KYLE K. ZHAO **kzhao@tulane.edu**

Contact Information

Department of Mathematics
Tulane University
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Education

- Ph.D. in Mathematics, Georgia Institute of Technology 2004–2009
- M.S. in Mathematics, University of Science and Technology of China 2001–2004
- B.S. in Mathematics, University of Science and Technology of China 1997–2001

Employment

- Associate Professor, Mathematics Department, Tulane University 2018 – now
- Assistant Professor, Mathematics Department, Tulane University 2012–2018
- Visiting Assistant Professor, Department of Mathematics, University of Iowa 2011–2012
- Postdoctoral Researcher, Mathematical Biosciences Institute 2009–2011

Research Interests

- Analysis of Partial Differential Equations, Mathematical Biology, Fluid Dynamics

Publications

Works Published in Peer Reviewed Journals

1. J. Wu and **K. Zhao**, On 2D incompressible Boussinesq systems: global stabilization under dynamic boundary data, *Journal of Differential Equations*, Vol. 367, pp. 246-289, 2023.
2. Z.-A. Wang, A. Yang and **K. Zhao**, Wave propagation and stabilization in the Boussinesq-Burgers system, *Physica D: Nonlinear Phenomena*, Vol. 447, 2023.
3. H. Peng and **K. Zhao**, On a hyperbolic-parabolic chemotaxis system, *Mathematical Bioscience Engineering*, Vol. 20, pp. 7802-7827, 2023.
4. L. Xue, M. Zhang, **K. Zhao** and X. Zheng, Global stability under dynamic boundary conditions of a nonlinear PDE model arising from reinforced random walks, *Communications in Nonlinear Science and Numerical Simulation*, Vol. 117, pp. 106913, 2023.
5. Y. Zeng and **K. Zhao**, Asymptotic Behavior of Solutions to a chemotaxis-logistic model with transitional end-states, *Journal of Differential Equations*, Vol. 336, pp. 1-43, 2022.
6. L. Xue, M. Zhang, **K. Zhao** and X. Zheng, Controlled dynamics of a chemotaxis model with logarithmic sensitivity by physical boundary conditions, *Electronic Research Archive*, Vol. 30, pp. 4530-4552, 2022.
7. X. Zheng, **K. Zhao**, T. Jackson and J. Lowengrub, Tumor grows towards lower extracellular matrix conductivity regions under Darcy's law and steady morphology, *Journal of Mathematical Biology*, Vol. 85, pp., 2022.
8. H. Zhang and **K. Zhao**, On 3D Hall-MHD equations with fractional Laplacians: global well-posedness, *Journal of Mathematical Fluid Mechanics*, Vol. 23, pp., 2021.
9. B. Li, F. Wang, L. Xue, K. Yang and **K. Zhao**, On the Cahn-Hilliard-Brinkman equations in $\mathbb{R}^4$: global well-posedness, *Annals of Applied Mathematics*, Vol. 37, pp. 513-536, 2021.

10. T. Li, D. Wang, F. Wang, Z. Wang and **K. Zhao**, Large time behavior and diffusion limit for a system of balance laws from chemotaxis in multi-dimensions, *Communications in Mathematical Sciences*, Vol. 19, pp. 229-272, 2021.

11. D. Wang, Z. Wang and **K. Zhao**, Cauchy problem of a system of parabolic conservation laws arising from the singular Keller-Segel model in multi-dimensions, *Indiana University Mathematics Journal*, Vol. 70, pp. 1-47, 2021.

12. Z. Feng, J. Xu, L. Xue and **K. Zhao**, Initial and boundary value problem for a system of balance laws from chemotaxis: global dynamics and diffusion limit, *Annals of Applied Mathematics*, Vol. 37, pp. 61-110, 2021.

13. F. Wang, L. Xue, **K. Zhao** and X. Zheng, Global stabilization and boundary control of generalized Fisher/KPP equation and application to diffusive SIS model, *Journal of Differential Equations*, Vol. 275, pp. 391-417, 2021.

14. N. Zhu, Z. Liu, F. Wang and **K. Zhao**, Asymptotic dynamics of a system of conservation laws from chemotaxis, *Discrete and Continuous Dynamical Systems*, Vol. 41, pp. 813-847, 2021.

15. B. Li, F. Wang and **K. Zhao**, Large time dynamics of 2D semi-dissipative Boussinesq systems, *Nonlinearity*, Vol. 33, pp. 2481-2501, 2020.

16. J. Fan, L. Jing, G. Nakamura and **K. Zhao**, Qualitative analysis of an integrated chemotaxis-fluid model: global existence and extensibility criterion, *Communications in Mathematical Sciences*, Vol. 18, pp. 809-836, 2020.

17. S. Li, J. Wu and **K. Zhao**, On the degenerate Boussinesq equations on surfaces, *Journal of Geometric Mechanics*, Vol. 12, pp. 107-140, 2020.

18. Y. Zeng and **K. Zhao**, Erratum to "Optimal Decay Rates for a Chemotaxis Model with Logistic Growth, Logarithmic Sensitivity and Density-dependent Production/Consumption Rate" [J. Differential Equations (2020) 1379-1411], *Journal of Differential Equations*, Vol. 269, pp. 6359-6363, 2020.

19. L. Tao, J. Wu, **K. Zhao** and X. Zheng, Stability near hydrostatic equilibrium to the 2D Boussinesq equations without thermal diffusion, *Archive for Rational Mechanics and Analysis*, Vol. 237, pp. 585-630, 2020

20. N. Zhu, Z. Liu, F. Wang and **K. Zhao**, Explicit decay rates for a generalized Boussinesq-Burgers system, *Applied Mathematics Letters*, Vol. 100, 106054, 7 pp, 2020.

21. Y. Zeng and **K. Zhao**, Optimal decay rates for a chemotaxis model with logistic growth, logarithmic sensitivity and density-dependent production/consumption rate, *Journal of Differential Equations*, Vol. 268, pp. 1379-1411, 2020.

22. Y. Zeng and **K. Zhao**, On the Keller-Segel-Fisher/KPP system, *Discrete and Continuous Dynamical Systems*, Vol. 39, pp. 5365–5402, 2019.

23. L. Rebholz, D. Wang, Z. Wang, C. Zerfas and **K. Zhao**, Initial boundary value problems for a system of parabolic conservation laws arising from chemotaxis in multi-dimensions, *Discrete and Continuous Dynamical Systems*, Vol. 39, pp. 3789-3838, 2019.

24. L. Guan, D. Li, K. Wang and **K. Zhao**, On a class of nonlocal SIR models, *Journal of Mathematical Biology*, Vol. 78, pp. 1581-1604, 2019.

25. N. Zhu, Z. Liu and **K. Zhao**, Non blowup of a generalized Boussinesq-Burgers system with nonlinear dispersion relation and large data, *Physica D: Nonlinear Phenomena*, Vol. 392, pp. 81-98, 2019.

26. J. Fan and **K. Zhao**, Improved extensibility criteria and long-time behavior of a coupled chemotaxis-fluid model, *Discrete and Continuous Dynamical Systems - Series B*, Vol. 23, pp. 3949-3967, 2018.

27. N. Zhu, Z. Liu, V. Martinez and **K. Zhao**, Global Cauchy problem of a system of parabolic conservation laws arising from a Keller-Segel type chemotaxis model, *SIAM Journal on Mathematical Analysis*, Vol. 50, pp. 5380-5425, 2018.

28. C. Doering, J. Wu, **K. Zhao** and X. Zheng, Long-time behavior of two-dimensional Boussinesq equations without buoyancy diffusion, *Physica D: Nonlinear Phenomena*, Vol. 376/377, pp. 144-159, 2018.

29. H. Peng, Z. Wang, **K. Zhao** and C. Zhu, Boundary layers and stabilization of the singular Keller-Segel model, *Kinetic and Related Models*, Vol. 11, pp. 1085-1123, 2018.

30. V. Martinez, Z. Wang and **K. Zhao**, Asymptotic and viscous stability of large-amplitude solutions of a hyperbolic system arising from biology, *Indiana University Mathematics Journal*, Vol. 67, pp. 1383-1424, 2018.

31. N. Zhu, Z. Liu, and **K. Zhao**, On the Boussinesq-Burgers equations driven by dynamic boundary conditions, *Journal of Differential Equations*, Vol. 264, pp. 2287-2309, 2018.

32. V. Martinez and **K. Zhao**, Analyticity and dynamics of a Navier-Stokes-Keller-Segel system on bounded domains, *Dynamics of Partial Differential Equations*, Vol. 14, pp. 125-158, 2017.

33. L. Rebholz, C. Zerfas and **K. Zhao**, Global in time analysis and sensitivity analysis for the reduced NS-α model of incompressible flow, *Journal of Mathematical Fluid Mechanics*, Vol. 19, pp. 445-467, 2017.

34. Q. Hou, Z. Wang and **K. Zhao**, Boundary layers on a hyperbolic system arising from chemotaxis, *Journal of Differential Equations*, Vol. 261, pp. 5035-5070, 2016.

35. T. Li and **K. Zhao**, Analysis of non-isentropic compressible Euler equations with relaxation, *Journal of Differential Equations*, Vol. 259, pp. 6338-6367, 2015.

36. D. Li, R. Pan and **K. Zhao**, Quantitative decay of a hybrid type chemotaxis model with large data, *Nonlinearity*, Vol. 28, pp. 2181-2210, 2015.

37. H. Li and **K. Zhao**, Initial boundary value problems for a system of hyperbolic balance laws arising from chemotaxis, *Journal of Differential Equations*, Vol. 258, pp. 302-338, 2015.

38. J. Fan and **K. Zhao**, Global dynamics of a coupled chemotaxis-fluid model on bounded domains, *Journal of Mathematical Fluid Mechanics*, Vol. 16, pp. 351-364, 2014.

39. J. Fan and **K. Zhao**, A note on a 3D haptotaxis model of cancer invasion, *Applied Mathematics Research Express*, Vol. 2014, 74-86, 2014.

40. J. Fan and **K. Zhao**, Global Cauchy problem of 2D generalized MHD equations, *Journal of Mathematical Analysis and Applications*, Vol. 420, pp. 1024-1032, 2014.

41. J. Lowengrub, E.S. Titi and **K. Zhao**, Analysis of a mixture model of tumor growth, *European Journal of Applied Mathematics*, Vol. 24, pp. 691-734, 2013.

42. S. Dai, D. Li and **K. Zhao**, Finite-time quenching of competing species with constrained border evaporation, *Discrete and Continuous Dynamical Systems - Series B*, Vol. 18, pp. 1275-1290, 2013.

43. Z. Wang and **K. Zhao**, Global dynamics and diffusion limit of a parabolic system arising from repulsive chemotaxis, *Communications on Pure and Applied Analysis*, Vol. 12, pp. 3027-3046, 2013.

44. J. Fan and **K. Zhao**, Blow up criteria for a hyperbolic-parabolic system arising from chemotaxis, *Journal of Mathematical Analysis and Applications*, Vol. 394, pp. 687-695, 2012.

45. T. Li, R. Pan and **K. Zhao**, Global dynamics of a chemotaxis model on bounded domains with large data, *SIAM Journal on Applied Mathematics*, Vol. 72, pp. 417-443, 2012.

46. **K. Zhao**, Large time behavior of density-dependent incompressible Navier-Stokes equations on bounded domains, *Journal of Mathematical Fluid Mechanics*, Vol. 14, pp. 471-483, 2012.

47. **K. Zhao**, Long-time dynamics of a coupled Cahn-Hilliard-Boussinesq system, *Communications in Mathematical Sciences*, Vol. 10, pp. 735-749, 2012.

48. T. Li and **K. Zhao**, Global existence and long-time behavior of entropy weak solutions to a quasilinear hyperbolic blood flow model, *Networks and Heterogeneous Media*, Vol. 6, pp. 625-646, 2011.

49. D. Li, T. Li and **K. Zhao**, On a hyperbolic-parabolic system modeling repulsive chemotaxis, *Mathematical Models and Methods in Applied Sciences*, Vol. 21, pp. 1631-1650, 2011.

50. T. Li and **K. Zhao**, On a quasilinear hyperbolic system in blood flow modeling, *Discrete and Continuous Dynamical Systems - Series B*, Vol. 16, pp. 333-344, 2011.

51. **K. Zhao**, Global regularity for a coupled Cahn-Hilliard-Boussinesq system on bounded domains, *Quarterly of Applied Mathematics*, Vol. 69, pp. 331-356, 2011.

52. **K. Zhao**, Large time behavior for Cahn-Hilliard-Boussinesq equations on bounded domains, *Electronic Journal of Differential Equations*, Vol. 2011, No. 46, pp. 1-21, 2011.

53. M. Lai, R. Pan and **K. Zhao**, Initial boundary value problem for 2D viscous Boussinesq equations, *Archive for Rational Mechanics and Analysis*, Vol. 199, pp. 739-760, 2011.

54. **K. Zhao**, 2D inviscid heat conductive Boussinesq system in a bounded domain, *Michigan Mathematical Journal*, Vol. 59, pp. 329-352, 2010.

55. **K. Zhao**, On the isothermal compressible Euler equations with frictional damping, *Communications in Mathematical Analysis*, Vol. 9, pp. 77-97, 2010.

56. K. Fakhar, T. Hayat, Y. Cheng and **K. Zhao**, Symmetry transformation of solutions for the Navier-Stokes equations, *Applied Mathematics and Computation*, Vol. 207, pp. 213-224, 2009.

57. R. Pan and **K. Zhao**, 3D compressible Euler equations with damping in a bounded domain, *Journal of Differential Equations*, Vol. 246, pp. 581-596, 2009.

58. R. Pan and **K. Zhao**, Initial boundary value problem for compressible Euler equations with damping, *Indiana University Mathematics Journal*, Vol. 57, pp. 2257-2282, 2008.

59. Z. Chen and **K. Zhao**, Global bifurcation from the eigenvalues of the p-Laplacian operator in weighted Sobolev spaces, *Acta Mathematica Scientia*, Vol. 25, pp. 145-157, 2005.

60. Z. Chen and **K. Zhao**, On bifurcation problem for a semilinear biharmonic equation, *J. Univ. Sci. Tech. China*, Vol. 34, pp. 283-294, 2004.

61. Z. Chen and **K. Zhao**, Global bifurcation from eigenvalues of some biharmonic equations, *Inter. J. Diff. Equ. Appl.*, Vol. 7, pp. 181-193, 2003.

Works Published in Book Chapters

62. R.M. Fuster-Aguilera, V. Martinez and **K. Zhao**, A PDE model for chemotaxis with logarithmic sensitivity and logistic growth, *Contemporary Research in Mathematical Biology: Modeling, Computation and Analysis*, *Contemporary Mathematics and its Applications: Monographs, Expositions and Lecture Notes*, to appear.

Works Published in Conference Proceedings

63. Y. Zeng and **K. Zhao**, Optimal time decay rates for a chemotaxis model with logarithmic sensitivity. In: Kilgour D.M., Kunze H., Makarov R., Melnik R., Wang X. (eds) *Recent Developments in Mathematical, Statistical and Computational Sciences. AMMCS 2019. Springer Proceedings in Mathematics & Statistics*, Vol. 343, pp. 451-461, 2021. Springer, Cham.

64. Y. Zeng and **K. Zhao**, Recent results for the logarithmic Keller-Segel-Fisher/KPP system, *Boletim da Sociedade Paranaense de Matemática*, Vol. 38, pp. 37-48, 2020.

65. R. Pan and **K. Zhao**, Initial boundary value problems for compressible Euler equations with

damping, *Hyperbolic problems: theory, numerics and applications*, pp. 825-834, *Proceedings of Symposia in Applied Mathematics*, 67, Part 2, American Mathematical Society, Providence, RI, 2009.

66. Z. Chen and **K. Zhao**, Global bifurcation from the eigenvalues of some semilinear biharmonic equations, *Nonlinear Evolution Equations and Dynamical Systems*, pp. 13-23, World Scientific Publication, River Edge, NJ, 2003.

Ph.D. Thesis

67. **K. Zhao**, *Initial-boundary value problems in fluid dynamics*, PhD Thesis, Georgia Institute of Technology. 2009. 157 pp. ISBN: 978-1109-62174-7, ProQuest LLC.

Works Submitted to Peer Reviewed Journals

68. L. Xue, M. Zhang and **K. Zhao**, Stability of aerostatic equilibria in porous medium flows. Re-submitted to *Journal of Differential Equations* after minor revisions.

69. L. Xue, M. Zhang, **K. Zhao** and X. Zheng, On 2D incompressible and density-dependent Navier-Stokes equations: global stabilization under dynamic Couette flow. Re-submitted to *Computational and Applied Mathematics* after minor revisions.

70. N. Zhu, **K. Zhao** and W. Wang, Critical mass and competing effect in a two-dimensional attraction-repulsion chemotaxis system with rotational fluxes.

71. Z. Feng, G. Hong, J. Wu and **K. Zhao**, Stability of vertically charged steady magnetic field in 3D incompressible magneto-micropolar fluids without magnetic and angular viscosities in a strip domain.

72. R.M. Fuster-Aguilera and **K. Zhao**, Global stability of a logarithmically sensitive chemotaxis model under dynamic boundary conditions.

73. X. Zheng, **K. Zhao**, W. Hu, D. Du and J. Wu, Iterative projection method for unsteady Navier-Stokes equations with high Reynolds numbers.

74. Z. Feng, **K. Zhao** and S. Zhou, Existence and stability of boundary spike layer solutions of an attractive chemotaxis model with singular sensitivity and nonlinear consumption rate of chemical stimuli.

Short Term Academic Visits

- Department of Applied Mathematics, Hong Kong Polytechnic University, Hong Kong, 2023
- Department of Mathematics, South China University of Technology, Guangzhou, China, 2023
- Department of Mathematics, Chongqing Normal University, Chongqing, China, 2023
- Department of Mathematics, Chongqing University, Chongqing, China, 2023
- Department of Mathematics, Harbin Engineering University, Harbin, China, 2023
- Department of Mathematics, Nanchang University, Nanchang, China, 2023
- Department of Mathematics, Jiangxi Normal University, Nanchang, China, 2023
- Department of Mathematics, Changsha University of Science & Technology, Changsha, China, 2023
- Department of Mathematics, Hunan University, Changsha, China, 2023
- Department of Mathematics, Central South University, Changsha, China, 2023
- Department of Mathematics, North Minzu University, Yinchuan, China, 2023
- Department of Mathematics, Northeast Normal University, Changchun, China, 2023
- Department of Mathematics, Tiangong University, Tianjin, China, 2023
- Department of Mathematics, Harbin Engineering University, Harbin, China, 2020
- Department of Mathematics, Changsha University of Science and Technology, Changsha, China, 2020
- Department of Mathematics, Hunan Normal University, Changsha, China, 2020

- Center for Applied Mathematics, Tianjin University, Tianjin, China, 2019
- Department of Mathematics, Harbin Engineering University, Harbin, China, 2019
- Center for Applied Mathematics, Tianjin University, Tianjin, China, 2018
- Department of Applied Mathematics, Hong Kong Polytechnic University, 2018
- Department of Mathematics, Hong Kong University of Science and Technology, 2018
- Department of Mathematics, University of Alabama, Birmingham, AL, 2017
- Center for Applied Mathematics, Tianjin University, Tianjin, China, 2017
- Center for Applied Mathematics, Tianjin University, Tianjin, China, 2016
- Department of Mathematics, South China University of Technology, Guangzhou, China, 2016
- Department of Mathematics, Hong Kong University of Science and Technology, 2016
- Department of Mathematics, City University of Hong Kong, 2016
- Department of Applied Mathematics, Hong Kong Polytechnic University, 2016
- Department of Mathematics, University of British Columbia, Vancouver, Canada, 2016
- Mathematical Biosciences Institute, The Ohio State University, Columbus, OH, 2015
- Center for Applied Mathematics, Tianjin University, Tianjin, China, 2015
- Department of Mathematics, University of Pittsburgh, Pittsburgh, PA, 2014
- Department of Mathematics, University of British Columbia, Vancouver, Canada, 2014
- Department of Mathematics, Central Michigan University, Mount Pleasant, MI, 2014
- Courant Institute of Mathematical Sciences, New York University, New York, NY, 2014
- Department of Mathematics, University of Iowa, Iowa City, IA, 2009 - 2010
- Department of Mathematics, University of California, Irvine, CA, 2009
- Department of Mathematics, University of Georgia, Athens, GA, 2008

Honors and Awards

- (PI) Simons Collaboration Grant for Mathematicians, 2016-2023
- Certificate of Outstanding Contribution in Reviewing, Journal of Differential Equations, 2015
- (PI) LA BoR Research Competitiveness Subprogram Award, 2015-2018
- Certificate of Reviewing Excellence, Journal of Mathematical Analysis and Applications, 2014
- Research-in-Team at Banff International Research Station, Canada, March, 2014
- MBI Early Career Award, 2014 (supported by NSF)
- (PI) LA EPSCoR Pilot Fund, 2013 (supported by NSF)
- (PI) NSF Conference Grant DMS-1342607, 2013
- CoR Research Fellowship, Office of Provost, Tulane University, 2013
- MBI Travel Award, 2012
- AIMS Travel Award, 2012
- SIAM Early Career Travel Award, 2011
- Travel Grants to Eight Conferences, Workshops, Summer Schools, 2005-2010
- Top Graduate Student Award, Georgia Tech, 2008
- John Festa Fellowship, Georgia Tech, 2008

Memberships

- American Mathematical Society (AMS)
- Society for Industrial and Applied Mathematics (SIAM)
- Mathematical Association of America (MAA)

Presentations

- 2023
  - Invited Mini-Symposium Talk, International Congress on Industrial and Applied Mathematics, Tokyo, Japan, August
  - Invited Talk, Department of Applied Mathematics, Hong Kong Polytechnic University, Au-

gust
  - Invited Talk, Department of Mathematics, Tiangong University, Tianjin, China, July
  - Invited Talk, Department of Mathematics, Northeast Normal University, Changchun, China, July
  - Invited Talk, Department of Mathematics, North Minzu University, Yinchuan, China, July
  - Invited Talk, Department of Mathematics, Central South University, Changsha, China, June
  - Invited Talk, Department of Mathematics, Hunan University, Changsha, China, June
  - Invited Talk, Department of Mathematics, Changsha University of Science & Technology, Changsha, China, June
  - Invited Talk, Department of Mathematics, Jiangxi Normal University, Nanchang, China, June
  - Invited Talk, Department of Mathematics, Nanchang University, Nanchang, China, June
  - Invited Talk, Department of Mathematics, Chongqing University, Chongqing, China, June
  - Invited Talk, Department of Mathematics, Chongqing Normal University, Chongqing, China, June
  - Invited Talk, Department of Mathematics, South China University of Technology, Guangzhou, China, May
  - Invited Talk, Department of Mathematics, University of Pittsburgh, Pittsburgh, PA, April

- 2022
  - Invited Talk, Department of Mathematics, Northeast Normal University, Changchun, Jilin, China, December
  - Invited Talk, Department of Mathematics, North Minzu University, Yinchuan, Ningxia, China, November
  - Invited Talk, International Center for Mathematics, Southern University of Science and Technology, Shenzhen, China, October
  - Invited Talk, Department of Mathematics, South China University of Technology, Guangzhou, China, October
  - Invited Talk, Department of Mathematics, Chongqing University, Chongqing, China, October
  - Invited Talk, Annual Meeting of SIAM Central States Section, Oklahoma State University, OK, October
  - Invited Talk, Department of Mathematics, Southern University of Science and Technology, Shenzhen, China, August
  - Invited Talk, The 9th International Congress of Chinese Mathematicians, Beijing, China, July
  - Invited Talk, College of Mathematical Sciences, Chongqing Normal University, Chongqing, China, April
  - Invited Talk, Waves2022 (The 12th IMACS International Conference on Nonlinear Evolution Equations and Wave Phenomena: Computation and Theory), University of Georgia, Athens, GA, March
  - Invited Mini-Symposium Talk, SIAM Conference on Analysis of PDEs, March

- 2021
  - Invited Talk, College of Mathematical Sciences, Nanchang University, Nanchang, China, December

- 2020
  - Invited Talk, International Workshop on Differential Equations and Applications in Biology, Central Florida University, Orlando, FL, March (Interrupted by COVID-19)
  - Invited Talk, Department of Mathematics, Harbin Engineering University, Harbin, China, January
  - Invited Talk, Department of Mathematics, Changsha University of Science and Technology, Changsha, China, January
  - Invited Talk, Department of Mathematics, Hunan Normal University, Changsha, China, January

- 2019
  - Invited Mini-Symposium Talk, SIAM Conference on Analysis of Partial Differential Equations, La Quinta, CA, December
  - Invited Mini-Symposium Talk, AMS Fall Southeastern Sectional Meetings, University of Florida, Gainesville, FL, November
  - Invited Talk, AMS/AWM Faculty Talk, Department of Mathematics, Tulane University, October
  - Invited Mini-Symposium Talk, Annual Meeting and Conference of the Society for Mathematical Biology, Montréal, Canada, July
  - Invited Mini-Symposium Talk, International Council for Industrial and Applied Mathematics, Valencia, Spain, July
  - Invited Talk, Center for Applied Mathematics, Tianjin University, Tianjin, China, July
  - Invited Talk, Workshop on Recent Mathematical Advances in Biological Models, Harbin Engineering University, Harbin, China, June
  - Invited Talk, The 2019 Summer Workshop on Nonlinear Partial Differential Equations, Harbin Engineering University, Harbin, China, June
  - Invited Talk, PDE Forum: Modeling and Analysis, University of Pittsburgh, Pittsburgh, PA, May

- 2018
  - Invited Talk, Workshop on Regularity and Blow-up of Navier-Stokes Type PDEs using Harmonic and Stochastic Analysis, Banff International Research Station, Banff, AB, Canada, August
  - Invited Seminar Talk, Department of Mathematics, Hong Kong University of Science and Technology, Hong Kong, June
  - Invited Talk, Conference on Frontiers of Mathematical Biology: Modeling, Computation and Analysis, University of Central Florida, Orlando, FL, May
  - Invited Seminar Talk, Department of Mathematics, University of Pittsburgh, Pittsburgh, PA, April
  - Invited Seminar Talk, Department of Mathematics, University of Kansas, Lawrence, KS, April
  - Invited Seminar Talk, Department of Mathematics and Statistics, Clemson University, Clemson, SC, March

- 2017
  - Invited Mini-Symposium Talk, AMS Fall Western Sectional Meeting, University of California, Riverside, CA, November
  - Invited Seminar Talk, Department of Mathematics, Louisiana State University, Baton Rouge, LA, October
  - Invited Mini-Symposium Talks, AMS Fall Central Sectional Meeting, University of North Texas, Denton, TX, September
  - Invited Talk, Graduate Student Colloquium, Mathematics Department, Tulane University, LA, March
  - Invited Talk, Workshop on Nonlinear Waves: Analysis and Applications, University of Pittsburgh, PA, March
  - Invited Mini-Symposium Talks, AMS-MAA Joint Mathematics Meetings, Atlanta, GA, January

- 2016
  - Invited Keynote Talk, Lloyd Roeling Mathematics Conference, University of Louisiana at Lafayette, November
  - Invited Colloquium Talk, Center for Applied Mathematics, Tianjin University, Tianjin, China, June
  - Invited Colloquium Talk, Department of Mathematics, South China University of Technology,

Guangzhou, China, June
- Invited Mini-Symposium Talk, AMS Spring Southeastern Sectional Meeting, University of Georgia, Athens, GA, March

- 2015
  - Invited Mini-Symposium Talk, Canadian Mathematical Society Winter Meeting, Montreal, Quebec, Canada, December
  - Invited Mini-Symposium Talk, International Congress on Industrial and Applied Mathematics, Beijing, China, August
  - Invited Mini-Symposium Talk, International Symposium on Application of Nonlinear Partial Differential Equations in Life Science, Nankai University, Tianjin, China, August
  - Invited Colloquium Talk, Center for Applied Mathematics, Tianjin University, Tianjin, China, June
  - Invited Colloquium Talk, Department of Mathematics, Capital Normal University, Beijing, China, June
  - Invited Talk, Workshop on Hyperbolic Conservation Laws and Related Problems, Chinese Academy of Sciences, Beijing, China, June
  - Visitor Seminar Talk, Mathematical Biosciences Institute, The Ohio State University, May
  - Invited PDE Seminar Talk, Department of Mathematics, The Ohio State University, April
  - Invited Mini-Symposium Talk, AMS Spring Western Sectional Meetings, Las Vegas, Nevada, April
  - Invited Mini-Symposium Talk, 39th SIAM Southeastern Atlantic Section Conference, Birmingham, Alabama, March
  - Invited PDE Seminar Talk, Department of Mathematics, Indiana University Bloomington, January

- 2014
  - Invited PDE Seminar Talk, Department of Mathematics, University of Pittsburgh, November
  - Invited Colloquium Talk, Department of Mathematics, University of Louisiana - Lafayette, November
  - Invited Mini-Symposium Talk, AMS Fall Western Sectional Meetings, San Francisco State University, San Francisco, California, October
  - Invited Mini-Symposium Talk, SIAM Conference on Life Sciences, Charlotte, North Carolina, August
  - PDE Seminar Talks, Mathematics Department, Tulane University, Spring
  - Invited Mini-Symposium Talk, AMS Spring Southeastern Sectional Meetings, University of Tennessee, Knoxville, TN, March
  - Invited PDE Seminar Talk, Department of Mathematics, University of Pittsburgh, February

- 2013
  - Invited Colloquium Talk, Department of Mathematics, Florida State University
  - Invited Colloquium Talk, Department of Mathematics, Central Michigan University
  - PDE Seminar Talks, Mathematics Department, Tulane University

- 2012
  - Invited Mini-Symposium Talk, AMS Fall Sectional Meetings, New Orleans, LA
  - PDE Seminar Talks, Mathematics Department, Tulane University
  - Poster Presentation, Math Biology: Looking At the Future, MBI, OSU
  - Invited Mini-Symposium Talks (with travel award), The 9th AIMS Conference on Dynamical Systems, Differential Equations and Applications, Orlando, FL
  - Invited Colloquium Talk, Department of Mathematics, City University of Hong Kong
  - Invited Colloquium Talk, Department of Mathematics and Statistics, Oakland University
  - Invited Colloquium Talk, Department of Mathematical Sciences, Clemson University

- Invited Colloquium Talk, Department of Mathematics, University of Alabama at Birmingham
- Invited Colloquium Talk, Mathematics Department, Tulane University
- Invited Mini-Symposium Talk, MAA-AMS Joint Mathematics Meetings, Boston, MA

- 2011
  - PDE Seminar Talk, Department of Mathematics, University of Iowa
  - Invited Mini-Symposium Talk (with travel award), SIAM Conference on Analysis of Partial Differential Equations, San Diego, CA
  - Invited Talk, The Methodist Hospital Research Institute, Houston, TX
  - Invited Mini-Symposium Talks, AMS Spring Sectional Meeting, Iowa City, IA

- 2010
  - Poster Presentation, Blackwell-Tapia Conference, MBI, Ohio State University
  - Postdoc Seminar Talk, MBI, Ohio State University
  - Poster Presentation, Workshop for Young Researchers in Mathematical Biology, MBI, Ohio State University
  - PDE Lunch Seminar Talk, Department of Mathematics, University of Iowa

- 2009
  - Postdoc Seminar, MBI, Ohio State University
  - Invited PDE Seminar Talk, Department of Mathematics, Ohio State University
  - Invited Colloquium Talk, Department of Mathematics, University of Iowa
  - Invited PDE Seminar Talk, Department of Mathematics, University of California at Irvine
  - Working Seminars on Hyperbolic Balance Laws and Nonlinear Partial Differential Equations, School of Mathematics, Georgia Tech
  - Working Seminars on Special Topics in Dynamics of Nonlinear Differential Equations, School of Mathematics, Georgia Tech

- 2008
  - Contributed Talk, The 12th International Conference on Hyperbolic Problems: Theory, Numerics, Applications (HYP2008), Department of Mathematics, University of Maryland at College Park
  - Invited Applied Math Seminar Talk, Department of Mathematics, University of Georgia

- 2007
  - PDE Seminar Talk, School of Mathematics, Georgia Tech

Synergistic Activities

- Editorial Service
  - Associate Editor for Annals of Applied Mathematics (Since August 2020)

- Invited Reviewer
  - MathReview (Since March 2014)
  - Zentralblatt MATH (Since January 2012)

- Referee
  - Acta Applicandae Mathematicae (Since January 2015)
  - Acta Mathematica Scientia (Since March 2016)
  - Advances in Mathematics (China) (Since June 2016)
  - Advances in Nonlinear Analysis (Since January 2022)
  - AMS Contemporary Mathematics (Since September 2017)
  - Analysis (Since April 2023)

- Analysis & PDE (Since December 2022)
- Annales Polonici Mathematici (Since July 2016)
- Applicable Analysis (Since January 2020)
- Applied Mathematical Modeling (Since April 2020)
- Applied Mathematics Letter (Since August 2020)
- Asymptotic Analysis (Since June 2019)
- Chaos, Solitons and Fractals (Since October 2016)
- Communications in Mathematical Sciences (Since January 2015)
- Communications in Nonlinear Science and Numerical Simulation (Since June 2022)
- Communications on Pure and Applied Analysis (Since May 2013)
- Discrete and Continuous Dynamical Systems - Series A (Since February 2019)
- Discrete and Continuous Dynamical Systems - Series B (Since February 2017)
- Discrete and Continuous Dynamical Systems - Series S (Since April 2018)
- Dynamics of Partial Differential Equations (Since February 2013)
- Electronic Research Archive (Since August 2021)
- Indiana University Mathematics Journal (Since August 2017)
- Journal of Differential Equations (Since January 2010)
- Journal of Dynamics and Differential Equations (Since April 2017)
- Journal of European Mathematical Society (Since October 2016)
- Journal of Hyperbolic Differential Equations (Since October 2011)
- Journal of Mathematical Analysis and Applications (Since April 2013)
- Journal of Mathematical Fluid Mechanics (Since March 2021)
- Journal of Mathematical Physics (Since November 2014)
- Journal of Nonlinear Science (Since November 2013)
- Kinetic and Related Models (Since March 2016)
- Mathematical Biosciences (Since May 2018)
- Mathematical Biosciences and Engineering (Since November 2017)
- Mathematical Methods in Applied Sciences (Since August 2013)
- Mathematical Models and Methods in Applied Sciences (Since March 2011)
- Mathematical Modeling of Natural Phenomena (Since February 2022)
- Nonlinear Analysis - Real World Applications (Since January 2017)
- Nonlinear Analysis - Theory, Methods and Applications (Since July 2014)
- Nonlinearity (Since March 2018)
- Pacific Journal of Mathematics (Since June 2018)
- Pure and Applied Mathematics Quarterly (Since December 2017)
- PLOS ONE (Since April 2021)
- Proceeding of AMS (Since April 2019)
- Science China Mathematics (Since November 2022)
- SIAM Journal on Mathematical Analysis (Since October 2015)
- Wave Motion (Since September 2023)
- Zeitschrift für angewandte Mathematik und Mechanik (ZAMM) (Since August 2016)
- Zeitschrift für angewandte Mathematik und Physik (ZAMP) (Since February 2015)

- Proposal Review
  - National Science Foundation, Applied Math, Fluids and Geosciences Panel, 2023
  - National Research and Development Agency, Ministry of Science, Technology, Knowledge and Innovation, Chile, 2021

- Organizing
  - International Conference on Dynamical Modeling, Analysis, and Applications in Mathematical Biosciences, Harbin Engineering University, Harbin, June 2021
  - International Conference on Dynamical Modeling, Analysis, and Applications in Mathematical Biosciences, Harbin Engineering University, Harbin, June 2020
  - Mini-Symposium in AMS Spring Eastern Sectional Meetings, Tufts University, Medford MA,

March 2020
- Mini-Symposium in International Council for Industrial and Applied Mathematics, Valencia, Spain, July 2019
- Mini-Symposium in Louisiana-Texas SIAM Meeting, Louisiana State University, October 2018
- Applied and Computational Math Seminar, Mathematics Department, Tulane University, 2017 - 2019
- Mini-Symposium in International Congress on Industrial and Applied Mathematics, Beijing, China, August 2015
- Mini-Symposium in AMS Spring Western Sectional Meetings, Las Vegas, Nevada, April 2015
- Visitors Seminar, Mathematical Biosciences Institute, The Ohio State University, January - May 2015
- Applied and Computational Math Seminar, Mathematics Department, Tulane University, 2013 - present
- Clifford Lectures, Mathematics Department, Tulane University, Fall 2013
- PDE Seminar, Mathematics Department, Tulane University, Spring 2013
- Mini-Symposium in SIAM Conference on Analysis of Partial Differential Equations, San Diego, CA, 2011
- Workshop for Young Researchers in Mathematical Biology, MBI, 2011
- Postdoc Seminar, MBI, 2011
- Workshop for Young Researchers in Mathematical Biology, MBI, 2010

Supervising at Tulane University

- Postdoctoral Scholar
  - Vincent Martinez, January 2015-August 2017
    Current Position: Assistant Professor, Hunter College, City University of New York
- Ph.D. Students
  - Sinchita Lahiri, 2022-present
  - Rosa Fuster-Aguilera, October 2016-May 2021
    Current Position: Postdoctoral Researcher, University of Colorado at Boulder
- Master's Students
  - Tian Dai, 2019-2021
    Current Position: Ph.D. Student at University of Pittsburgh
  - Yao Tang, 2019-2021
    Current Position: Ph.D. Student at York University, Canada
  - Ying Bi, 2016-2019
    Current Position: Ph.D. Student at Tulane University
- Undergraduate Students
  - Hui Huang, Fall 2021
  - Robert Johnson, Spring 2021
    Current Position: Ph.D. Student in Physics at Rochester University
  - Zhen Hao, Fall 2019-Spring 2020
  - Anne Nygard, Fall 2016-Spring 2017
  - Troy Ward, Fall 2015-Spring 2016
  - Nicole Florack, Fall 2014-Spring 2015
  - Kaixiang Yao, Fall 2014-Spring 2015

Visitors Hosted at Tulane University

- Jiao Xu (Graduate Student at South China University of Technology, Guangzhou, Guangdong

Province, China), September 2019-August 2020
Current Position: Associate Professor at South China University of Technology, Guangzhou, Guangdong Province, China
- Zefu Feng (Graduate Student at South China University of Technology, Guangzhou, Guangdong Province, China), September 2019-February 2021
Current Position: Associate Professor at Chongqing Normal University, Chongqing, Sichuan Province, China
- Jiahong Wu (Regent's Professor at Oklahoma State University, Stillwater, OK), September 2017-December 2017
- Fang Wang (Associate Professor at Changsha University of Science and Technology, Changsha, Hunan Province, China), December 2017-December 2018
- Neng Zhu (Graduate Student at South China University of Technology, Guangzhou, Guangdong Province, China), September 2016-August 2017
Current Position: Associate Professor at Nanchang University, Nanchang, Jiangxi Province, China

Services at Tulane University

- Committee Members
  - Curriculum Committee, Newcomb-Tulane College, 2016-2018, 2022-now
  - Graduate Studies Committee, Mathematics Department, 2021-now
  - Executive Committee, Mathematics Department, 2015-2016, 2021-now
  - Graduate Studies Committee (director), Mathematics Department, 2021-2023
  - Graduate Admissions Committee (director), Mathematics Department, 2018-2021
  - Hiring Committee, Mathematics Department, 2015-2016, 2017-2019, 2020-2021

- Ph.D. Dissertation Defense Committee
  - Zachery Bradshaw, Spring 2023
  - Kristina Vandusen, Summer 2021
  - Zhe Qu, Spring 2019
  - Benjamin Boniece, Spring 2018
  - Asma Boroujeni, Spring 2018
  - Hui Li, Spring 2017
  - Xiao Guan, Spring 2017
  - Forest Mannan, Spring 2017
  - Yuanzhen Cheng, Fall 2016
  - Zhuolin Qu, Spring 2016
  - Tong Wu, Spring 2016
  - Qiang Yang, Fall 2015
  - Franz Hoffmann, Spring 2015
  - Jianjun Huang, Summer 2014
  - Jeremy Dewar, Fall 2013

- Ph.D. Oral Exam Committee
  - Ying Bi, Fall 2023
  - Irene Erazo, Spring 2023
  - Alex Nisbet, Spring 2023
  - Zheng Wang, Spring 2023
  - Kendall Gibson, Fall 2022
  - John Lopez, Fall 2022
  - Sang-Eun Lee, Fall 2022
  - Christian Frederiksen, Fall 2022
  - Borui Zhao, Spring 2022
  - Zachery Bradshaw, Spring 2021

- Dana Ferranti, Fall 2020
- Kristina Vandusen, Fall 2018
- Zhe Qu, Spring 2018
- Benjamin Boniece, Spring 2016
- Asma Boroujeni, Fall 2014
- Xiao Guan, Fall 2014
- Forest Mannan, Fall 2014
- Yuanzhen Cheng, Fall 2013
- Qiang Yang, Spring 2013
- Franz Hoffmann, Spring 2013

- Ph.D. Qualifying Exam Committee
  - Analysis Exam, 2013-2016, 2018-2023
  - Placement Exam, Fall 2014

Teaching Experience

Tulane University, Mathematics Department 2012 - now

- Lecturer for Math 7210 Analysis I — Fall 2023
  - Took full responsibility of the course with 3 students.
- Lecturer for Math 7220 Analysis II — Spring 2023
  - Took full responsibility of the course with 7 students.
- Lecturer for Math 7210 Analysis I — Fall 2022
  - Took full responsibility of the course with 15 students.
- Lecturer for Math 7750 Energy Methods in Linear/Nonlinear PDEs — Spring 2022
  - Took full responsibility of the course with 7 students.
- Lecturer for Math 4240 Ordinary Differential Equations — Fall 2021
  - Took full responsibility of the course with 11 students.
- Lecturer for Math 4470 Analytical Methods in Applied Mathematics — Fall 2021
  - Took full responsibility of the course with 18 students.
- Lecturer for Math 7220 Analysis II — Spring 2021
  - Took full responsibility of the course with 3 students.
- Lecturer for Math 7210 Analysis I — Fall 2020
  - Took full responsibility of the course with 11 students.
- Lecturer for Math 4470 Analytical Methods in Applied Mathematics — Fall 2020
  - Took full responsibility of the course with 23 students.
- Lecturer for Math 7540 Partial Differential Equations II — Spring 2020
  - Took full responsibility of the course with 8 students.
- Lecturer for Math 1310 Consolidated Calculus — Fall 2019
  - Took full responsibility of the course with 35 students.
- Lecturer for Math 7530 Partial Differential Equations I — Fall 2019
  - Took full responsibility of the course with 10 students.
- Lecturer for Math 3090 Linear Algebra — Fall 2018
  - Took full responsibility of the course with 35 students.
- Lecturer for Math 3050 Real Analysis I — Fall 2018
  - Took full responsibility of the course with 25 students.
- Lecturer for Math 7220 Analysis II — Spring 2018
  - Took full responsibility of the course with 11 students.
- Lecturer for Math 2240 Introduction to Applied Mathematics — Fall 2017
  - Took full responsibility of the course with 70 students.
- Lecturer for Math 7210 Analysis I — Fall 2017
  - Took full responsibility of the course with 16 students.
- Lecturer for Math 7530 Partial Differential Equations — Fall 2016

- Took full responsibility of the course with 8 students.
- Lecturer for Math 1310 Consolidated Calculus — Fall 2016
  - Took full responsibility of the course with 30 students.
- Lecturer for Math 7220 Analysis II — Spring 2016
  - Took full responsibility of the course with 11 students.
- Lecturer for Math 7210 Analysis I — Fall 2015
  - Took full responsibility of the course with 9 students.
- Lecturer for Math 1310 Consolidated Calculus — Fall 2015
  - Took full responsibility of the course with 24 students.
- Lecturer for Math 7530 Partial Differential Equations I — Fall 2014
  - Took full responsibility of the course with 10 students.
- Lecturer for Math 2210 Calculus III — Spring 2014
  - Took full responsibility of the course with 20 students.
- Lecturer for Math 2210 Calculus III — Fall 2013
  - Took full responsibility of the course with 40 students.
- Lecturer for Math 7220 Analysis II — Spring 2013
  - Took full responsibility of the course with 10 students.
- Lecturer for Math 7210 Analysis I — Fall 2012
  - Took full responsibility of the course with 16 students.

University of Iowa, Department of Mathematics — 2011 - 2012

- Lecturer for Math 055 Fundamental Properties of Spaces and Functions I — Spring 2012
  - Took full responsibility of the course with 30 students.
- Lecturer for Math 025 Calculus I — Fall 2011
  - Took full responsibility of the course with 60 students.
- Lecturer for Math 037 Engineering Mathematics V - Vector Calculus — Fall 2011
  - Took full responsibility of the course with 40 students.

Ohio State University, Mathematical Biosciences Institute — 2009 - 2011

- Lecturer for Math 152 Calculus and Analytic Geometry II — Fall 2010
  - Took full responsibility of the course with 110 students.
- Project advisor for Math 151L Calculus for Biology and Medicine — Fall 2010
- Project advisor for Math 151L Calculus for Biology and Medicine — Fall 2009
  - Prepared and presented a group project that incorporated basic calculus concepts in a life science application for first year undergraduate students in biology.
  - Met with students in small groups for several sessions to provide guidance.

Georgia Institute of Technology, School of Mathematics — 2004 - 2009

- Lecturer for Calculus II — Summer 2009
  - Took partial responsibility of the course with 70 students.
- Lecturer for Differential Equations — Summer 2007
  - Took partial responsibility of the course with 80 students.
- Lecturer for Calculus II — Summer 2006
  - Took partial responsibility of the course with 70 students.
- Lecturer for Differential Equations — Summer 2006
  - Took partial responsibility of the course with 80 students.