

CURRICULUM VITAE

Xianpeng Hu

Contact Information

- Address: Department of Mathematics, City University of Hong Kong, Kowloon, Hong Kong.
- Phone: (+852) 3442-2964; Email: xianpehu@cityu.edu.hk.

Education

- University of Pittsburgh, Mathematics, Ph.D., August 2010;
Advisor: Prof. Dehua Wang.
- Sun Yat-sen (Zhongshan) University, Mathematics, B.S., M.S., 2006.

Appointments

- Guest Professor, South China University of Technology, 2020-;
- Associate Professor, City University of Hong Kong, 2020-;
- Assistant Professor, City University of Hong Kong, 2014-2020;
- Visiting Assistant Professor, New York University, 2013-2014;
- Courant Instructor, New York University, 2010-2013;

Awards & Grants

- GRF Grant, 2022-2025, PI, UGC;
- RGC Research Fellow Scheme, 2021-2026, PI, RGC;
- GRF Grant, 2021-2024, PI, UGC;
- Outstanding Supervisor Award, CityU, 2020;
- GRF Grant, 2020-2023, PI, UGC;
- GRF Grant, 2019-2022, PI, UGC;
- CityU Strategic Research Grant, 2018-2020, PI, CityU;
- GRF Grant, 2017-2020, PI, UGC;
- 2017 HKMS Award for Young Scholars;
- National Science Foundation of China, Participant, 2016-2019;
- GRF Grant, 2016-2019, PI, UGC;
- ECS Grant, 2015-2018, PI, UGC;

- Start-up grant, 2014-2016, PI, City University of Hong Kong;
- National Science Foundation, PI, DMS-1108647, 2011-2014;
- 2010 Thomas C. Hales Distinguished Research Award, University of Pittsburgh;
- SIAM Student Travel Award, 2009;
- Mellon Predoctoral Fellowship, University of Pittsburgh, 2008-2009.

Research Interests

- Nonlinear partial differential equations;
- Applied mathematics, including nonlinear problems in fluid dynamics, plasmas, magnetohydrodynamics, viscoelastic fluids, elastodynamics, liquid crystals;
- Calculus of variation, geometric measure theory and its application in nonlinear differential equations.

Publications

- Handbook Chapter
 1. X. Hu, F. Lin, C. Liu, *Equations for viscoelastic fluids*. Handbook of Mathematical Analysis in Mechanics of Viscous Fluids. 1045-1073, Springer, Cham, 2018.
- Journal Paper
 1. X. Hu, *Existence of time-periodic solutions to incompressible Navier-Stokes equations in the whole plane*, Electronic J. Differential Equations 104 (2005), 1-6.
 2. X. Hu, D. Wang, *Global solutions to the three-dimensional full compressible magnetohydrodynamic flows*, Comm. Math. Phys. 283 (2008), 255–284.
 3. X. Hu, D. Wang, *Compactness of weak solutions to compressible magnetohydrodynamics equations with density-dependent viscosities*, J. Differential Equations 245 (2008), 2176-2198.
 4. X. Hu, D. Wang, *Global existence and incompressible limit of weak solutions to the multi-dimensional compressible magnetohydrodynamics*. Proceedings of Hyperbolic problems: theory, numerics, applications, 2008.
 5. X. Hu, D. Wang, *Low Mach number limit of viscous compressible magnetohydrodynamic flows*, SIAM J. Math. Anal. 41 (2009), 1272-1294.
 6. X. Hu, D. Wang, *Global existence and large-time behavior of solutions to the three-dimensional equations of compressible magnetohydrodynamic flows*. Arch. Rational Mech. Anal. 197 (2010), 203-238.
 7. X. Hu, D. Wang, *Global solution to the three-dimensional incompressible flow of liquid crystals*. Comm. Math. Phys. 296 (2010), 861-880.
 8. X. Hu, D. Wang, *Local strong solution to the compressible viscoelastic fluid with large data*. J. Differential Equations 249 (2010), 1179-1198.

9. X. Hu, D. Wang, *Global existence for the multi-dimensional compressible viscoelastic flows*. J. Differential Equations 250 (2011), 1200-1231.
10. X. Hu, D. Wang, *Formation of singularity for compressible viscoelasticity*. Acta Mathematica Scientia 32 (2012), 109-128.
11. X. Hu, D. Wang, *Strong solutions to the compressible viscoelastic fluids*. J. Differential Equations 252 (2012), 4027-4067.
12. X. Hu, Z. Lei, F. Lin, *On magnetohydrodynamics with partial magnetic dissipation near equilibrium*. Recent developments in geometry and analysis, 155-164, Adv. Lect. Math. (ALM), 23, Int. Press, Somerville, MA, 2012.
13. X. Hu, R. Hynd, *A blowup criterion for ideal viscoelastic flow*. J. Math. Fluid Mech. 15 (2013), 431-437.
14. X. Hu, H. Wu, *Long-time dynamics of the nonhomogeneous incompressible flow of nematic liquid crystals*. Commun. Math. Sci., 11 (2013), 779-806.
15. X. Hu, H. Wu, *Global solution to the three-dimensional compressible flow of liquid crystals*. SIAM J. Math. Anal. 45 (2013), 2678-2699.
16. X. Hu, G. Wu, *Global existence and optimal decay rates for three-dimensional compressible viscoelastic flows*. SIAM J. Math. Anal. 45 (2013), 2815-2833.
17. X. Hu, F. Lin, *Scaling limit for compressible viscoelastic fluids*. Frontiers in differential geometry, partial differential equations and mathematical physics, 243-269, World Sci. Publ., Hackensack, NJ, 2014.
18. X. Hu, D. Wang, *The initial-boundary value problem for the compressible viscoelastic fluids*. Discrete Contin. Dyn. Syst.-A 35 (2015), 917-934.
19. X. Hu, H. Wu, *Long time behavior and weak-strong uniqueness for incompressible viscoelastic flows*. Discrete Contin. Dyn. Syst.-A 35 (2015), 3437-3461.
20. X. Hu, F. Lin, *Global solution to two dimensional incompressible viscoelastic fluid with discontinuous data*. Comm. Pure Appl. Math. 69 (2016), 372-404.
21. X. Hu, N. Masmoudi, *Global solutions to repulsive Hookean elastodynamics*. Arch. Ration. Mech. Anal. 223 (2017), 543-590.
22. X. Hu, Q. Liu, *Global solution to the 3D inhomogeneous nematic liquid crystal flows with variable density*. J. Differential Equations 264 (2018), 5300-5332.
23. X. Hu, *Global existence of weak solutions to compressible viscoelasticity*. J. Differential Equations 265 (2018), 3130-3167.
24. X. Hu, Y. Huang, *Well-posedness of the free boundary problem for incompressible elastodynamics*. J. Differential Equations 266 (2019), 7844-7889.
25. X. Hu, *Hausdorff dimensions of concentrations for isentropic compressible Navier-Stokes equations*. Arch. Ration. Mech. Anal. 234 (2019), 375-416.
26. X. Hu, W. Zhao, *Global existence for the compressible viscoelastic system with zero shear viscosity in three dimensions*. J. Differential Equations 268 (2020), 1658-1685.
27. X. Hu, W. Zhao, *Global existence of compressible dissipative elastodynamics systems with zero shear viscosity in two dimensions*. Arch. Ration. Mech. Anal. 235(2020). 1177-1243.
28. X. Hu, G. Wu, *The optimal rates of decay for solutions to the isentropic compressible Navier-Stokes equations with discontinuous initial data and large oscillations*. J. Differential Equations 269 (2020), 8132-8172.

29. H. Du, X. Hu, C. Wang, *Suitable weak solutions for the co-rotational Beris-Edwards system in dimension three*. Arch. Ration. Mech. Anal. 238 (2020), 749-803.
30. X. Hu, *Weak solutions for compressible isentropic Navier-Stokes equations in dimensions three*. Arch. Ration. Mech. Anal. 242 (2021), 1907-1945.
31. Z. Gan, X. Hu, F. Lin, *Defects in liquid crystal flows*. SIAM J. Math. Anal. 54 (2022), 1695-1717.
32. X. Hu, *Self-similar solutions of Leray's type for compressible Navier-Stokes equations in two dimension*. Commun. Math. Anal. Appl., 1 (2022), 241-262.
33. X. Cui, X. Hu, *Incompressible limit of three dimensional compressible viscoelastic systems with vanishing shear viscosity*. Arch. Ration. Mech. Anal. 245 (2022), 753-807.

Teaching Experience

- Graduate Courses
 - Applied Partial Differential Equations, Fall 2019 & Fall 2021, City University of Hong Kong;
 - Complex Variables, Fall 2013, NYU;
 - Introduction to Mathematical Analysis, Spring 2013, NYU.
- Undergraduate Courses
 - Discrete Math, Fall 2020, City University of Hong Kong;
 - Multivariable Calculus, Fall 2021, City University of Hong Kong;
 - Analysis, Spring 2018, Spring 2019, City University of Hong Kong;
 - Calculus II, Spring 2015, Spring 2016, City University of Hong Kong;
 - PDE, Fall 2014, Fall 2015, Fall 2017, Fall 2018, Fall 2019, Fall 2020, City University of Hong Kong;
 - Vector Analysis & Discrete Math, Spring 2014, NYU;
 - ODE, Spring 2012, NYU;
 - Calculus 1, Fall 2011, Fall 2012, NYU;
 - Calculus 2, Fall 2013, Fall 2010, Spring 2011, NYU;
 - Calculus 1, Summer 2008, University of Pittsburgh.
- Research Related Minicourses
 - Mathematical Theory of MHD, National Center for Theoretical Sciences, Mathematics Division, Taiwan, 2016.
 - Partial regularity theory of incompressible Navier-Stokes equations, Tianyuan Mathematical Center in Southwest China, Sichuan, 2020. *Online*

Editorship

- Advances in Nonlinear Analysis;
- AIMS Electronic Research Archive;
- Communications in Mathematical Analysis and Applications.

Supervision

- Undergraduate students
 - Luo Kaihui & Yang Yuwei, 2018-2019; Gao Ya, 2020-2021; Zhang Bigeng, 2021-2022, Final Year Project;
 - Chuxiao Feng, Qingyuan Zhang, Xilin Zhang, Second Prize, Contemporary Undergraduate Mathematical Contest in Modeling (CUMCM) 2018;
 - Xunlei Qian, Boxun Yan, Chen Wang, Second Prize, Contemporary Undergraduate Mathematical Contest in Modeling (CUMCM) 2019;
 - Xinchun Zhang, Peiyao He, Weichun Tang, Honorable Mention, Interdisciplinary Contest in Modeling (ICM) 2020;
 - Xunlei Qian, Boxun Yan, Feng Cheng, Second Prize, Contemporary Undergraduate Mathematical Contest in Modeling (CUMCM) 2020;
 - Jinyun Shan, Tang Wei, Yue Yin, Meritorious Winners, Interdisciplinary Contest in Modeling (ICM) 2021;
 - Chinchin Wong & Hamza Sheikh, June-August 2022, STEM Internship Scheme.
- Ph.D students
 - Wenbin Zhao, 2016-2019. Outstanding Research Thesis Award 2019. Current Position: Jinguang Instructor in School of Mathematics at Peking University.
 - Pei Lv, 2020-.
 - Xinrui Song, 2021-.
 - Bigeng Zhang, 2022-.
 - Andrew Yang, 2022-, Hong Kong PhD Fellowship Scheme.

Services

- Member of Departmental Staff Committee, 2018-2022.
- Research Degree Coordinator, 2021-2022.
- Deputy Chairman, Sub-Committee on Research Degrees, College Graduate Studies Committee, 2021-2022.
- Co-organizer of Departmental Colloquium, 2017-2021.

Journal Referee

Annales Henri Poincaré; Mathematische Annalen; SIAM Journal on Mathematical Analysis; SIAM Journal on Applied Mathematics; Archive of Rational Mechanics and Analysis; Calculus of Variations and Partial Differential Equations; Communications in Mathematical Physics; Journal of Differential Equations; IMRN; Journal of Functional Analysis; ...