CURRICULUM VITAE

Professor Tong Yang

Personal Particulars

Name: Tong Yang
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Education

- PhD in Mathematics, University of California, Davis, USA — June 1993
- MSc in Zhongshan University — July 1990
- BSc in Zhongshan University — July 1987

Professional Career

- Chair Professor, The Hong Kong Polytechnic University — 11/2022 - present
- Chair Professor of Mathematics, City University of Hong Kong — 09/2007 - 11/2022
- Professor, City University of Hong Kong — 07/2002 - 08/2007
- Associate Professor, City University of Hong Kong — 07/1999 - 06/2002
- Assistant Professor/Lecturer, City University of Hong Kong — 09/1994 - 06/1999
- Postdoctoral Member, Institute for Advanced Study, Princeton, USA — 09/1993 - 08/1994

Distinctions and Academic Awards

- Foreign member, Academia Europaea, 2022
- Member, Hong Kong Academy of Sciences, 2021
- Member, The World Academy of Sciences, 2021
- American Mathematical Society Fellow, 2021
- The Hong Kong Research Grants Council-Senior Research Fellow, 2020
- Ministry of Education Higher Education Outstanding Scientific Research Output Award (Science and Technology), China (First Prize in Natural Science), 2019
- Foreign member, the European Academy of Sciences, 2018
- State Natural Science Award (2nd class), China, 2012
- Croucher Senior Research Fellowship, 2011
- Changjiang Chair Professor, the Ministry of Education of China, 2005
- National Science Fund for Distinguished Young Scholars, China, 2004
- Morningside Silver Medal of Mathematics, ICCM, 1998

Honors and Professional Positions

- Board member of Hong Kong Academy of Sciences (2022–present)
- Sectional core member for ICM 2022
- Member at large, Hong Kong Mathematical Society (2020–present)

- Officer of Mathematics Division, European Academy of Sciences (2019–2023)
- The President of the Hong Kong Mathematical Society (2016–2020)
- Honorary Professor of Guangxi University (2019–2024)
- Visiting Chair Professor of Shanghai Jiao Tong University, China (2013–present)
- Visiting Chair Professor of Jinan University, China (2015–18)
- Panel Member of the Physical Science Panel of Research Grants Council (RGC), HKSAR (2010–15; 2019–2022)
- Academic Committee Member of the Hong Kong Scholar Scheme (since 2011)

Editorial Work

Co-Editor-in-Chief

- Kinetic and Related Model, (2008–present)
- Communications in Mathematical Analysis and Applications, (2022–present)
- Analysis and Applications, (2013–2017)

Editorial Board

- London Mathematical Society: Bulletin and Journal, (2020–present)
- SIAM Journal on Mathematical Analysis, (2021–present)
- Chinese Annals of Mathematics, Series B, (2022–present)
- Annals of Applied Mathematics, (2015–present)
- Journal of Mathematical Analysis and Applications, (2017–2021)

Administration Posts

- Head of Department of Mathematics 08/2012 – 08/2018
- Associate Dean of College of Science and Engineering 09/2007 – 08/2011

Grants as Principle investigator

- 28 GRF/CERG General Research Grant of Hong Kong/Competitive Earmark Research Grant of Hong Kong
- 1 NSFC/RGC NSFC/RGC Joint Research Scheme

Citation

- H-Index: 42, Sum of Times Cited: 5700
- Listed among the World's Top 2% scientists by Stanford University

Selected Publications (from over 200 journal papers)

1. Renjun Duan, Shuangqian Liu and Tong Yang, The Boltzmann equation for plane Couette flow, to appear in Journal of the European Mathematical Society.
2. Renjun Duan, Ling-Bing He, Tong Yang and Yu-Long Zhou, Solutions to the non-cutoff Boltzmann equation in the grazing limit, to appear in Annales de l'Institut Henri Poincaré C. Analyse Non Linéaire.
3. Tong Yang and Yu-Long Zhou, An explicit coercivity estimate of the linearized quantum Boltzmann operator without angular cutoff. Journal of Functional Analysis 286 (2024), no. 1, Paper No. 110197.
4. Tong Yang and Zhu Zhang, Linear instability analysis on compressible Navier-Stokes equations with strong boundary layer. Archive for Rational Mechanics and Analysis 247 (2023), no. 5, Paper No. 83.
5. Hailiang Li, Tong Yang and Mingying Zhong, Green's function and pointwise behavior of the one-

dimensional Vlasov-Maxwell-Boltzmann system. Archive for Rational Mechanics and Analysis 247 (2023), no. 5, Paper No. 82.
6. Wei-Xi Li, Nader Masmoudi and Tong Yang, Well-posedness in Gevrey function space for 3D Prandtl equations without structural assumption. Communications on Pure and Applied Mathematics 75 (2022), no. 8, 1755–1797.
7. Chengjie Liu, Tong Yang and Zhu Zhang, Analysis of the Tollmien-Schlichting wave in the Prandtl-Hartmann regime. Journal de Mathématiques Pures et Appliquées 165 (2022), 58–105.
8. Hai-Liang Li, Tong Yang and Mingying Zhong, Spectrum analysis for the Vlasov-Poisson-Boltzmann system. Archive for Rational Mechanics and Analysis 241 (2021), no. 1, 311–355.
9. Jingwei Hu, Kunlun Qi and Tong Yang, A new stability and convergence proof of the Fourier-Galerkin spectral method for the spatially homogeneous Boltzmann equation, SIAM Journal on Numerical Analysis 59 (2021), no. 2, 613–633.
10. Huanyao Wen, Tong Yang, Xinhua Zhao and Changjiang Zhu, Optimal convergence rate of the vanishing shear viscosity limit for compressible Navier-Stokes equations with cylindrical symmetry. Journal de Mathématiques Pures et Appliquées 146 (2021), 99–126.
11. Ricardo Alonso, Yoshinori Morimoto, Weiran Sun and Tong Yang, Non-cutoff Boltzmann equation with polynomial decay perturbation, Revista Matemática Iberoamericana 37 (2021), no. 1, 189–292.
12. Chengjie Liu, Dehua Wang, Feng Xie and Tong Yang, Magnetic effects on the solvability of 2D MHD boundary layer equations without resistivity in Sobolev spaces. Journal of Functional Analysis 279 (2020), no. 7, 108637.
13. Hailiang Li, Tong Yang and Mingying Zhong, Green's function and pointwise space-time behaviors of the Vlasov-Poisson-Boltzmann system. Archive for Rational Mechanics and Analysis 235 (2020), no. 2, 1011–1057.
14. Wei-Xi Li and Tong Yang, Well-posedness in Gevrey function spaces for the Prandtl equations with non-degenerate critical points. Journal of European Mathematical Society 22 (2020), no. 3, 717–775.
15. Chengjie Liu, Feng Xie and Tong Yang, MHD boundary layers theory in Sobolev spaces without monotonicity I: Well-posedness theory. Communications on Pure and Applied Mathematics 72 (2019), no. 1, 63–121.
16. Hailiang Li, Yi Wang, Tong Yang and Mingying Zhong, Stability of nonlinear wave patterns to the bipolar Vlasov-Poisson-Boltzmann system. Archive for Rational Mechanics and Analysis 228 (2018), no. 1, 39–127.
17. Chengjie Liu and Tong Yang, Ill-posedness of the Prandtl equations in Sobolev spaces around a shear flow with general decay. Journal de Mathématiques Pures et Appliquées 108 (2017), no. 2, 150–162.
18. Renjun Duan, Feimin Huang, Yong Wang and Tong Yang, Global well-posedness of the Boltzmann equation with large amplitude initial data. Archive for Rational Mechanics and Analysis 225 (2017), no. 1, 375–424.
19. Renjun Duan, Yuanjie Lei, Tong Yang and Huijiang Zhao, The Vlasov-Maxwell-Boltzmann system near Maxwellians in the whole space with very soft potentials. Communications in Mathematical Physics 351 (2017), no. 1, 95–153.
20. Cheng-Jie Liu, Ya-Guang Wang and Tong Yang, A well-posedness theory for the Prandtl equations in three space variables. Advances in Mathematics 308 (2017), 1074–1126.
21. Yoshinori Morimoto, Tong Yang and Huijiang Zhao, Convergence to self-similar solutions for the homogeneous Boltzmann equation. Journal of European Mathematical Society 19 (2017), no. 8, 2241–2267.
22. Tong Yang and Hongjun Yu, Spectrum analysis of some kinetic equations. Archive for Rational Mechanics and Analysis 222 (2016), no. 2, 731–768.
23. Cheng-Jie Liu, Ya-Guang Wang and Tong Yang, On the ill-posedness of the Prandtl equations in three-dimensional space. Archive for Rational Mechanics and Analysis 220 (2016), no. 1, 83–108.
24. Xulong Qin, Tong Yang, Zheng-an Yao and Wenshu Zhou, Vanishing shear viscosity and boundary layer for the Navier-Stokes equations with cylindrical symmetry. Archive for Rational Mechanics and Analysis

216 (2015), no. 3, 1049–1086.
25. Yoshinori Morimoto, Shuaikun Wang and Tong Yang, A new characterization and global regularity of infinite energy solutions to the homogeneous Boltzmann equation. Journal de Mathématiques Pures et Appliquées 103 (2015), no. 3, 809–829.
26. Radjesvarane Alexandre, Ya-Guang Wang, Chao-Jiang Xu and Tong Yang, Well-posedness of the Prandtl equation in Sobolev spaces. Journal of American Mathematical Society 28 (2015), no. 3, 745–784.
27. Yoshinori Morimoto and Tong Yang, Smoothing effect of the homogeneous Boltzmann equation with measure valued initial datum. Annales de l'Institut Henri Poincaré C. Analyse Non Linéaire 32 (2015), no. 2, 429–442.
28. Hongxia Liu, Tong Yang, Huijiang Zhao and Qingyang Zou, One-dimensional compressible Navier-Stokes equations with temperature dependent transport coefficients and large data. SIAM Journal on Mathematical Analysis 46 (2014), no. 3, 2185–2228.
29. Zhouping Xin, Tong Yang and Hongjun Yu, The Boltzmann equation with soft potentials near a local Maxwellian. Archive for Rational Mechanics and Analysis 206 (2012), no. 1, 239–296.
30. Radjesvarane Alexandre, Yoshinori Morimoto, Seiji Ukai, Chao-Jiang Xu and Tong Yang, The Boltzmann equation without angular cutoff in the whole space: I, Global existence for soft potential. Journal of Functional Analysis 262 (2012), no. 3, 915–1010.
31. Feimin Huang, Yi Wang and Tong Yang, Vanishing viscosity limit of the compressible Navier-Stokes equations for solutions to a Riemann problem. Archive for Rational Mechanics and Analysis 203 (2012), no. 2, 379–413.
32. Tong Yang and Hongjun Yu, Global solutions to the relativistic Landau-Maxwell system in the whole space. Journal de Mathématiques Pures et Appliquées 97 (2012), no. 6, 602–634.
33. Radjesvarane Alexandre, Yoshinori Morimoto, Seiji Ukai, Chao-Jiang Xu and Tong Yang, The Boltzmann equation without angular cutoff in the whole space: qualitative properties of solutions. Archive for Rational Mechanics and Analysis 202 (2011), no. 2, 599–661.
34. Radjesvarane Alexandre, Yoshinori Morimoto, Seiji Ukai, Chao-Jiang Xu and Tong Yang, Global existence and full regularity of the Boltzmann equation without angular cutoff. Communications in Mathematical Physics 304 (2011), no. 2, 513–581.
35. Tong Yang and Hongjun Yu, Optimal convergence rates of classical solutions for Vlasov-Poisson-Boltzmann system. Communications in Mathematical Physics 301 (2011), no. 2, 319–355.
36. Radjesvarane Alexandre, Yoshinori Morimoto, Seiji Ukai, Chao-Jiang Xu and Tong Yang, Regularizing effect and local existence for the non-cutoff Boltzmann equation. Archive for Rational Mechanics and Analysis 198 (2010), no. 1, 39–123.
37. Feimin Huang, Yi Wang and Tong Yang, Hydrodynamic limit of the Boltzmann equation with contact discontinuities. Communications in Mathematical Physics 295 (2010), no. 2, 293–326.
38. Radjesvarane Alexandre, Yoshinori Morimoto, Seiji Ukai, Chao-Jiang Xu and Tong Yang, Uncertainty principle and kinetic equations. Journal of Functional Analysis 255 (2008), no. 8, 2013–2066.
39. Feimin Huang, Zhouping Xin and Tong Yang, Contact discontinuity with general perturbations for gas motions. Advances in Mathematics 219 (2008), no. 4, 1246–1297.
40. Renjun Duan, Seiji Ukai, Tong Yang and Huijiang Zhao, Optimal decay estimates on the linearized Boltzmann equation with time dependent force and their applications. Communications in Mathematical Physics 277 (2008), no. 1, 189–236.
41. Tong Yang and Huijiang Zhao, Global existence of classical solutions to the Vlasov-Poisson-Boltzmann system. Communications in Mathematical Physics 268 (2006), no. 3, 569–605.
42. Tong Yang, Hongjun Yu and Huijiang Zhao, Cauchy problem for the Vlasov-Poisson-Boltzmann system. Archive for Rational Mechanics and Analysis 182 (2006), no. 3, 415–470.
43. Tai-Ping Liu, Tong Yang, Shih-Hsien Yu and Huijiang Zhao, Nonlinear stability of rarefaction waves for the Boltzmann equation. Archive for Rational Mechanics and Analysis 181 (2006), no. 2, 333–371.
44. Tong Yang and Huijiang Zhao, A half-space problem for the Boltzmann equation with specular reflection boundary condition. Communications in Mathematical Physics 255 (2005), no. 3, 683–726.

45. Alberto Bressan and Tong Yang, On the convergence rate of vanishing viscosity approximations. Communications on Pure and Applied Mathematics 57 (2004), no. 8, 1075–1109.
46. Tai-Ping Liu, Tong Yang and Shih-Hsien Yu, Energy method for Boltzmann equation, Physica D, 188 (2004), 178-192.
47. Seiji Ukai, Tong Yang and Shih-Hsien Yu, Nonlinear stability of boundary layers of the Boltzmann equation. I. The case $\mathcal{M}^{\infty} < -1$. Communications in Mathematical Physics 244 (2004), no. 1, 99–109.
48. Seiji Ukai, Tong Yang and Shih-Hsien Yu, Nonlinear boundary layers of the Boltzmann equation. I. Existence. Communications in Mathematical Physics 236 (2003), no. 3, 373–393.
49. Seungyeal Ha and Tong Yang, L^1 stability for systems of hyperbolic conservation laws with a resonant moving source. SIAM Journal of Mathematical Analysis 34 (2003), no. 5, 1226–1251.
50. Yinbin Deng, Tai-Ping Liu, Tong Yang and Zheng-an Yao, Solutions of Euler-Poisson equations for gaseous stars. Archive for Rational Mechanics and Analysis 164 (2002), no. 3, 261–285.
51. Tai-Ping Liu and Tong Yang, Weak solutions of general systems of hyperbolic conservation laws. Communications in Mathematical Physics 230 (2002), no. 2, 289–327.
52. Tong Yang and Changjiang Zhu, Compressible Navier-Stokes equations with degenerate viscosity coefficient and vacuum. Communications in Mathematical Physics 230 (2002), no. 2, 329–363.
53. Tai-Ping Liu and Tong Yang, L_1 stability for 2×2 systems of hyperbolic conservation laws. Journal of American Mathematical Society 12 (1999), no. 3, 729–774.
54. Tai-Ping Liu and Tong Yang, Well-posedness theory for hyperbolic conservation laws. Communications on Pure and Applied Mathematics 52 (1999), no. 12, 1553–1586.
55. Tai-Ping Liu and Tong Yang, A new entropy functional for a scalar conservation law. Communications on Pure and Applied Mathematics 52 (1999), no. 11, 1427–1442.
56. Alberto Bressan, Tai-Ping Liu and Tong Yang, L^1 stability estimates for $n \times n$ conservation laws. Archive for Rational Mechanics and Analysis 149 (1999), no. 1, 1–22.
57. Hailiang Liu, Jinghua Wang and Tong Yang, Stability of a relaxation model with a nonconvex flux. SIAM Journal of Mathematical Analysis 29 (1998), no. 1, 18–29.
58. Tong Yang, A functional integral approach to shock wave solutions of Euler equations with spherical symmetry. Communications in Mathematical Physics 171 (1995), no. 3, 607–638.

PhD students and Postdocs

20 PhD students, 10 Postdocs

Selected Recent Plenary Talks

- The 31th Yangtse River conference on PDEs, November 10-12, 2023, Ningbo, China.
- XVIII international conference on hyperbolic problems: theory, numerics, applications, June 20-25, 2022, Malaga, Spain.
- The Chinese Mathematical Society 2021 Annual Conference, Kunming, China.
- International forum on mathematics and history of mathematics-dedicated to the 100th birthday of Wen-Tsun Wu, May 9-10, 2019, Shanghai, China.
- International conference on contemporary applied mathematics, May 7-11, 2018, LIASFMA, Shanghai, China.
- International conference on Partial Differential Equations-Silkroad Mathematics Center series international conferences, April 1-21, 2017, Beijing, China.