-Procesi equation with discontinuous solutions*, Annals of Mathematical Sciences and Applications, **2** (2017), pp.319-340.

20. R. Guo, Y. Xia and Y. Xu, *Semi-implicit spectral deferred correction methods for highly nonlinear partial differential equations*, Journal of Computational Physics, **338** (2017), pp.269-284.

21. C. Klingenberg, G. Schnücke, and Y. Xia, *An arbitrary Lagrangian-Eulerian local discontinuous Galerkin method for Hamilton-Jacobi equations*, Journal of Scientific Computing, **73** (2017), pp. 906-942.

22. Z. Cao, P. Fu, L.-W. Ji, and Y. Xia, *Application of local discontinuous Galerkin method to Einstein equations*, International Journal of Modern Physics D, **28** (2019), 1950014.

23. Q. Zhang, and Y. Xia, *Conservative and dissipative local discontinuous Galerkin methods for Korteweg-de Vries type equations*, Communications in Computational Physics, **25** (2019), pp. 532-563.

24. L. Zhou, Y. Xia, and C.-W. Shu, *Stability analysis and error estimates of arbitrary Lagrangian-Eulerian discontinuous Galerkin method coupled with Runge-Kutta time-marching for linear conservation laws*, ESAIM: Mathematical Modelling and Numerical Analysis, **53** (2019), pp. 105-144..

25. C. Sun, and Y. Xia, *Asymptotic preserving spectral deferred correction methods for hyperbolic systems with relaxation*, Communications in Computational Physics, **26** (2019), pp. 531-557.

26. C. Zhang, Y. Xu and Y. Xia, *Local discontinuous Galerkin methods for the μ-Camassa-Holm and μ-Degasperis-Procesi equations*, Journal of Scientific Computing, **79** (2019), pp. 1294-1334.

27. P. Fu, G. Schnücke, and Y. Xia, *Arbitrary Lagrangian-Eulerian discontinuous Galerkin method for conservation laws on moving simplex meshes*, Mathematics of Computation, 88 (2019), pp. 2221-2255.

28. Q. Tao, and Y. Xia, *Error estimates and post-processing of local discontinuous Galerkin method for Schrödinger equations*, Journal of Computational and Applied Mathematics, **356** (2019), pp. 198-218.

29. J.J.W. van der Vegt, Y. Xia and Y. Xu, *Positivity preserving limiters for time-implicit higher order accurate discontinuous Galerkin discretizations*, SIAM Journal on Scientific Computing, **41** (2019), pp. A2037-A2063.

30. Y. Li, J. Cheng, Y. Xia and C.-W. Shu, *High order arbitrary Lagrangian-Eulerian finite difference WENO scheme for Hamilton-Jacobi equations*, Communications in Computational Physics, **26** (2019), pp. 1530-1574.

31. Q. Zhang, and Y. Xia, *Discontinuous Galerkin methods for short pulse type equations via hodograph transformations*, Journal of Computational Physics, **399** (2019), 108928.

32. X. Hong, and Y. Xia, *Arbitrary Lagrangian-Eulerian discontinuous Galerkin method for hyperbolic equations involving δ-singularities*, SIAM Journal on Numerical Analysis, **58** (2020), pp. 125-152.

33. Q. Zhang, and Y. Xia, *Discontinuous Galerkin methods for the Ostrovsky-Vakhnenko equation*, Journal of Scientific Computing, **82**:24, (2020).

34. Y. Li, J. Cheng, Y. Xia and C.-W. Shu, *On moving mesh WENO schemes with characteristic boundary conditions for Hamilton-Jacobi equations*, Computers and Fluids, **205** (2020), 104582.

35. J. Zhao, Q. Zhang, Y. Yang and Y. Xia, *Conservative discontinuous Galerkin methods for the nonlinear Serre equations*, Journal of Computational Physics, **421** (2020), 109729.

36. C. Zhang, Y. Xu and Y. Xia, *Local discontinuous Galerkin methods to a dispersive system of KdV-type equations*, Journal of Scientific Computing, **86**:4 (2021).

37. X. Hong and Y. Xia, *Arbitrary Lagrangian-Eulerian discontinuous Galerkin methods for KdV type equations*, Communications on Applied Mathematics and Computation, **4** (2022), pp. 530-562.

38. Y. Wan and Y. Xia, *A new hybrid WENO scheme with the high-frequency region for hyperbolic conservation laws*, Communications on Applied Mathematics and Computation, **5** (2023), pp. 199-234.

39. W. Zhang, Y. Xia and Y. Xu, *Positivity-preserving well-balanced arbitrary Lagrangian-Eulerian discontinuous Galerkin methods for the shallow water equations*, Journal of Scientific Computing, **88**:57 (2021).

40. L. Zhou and Y. Xia, *Arbitrary Lagrangian-Eulerian local discontinuous Galerkin method for linear convection-diffusion equations*, Journal of Scientific Computing, **90**:21 (2022).

41. W. Zhang, Y. Xing, Y. Xia and Y. Xu, *High-order positivity-preserving well-balanced discontinuous Galerkin methods for Euler equations with gravitation on unstructured meshes*, Communications in Computational Physics, **32** (2022), pp. 771-815.

42. B. Li, Y. Xia and Z. Yang, *Optimal convergence of arbitrary Lagrangian-Eulerian iso-parametric finite element methods for parabolic equations in an evolving domain*, IMA Journal of Numerical Analysis, **43** (2023), pp. 501-534.

43. Z. Xue, Y. Xia, C. Li and X. Yuan, *A simplified multilayer perceptron detector for the hybrid WENO scheme*, Computers and Fluids, **244** (2022), 105584.

44. Y. Wan, and Y. Xia, *A hybrid WENO scheme for steady-state simulations of Euler equations*, Journal of Computational Physics, **463** (2022), 111292.

45. Y. Liu, J. Lu, Q. Tao and Y. Xia, *An oscillation-free discontinuous Galerkin method for shallow water equations*, Journal of Scientific Computing, **92**:109 (2022).

46. S. Hou, Y. Chen, and Y. Xia, *Fast L2 optimal mass transport via reduced basis methods for the Monge-Ampère equation*, SIAM Journal of Scientific Computing, **44**(6) (2022), A3536-A3559.

47. P. Fu, and Y. Xia, *The positivity preserving property on the high order arbitrary Lagrangian-Eulerian discontinuous Galerkin method for Euler equations*, Journal of Computational Physics, **470** (2022), 111600.

48. J. Zhang, Y. Xia, and Y. Xu. *Structure-preserving finite volume arbitrary Lagrangian-Eulerian WENO schemes for the shallow water equations*, Journal of Computational Physics, **473** (2023), 111758.

49. Y. Wan, and Y. Xia. *A hybrid WENO scheme for steady Euler equations in curved geometries on Cartesian grids*, Communications in Computational Physics, **33** (2023), pp. 1270-1331.

50. J. Zhang, Y. Xia, and Y. Xu. *Moving water equilibria preserving discontinuous Galerkin method for the shallow water equations*, Journal of Scientific Computing, **95**:48 (2023).

51. R. Guo, and Y. Xia. *Arbitrary high-order fully-decoupled numerical schemes for phase-field models of two-phase incompressible flows*, Communications on Applied Mathematics and Computation, to appear.

52. W. Zhang, Y. Xing, Y. Xia and Y. Xu. *High order structure-preserving arbitrary Lagrangian-Eulerian discontinuous Galerkin methods for the Euler equations under gravitational fields*, Computers and Mathematics with Applications, **146** (2023), pp. 339-359.

53. F. Yan, J.J.W. van der Vegt, Y. Xia and Y. Xu, *Higher order accurate bounds preserving time-Implicit discretizations for the chemically reactive Euler equations*, Communications in Computational Physics, to appear.

54. F. Yan, J.J.W. van der Vegt, Y. Xia and Y. Xu, *Entropy dissipative higher order accurate positivity preserving time-implicit discretizations for nonlinear degenerate parabolic equations*, Journal of Computational and Applied Mathematics, to appear.

- Publications in Proceedings

    1. Y. Xia, L. Huang, S.C. Wong, M. Zhang, C.-W. Shu and W.H.K. Lam, The follow-the-crowd effect in a pedestrian flow model, the Proceedings of the 12th International Conference of Hong Kong Society for Transportation Studies, December 2007, Hong Kong, pp.309-317.

    2. Y. Liang, A. Schiemenz, Y. Xia and M. Parmentier, High porosity harzburgite and dunite channels for the transport of compositionally heterogeneous melts in the mantle: II. Geochemical consequences, AGU Fall meeting, 2009.

    3. Y. Liang, Y. Xia and P. Bons,Grain growth and dissolution during crystal-melt interaction, Conference on Goldschmidt 2010 - Earth, Energy, and the Environment.

    4. J. Gallego, J. Loebbert, P. Bastian, C. Klingenberg, Y. Xia, Implementing a discontinuous Galerkin method for the compressible, inviscid Euler equations in the DUNE framework, Proceedings in Applied Mathematics and Mechanics, Vol. 14,1 (2014).

    5. C. Klingenberg, G. Schnücke, and Y. Xia, An arbitrary Lagrangian-Eulerian discontinuous Galerkin method for conservation laws: Entropy stability, In: Klingenberg C., Westdickenberg M. (eds) Theory, Numerics and Applications of Hyperbolic Problems II. HYP 2016, pp. 209-219. Springer Proceedings in Mathematics & Statistics, vol 237. Springer, Cham.