Yu Gao

Curriculum Vitae

Male, March 1990
Department of Science, HITSZ
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Work

2024.02-present **Associate Professor**, Department of Science, Harbin Institute of Technology, Shenzhen

2020.07-2024.02 **Research Assistant Professor**, Department of Applied Mathematics, The Hong Kong Polytechnic University, Hong Kong

2018.06-2020.06 **Postdoctoral Fellow**, Department of Mathematics, The University of Hong Kong, Hong Kong, *Advisor:Tak Kwong Wong*

Education

2012–2018 **Ph.D. in Mathematics**, Harbin Institute of Technology, China, *Advisor:Xiaoping Xue*
Thesis: *Well-posedness for two types of partial differential equations by particle methods*

2015–2017 **Joint Ph.D. progremme**, Duke University, US, *Advisor:Jian-Guo Liu*

2008–2012 **Bachelor in Mathematics (Rank/Steudents: 1/57)**, Harbin Institute of Technology, China

2010–2011 **Exchange Student in Mathematics**, Fudan University, China

Research Interest

Research Nonlinear partial differential equations, integrable systems, kinetic theory, self-organized behaviors

Preprints

[1] Y. Gao, H. Liu *On the large-time asymptotic behaviors of λ-dissipative solutions to the Hunter-Saxton equation,* arXiv:2208.09868.

Published Papers

[1] Y. Gao and J.-G. Liu, *Global convergence of a sticky particle method for the modified Camassa-Holm equation,* SIAM J. Math. Anal., 2017, 49(2):1267-1294.

[2] Y. Gao and X. Xue, *Global existence and uniqueness of measure valued solutions to a Vlasov type equation with local alignment,* Math. Methods Appl. Sci. 2017, 40:7640-7662.

[3] Y. Gao and J.-G. Liu, *The modified Camassa-Holm equation in Lagrangian coordinates,* Discrete Contin. Dyn. Syst. Ser. B., 2018, 23(6):2545-2592.

[4] Y. Gao, L. Li and J.-G. Liu, *A dispersive regularization for the modified Camassa-Holm equation,* SIAM J. Math. Anal., 2018, 50(3):2807-2838.

[5] Y. Gao, L. Li and J.-G. Liu, *Patched peakon weak solutions of the modified Camassa-Holm equation,* Physica D, 2019, 390: 15-35.

[6] Yu Gao, Yuan Gao and Jian-Guo Liu, *Large time behavior, bi-Hamiltonian structure and kinetic formulation for complex Burgers equation,* Quart. Appl. Math., 2021, 79:55-102.

[7] Y. Gao and H. Liu, *Global N-peakon weak solutions to a family of nonlinear equations,* J. Differential Equations, 2021, 271:343-355.

[8] F. Zeng, Y. Gao, and X. Xue, *Global weak solutions to the generalized mCH equation via characteristics,* Discrete Contin. Dyn. Syst. Ser. B., 2022, 27(8): 4317-4329.

[9] C. Wang, Y. Gao, and X. Xue *Joint space-time analyticity of mild solutions to the Navier-Stokes equations,* J. Math. Anal. Appl., 2022, 515(2), 126428.

[10] Y. Gao, H. Liu, and T. K. Wong *Regularity structure of conservative solutions to the Hunter-Saxton equation,* SIAM J. Math. Anal., 2022, 54(1), 423-452.

[11] Y. Gao, H. Liu, and T. K. Wong *Stability of peakons of the Camassa-Holm equation beyond wave breaking,* J. Math. Phys., 2022, 63(12), 121503

[12] C. Wang, Y. Gao, and X. Xue *Quantitative estimates for space-time analyticity of solutions to the fractional Navier-Stokes equations,* Comm. Pure Appl. Anal., 2023, 22(8), 2619-2645.

[13] Y. Gao, H. Liu, and T. K. Wong *Asymptotic behavior of conservative solutions to the Hunter-Saxton equation,* SIAM J. Math. Anal., 2023, 55(5), 5483-5525.

[14] Y. Gao, *On conservative sticky peakons to the modified Camassa-Holm equation,* J. Differential Equations, 2023, 365, 486-520.

[15] Y. Gao, C. Wang, and X. Xue *Global existence and spatial analyticity for a nonlocal flux with fractional diffusion,* J. Math. Phys., 2023, 64, 091506

[16] C. Wang, Y. Gao, and X. Xue *Optimal decay rates and space-time analyticity of solutions to the Patlak-Keller-Segel equations,* Nonlinear Anal. RWA, 2024, 79: 104114

Awards

2019 Excellent Doctoral Thesis, Harbin Institute of Technology

2018 Gold Medal of Doctoral Thesis for New World Mathematics Awards

Teaching

2024-2025 **Instructor** Complex variables functions and integral transformation (MATH1005), Harbin Institute of Technology, Shenzhen.

2023-2024 **Instructor** Mathematics I (AMA2111), The Hong Kong Polytechnic University, Hong Kong.

2022-2023 **Instructor** Mathematics I (AMA2111), The Hong Kong Polytechnic University, Hong Kong.

2021-2022 **Instructor** Mathematics I (AMA2111), The Hong Kong Polytechnic University, Hong Kong.

2020-2021 **Instructor** Mathematics I (AMA2111), The Hong Kong Polytechnic University, Hong Kong.

2019-2020 **Instructor** Functional analysis (MATH4404), The University of Hong Kong, Hong Kong.

2018-2019 **Instructor** Functional analysis (MATH4404), The University of Hong Kong, Hong Kong.

Invited Talks

07/2024 Harbin Engineering University, Harbin.

07/2024 Harbin Institute of Technology, Harbin.

07/2024 9ECM, MS: Interfaces between Interacting Particle Systems and PDEs: From Analysis to Applications, Sevilla (Spain).

10/2023 Seminar Yanqihu Mathematical center, Beijing.

07/2023 Symposium on Applied Mathematics and Data Science, Hong Kong.

12/2022 Seminar (SJTU), Shanghai.

09/2021 Analysis and PDE Seminar (organized by CUHK, HKU and UNIST (Korea)), Hong Kong.

02/2021 Symposium on PDE (organized by EdUHK and HKU), Hong Kong.

11/2019 Differential equations, optimization and control, Ningbo, China.

11/2019 Yong Jiang Forum for Mathematics, Ningbo, China.