

# LONG CHEN

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## Academic Experience

- **Professor** Jul. 2015 – present  
Department of Mathematics, University of California at Irvine, Irvine, CA
- **Associate Professor** Jul. 2011 – Jun. 2015  
Department of Mathematics, University of California at Irvine, Irvine, CA
- **Assistant Professor** Jul. 2007 – Jun. 2011  
Department of Mathematics, University of California at Irvine, Irvine, CA
- **Postdoctoral Fellow** Sep. 2006 – Jun. 2007  
Department of Mathematics, University of Maryland, College Park, MD
- **Postdoctoral Fellow** Sep. 2005 - Aug. 2006  
Department of Mathematics, University of California, San Diego, La Jolla, CA

## Education

- **Ph.D. Mathematics** Aug. 2000 - Aug. 2005  
Pennsylvania State University, University Park, PA, USA
- **M.S. Mathematics** Sep. 1997 – Jul. 2000  
Peking University, Beijing, CHINA
- **B.S. Mathematics** Sep. 1993 - Jul. 1997  
Nanjing University, Nanjing, CHINA

## Research Funding

- NSF Grant (PI) DMS-2309785 \$401,282.00 Aug 2023 - July 2026
- NSF Grant (PI) DMS-2012465 \$249,999.00. Aug 2020 - July 2024
- NSF Grant (co-PI) DMS-1913080 \$153,626.00. July 2019 - June 2022
- NSF grant (PI) DMS-1418934 \$204,996.00 Aug 2014 - July 2018
- NSF grant (PI) DMS-1115961 \$179,927.00. Oct 2011 - Sept 2014
- U.S. DOE grant DE-SC0006903. Subaward No. 4495-UCI-DOE-6903  
\$84,196.00. Sept 2011 - Aug 2014
- NSF grant (PI) DMS-0811272 \$149,999.00. Sept 2008 - Aug 2011

## Research Interest

- Numerical Methods of Partial Differential Equations
- Finite Element Methods
- Multigrid Methods
- Mesh Generation and Optimization
- Software development

## Editor and Referee

- **Editorial Board:**

- Journal of Computational Mathematics. 2021 - present.
- Computers and Mathematics with Applications. 2013 - present.
- Multiscale Modeling and Simulation. 2014 - present.
- Advances in Computational Mathematics. 2016 - present.
- Advances in Applied Mathematics and Mechanics. 2019 - present.

- **Referee:** Advances in Computational Mathematics, Advances in Mechanical Engineering, Applied Numerical Mathematics, Advances in Applied Mathematics and Mechanics, Applicable Analysis, Applied Mathematical Modeling, Applied Mathematics Letters, , Bulletin of Mathematical Biology, Communications in Computational Physics, Computer Methods in Applied Mechanics and Engineering, Computational and Applied Mathematics, Computers and Mathematics with Applications, Computer-Aided Design, Discrete and Continuous Dynamical System – B, ESAIM: Mathematical Modelling and Numerical Analysis, Foundations of Computational Mathematics, International Journal for Numerical Methods in Engineering, International Journal for Numerical Methods in Engineering, Journal of Computational and Applied Mathematics, Journal of Computational Chemistry, Journal of Computational Physics, Journal of Scientific Computing, Mathematics of Computation, Numerical Mathematica: Theory, Methods and Applications, Numerische Mathematik, Numerical Linear Algebra with Applications, Numerical Methods for Partial Differential Equations, SCIENCE CHINA Mathematics, SIAM Matrix Analysis and Applications, SIAM Numerical on Analysis, SIAM Scientific Computing, SIGGRAPH.

## List of Publications

- **Submitted Articles**

5. L. Chen and X. Huang. A Mixed Finite Element Method for the Biharmonic Equation with Hybridization. *Submitted*, 2023.
4. L. Chen and J. Wei. Accelerated Gradient and Skew-Symmetric Splitting Methods for A Class of Monotone Operator Equations. *Submitted*, 2023.
3. L. Chen and X. Huang. Complexes from Complexes: Finite Element Complexes in Three Dimensions. *Submitted*, 2022.
2. L. Chen and X. Huang. Finite Element Complexes in Two Dimensions. *Submitted*, 2022.
1. L. Chen and X. Huang. Geometric Decompositions of Div-Conforming Finite Element Tensors. *Submitted*, 2022.

- **Published or Accepted Journal Articles**

69. L. Chen, R. Guo, and J. Zou. A Family of Immersed Finite Element Spaces and Applications to Three Dimensional H(Curl) Interface Problems. *SIAM Journal on Scientific Computing*. To appear. 2023.
68. L. Chen and X. Huang. Finite Element de Rham and Stokes Complexes in Three Dimensions. *Mathematics of Computation*, 2023.  
DOI <https://doi.org/10.1090/mcom/3859>
67. Y. Xie, S. Cao, L. Chen, and L. Zhong. Convergence and Optimality of an adaptive modified weak Galerkin finite element method. *Numerical Methods for Partial Differential Equations*, 2023.  
DOI <https://doi.org/10.1002/num.23027>

66. L. Chen and J. Wei. Transformed Primal-Dual Methods for Nonlinear Saddle Point Systems. *Journal of Numerical Mathematics*. 2023.  
DOI <https://doi.org/10.1515/jnma-2022-0056>
65. S. Cao, L. Chen, and R. Guo. Immersed Virtual Element Methods for Electromagnetic Interface Problems in Three Dimensions. *Mathematical Models and Methods in Applied Sciences*, 33(03): 455–503, 2023.  
DOI <https://doi.org/10.1142/S0218202523500112>
64. S. Cao, L. Chen, R. Guo, and F. Lin. Immersed Virtual Element Methods for Elliptic Interface Problems in Two Dimensions. *Journal of Scientific Computing*, 93 (12), 2022.  
DOI <https://doi.org/10.1007/s10915-022-01949-x>
63. L. Chen and X. Huang. Finite elements for div and divdiv conforming symmetric tensors in arbitrary dimensions. *SIAM Journal on Numerical Analysis*, 60: 1932–1961, 2022.  
DOI <https://doi.org/10.1137/21M1433708>
62. D. Wang, B. Zheng, L. Chen, G. Lin and J. Xu. Block Triangular Preconditioning for Stochastic Galerkin Method. *Journal of Computational and Applied Mathematics*. 412,114298, 2022.  
DOI <https://doi.org/10.1016/j.cam.2022.114298>
61. L. Chen and X. Huang. A finite elements elasticity complex in three dimensions. *Mathematics of Computation*, 91, 2095–2127, 2022.  
DOI <https://doi.org/10.1090/mcom/3739>
60. S. Cao, L. Chen, and X. Huang. Error analysis of a decoupled finite element method for quad-curl problems. *Journal of Scientific Computing*, 90(29) 2022.  
DOI <https://doi.org/10.1007/s10915-021-01705-7>
59. S. Cao, L. Chen, and R. Guo. A Virtual Finite Element Method for Two Dimensional Maxwell Interface Problems with a Background Unfitted Mesh. *Mathematical Models and Methods in Applied Sciences*, vol. 31(14), 2907–2936, 2021.  
DOI <https://doi.org/10.1142/S0218202521500652>
58. H. Luo and L. Chen. From Differential Equation Solvers to Accelerated First-Order Methods for Convex Optimization. *Mathematical Programming*. 195, 735–781, 2021.  
DOI <https://doi.org/10.1007/s10107-021-01713-3>
57. L. Chen and X. Huang. Finite elements for divdiv-conforming symmetric tensors in three dimensions. *Mathematics of Computation*, 91, 1107–1142, 2021.  
DOI <https://doi.org/10.1090/mcom/3700>
56. L. Chen, X. Hu, and S. Wise. Convergence Analysis of the Fast Subspace Descent Methods for Convex Optimization Problems. *Mathematics of Computation*. 2249-2282, 89, 2020.  
DOI <https://doi.org/10.1090/mcom/3526>
55. L. Chen and X. Huang. Nonconforming Virtual Element Method for 2m-th Order Partial Differential Equations in  $\mathbb{R}^n$ . *Mathematics of Computation*, 89, 1711-1744, 2020.  
DOI <https://doi.org/10.1090/mcom/3498>
54. S. Cao and L. Chen. Anisotropic Error Estimates of the Linear Nonconforming Virtual Element Methods. *SIAM Journal on Numerical Analysis*. 57(3), 1058–1081, 2019.  
DOI <https://doi.org/10.1137/18M1196455>
53. G. Wang, F. Wang, L. Chen, and Y. He. A Divergence Free Weak Virtual Element Method for the Stokes-Darcy Problem on General Meshes. *Computer Methods in Applied Mechanics and Engineering*. 344: 998–1020, 2019.  
DOI <https://doi.org/10.1016/j.cma.2018.10.022>
52. L. Chen and F. Wang. A Divergence Free Weak Virtual Element Method for the Stokes Problem on Polyhedral Meshes. *Journal of Scientific Computing*. 78, 864–886, 2019.  
DOI <https://doi.org/10.1007/s10915-018-0796-5>

51. L. Chen and X. Huang. Decoupling of Mixed Methods Based on Generalized Helmholtz Decompositions. *SIAM Journal on Numerical Analysis*. 56(5):2796–2825, Jan. 2018.  
DOI <https://doi.org/10.1137/17M1145872>
50. S. Cao and L. Chen. Anisotropic Error Estimates of the Linear Virtual Element Method on Polygonal Meshes. *SIAM Journal on Numerical Analysis*. 56(5):2913–2939, 2018.  
DOI <https://doi.org/10.1137/17M1154369>
49. L. Chen, J. Hu, X. Huang. Multigrid Methods for Hellan-Herrmann-Jonson Mixed Method of Kirchhoff Plate Bending Problems. *Journal of Scientific Computing*, 76: 673–696, 2018.  
DOI <https://doi.org/10.1007/s10915-017-0636-z>
48. L. Chen and J. Huang. Some Error Analysis on Virtual Element Methods. *Calcolo*. 55:5,2018.  
DOI <https://doi.org/10.1007/s10092-018-0249-4>
47. L. Chen, J. Hu, X. Huang, and H. Man. Residual-Based A Posteriori Error Estimates for Symmetric Conforming Mixed Finite Elements for Linear Elasticity Problems. *Science China Mathematics*. 61:973–992, 2018.  
DOI <https://doi.org/10.1007/s11425-017-9181-2>
46. L. Chen, Y. Wu, L. Zhong, and J. Zhou. MultiGrid Preconditioners for Mixed Finite Element Methods of the Vector Laplacian. *Journal of Scientific Computing*, 77(1):101–128, Oct. 2018.  
DOI <https://doi.org/10.1007/s10915-018-0697-7>
45. L. Chen and Y. Wu. Convergence of Adaptive Mixed Finite Element Methods for Hodge Laplacian Equation without harmonic forms. *SIAM Journal on Numerical Analysis*. 55(6), 2905–2929, 2017.  
DOI <https://doi.org/10.1137/16M1097912>
44. J. Huang, L. Chen and H. Rui. Multigrid Methods for A Mixed Finite Element Method of The Darcy-Forchheimer Model. *Journal of Scientific Computing*, 74(1), 396–411, 2018.  
DOI <https://doi.org/10.1007/s10915-017-0466-z>
43. L. Chen, J. Hu, X. Huang. Fast Auxiliary Space Preconditioner for Linear Elasticity in Mixed Form. *Mathematics of Computation*. 87(312):1601–1633, 2018.  
DOI <https://doi.org/10.1090/mcom/3285>
42. L. Chen, H. Wei, M. Wen. An Interface-Fitted Mesh Generator and Virtual Element Methods for Elliptic Interface Problems. *Journal of Computational Physics*. 334(1), 2017, 327–348.  
DOI <http://dx.doi.org/10.1016/j.jcp.2017.01.004>
41. L. Chen, J. Hu, X. Huang. Stabilized mixed finite element methods for linear elasticity on simplicial grids in  $\mathbb{R}^n$ . *Comput. Methods Appl. Math.* 2016.  
DOI <https://doi.org/10.1515/cmam-2016-0035>
40. B. Zheng, L.P. Chen, X. Hu, L. Chen, R.H. Nochetto, J. Xu. Fast multilevel solvers for a class of discrete fourth order parabolic problems. *Journal of Scientific Computing*, 69(1), 201–226, 2016.  
DOI <http://dx.doi.org/10.1007/s10915-016-0189-6>
39. W. Wang, L. Chen, and J. Zhou. Postprocessing mixed finite element methods for solving Cahn-Hilliard equation: Methods and Error Analysis. *Journal of Scientific Computing*, 67(2), 724–746, 2016.  
DOI <http://dx.doi.org/10.1007/s10915-015-0101-9>
38. L. Chen, R.H. Nochetto, E. Otarola, A.J. Salgado. Multilevel Methods For Nonuniformly Elliptic Operators and Fractional Diffusion. *Mathematics of Computation*. 85 (302), 2583–2607, 2016.  
DOI <http://dx.doi.org/10.1090/mcom/3089>

37. L. Chen. Multi-Grid Methods for Saddle Point Systems using Constrained Smoothers. *Computers and Mathematics with Applications*, 70(12) 2854 – 2866, 2015.  
DOI <http://dx.doi.org/10.1016/j.camwa.2015.09.020>
36. P. Zu, L. Chen, and J. Xin. A Computational Study of Residual KPP Front Speeds in Time-Periodic Cellular Flows in the Small Diffusion Limit. *Physica D: Nonlinear Phenomena*, 311, 37 - 44, 2015.  
DOI <http://dx.doi.org/10.1016/j.physd.2015.07.001>
35. L. Chen, J. Wang, Y. Wang and X. Ye. An Auxiliary Space Multigrid Preconditioner for the Weak Galerkin Method. *Computers and Mathematics with Applications*, 70(4):330–344 2015.  
DOI <http://dx.doi.org/10.1016/j.camwa.2015.04.016>
34. L. Chen, R.H. Nochetto, E. Otarola, A.J. Salgado. A PDE approach to fractional diffusion: a posteriori error analysis. *Journal of Computational Physics*, 293, 339-358, 2015.  
DOI <http://dx.doi.org/10.1016/j.jcp.2015.01.001>
33. L. Chen, X. Hu, M. Wang, and J. Xu. A Multigrid Solver based on Distributive Smoother and Defect Correction for Oseen Problems. *Numerical Mathematics: Theory, Methods and Applications*, 8(2), 237-252, 2015.  
DOI <http://dx.doi.org/10.4208/nmtma.2015.w09si>.
32. L. Chen. A simple construction of a Fortin operator for the two dimensional Taylor-Hood element. *Computers and Mathematics with Applications*, 68(10),1368–1373, 2014.  
DOI <http://dx.doi.org/10.1016/j.camwa.2014.09.003>.
31. J. Zhou, L. Chen, Y. Huang and W. Wang. An Efficient Two-Grid Scheme for the Cahn-Hilliard Equation. *Communications in Computational Physics*, 17(01), 127-145, 2015. DOI <http://dx.doi.org/10.4208/cicp.231213.100714a>.
30. L. Chen, M. Wang, and L. Zhong. Convergence Analysis of The Triangular MAC Scheme for Stokes Equations. *Journal of Scientific Computing*, 63(3), 716-744, 2015.  
DOI <http://dx.doi.org/10.1007/s10915-014-9916-z>.
29. J. Hateley, H. Wei and L. Chen. Fast Methods for Computing Centroidal Voronoi Tessellations. *Journal of Scientific Computing*, 2014.  
DOI <http://dx.doi.org/10.1007/s10915-014-9894-1>.
28. J. Zhou, X. Hu, L. Zhong, S. Shu, and L. Chen. Two-Grid Methods for Maxwell Eigenvalue Problems. *SIAM Journal on Numerical Analysis*, 52(4), 2027–2047, 2014.
27. H. Wei, L. Chen, Y. Huang and B. Zheng. Adaptive Mesh Refinement and Superconvergence for Two Dimensional Interface Problems. *SIAM Journal on Scientific Computing*, 36(4), A1478–A1499, 2014.
26. L. Chen, J. Wang and X. Ye. A posteriori error estimates for Weak Galerkin finite element methods for second order elliptic problems. *Journal of Scientific Computing*, 59(2), 496-511, 2014.
25. Y. Wu, X. Xie, and L. Chen. Hybrid Stress Finite Volume Method for Linear Elasticity Problems. *International Journal of Numerical Analysis and Modeling*, 10(3), 634–656, 2013.
24. L. Chen and M. Wang. Cell conservative flux recovery and a posteriori error estimate of vertex-centered finite volume methods. *Advances in Applied Mathematics and Mechanics*, 5 (5), 705-727. 2013.
23. M. Wang and L. Chen. Multigrid Methods for the Stokes equations using Distributive Gauss-Seidel Relaxations based on the Least Squares Commutator. *Journal of Scientific Computing*. 56(2): 409-431, 2013.  
DOI <http://10.1007/s10915-013-9684-1>

22. L. Chen, M.J. Holst, J. Xu, and Y. Zhu. Local Multilevel Preconditioners for Elliptic Equations with Jump Coefficients on Bisection Grids. *Computing and Visualization in Science*, 15(5), 271–289, 2012.
21. W.C. Lo, L. Chen, M. Wang and Q. Nie. A Robust and Efficient Method for Steady State Patterns in Reaction-Diffusion Systems. *Journal of Computational Physics*, 231(15), 5062–5077, 2012.
20. Y. Wu, L. Chen, X. Xie, and J. Xu. Convergence Analysis of V-Cycle Multigrid Methods for Anisotropic Elliptic Equations. *IMA Journal of Numerical Analysis* 32(4):1329–1347, 2012. DOI <http://dx.doi.org/10.1093/imanum/drr0430>.
19. L. Zhong, L. Chen, S. Shu, G. Wittum, and J. Xu. Quasi-optimal convergence of adaptive edge finite element methods for three dimensional indefinite time-harmonic Maxwell's equations. *Mathematics of Computation*. 81(278):623–642, 2012.
18. L. Chen, R.H. Nochetto and J. Xu. Optimal Multilevel Methods for Graded Bisection Grids. *Numerische Mathematik*. 120(1): 1– 34, 2011.
17. L. Chen and M.J. Holst. Efficient Mesh Optimization Schemes based on Optimal Delaunay Triangulations. *Computer Methods in Applied Mechanics and Engineering*, 200, 967–984, 2011.
16. H. Wei, L. Chen and Y. Huang. Superconvergence and Gradient Recovery of Linear Finite Elements for the Laplace-Beltrami Operator on General Surfaces. *SIAM Journal on Numerical Analysis*, 48(5):1920–1943, 2010.
15. L. Chen and C-S. Zhang. A coarsening algorithm on adaptive grids by newest vertex bisection and its applications. *Journal of Computational Mathematics*. 28(6), 767–789, 2010.
14. P. Sun, L. Chen, and J. Xu. Numerical studies of adaptive finite element methods for two dimensional convection-dominated problems. *Journal of Scientific Computing*. 43(1), 24–43, 2010.
13. L. Zhong, S. Shu, L. Chen and J. Xu, Convergence of adaptive edge finite element methods for H(curl) – elliptic problems. *Numerical Linear Algebra with Applications*, 17(2–3):415–432, 2010.
12. L. Chen. A New Class of High Order Finite Volume Methods for Second Order Elliptic equations. *SIAM Journal on Numerical Analysis*, 47(6):4021–4043, 2010.
11. L. Chen and H. Li. Superconvergence of Gradient Recovery Schemes on graded meshes for corner singularities. *Journal of Computational Mathematics*. 28:11–31, 2010.
10. L. Chen, M.J. Holst, and J. Xu. Convergence and optimality of adaptive mixed finite element methods. *Mathematics of Computation*, 78: 35–53, 2009.
9. L. Chen. On minimizing the linear interpolation error of convex quadratic functions and the optimal simplex. *East Journal of Approximation*, 14(3), 271–284, 2008.
8. L. Chen, Y. Wang, and J. Wu. Stability of a streamline diffusion finite element method for turning point problems. *Journal of Computational and Applied Mathematics*, 220: 712–724, 2008.
7. L. Chen and J. Xu. Stability and accuracy of adapted finite element methods for singularly perturbed problems. *Numerische Mathematik*, 109(2): 167–191, 2008.
6. L. Chen, M.J. Holst, and J. Xu. The Finite Element Approximation of the Nonlinear Poisson-Boltzmann Equation. *SIAM Journal on Numerical Analysis*, 45(6): 2298–2320, 2007.
5. L. Chen, P. Sun, and J. Xu. Optimal anisotropic simplicial meshes for minimizing interpolation errors in  $L^p$ -norm. *Mathematics of Computation*, 76(257):179–204, 2007.
4. J. Jiang, S. Shu, Y. Huang, and L. Chen. A Mesh Adaptive Mesh Method for Two Dimensional Heat Conduction Equations with Three Temperatures. *Chinese Journal of Computational Physics*, 24(1):19–28, 2007.

3. L. Chen. Superconvergence of tetrahedral linear finite elements. *International Journal of Numerical Analysis and Modeling*, 3(3):273–282, 2006.
2. L. Chen. New analysis of the sphere covering problems and optimal polytope approximation of convex bodies. *Journal of Approximation Theory*, 133(1):134–145, 2005.
1. L. Chen and J. Xu. Optimal Delaunay triangulations. *Journal of Computational Mathematics*, 22(2):299–308, 2004.

### • Conference Proceedings

10. R. Guo, S. Cao, and L. Chen. Transformer Meets Boundary Value Inverse Problem. *ICLR*. 2023.
9. S. Kia, J. Wei, and L. Chen. Distributed Optimal Resource Allocation Using Transformed Primal-Dual Method. *2023 American Control Conference (ACC)*.
8. T.M. Nguyen, V. Suliafu, S.J. Osher, L. Chen, and B. Wang. FMMformer: Efficient and Flexible Transformer via Decomposed Near-field and Far-field Attention. *NeurIPS*. 2021.
7. C. Bacuta, L. Chen and J. Xu. *Equidistribution and optimal approximation class*. Domain Decomposition Methods in Science and Engineering XX. Lecture Notes in Computational Science and Engineering Volume 91, 3-14, 2013.
6. L. Chen. *Deriving the X-Z Identity from Auxiliary Space Method*. Domain Decomposition Methods in Science and Engineering XIX, 309-316, 2010.
5. L. Chen, R.H. Nochetto and C-S. Zhang. *Multigrid Methods for Elliptic Obstacle Problems on 2D Bisection Grids*. Domain Decomposition Methods in Science and Engineering XIX, 229-236, 2010.
4. L. Chen. *Short implementation of bisection in MATLAB*, in Recent Advances in Computational Sciences – Selected Papers from the International Workshop on Computational Sciences and Its Education, P. Jorgensen, X. Shen, C.-W. Shu, and N. Yan, eds., 2008, pp. 318 – 332.
3. L. Chen and J. Xu. An optimal streamline diffusion finite element method for a singularly perturbed problem. In *AMS Contemporary Mathematics Series: Recent Advances in Adaptive Computation*, volume 383, pages 236–246, Hangzhou, 2005.
2. L. Chen, P. Sun, and J. Xu. Multilevel homotopic adaptive finite element methods for convection dominated problems. In *The Proceedings for 15th Conferences for Domain Decomposition Methods*, Lecture Notes in Computational Science and Engineering 40, pages 459–468. Springer, 2004.
1. L. Chen. Mesh smoothing schemes based on optimal Delaunay triangulations. In *13th International Meshing Roundtable*, pages 109–120, Williamsburg, VA, 2004. Sandia National Laboratories.

### • Articles in books and monographs

3. L. Chen and X. Huang. Discrete Hessian complexes in three dimensions. In Antonietti, P.F., Beirão da Veiga, L., Manzini, G. (eds) *“The Virtual Element Method ad its Applications”*. SEMA-SIMAI Springer series. vol 31. 93–135, 2022.  
DOI [https://doi.org/10.1007/978-3-030-95319-5\\_3](https://doi.org/10.1007/978-3-030-95319-5_3)
2. J. Xu, L. Chen, and R.H. Nochetto. *Optimal Multilevel Methods for  $H(\text{grad})$ ,  $H(\text{curl})$ , and  $H(\text{div})$  Systems on Graded and Unstructured Grids*. Ronald A. DeVore, Angela Kunoth (Eds.), Springer, September 2009.
1. L. Chen and J. Xu. *Topics on adaptive finite element methods*. in Adaptive Computations: Theory and Algorithms, T. Tang and J. Xu, eds., Science Press, Beijing, 2007, pp. 1–31.

- **Others**

3. L. Chen. *iFEM: an integrated finite element methods package in MATLAB*, Technical Report, University of California at Irvine. 2008.
2. L. Chen and C-S. Zhang. *AFEM@matlab: a MATLAB package of Adaptive Finite Element Methods*. *Technical Report*. *University of Maryland*. 2006.
1. L. Chen. *Robust and Accurate Algorithms for Solving Anisotropic Singularities*. PhD thesis, Department of Mathematics, The Pennsylvania State University, 2005.

## Students

- **Ph.D students in UCI**

- Lin Zhong. UCI. Graduated. 2015 Dec.
- Penghe Zu. (Joint with Jack Xin) UCI.
- Dongwu Wang. UCI. Graduated. 2018 Sep.
- Min Wen. UCI. Graduated. 2018 Dec.
- Huiwen Wu. UCI. Graduated. 2019.
- Frank Lin. UCI. Graduated. 2021.
- Seulip Lee. UCI. Graduated. 2021.
- Jingrong Wei. UCI. Expected 2024.

- **Visiting students**

- Ming Wang. 9/2010 - 8/2012. Peking University.
- Huayi Wei. 1/2011 - 12/2011. Xiangtan University.
- Jie Zhou. 9/2012 - 8/2013. Xiangtan University.
- Jian Huang. 9/2014-8/2015. Shandong University.
- Zhaoqi Zhou. 10/2016 - 10/2017. Chinese Academy of Science.
- Gang Wang. 10/2016 - 10/2017. Xi'an Jiaotong University.
- Qian Zhang. 9/2017 - 3/2018. Beijing University of Technology.
- Hao Luo. 10/2018 - 9/2019. Sichuan University.
- Yongchao Zhang. 10/2018 - 9/2019. Xi'an Jiaotong University.

## Scholars

- **Postdocs in UCI**

- Bin Zheng. 1/2008 - 6/2008. Visiting Scholar.
- Shuhao Cao. 7/2017 - 7/2020. Visiting Assistant Professor.
- Ruchi Guo. 8/2020 - 7/2023. Visiting Assistant Professor.

- **Visiting scholars**

- Ying Li. 9/2013 - 8/2014. National University of Defense Technology.
- Liuqiang Zhong. 9/2013 - 8/2014. South China Normal University.
- Xiaoqing Xing. 9/2013 - 8/2014. South China Normal University.



- Hongying Man. 9/2014 - 8/2015. Beijing Institute of Technology.
- Kyoung-Sook Moon. 7/2015 - 6/2016. Gachon University.
- James Brannick. 1/2016 - 6/2016. Pennsylvania State University.
- Shuhao Cao. 1/2016 - 6/2016. Pennsylvania State University.
- Yongke Wu. 2/2016 - 2/2017. University of Electronic Science and Technology of China.
- Feng Wang. 2/2016 - 2/2017. Nanjing Normal University.
- Yanhong Bai. 7/2016-12/2016. Southwest Petroleum University.
- Qiumei Huang. 1/2017-12/2017. Beijing University of Technology.
- Zhiqiang Yu. 11/2017 - 11/2018. Changzhou College of Information Technology.
- Caixia Kou. 1/2018 - 1/2019. Beijing University of Posts and Telecommunications.
- Jikun Zhao. 9/2019 - 9/2020. Zhengzhou University.
- Fei Wang. 11/2019 - 5/2020, Xi'an Jiaotong University.

## Conference Session Organization and Summer Schools

- Summer School on Multilevel Adaptive Finite Element Methods, Peking University, Beijing, CHINA. July 17 – 21, 2006.
- Summer School on Multilevel Adaptive Finite Element Methods, Peking University, Beijing, CHINA. June, 2007.
- Summer School on Multilevel Adaptive Finite Element Methods, Peking University, Beijing, CHINA, July 7–11, 2008.
- Summer School on Multilevel Adaptive Finite Element Methods, Peking University, Beijing, CHINA, July 13–31, 2009.
- Summer School on Multilevel Adaptive Finite Element Methods, Peking University, Beijing, CHINA, July 26–Aug 6, 2010.
- Summer School on Finite Element Methods, Kunming University of Science and Technology, Kunming, CHINA, July 12–July 16, 2010.
- Mini-symposium: Theory and Application of Adaptive and Multilevel Methods. 20-th International Conference on Domain Decomposition Methods. UC San Diego, 7-11 Feb, 2011.
- Mini-symposium: Multilevel Mesh Adaptivity and Beyond: Computational Methods for Solving Complex Systems. AMS Western Section in Las Vegas. University of Nevada at Las Vegas. Apr 30, 2011.
- Workshop on Algebraic Multigrid Methods. Kunming, China, August 2011.
- Mini-symposium: Multilevel and Adaptive Methods for Solving Complex Systems. In the Eighth International Conference on Scientific Computing and Applications. Las Vegas, Nevada, April, 2012.
- Workshop on Scientific Computing With Applications Kunming, CHINA. July 18, 2013.
- Workshop on finite element methods. Beijing Institute for Scientific and Engineering Computing (BISEC), CHINA, August 8 - 9, 2015.

- Mini-symposium: Weak Galerkin Method and Its Applications. The 8th International Congress on Industrial and Applied Mathematics (ICIAM). Beijing, CHINA, August 10 - 14, 2015.
- Peking University Summer Academic Activities on Numerical Partial Differential Equations. August 15 - 21, 2015
- 2016 Workshop on Numerical Methods for Partial Differential Equations at Peking University, Beijing, CHINA. July 19-23, 2016.
- Southern California Applied Mathematics Symposium. UC Irvine. June 3, 2017.
- 2017 Workshop on Numerical Methods for Partial Differential Equations at Peking University, Beijing, CHINA. July 24-28, 2017.
- 2017 Summer School on Numerical Methods for Partial Differential Equations. Guangzhou, CHINA. Aug 10-11, 2017
- Workshop of Scientific Computing and Applications. Kunming. July 5 - 7, 2018.
- 2018 Summer School on Numerical Methods for Partial Differential Equations. Beijing, CHINA. July 30 - Aug 15, 2018
- Mini-symposium. The International Multigrid Conference (IMG 2019). Kunming, CHINA. August 11-16, 2019.
- 11/3 – 11/5/2021 In organizing committee of Workshop on Neural Networks, Learning, and Multilevel Finite Element Methods.
- 6/19 – 6/23/2023 In organizing committee of CBMS Conference: Deep Learning and Numerical PDEs
- 8/21/2023 Session chair of ICIAM 2023

## Presentations

- 8/20/2023 10th International Congress on Industrial and Applied Mathematics. Japan.
- 7/20/2023 Shanghai University of Finance and Economics
- 7/20/2023 Fudan University, Shanghai.
- 7/14/2023 Northwestern Polytechnical University. XiAn.
- 7/11/2023 Peking University. Beijing.
- 7/10/2023 Beijing University of Technology. Beijing.
- 7/3/2023 National Center for Applied Mathematics in Chongqing Big Data Research Institute
- 6/29/2023 University of Electronic Science and Technology of China, Chengdu
- 6/26/2023 Scientific Computing: Theory and Applications. Sichuan University.
- 6/23/2023 Xiamen University
- 6/21/2023 Hong Kong University
- 6/20/2023 Hong Kong Polytechnic University
- 6/20/2023 The Chinese University of Hong Kong

- 5/16/2023 Frontiers of Numerical PDEs. Brin Mathematics Research Center. University of Maryland.
- 4/28/2023 (Online) Numerical Methods for Data Science and Engineering Seminar. Texas State University
- 3/27/2023 ACMS Colloquium. Notre Dame
- 3/6/2023 Colloquia Salientia. Portland State University.
- 1/17/2023 Math Colloquium. The University of Alabama.
- 11/2/2022 (Online) Shanghai University of Finance and Economics.
- 6/6/2022 (Online) Beijing Computational Science Research Center.
- 6/6/2022 (Online) South China Normal University - Guangzhou University
- 5/10/2022 (Online) Peking University.
- 5/3/2022 (Online) Numerical Analysis Seminar. University of Maryland
- 3/29/2022 (Online) University of Georgia Athens.
- 2/25/2022 (Online) Numerical Analysis and PDE Seminar. University of Delaware
- 1/20/2022 (Online) Tsinghua-BIMSA Seminars in Applied Mathematics. Tsinghua University
- 1/12/2022 (Online) Optimization and Data Science Seminar. UCSD
- 12/27/2021 Morgan State University
- 11/5/2021 Workshop on Neural Networks, Learning, and Multilevel Finite Element Methods.
- 9/23/2021 (Online) University of South Carolina
- 4/16/2021 (Online) Shanghai Normal University
- 3/12/2021 (Online) Emory University
- 3/6/2021 (Online) Workshop on Scientific Computing and Applications. University of Nevada, Las Vegas.
- 1/29/2021 (Online) Mathematical Sciences Colloquium, Department of Mathematical Sciences, Michigan Technological University.
- 1/10/2021 (Online) Oberwolfach Workshop on Nonstandard Finite Element Methods
- 12/29/2020 (Online) 2020 Annual meeting of International Consortium of Chinese Mathematicians, USTC, Anhui.
- 10/8/2020 (Online) Shandong University
- (Online) Workshop on Multiphysics: Mathematical Theory and Numerical Methods. Xi'an Jiaotong University, Aug 21, 2020.
- (Online) Tianyuan Mathematical Center in Northeast China, Jilin University, Changchun, July 28, 2020.
- (Online) CCMA Seminar on Mathematics of Data and Computation, Pennsylvania State University, May 14, 2020.

- The International Multigrid Conference, Kunming. Aug 13, 2019.
- Sichuan University, Chengdu. Aug 6, 2019.
- Chinese Academy of Sciences, Beijing. July 26, 2019.
- Beijing University of Technology, Beijing. July 24, 2019.
- Fudan University, Shanghai. July 19, 2019.
- Shanghai University of Finance and Economics, Shanghai. July 18, 2019.
- University of Electronic Science and Technology of China, Chengdu. July 12, 2019.
- UCSD Optimization and Data Science Seminar. Oct 10, 2018.
- CAM Seminar, University of Tennessee. Sep 19, 2018.
- Jilin University, Jilin. Aug 27, 2018.
- China West Normal University, Nanchong. Aug 21, 2018.
- Sichuan University, Chengdu. Aug 20, 2018.
- Chinese Academy of Sciences, Beijing. Aug 16, 2018.
- University of Electronic Science and Technology of China, Chengdu. July 9, 2018.
- Workshop of Scientific Computing and Applications. Kunming. July 5 - 7. 2018.
- 2017 Summer School on Numerical Methods for Partial Differential Equations. Guangzhou. Aug 10-11, 2017
- **Invite (Plenary) Speakers.** 11-th National Conference on Computational Math. XiAn. July 22, 2017
- XiAn Jiaotong University, XiAn. CHINA. July 20, 2017
- Nanjing Normal University, Nanjing. CHINA. July 3, 2017
- Sichuan University, Chengdu. CHINA. July 7, 2017.
- University of Electronic Science and Technology of China, Chengdu. June 19, 2017
- SIAM Central States Section. Little Rock, Arkansas. Sep 30, 2016.
- 9-th National Conference on Finite Element Methods. Emei, Sichuan. Aug 20, 2016.
- Shanghai Jiao Tong University, Shanghai. Aug 10-11, 2016.
- Workshop on Numerical Methods for PDE at Peking University, Beijing, Jul 20, 2016.
- Chinese Academy of Sciences, Beijing. July 5, 2016.
- MAFELAP, Brunel University London, June 14-17, 2016.
- SoCAMS. Claremont Colleges. June 4, 2016.
- Tufts University. Boston. Feb 13 - 16. 2016.
- University of California at Riverside. Riverside, CA, Feb 3, 2016.

- Chinese Academy of Sciences, Beijing, Jan 4, 2016.
- Shandong University. Jinan, Shandong. Dec 28 - 30. 2015.
- Sichuan University. Chengdu, Sichuan. Dec 18. 2015.
- Jilin University. Changchun, Jilin. Dec 7 - 9, 2015.
- Shanghai Jiaotong University. Shanghai. Dec 3-5, 2015.
- Wenzhou University. Wenzhou, Zhejiang. Nov 16 - 18, 2015.
- Xiamen University. Xiamen, Fujian. Nov 6-9, 2015.
- Numerical Methods on Polygon Meshes. Altanata. Oct 26-28, 2015.
- School of Mathematics and Computational Science, Changsha University of Science and Technology. Oct 13, 2015.
- School of Mathematics, Xiangtan University, Hunan. Oct 11, 2015.
- School of Mathematics, South China Normal University Guangzhou, CHINA. Sep 11, 2015.
- The 8th International Congress on Industrial and Applied Mathematics (ICIAM). Beijing, August 10 - 14, 2015.
- School of Mathematical Sciences. Sichuan University. CHINA, July 20, 2015.
- SIAM Conference on Computational Science. Salt Lake City, Utah. March 14 - 15, 2015.
- Numerical Analysis Seminar. Texas A&M. Feb 25, 2015.
- Finite Element Circus. Minnesota. October 24-25, 2014.
- IMA Special workshop. Minnesota. October 22-24, 2014.
- School of Mathematics and Statistics, Beijing Institute of Technology, July 10, 2014.
- Beijing Computational Science Research Center, July 8, 2014.
- Chinese Academy of Sciences, July 8, 2014.
- School of Mathematics, Sichuan University, Chengdu, Sichuan CHINA. July 2, 2014.
- School of Mathematics and Statistics, WuHan University, June 27, 2014.
- Beijing International Center for Mathematical Research (BICMR), June 26, 2014.
- ICERM Workshop. Brown University. May 12-16, 2014.
- Oberwolfach Workshop. Oberwolfach, Germany. Nov 17-22, 2013.
- Colloquium. Department of Mathematics and Statistics. Portland State University. Portland, Oregon. Oct 4. 2013.
- School of Mathematics, Sun Yat-sen University International Conference on Frontiers of Numerical PDEs. Guangzhou. Aug 2. 2013.
- School of Mathematics, Sichuan University, Chengdu, Sichuan CHINA. July 25, 2013.
- Workshop on Scientific Computing With Applications Kunming. July 18, 2013.

- South China Normal University Guangzhou. July 12, 2013.
- SIAM Annual Meeting San Diego, CA. July 10, 2013.
- Workshop on Multilevel computational methods and optimization Weizmann Institute of Science, Israel Apr 30-May 2, 2013.
- Numerical Approximation of Partial Differential Equations. In Occasion of Ricardo H. Nochetto's 60th Birthday. Gargnano del Garda, Brescia, Italy. Mar 21, 2013.
- AMS Joint Mathematics Meetings. San Diego, Jan 11, 2013.
- Numerical Analysis Seminar, University of Maryland at College Park. Dec 11, 2012.
- Department of Mathematics and Statistics. Missouri University of Science and Technology. Oct 12, 2012.
- Workshop on Efficient Numerical Methods for Partial Differential Equations. Urumqi. August 13-18, 2012.
- Eighth International Conference on Scientific Computing and Applications. University of Nevada at Las Vegas, Nevada, Apr 1 - 4, 2012.
- Frontiers of Computational and Applied Mathematics. Beijing International Center for Mathematical Research. Oct 21 - Oct 25, 2011.
- Department of Mathematics, Hong Kong Baptist University. Aug 30, 2011.
- School of Mathematical Science. Peking University. Beijing. CHINA. Aug 15 - 20, 2011.
- Short Course/Workshop on (Algebraic) Multigrid Methods Kunming. Aug 1 - 10, 2011.
- 2011 Sun Yat-sen University International Conference on Frontiers of Numerical PDEs. Guangzhou. Aug 1-4. 2011.
- AMS Western Section in Las Vegas. University of Nevada at Las Vegas. Apr 30, 2011.
- Department of Applied Mathematics. Illinois Institute of Technology Chicago, 25 Apr, 2011.
- **Invite (Plenary) Speakers** of 20-th International Conference on Domain Decomposition Methods. UC San Diego, 7-11 Feb, 2011.
- Changjiang International Conference on Mathematics. Sichuan. CHINA, Aug 9, 2010.
- Summer School on Multilevel Adaptive Finite Element Methods, Beijing, July 26–Aug 6, 2010.
- Summer School on Finite Element Methods, Kunming University of Science and Technology, Kunming, July 12–July 16, 2010.
- School of Mathematical Sciences. Sichuan University. CHINA, July 6, 2010.
- Midwest Numerical Analysis Day, Iowa State University, Ames, Iowa. April 24-25, 2010
- Scientific Computing Seminars. University of Houston, April 8, 2010.
- Adaptive and Multilevel Methods for Partial Differential Equations. University of California at San Diego in La Jolla, California. November 13-14, 2009.
- 19-th International Conference on Domain Decomposition Methods, Zhangjiajie, August 18, 2009.

- Summer School on Multilevel Adaptive Finite Element Methods, Beijing, July 13–31, 2009.
- International Conference on Applied Analysis and Scientific Computation Shanghai Normal University, June 26, 2009.
- Nanjing University, June 23, 2009.
- Chinese Academy of Sciences, June 9, 2009.
- 14-th Copper Mountain Conference on Multigrid Methods, March 25, 2009.
- Mathematical Sciences Seminars, University of Nevada at Las Vegas, March 11, 2009.
- SIAM Conference on Computational Science and Engineering (CSE09), Miami, March 4, 2009.
- Computational and Applied Mathematics Seminar, Purdue University, November 21, 2008.
- Department of Mathematics Colloquium, Wayne State University, November 3, 2008.
- Finite Element Circus, Rensselaer Polytechnic Institute, October 25, 2008.
- Chinese Academy of Sciences, July 7, 2008.
- Summer School on AFEM and Multigrid, Beijing, July 7–11, 2008.
- Foundation of Computational Mathematics, Hong Kong, June 20, 2008.
- Mathematical Sciences Seminars and Colloquium, University of Nevada at Las Vegas, May 6, 2008.
- Applied Math Seminar, University of California, Irvine, April 21, 2008.
- Xiangtan University, March 25, 2008.
- Graduate Seminar, University of California, Irvine, November 16, 2007.
- 10th SIAM conference on Geometric Design and Computing, San Antonio, Texas, November 4, 2007.
- Summer School on AFEM and Multigrid, Beijing, June, 2007.
- Mathematical and Computational Sciences Division Seminar Series, National Institute of Standards and Technology (NIST), June 5, 2007.
- NSF-CBMS Regional Research Conference, University of Iowa, May 23, 2007.
- Finite Element Circus, University of Maryland, April 21, 2007.
- Numerical Analysis Seminar, University of Maryland, January 30, 2007.
- University of California, Irvine (Special Recruitment Colloquium), January 19, 2007.
- Finite Element Circus, The Pennsylvania State University, November 4, 2006.
- Academy of Mathematics and System Sciences, Chinese Academy of Sciences. July 21, 2006.
- 2006 Summer School on the Multiscale Adaptive Method, Beijing University, July 17 – 21, 2006.
- Numerical Analysis Seminar, UCSD, May 23, 2006.
- Tech Report, National Biomedical Computation Resource, UCSD, Apr. 27, 2006

- Numerical Analysis Seminar, UCSD, Oct. 11, 2005.
- 8th US National Congress on Computational Mechanics Austin, Texas, July 24-28, 2005
- Midwest Numerical Analysis Conference, May 22, 2005
- University of California, San Diego (Special Recruitment Colloquium), Jan 6, 2005
- University of Delaware, Dec 13, 2004
- Wayne State University, Dec 8, 2004
- University of Maryland, Nov 30, 2004
- Finite Element Circus. Syracuse University, Oct 15, 2004
- CAM Luncheon Seminar in Penn State, Sep 24, 2004
- 13th International Meshing Roundtable. Williamsburg, VA. Sep. 20 2004
- Peking University, June 21, 2004
- Superconvergence and A Posteriori Error Estimates, Changsha, May 31-Jun 2, 2004
- Recent Advances in Adaptive Computation, Hangzhou, May 24-28, 2004
- Finite Element Circus, University of Pittsburgh, April 17 2004
- Finite Element Circus. Cornell University, Nov 8, 2003
- CAM Luncheon Seminar in Penn State, Nov 14, 2003

## Teaching Experience

- Math 290C: METH IN APPLD MATH Spring 2023
- Math 105A-Sec A: NUMERICAL ANALYSIS Fall 2022
- Math 105A-Sec B: NUMERICAL ANALYSIS Fall 2022
- Math 290C: METH IN APPLD MATH Spring 2022
- Math 226B: COMPUTATIONAL PDES Winter 2022
- Math 226A: COMPUTATIONAL PDES Fall 2021
- Math 225C: INT NUM AN SCI COMP Spring 2021
- Math 130B: PROBABILITY II Spring 2021
- Math 225 A: Introduction to Numerical Analysis and Scientific Computing A. Fall 2020.
- Math 226B: Computational PDE B. Winter 2020.
- Math 110B: Optimization Methods. Winter 2020.
- Math 226A: Computational PDE A. Fall 2019.
- Math 110A: Optimization Methods. Fall 2019.
- Math 290C: Methods in Applied Mathematics. Spring 2019.



- Math 225B: Numerical Analysis. Winter 2019.
- Math 290B: Methods in Applied Mathematics. Winter 2019.
- Math 290A: Methods in Applied Mathematics. Fall 2018.
- Math 130B: Probability and Stochastic Process. Spring 2018.
- Math 130B: Probability and Stochastic Process. Winter 2018.
- Math 226B: Computational PDEs B. Winter 2018.
- Math 226A: Computational PDEs A. Fall 2017.
- Math 130B: Probability and Stochastic Process. Spring 2017.
- Math 290 B: Perturbation theory. Winter 2017.
- Math 130A: Probability and Stochastic Process. Winter 2017.
- Math 2E: Multivariable Calculus. Winter 2017.
- Math 3A: Introduction to Linear Algebra. Spring 2016.
- Math 226C: Computational PDEs C. Spring 2016.
- Math 226B: Computational PDEs B. Winter 2016.
- Multilevel Algorithms and Randomized Algorithms. PKU. Fall 2015.
- Math 115: Mathematical Modeling. Spring 2015.
- Math 2E: Multivariable Calculus. Winter 2015.
- Math 130A: Probability & Stochastic Process. Fall 2014.
- Math 121A: Advanced Linear Algebra. Summer II 2014.
- Math 2E: Multivariable Calculus. Spring 2014.
- Math 226B: Computational Partial Differential Equations B. Winter 2014.
- Math 226A: Computational Partial Differential Equations A. Fall 2013.
- Math 290C: Methods in Applied Mathematics: Lec C. Calculus of Variation. Spring 2013.
- Math 290B: Methods in Applied Mathematics: Lec B. Perturbation Methods. Winter 2013.
- Math 226C: Computational Partial Differential Equations C. Spring 2012.
- Math 226B: Computational Partial Differential Equations B. Winter 2012.
- Math 226A: Computational Partial Differential Equations A. Fall 2011.
- Math 6G: Linear Algebra. Fall 2011.
- Math 290C: Methods in Applied Mathematics: Lec C. Calculus of Variation. Spring 2011.
- Math 225C: Introduction to Numerical Analysis and Scientific Computing. Spring 2011.
- Math 2E: Multivariable Calculus. Winter 2011.
- Math 290 A: Methods in Applied Mathematics: Lec A. Fall 2010.

- Math 2E: Multivariable Calculus. Winter 2011.
- Math 290A: Methods in Applied Mathematics. Fall 2010.
- Math 2E: Multivariable Calculus. Spring 2010.
- Math 226 A: Computational Partial Differential Equations. Fall 2009.
- Math 226 C: Computational Partial Differential Equations. Spring 2009.
- Math 226 B: Computational Partial Differential Equations. Winter 2009.
- Math 226 A: Computational Partial Differential Equations. Fall 2008.
- Math 226 C: Computational Partial Differential Equations. Spring 2008.
- Math 226 B: Computational Partial Differential Equations. Winter 2008.
- Math 226 A: Computational Partial Differential Equations. Fall 2007.
- Math 462: Partial Differential Equations for Scientists and Engineers.  
Spring 2007, Department of Mathematics. University of Maryland, College Park.
- Math 246: Differential Equations for Scientists and Engineers.  
Spring 2007, Department of Mathematics. University of Maryland, College Park.
- Math 20C: Calculus and Analytic Geometry for Science and Engineering.  
Winter 2006, Department of Mathematics. University of California at San Diego.
- Math 20A: Calculus for Science and Engineering.  
Fall 2005, Department of Mathematics, University of California at San Diego.
- Math 230: Multivariate and Vector Calculus.  
Spring 2004, Department of Mathematics, The Pennsylvania State University.
- Math 230: Multivariate and Vector Calculus.  
Fall 2003, Department of Mathematics, The Pennsylvania State University.
- Teaching Assistant.  
Aug. 2000 - Aug. 2002. Department of Mathematics, The Pennsylvania State University.