

# CURRICULUM VITAE

## Yan Xu

School of Mathematical Sciences  
University of Science and Technology of China  
HeFei, AnHui 230026  
P.R. China

Office : + 86 551 6360 7151  
Fax: + 86 551 6360 1005  
E-mail: [yxu@ustc.edu.cn](mailto:yxu@ustc.edu.cn)  
<http://staff.ustc.edu.cn/~yxu>

### Education

- *Ph.D.* in Department of Mathematics, University of Science and Technology of China, Hefei, Anhui, P.R. China, June 2005.  
*Advisor:* Professor Chi-Wang Shu
- *M.Sc.* in School of Mathematical Sciences, Tianjin Normal University, Tianjin, P.R. China, June 2003.
- *B.Sc.* in Department of Mathematics, Tianjin Normal University, Tianjin, P.R. China, June 2000.

### Professional Appointments

- Professor: School of Mathematical Sciences, University of Science and Technology of China, June 2012 – present.
- Associate Professor: Department of Mathematics, University of Science and Technology of China, December 2007 – June 2012.
- Alexander von Humboldt-Foundation, Humboldt Research Fellowship: Department of Applied Mathematics, Freiburg University, Freiburg, Germany, September 2009 – August 2010.
- Post-doctoral Research Associate: Department of Applied Mathematics, University of Twente, the Netherlands, August 2005 – July 2007.
- Lecturer: Department of Mathematics, University of Science and Technology of China, July 2005 – December 2007.

### Short Term Visiting Positions

- Visiting Professor: Department of Mathematics, Würzburg University, Germany, May 26, 2014 – August 24, 2014.
- Visiting Professor: Department of Mathematics, Würzburg University, Germany, January 18, 2014 – February 14, 2014.

- Visiting Professor: Department of Mathematics, City University of Hong Kong, Hong Kong, January 13, 2012 – January 20, 2012.
- Research Fellow: Department of Mathematics, City University of Hong Kong, Hong Kong, January 17, 2011 – February 16, 2011.
- Research visitor: Division of Applied Mathematics, Brown University, Providence, USA, January 21, 2010 – February 20, 2010.
- Research visitor: Delft Institute of Applied Mathematics, Delft University of Technology, the Netherlands, November 9–November 12, 2009.
- Research visitor: Division of Applied Mathematics, Brown University, Providence, USA, January 2, 2009 – February 15, 2009.
- Research visitor: Division of Applied Mathematics, Brown University, Providence, USA, July 22, 2006 – August 11, 2006.
- Research visitor: Department of Applied Mathematics, University of Twente, the Netherlands, February 1, 2005 – March 31, 2005.

## Awards

- Youth Innovation Award of Computational Mathematics Society of China, 2016
- Outstanding Graduate Supervisor Award of the Chinese Academy of Sciences, 2016.
- “Zhu Li Yue Hua” Outstanding Teacher Award of the Chinese Academy of Sciences, 2016.
- KC Wong Yucai Award, 2016.
- Outstanding Graduate Supervisor Award of the Chinese Academy of Sciences, 2013.
- “Zhu Li Yue Hua” Outstanding Teacher Award of the Chinese Academy of Sciences, 2013.
- USTC 7-th “Kun Xue Shou Wang” Outstanding Teaching Award, 2012.
- USTC Alumni Foundation Young Faculty Career Award, 2010.
- New Century Excellent Talents in University, 2009.
- National Excellent Doctoral Dissertation of PR China, 2008.
- Excellent Doctor Dissertation of the Chinese Academy of Sciences, 2007.

## Research Interests

- Numerical solutions of conservation laws and in general convection dominated problems using high order methods such as
  - Finite difference/finite volume weighted ENO (WENO) methods.
  - Finite element discontinuous Galerkin (DG) methods.
- Numerical solutions of nonlinear wave equations using local discontinuous Galerkin (LDG) methods.
- Numerical solutions of MHD equations using DG methods.
- Numerical solutions of water wave equations with free-surface using space-time discontinuous Galerkin (STDG) methods.
- Numerical solutions of incompressible Navier-Stokes equations using DG methods.
- Discontinuous Hamiltonian Finite Element Method for Bilinear Poisson Brackets.
- Accuracy-enhancement technique of discontinuous Galerkin solutions.

## Editorship

- Associate Editor, Journal of Scientific Computing, 2019 - present
- Associate Editor, Advances in Applied Mathematics and Mechanics, 2018 - present
- Associate Editor, Communication on Applied Mathematics and Computation, 2018 - present
- Associate Editor, Chinese Journal of Computational Physics, 2020 - present

## Publications in Refereed Journals (Appeared or Accepted)

1. Y. Xu, *The convergence and stability of difference solutions for Burgers-KdV equation* (in Chinese), Journal of Tianjin Normal University (Natural Science Edition), **22** (2002), pp.33–37.
2. Y. Xu and C.-W. Shu, *Local discontinuous Galerkin methods for three classes of nonlinear wave equations*, Journal of Computational Mathematics, **22** (2004), pp.250–274.
3. Y. Xu, *The convergence and stability of difference solutions for a class of coupled KdV equation* (in Chinese), Journal of Engineering Mathematics, **22** (2005), pp.47–52.
4. Y. Xu and C.-W. Shu, *Local discontinuous Galerkin methods for nonlinear Schrödinger equations*, Journal of Computational Physics, **205** (2005), pp.72–97.

5. Y. Xu and C.-W. Shu, *Local discontinuous Galerkin methods for two classes of two dimensional nonlinear wave equations*, Physica D, **208** (2005), pp.21-58.
6. Y. Xu and C.-W. Shu, *Local discontinuous Galerkin methods for the Kuramoto-Sivashinsky equations and the Ito-type coupled KdV equations*, Computer Methods in Applied Mechanics and Engineering, **195** (2006), pp.3430-3447.
7. J.J.W. van der Vegt and Y. Xu, *Space-Time Discontinuous Galerkin Method for Nonlinear Water Waves*, Journal of Computational Physics, **224** (2007), pp.17-39.
8. Y. Xu and C.-W. Shu, *Error estimates of the semi-discrete local discontinuous Galerkin method for nonlinear convection-diffusion and KdV equations*, Computer Methods in Applied Mechanics and Engineering, **196** (2007), pp.3805-3822.
9. 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.
10. Y. Xia, Y. Xu and C.-W. Shu, *Local Discontinuous Galerkin Methods for the Cahn-Hilliard type equations*, Journal of Computational Physics, **227** (2007), pp.472-491.
11. Y. Xu and C.-W. Shu, *A local discontinuous Galerkin method for the Camassa-Holm equation*, SIAM Journal on Numerical Analysis, **46** (2008), pp.1998-2021.
12. Y. Xu, J.J.W. van der Vegt and O. Bokhove, *Discontinuous Hamiltonian finite element method for linear hyperbolic systems*, Journal of Scientific Computing, **35** (2008), pp.241-265.
13. Y. Xu and C.-W. Shu, *Local discontinuous Galerkin method for the Hunter-Saxton equation and its zero-viscosity and zero-dispersion limit*, SIAM Journal on Scientific Computing, **31** (2008), pp. 1249-1268.
14. 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.
15. Y. Xu and C.-W. Shu, *Local discontinuous Galerkin method for surface diffusion and Willmore flow of graphs*, Journal of Scientific Computing, **40** (2009), pp.375-390.
16. Y. Xu and C.-W. Shu, *Local discontinuous Galerkin methods for high-order time-dependent partial differential equations*, Communications in Computational Physics, **7** (2010), pp. 1-46.
17. 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.

18. Y. Xu and C.-W. Shu, *Dissipative numerical methods for the Hunter-Saxton equation*, Journal of Computational Mathematics, 28(2010), pp.606-620.
19. L. Ji and Y. Xu, *Optimal error estimates of the local discontinuous Galerkin method for Willmore flow of graphs on Cartesian meshes*, International Journal of Numerical Analysis & Modeling, 8(2011), pp.252-283.
20. Y. Xu and C.-W. Shu, *Local discontinuous Galerkin methods for the Degasperis-Procesi equation*, Communications in Computational Physics, 10(2011), pp. 474-508.
21. Y. Xu and C.-W. Shu, *Optimal error estimates of the semi-discrete local discontinuous Galerkin methods for high order wave equations*, SIAM Journal on Numerical Analysis, 50(2012), pp. 79-104.
22. L. Ji and Y. Xu, *Optimal error estimates of the local discontinuous Galerkin method for surface diffusion of graphs on Cartesian meshes*, Journal of Scientific Computing, 51(2012), pp.1-27.
23. X.Z. Li, Y. Xu and Y.S. Li, *Investigation of multi-soliton, multi-cuspon solutions and their interaction of the Camassa-Holm equation*, Chinese Annals of Mathematics, Series B, 33B(2012), pp.225-246.
24. L. Ji, Y. Xu and J.K. Ryan, *Accuracy-enhancement of discontinuous Galerkin solutions for convection-diffusion equations in multiple-dimensions*, Mathematics of Computation, 81(2012), pp.1929-1950.
25. L. Ji, Y. Xu and J.K. Ryan, *Negative order norm estimates for nonlinear hyperbolic conservation laws*, Journal of Scientific Computing, 54(2013), pp.531-548.
26. J. Jiang and Y. Xu, *Local discontinuous Galerkin method for the impact-induced wave in a slender cylinder composed of a non-convex elastic material*, Communications in Mathematics and Statistics, 1 (2013), pp.393-415.
27. R. Guo and Y. Xu, *Efficient solvers of discontinuous Galerkin discretization for the Cahn-Hilliard equations*, Journal of Scientific Computing, 58(2014), pp.380-408.
28. J. Jiang, Y. Xu, D. Dai, *A dissipation-rate reserving DG method for wave catching-up phenomena in a nonlinearly elastic composite bar*, Journal of Computational Physics, 258(2014), pp. 405-430.
29. L. Guo and Y. Xu, *Local discontinuous Galerkin methods for the 2D simulation of quantum transport phenomena*, Communications in Computational Physics, 15 (2014), pp. 1012-1028.
30. Y. Xia and Y. Xu, *Conservative local discontinuous Galerkin methods for the Schrödinger-KdV system*, Communications in Computational Physics, 15 (2014), pp. 1091-1107.

31. 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.
32. L. Tian, Y. Xu, J.G.M. Kuerten and J.J.W. Van der Vegt, *A local discontinuous Galerkin method for the propagation of phase transition in solids and fluids*, Journal of Scientific Computing, 59 (2014), pp.688-720.
33. F. Zhang, Y. Xu, F. Chen, *Discontinuous Galerkin Methods for Isogeometric Analysis for Elliptic Equations on Surfaces*, Communications in Mathematics and Statistics, 2(2014), pp.431-461.
34. R. Guo and Y. Xu, *Fast solver for the local discontinuous Galerkin discretization of the KdV type equations*, Communications in Computational Physics, 17(2015), pp. 424-457.
35. R. Guo, Y. Xu and Z. Xu, *Local discontinuous Galerkin methods for the functionalized Cahn-Hilliard equation*, Journal of Scientific Computing, 63(2015), pp 913-937.
36. L. Tian, Y. Xu, J.G.M. Kuerten and J.J.W. Van der Vegt, *A local discontinuous Galerkin method for the (non)-isothermal Navier-Stokes-Korteweg equations*, Journal of Computational Physics, 295(2015), pp.685-714.
37. R. Guo and Y. Xu, *An efficient, unconditionally energy stable local discontinuous Galerkin scheme for the Cahn-Hilliard-Brinkman system*, Journal of Computational Physics, 298(2015), pp.387-405.
38. L. Guo, Y. Xu, Z. Xu and J. Jiang, *A PDE-based Regularization Algorithm toward Reducing Speckle Tracking Noise: A Feasibility Study for Ultrasound Breast Elastography*, Ultrasonic Imaging, 37(2015), pp.277-293.
39. L. Guo and Y. Xu, *Energy conserving local discontinuous Galerkin methods for the nonlinear Schrödinger equation with wave operator*, Journal of Scientific Computing, 65(2015), pp.622-647.
40. F. Zhang, Y. Xu, F. Chen, R. Guo, *Interior Penalty Discontinuous Galerkin Based Isogeometric Analysis for Allen-Cahn Equations on Surfaces*, Communications in Computational Physics, 18(2015), pp.1380-1416.
41. R. Guo, L. Ji and Y. Xu, *High order local discontinuous Galerkin methods for the Allen-Cahn equation: analysis and simulation*, Journal of Computational Mathematics, 34(2016), pp.135-158.
42. R. Guo and Y. Xu, *Local discontinuous Galerkin method and high order semi-implicit scheme for the phase field crystal equation*, SIAM Journal on Scientific Computing, 38(2016), pp.A105-A127.

43. R. Guo, F. Filbet and Y. Xu, *Efficient high order semi-implicit time discretization and local discontinuous Galerkin methods for highly nonlinear PDEs*, Journal of Scientific Computing, 68(2016), pp.1029-1054.
44. L. Tian, Y. Xu, J.G.M. Kuerten and J.J.W. Van der Vegt, *An h-adaptive local discontinuous Galerkin method for the Navier-Stokes-Korteweg equations*, Journal of Computational Physics, 319(2016), pp.242-265.
45. Z. Lu, A. Cesmelioglu, J.J.W. Van der Vegt, Y. Xu, *Discontinuous Galerkin approximations for computing electromagnetic bloch modes in photonic crystals*, Journal of Scientific Computing, 70(2017), pp.922-964.
46. 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.
47. F. Zhang, Y. Xu, F. Chen, *Discontinuous Galerkin Based Isogeometric Analysis for Geometric flows*, Journal of Scientific Computing, 71(2017), pp.525C546.
48. Y. Xia and 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.
49. L. Zhou, Y. Xu, Z. Zhang, W. Cao, *Superconvergence of local discontinuous Galerkin method for one-dimensional linear Schrödinger equations*, Journal of Scientific Computing, 73(2017), pp.1290-1315.
50. R. Guo and Y. Xu, *An adaptive time-stepping strategy and local discontinuous Galerkin method for the modified phase field crystal equation*, Communications in Computational Physics, 24(2018), pp.123-151 .
51. L. Zhou and Y. Xu, *Stability analysis and error estimates of semi-implicit spectral deferred correction coupled with local discontinuous Galerkin method for linear convection-diffusion equations*, Journal of Scientific Computing, 77(2018), pp.1001-1029.
52. T. Ma and Y. Xu, *Local discontinuous Galerkin methods for the two-dimensional Camassa-Holm equation*, Communications in Mathematics and Statistics, 6(2018), pp.359-388.
53. Z. Lu, J.J.W. Van der Vegt, Y. Xu, *Spectral approximation for polynomial eigenvalue problems*, Computers and Mathematics with Applications, 76(2018), pp.1184-1197.
54. P. Fu, F. Li and Y. Xu, *Globally divergence-free discontinuous Galerkin methods for ideal magnetohydrodynamics equations*, Journal of Scientific Computing, 77(2018), pp.1621-1659.

55. R. Guo and Y. Xu, *Semi-implicit spectral deferred correction method based on the invariant energy quadratization approach for phase field problems*, Communications in Computational Physics, 26(2019), pp.87-113.
56. P. Fu, Y. Cheng, F. Li and Y. Xu, *Discontinuous Galerkin methods with optimal  $L_2$  accuracy for PDEs with high order spatial derivatives*, Journal of Scientific Computing, 78(2019), pp.816-863.
57. R. Guo and Y. Xu, *Efficient, accurate and energy stable discontinuous Galerkin methods for phase field models of two-phase incompressible flows*, Communications in Computational Physics, 26(2019), pp.1224-1248.
58. C. Zhang, Y. Xu and Y. Xia, *Local discontinuous Galerkin methods for the  $\mu$ -Camassa-Holm and  $\mu$ -Degasperis-Procesi equations*, Journal of Scientific Computing, 79(2019), pp.1294-1334.
59. 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.
60. Q. Tao and Y. Xu, *Superconvergence of arbitrary Lagrangian-Eulerian discontinuous Galerkin methods for linear hyperbolic equations*, SIAM Journal on Numerical Analysis, 57(2019), pp.2142-2165.
61. R. Guo and Y. Xu, *High order numerical simulations for the binary fluid-surfactant system using the discontinuous Galerkin and spectral deferred correction methods*, SIAM Journal on Scientific Computing, 42(2020), pp.B353-B378.
62. F. Yan and Y. Xu, *Stability analysis and error estimates of local discontinuous Galerkin method with semi-implicit spectral deferred correction time-marching for the Allen-Cahn equation*, Journal of Computational and Applied Mathematics, 376(2020), 112857.
63. Q. Tao, Y. Xu and C.-W. Shu, *An ultraweak-local discontinuous Galerkin method for PDEs with high order spatial derivatives*, Mathematics of Computation, 89(2020), 2753-2783.
64. Q. Tao, Y. Xu and C.-W. Shu, *A discontinuous Galerkin method and its error estimate for nonlinear fourth-order wave equations*, Journal of Computational and Applied Mathematics, 386(2021), 113230.
65. C. Zhang, Y. Xu and Y. Xia, *Local discontinuous Galerkin methods to a dispersive system of KdV-type equations*, Journal of Scientific Computing, 86(2021), Article number:4.
66. Q. Tao, Y. Xu and X. Li, *Negative norm estimates for arbitrary Lagrangian-Eulerian discontinuous Galerkin method for nonlinear hyperbolic equations*, Communications on Applied Mathematics and Computation, to appear.



67. Q. Zhang, Y. Xu and C.-W. Shu, *Dissipative and conservative local discontinuous Galerkin methods for the Fornberg-Whitham type equations*, Communications in Computational Physics, 30 (2021), pp. 321-356.
68. Q. Kang and Y. Xu, *A discontinuous Galerkin method with minimal dissipation for a finite-strain plate*, Advances in Applied Mathematics and Mechanics, 13 (2021), pp. 1027-1063.
69. F. Yan and Y. Xu, *Error analysis of an unconditionally energy stable local discontinuous Galerkin scheme for the Cahn-Hilliard equation with concentration dependent mobility*, Computational Methods in Applied Mathematics, 21 (2021), pp. 729-751.
70. W. Zhang, Y. Xia and Y. Xu, *Well-balanced arbitrary Lagrangian-Eulerian discontinuous Galerkin methods for the shallow water equations*, Journal of Scientific Computing, 88(2021), Article number:57.

## Publications in Refereed Proceedings

71. Y. Xu and C.-W. Shu, *Preliminary results in local discontinuous Galerkin methods for two classes of 2D nonlinear wave equations (Abstract)*, in Abstracts of the Papers Presented at the Minisymposia Sessions of the Sixth World Congress on Computational Mechanics in conjunction with the Second Asian-Pacific Congress on Computational Mechanics, Z.H. Yao, M.W. Yuan and W.X. Zhong, editors, Tsinghua University Press & Springer, 2004, p.212.
72. Y. Xu and J.J.W. van der Vegt, *Space-Time Discontinuous Galerkin Method for Large Amplitude Nonlinear Water Waves*, Computational Fluid Dynamics 2006: Proceedings of the Fourth International Conference on Computational Fluid Dynamics, ICCFD, Ghent, Belgium, July 10-14, 2006, H. Deconinck and E. Dick, (Eds.), Springer, 2009, pp. 53-58.

## Preprint

73. R. Guo and Y. Xu, *Semi-implicit spectral deferred correction methods based on second order time integration schemes for nonlinear PDEs*.
74. Z. Lu and Y. Xu, *A parallel eigensolver for photonic crystals discretized by edge finite elements*.
75. 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*.
76. Q. Zhang and Y. Xu, *A discontinuous Galerkin method for the generalized Camassa-Holm-Kadomtsev-Petviashvili equation*.
77. J. Lin, Y. Xu, H. Xu, X. Zhong, *High order finite difference WENO methods with unequal-sized sub-stencils for the Degasperis-Procesi type equations*.

## Memberships

- American Mathematical Society

## Students Supervision

- Past Ph.D. students in Computational Mathematics:
  1. Liangyue Ji, Ph.D. 2012.  
Thesis title: Error analysis of the discontinuous Galerkin methods for non-linear equations and post-processing methods.
  2. Ruihan Guo, Ph.D. 2014. Thesis title: Local discontinuous Galerkin methods and fast solvers for phase field models.
  3. Jinfeng Jiang, Ph.D. 2014.  
Thesis title: Discontinuous Galerkin methods for wave propagation in elastic materials and hyper-elastic materials.
  4. Li Guo, Ph.D. 2015.  
Thesis title: Numerical algorithms for high order derivative equations and their applications.
  5. Lulu Tian, Ph.D. 2015, University of Twente, jointly supervised with Professor J.J.W. van der Vegt and Prof. J.G.M. Kuerten.  
Thesis title: Local discontinuous Galerkin methods for phase transition problems.
  6. Zhongjie Lu, Ph.D. 2017.  
Thesis title: Discontinuous Galerkin approximations for computing band gaps in photonic crystals
  7. Dr. Lingling Zhou, Ph.D. 2018.  
Thesis title: Stability, Error Estimates and Superconvergence Analysis for Discontinuous Galerkin Method.
  8. Dr. Pei Fu, Ph.D. 2018.  
Thesis title: The Study of Discontinuous Galerkin Methods with Property Preserving.
  9. Dr. Chao Zhang, Ph.D. 2019.  
Thesis title: Local discontinuous Galerkin methods and theoretical analysis for nonlinear wave equations.
  10. Dr. Qian Zhang, Ph.D. 2019.  
Thesis title: The high-order conservative numerical methods for singular solutions of wave equations.
  11. Dr. Qi Tao, Ph.D. 2020.  
Thesis title: Error Estimates and superconvergence analysis of discontinuous Galerkin methods.

12. Dr. Jianli Zhao, Ph.D. 2020.  
Thesis title: The high resolution numerical methods for nonlinear high order dispersive equations.
  13. Dr. Fengna Yan, Ph.D. 2020, jointly supervised with Professor J.J.W. van der Vegt  
Thesis title: Error estimates and bound preserving schemes of discontinuous Galerkin methods for nonlinear equations.
  14. Dr. Xue Hong, Ph.D. 2021. jointly supervised with Professor Yinhua Xia  
Thesis title: The development and analysis for discontinuous Galerkin methods in Lagrangian-Eulerian framework.
  15. Dr. Weijie Zhang, Ph.D. 2021.  
Thesis title: Structure preserving discontinuous Galerkin methods for hyperbolic conservation law with source term.
- Past MS.C. Students
    1. Mr. Tian Ma, MS.C. 2018  
Thesis title: Local discontinuous Galerkin methods for the two-dimensional Camassa-Holm equation.
    2. Mr. Qiao Kang, MS.C. 2020  
Thesis title: Numerical Methods for a Finite-Strain Plate and Its Simulation.
  - Current Ph.D. students in Computational Mathematics:
    1. Mr. Xiangyi Meng, Fall 2016-present  
Research area: Local discontinuous Galerkin methods for phase transition problems
    2. Ms. Xiaoyu Cheng, Fall 2017-present  
Research area: Discontinuous Galerkin methods.
    3. Ms. Xiaoxuan Yu, Fall 2019-present  
Research area: Numerical methods for nonlocal PDEs.
    4. Mr. Wei Zheng, Fall 2018-present  
Research area: Implicit methods for nonlinear PDEs.
    5. Ms. Jinyang Lu, Fall 2018-present  
Research area: Discontinuous Galerkin methods for nonlinear PDEs.
    6. Ms. Jiahui Zhang, Fall 2020-present  
Research area: High order methods for hyperbolic conservation law with source term.
    7. Mr. Lei Wei, Fall 2020-present  
Research area: Discontinuous Galerkin methods for nonlinear PDEs.

## Teaching

Courses Taught at Department of Mathematics, University of Science and Technology of China.

1. Spring 2008, MA05135, Finite Difference Methods for Initial Boundary Value Problems of Partial Differential Equation.
2. Spring 2008, 00151107, Computational methods (B).
3. Fall 2008, MA06425, Numerical Methods for Nonlinear Hyperbolic Equations.
4. Spring 2009, 00151101, Computational methods (B).
5. Spring 2009, 00151107, Computational methods (B).
6. Fall 2010, 00151206, Calculus I.
7. Spring 2011, MA05164, Finite Difference Methods for Partial Differential Equation
8. Fall 2011, 00151212, Calculus I.
9. Spring 2012, 00104601, Numerical Analysis.
10. Spring 2012, MA06127, Numerical Methods for Nonlinear Partial Differential Equations.
11. Fall 2012, 00151212, Calculus I.
12. Spring 2013, 00104601, Numerical Analysis.
13. Spring 2013, MA06423, Multiscale Modeling.
14. Fall 2013, 00151203, Calculus I.
15. Spring 2014, 00104601, Numerical Analysis.
16. Fall 2014, 00151208, Calculus I.
17. Spring 2015, 00104601, Numerical Analysis.
18. Fall 2015, 00156302, Mathematical Analysis I.
19. Spring 2016, 00104601, Numerical Analysis.
20. Fall 2016, 00156302, Mathematical Analysis I.
21. Spring 2017, 00104601, Numerical Analysis.
22. Fall 2017, 00156304, Mathematical Analysis I.
23. Spring 2018, 00104601, Numerical Analysis.

24. Fall 2018, 00156301, Mathematical Analysis I.
25. Spring 2019, 00104601, Numerical Analysis.
26. Fall 2019, 001563.03, Mathematical Analysis I.
27. Spring 2020, 001046.01, Numerical Analysis.
28. Fall 2020, MATH1006.02, Mathematical Analysis I.
29. Spring 2021, 001046.01, Numerical Analysis.
30. Fall 2021, MATH1006.02, Mathematical Analysis I.

## **Referee for Journals**

1. SIAM Journal on Numerical Analysis
2. Numerische Mathematik
3. Mathematics of Computation
4. IMA Journal of Numerical Analysis
5. Journal of Computational Physics
6. Communication in Computational Physics
7. Computer Methods in Applied Mechanics and Engineering
8. Journal of Scientific Computing
9. Discrete and Continuous Dynamical Systems - Series B
10. Mathematics and Computers in Simulation
11. Journal of Computational Mathematics
12. Science in China Series A-Mathematics
13. Nonlinear Analysis: Modelling and Control
14. Journal of Computational and Applied Mathematics
15. The Advances in Applied Mathematics and Mechanics
16. Numerical Mathematics: A Journal of Chinese Universities
17. Acta Mathematicae Applicatae Sinica
18. International Journal of Numerical Analysis and Modeling
19. Applied Mathematics and Computation

20. Applied Numerical Mathematics
21. Journal of Shanghai Jiaotong University (Science)
22. Advances in Mathematics (China)
23. Science China Mathematics
24. Numerical Mathematics: Theory, Methods and Applications
25. Acta Mathematica Sinica, English Series
26. Journal of Engineering Mathematics
27. Communications in Mathematics and Statistics
28. Methods and Applications of Analysis
29. Computer Physics Communications
30. Computers and Fluids
31. Journal of Applied Mathematics
32. Computers and Mathematics with Applications
33. Numerical Methods for Partial Differential Equations
34. Acta Mathematica Scientia
35. SeMA Journal
36. Applied Mathematics and Mechanics (English Edition)

## Conferences/Workshops

- **Invited Talk (Conference/workshop):**

1. Workshop: Discontinuous Galerkin Methods for Partial Differential Equations, Banff International Research Station, Banff, AB, Canada , Nov 25-30, 2007.  
Presentation: *A local discontinuous Galerkin method for the Camassa-Holm equation.*
2. International Conference on Applied Mathematics: Modeling, Analysis and Computation, June 1-5, 2008, City University of Hong Kong, Hong Kong.  
Presentation: *A local discontinuous Galerkin method for the Camassa-Holm and Hunter-Saxton equations.*

3. 2008 Frontiers of computational and applied mathematics , July 19-22, 2008, University of Science and Technology of China, Hefei, China.  
Presentation: *A local discontinuous Galerkin method for the Camassa-Holm and Hunter-Saxton equations.*
4. A Workshop on Modern Numerical Methods in Fluid Mechanics, Dec. 26–28, 2008, Capital Normal University, Beijing, China.  
Presentation: *Discontinuous Hamiltonian Finite Element Method for Bilinear Poisson Brackets.*
5. International Conference on Scientific Computing in Aerodynamics Beihang University, Beijing, China, November 26–28, 2010.  
Presentation: *Local Discontinuous Galerkin Methods for the Schrödinger Type System.*
6. The fifth Workshop on Young Chinese Computational Mathematicians, Shanghai Jiao Tong University, Shanghai, China, August 13-14, 2011.  
Presentation: *Accuracy-enhancement of discontinuous Galerkin solutions for convection-diffusion equations.*
7. USTC/NUS Mathematical Workshop, University of Science and Technology of China, Hefei, Anhui, China, September 19-21, 2011.  
Presentation: *High order numerical methods for the nonlinear wave equations.*
8. The 11th Congress of Chinese Mathematical Society, Sichuan, Chengdu, China, November 13-17.  
Presentation: *Error estimates of the local discontinuous Galerkin method for fourth order geometric evolution equations*
9. International Conference on Applied Mathematics (ICAM2012) , May 28-June 1, 2012, City University of Hong Kong, Hong Kong.  
Presentation: *Multigrid methods of discontinuous Galerkin discretization for time-dependent fourth-order problems*
10. The Second International Conference on Scientific Computing in Aerodynamics , October 18-20, 2012, Beihang University, Beijing.  
Presentation: *Local discontinuous Galerkin methods for phase transition problem*
11. The second International Workshop on Development and Application of High-Order Numerical Methods, May 18-21, 2013, Xiamen University, Xiamen.  
Presentation: *A dissipation-rate reserving DG method for wave catching-up phenomena in a nonlinearly elastic composite bar*
12. The sixth International Congress of Chinese Mathematicians (ICCM), July 14-19, 2013, National Taiwan University, Taipei.  
Presentation: *Local discontinuous Galerkin methods for the nonlinear wave equations.*

13. International Workshop on Numerical Methods and Modeling for Compressible Multimaterial Flows and Mixing, August 12-16, 2013, Institute of Applied Physics and Computational Mathematics(IAPCM), Beijing.  
Presentation: *A dissipation-rate reserving DG method for wave catching-up phenomena in a nonlinearly elastic composite bar*
14. Sino-German Symposium on Modern Numerical Methods for Compressible Fluid Flows and Related Problems, May 21–27, 2014, The Sino-German Center, Beijing.  
Presentation: *Numerical simulations for the propagation of phase transitions*
15. 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.  
Presentation: *Local discontinuous Galerkin methods for phase field models*
16. International Conference on Numerical Partial Differential Equations and Their Applications, Wuhan University, Wuhan, China, 25-29 May, 2015.  
Presentation: *Local discontinuous Galerkin methods for phase field models*
17. International Workshop on Numerical Simulation for Multimaterial and Multiphysics Flows, Institute of Applied Physics and Computational Mathematics, Beijing, China, August 14-16, 2015.  
Presentation: *Local discontinuous Galerkin method and high order semi-implicit scheme for the phase field crystal equation*
18. International Workshop on Integrable Systems - Mathematical Analysis and Scientific Computing, Center for Advanced Study in Theoretical Sciences (CASTS), National Taiwan University, Taipei, October 17-21, 2015.  
Presentation: *High order numerical methods for the nonlinear wave equations.*
19. Trends of High Order Numerical Schemes and Their Application, Institute of Applied Physics and Computational Mathematics, Beijing, China, June 3-5, 2016.  
Presentation: *Local discontinuous Galerkin method and high order semi-implicit scheme for the phase field crystal equation*
20. Workshop on Numerical Methods and Analysis for Partial Differential Equations, Peking University, Beijing, China, July 20, 2016.  
Presentation: *An h-adaptive local discontinuous Galerkin method for liquid-vapor flows with phase change and solid wall boundaries*
21. The 9th national conference on finite element methods, Emei, China, August 19-22, 2016.  
Presentation: *Local discontinuous Galerkin method and high order semi-implicit scheme for the phase field equations*



22. Workshop on “Recent Advances in Scientific computing”, Yunnan University of Finance and Economics, Kunming, China, November 18-21, 2016.  
Presentation: *Local discontinuous Galerkin method and high order semi-implicit scheme for the phase field equations*
23. The Third International Workshop on Development and Application of High-Order Numerical Methods, Hefei, China, December 16-19, 2016.  
Presentation: *Discontinuous Galerkin approximations for computing electromagnetic Bloch modes in photonic crystals*
24. Workshop on “Recent Advances in Finite Element Methods”, City University of Hong Kong, Hong Kong, March 13-15, 2017.  
Presentation: *High order energy stable and efficient local discontinuous Galerkin methods for the Cahn-Hilliard-Navier-Stokes equation*
25. Workshop on “Mathematical and Computational Methods for Quantum and Kinetic Problems”, Beijing Computational Science Research Center, Beijing, China, June 11-14, 2017.  
Presentation: *An  $h$ -adaptive local discontinuous Galerkin method for phase transition problem*
26. International Workshop on Computational Mathematics and Scientific Computing, Ocean University of China, Qingdao, China, June 28-July 2, 2017  
Presentation: *Efficient high order semi-implicit time discretization and local discontinuous Galerkin methods for highly nonlinear PDEs*
27. International Conference on Numerical Simulation for Multimaterial and Multiphysics Flows, Institute of Applied Physics and Computational Mathematics, Beijing, China, July 4-7, 2017.  
Presentation: *Efficient high order semi-implicit time discretization and local discontinuous Galerkin methods for highly nonlinear PDEs*
28. International Workshop on “Recent Advances and Applications of DG Methods”, Harbin Institute of Technology, Harbin, China, July 17-19, 2017.  
Presentation: *High order energy stable and efficient local discontinuous Galerkin methods for the Cahn-Hilliard-Navier-Stokes equation*
29. The Sixth Chinese-German Workshop on Computational and Applied Mathematics, Shanghai, China, October 9-13, 2017.  
Presentation: *Efficient high order semi-implicit time discretization and local discontinuous Galerkin methods for highly nonlinear PDEs*
30. Workshop on Scientific Computing, Hong Kong Baptist University, Hong Kong, November 25, 2017.  
Presentation: *Globally divergence-free discontinuous Galerkin methods for ideal magnetohydrodynamics equations*

• **Invited Mini-Symposium Talk:**

1. Mini-Symposium on “Discontinuous Galerkin Methods Theory and Applications”, at Sixth World Congress on Computational Mechanics in conjunction with the Second Asian-Pacific Congress on Computational Mechanics, Beijing, China, Sept. 5–10, 2004.  
Presentation: *Local discontinuous Galerkin methods for two classes of two dimensional nonlinear wave equations.*
2. Mini-Symposium on “High order numerical methods for convection dominated problems and applications”, Second International Conference on Scientific Computing and Partial Differential Equations and First East Asia SIAM Conference, Hong Kong Baptist University, December 12-16, 2005.  
Presentation: *Space-time discontinuous Galerkin method for nonlinear water waves.*
3. Mini-Symposium on “Discontinuous Galerkin Methods”, at Seven World Congress on Computational Mechanics, Los Angeles, California, July 16 - 22, 2006.  
Presentation: *Discontinuous Hamiltonian Finite Element Method for a Bilinear Poisson Bracket.*
4. Mini-Symposium on “High order discontinuous Galerkin methods and application”, International Conference On Spectral and High Order Methods (ICOSAHOM07), Institute of Computational Mathematics Chinese Academy of Sciences, Beijing, P.R. China June 18- 22, 2007  
Presentation: *Space-time discontinuous Galerkin method for nonlinear water waves.*
5. Minisymposium on ”Discontinuous Galerkin Methods for Partial Differential Equations”, Joint SIAM/RSME-SCM-SEMA Meeting: Emerging Topics in Dynamical Systems and Partial Differential Equations (DSPDEs’10), May 31st–June 4th, 2010, Barcelona, Spain.  
Presentation: *Error estimates of the local discontinuous Galerkin method for fourth order geometric evolution equation.*
6. Minisymposium on “discontinuous Galerkin method”, International Conference on Interdisciplinary Applied and Computational Mathematics (ICIACM), Zhejiang University, Hangzhou, China, June 17-21, 2011.  
Presentation: *Negative-order norm error estimates of discontinuous Galerkin solutions for convection-diffusion equations.*
7. Minisymposium ”Discontinuous Galerkin method for PDEs”, 7th International Congress on Industrial and Applied Mathematics, Vancouver, BC, Canada, July 18-22, 2011.  
Presentation: *On the DG methods for Degasperis-Procesi equation*
8. Minisymposium on “High order accurate WENO and discontinuous Galerkin schemes for PDE”, Annual conference of China Society for Industrial and Applied Mathematics , August 19-24, 2012, University of Science and Technology of China, Hefei.

Presentation: *Multigrid methods of discontinuous Galerkin discretization for time-dependent fourth-order problems*

9. Minisymposium on “Applications and analysis of discontinuous Galerkin finite element methods”, The 8th International Conference on Computational Physics (ICCP8), January 7-11, 2013, Hong Kong Baptist University, Hong Kong.

Presentation: *Discontinuous Galerkin method for the wave catching-up phenomena in a two-layer nonlinearly elastic composite bar*

10. Minisymposium on “Numerical Simulation of Quantum and Kinetic Problems”, The 9th International Conference on Computational Physics (ICCP9), January 7-11, 2015, National University of Singapore, Singapore.

Presentation: *Energy conserving local discontinuous Galerkin methods for the nonlinear Schrödinger equation with wave operator*

11. Minisymposium on “High Order Methods and Applications to Complex Flows”, The 9th International Conference on Computational Physics (ICCP9), January 7-11, 2015, National University of Singapore, Singapore.

Presentation: *High order numerical methods for multi-phase fluid flow*

12. Minisymposium on “Discontinuous Galerkin method: recent development and application”, The International Congress on Industrial and Applied Mathematics (ICIAM), Beijing, China, August 10-14, 2015.

Presentation: *Fast solver for the local discontinuous Galerkin discretization of high order time-dependent partial differential equations*

13. Minisymposium on “Women in Applied Mathematics: Recent advances in modeling, numerical algorithms, and applications”, The International Congress on Industrial and Applied Mathematics (ICIAM), Beijing, China, August 10-14, 2015.

Presentation: *Energy conserving local discontinuous Galerkin methods for the nonlinear Schrödinger equation with wave operator*

14. Minisymposium on “Interface problem and phase field modeling”, The 11th national conference on computational mathematics, Xi’an, China, July 21-23, 2017.

Presentation: *High order energy stable and efficient local discontinuous Galerkin methods for the phase field models*

15. Minisymposium on “Mathematical theory and numerical methods for fluid mechanics”, The 15th Annual Meeting of the China Society for Industrial and Applied Mathematics, Qingdao, China, October 13-15, 2017.

Presentation: *Globally divergence-free discontinuous Galerkin methods for ideal magnetohydrodynamics equations*

#### • Invited Seminar and Colloquium talk

1. Seminar of scientific computing group, University of Science and Technology of China, Anhui, Hefei, P.R. China, Nov 23, 2007.

- Presentation: *Space-time discontinuous Galerkin method for nonlinear water waves.*
2. Seminar of scientific computing group, Brown University, Providence, RI, USA, Feb. 6, 2009.  
Presentation: *Local discontinuous Galerkin methods for the integrable nonlinear hyperbolic equations.*
  3. Seminar of Institute of Applied Mathematics, Freiburg University, Freiburg, Germany, Dec. 8, 2009.  
Presentation: *Local discontinuous Galerkin methods for the nonlinear wave equations.*
  4. Seminar of scientific computing group, Brown University, Providence, RI, USA, Feb. 19, 2010.  
Presentation: *Local discontinuous Galerkin method for fourth order geometric evolution equation.*
  5. Colloquium of Institute for Mathematics, Wuerzburg University, Wuerzburg, Germany, July 9, 2010.  
Presentation: *On a numerical method for the nonlinear wave equations.*
  6. Seminar on Applied Mathematics, Department of Mathematics, The Hong Kong University of Science and Technology, Hong Kong, January 18, 2011.  
Presentation: *High order numerical methods for the nonlinear wave equations.*
  7. Colloquium of Beijing Computational Science Research Center, Beijing, August 14, 2013.  
Presentation: *A dissipation-rate preserving DG method for wave catching-up phenomena in a nonlinearly elastic composite bar*
  8. Oberseminar of Institute for Mathematics, Wuerzburg University, Wuerzburg, Germany, January 21, 2014.  
Presentation: *Discontinuous Galerkin methods for the nonlinear wave equations*
  9. Oberseminar of Institute for Mathematics, Wuerzburg University, Wuerzburg, Germany, July 2, 2014.  
Presentation: *Accuracy enhancement of the discontinuous Galerkin solutions*
  10. Seminar for Mathematics, Chongqing University, Chongqing, China, May 22, 2015.  
Presentation: *Local discontinuous Galerkin method for the nonlinear wave equations*
  11. Seminar for Mathematics, National University of Defense Technology, Changsha, China, November 14, 2016.  
Presentation: *Local discontinuous Galerkin method and high order semi-implicit scheme for the phase field equations*

12. Seminar at the State Key Laboratory of Scientific and Engineering Computing, Institute of Computational Mathematics and Scientific/Engineering Computing, Chinese Academy of Sciences, Beijing, China, March 7, 2017.  
Presentation: *Local discontinuous Galerkin method and high order semi-implicit scheme for the phase field equations*
13. Seminar at School of Mathematical Sciences, Peking University, Beijing, China, June 12, 2017.  
Presentation: *Local discontinuous Galerkin method and high order semi-implicit scheme for the phase field equations*

• **Contributed Talk:**

1. Workshop on discontinuous Galerkin method and its applications, Beijing International Center for Computational Physics, June 13-17, 2007, Beijing, P.R. China.  
Presentation: *Discontinuous Hamiltonian Finite Element Method for Bilinear Poisson Brackets*
2. The 8th Congress on Computational Mathematics of China, Sichuan University, Sichuan Chengdu, P.R. China, Oct. 25-29, 2007.  
Presentation: *A local discontinuous Galerkin method for the Camassa-Holm equation.*
3. International Conference on Approximation in Scientific Computing (ICASC08), Oct. 26-30, 2008, Beijing, China.  
Presentation: *Discontinuous Hamiltonian Finite Element Method for Bilinear Poisson Brackets.*
4. The thirteenth International Conference on "Hyperbolic Problems: Theory, Numerics and Applications" (HYP2010), June 15–June19, 2010, Beijing, China.  
Presentation: *High order numerical methods for the Hunter-Saxton equation.*
5. The 1st "Symposium on Computational Science, Engineering and Finance", Kunming, China, July 28-31, 2011.  
Presentation: *On the DG methods for Degasperis-Procesi equation*
6. Cross-Strait Conference on integrable systems and related topics, Changshu, Jiangsu, China, October 4-8, 2011.  
Presentation: *High order numerical methods for Degasperis-Procesi equation*
7. The 12th annual meeting of computational mathematics, Changsha, Hunan, China, October 19-23, 2013.  
Presentation: *A local discontinuous Galerkin method for the propagation of phase transition in solids and fluids*

• **Poster:**

1. 31th Conference of the Dutch-Flemish Numerical Analysis Communities, Woudschoten, Zeist, the Netherlands, October 11-13, 2006.  
Poster: *Space-Time Discontinuous Galerkin Method for Nonlinear Water Waves*

• **Participant:**

1. International Workshop on Scientific Computing, on the occasion of Zhong-Ci Shi's 70th birthday, Institute of Computational Mathematics, Chinese Academy of Sciences, Beijing, P.R. China, December 5-6, 2003.
2. International Conference on Frontiers of Applied Mathematics, Morningside Center of Mathematics, Chinese Academy of Sciences, Beijing, P.R. China, June 14-17, 2004.
3. Summer School on Multiscale Modelings and Simulations, Morningside Center of Mathematics, Chinese Academy of Sciences, Beijing, P.R. China, June 10 - August 9, 2004.
4. Workshop on Adaptive Method for Compressible Flows, University of Science and Technology of China, Anhui, Hefei, P.R. China, June 28 - July 2, 2004.
5. International Conference on Control, Partial Differential Equations and Scientific Computing, dedicated to late Professor J.-L. Lions, Beijing, P.R. China, September 13-16, 2004.
6. Summer school in numerical analysis, University of Science and Technology of China, Hefei, P.R. China, May 23-Jun. 26, 2005
7. 30th Conference of the Dutch-Flemish Numerical Analysis Communities, Woudschoten, Zeist, the Netherlands, October 12-14, 2005.
8. 34th VKI CFD Lecture Series Very-High Order Discretization, Von Karman Institute For Fluid Dynamics, Brussels, Belgium, November 14-18, 2005
9. International Workshop on Scientific Computing, On The Occasion Of Cui Jun-Zhi'S 70 The Birthday , June 7-8, 2008, Institute of Computational Mathematics, Chinese Academy of Sciences, Beijing, China.
10. Advances in Mathematics and Its Applications , July 17-18, 2008, University of Science and Technology of China, Hefei, China.
11. Workshop Adaptive Finite Elements: Analysis and Application, Kirchzarten, Germany, September 7-11, 2009.
12. Workshop: Numerical Methods for Partial Differential Equations on Surfaces, Department of Applied Mathematics, University of Freiburg, Freiburg, Germany, September 14-17, 2009.
13. Chinese-German Workshop on Computational and Applied Mathematics 2009 (3rd Workshop), University of Heidelberg, Heidelberg, Germany, September 28 - October 2, 2009.

14. The fourth Russian-German advanced research workshop on computational science and high performance computing, Department of Applied Mathematics, University of Freiburg, Freiburg, Germany, October 12-16, 2009.
15. Network Meeting of the Alexander von Humboldt Foundation, Heidelberg, Germany, November 24-26, 2009.
16. Annual Meeting of the Alexander von Humboldt Foundation, Berlin, Germany, June 21-23, 2010.
17. Workshop on Computational Mathematics and Scientific Computing, Institute of Computational Mathematics and Scientific/Engineering Computing, Academy of Mathematics and Systems Science, Beijing, China, September 9 - 11, 2010.
18. International conference on the computational Sciences , July 16-20, 2012, Shanghai Normal University, Shanghai.
19. International Conference on Scientific Computing at Extreme Scales, May 7-9, 2014, Shanghai Jiao Tong University, Shanghai.
20. Annual Meeting of the Alexander von Humboldt Foundation, Berlin, Germany, June 2-5, 2014.

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