ZHAO YANG

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Zhongguancun East Road No.55, Haidian, Beijing China

EMPLOYMENT

Academy of Mathematics and Systems Science CAS, China

– Associate Professor (with tenure-track) *08/2022-current*

University of Illinois Urbana-Champaign, USA

– J. L. Doob Research Assistant Professor *08/2019-08/2022*
Mentors: Professors Vera Hur and Jared Bronski

EDUCATION

Indiana University, Bloomington, USA

– Doctor of Philosophy, Mathematics *08/2013-05/2019*
Advisor: Professor Kevin Zumbrun
Thesis: Traveling waves in an inclined channel and their stability
College of Arts and Sciences Dissertation Research Fellowship (*2018-2019)*

– Master of Science, Applied Statistics *08/2016-05/2018*

Fudan University, Shanghai, China

– Bachelor of Science, Mathematics and Applied Mathematics *09/2009-06/2013*

INTERESTS

Nonlinear Partial Differential Equations

– traveling waves and their stability; application to fluid dynamics.

– hyperbolic system of balance laws; free surface water wave equations.

– rigorous analysis; Evans functions; pointwise Green function estimates; Floquet theory.

PUBLICATIONS

11. Z. Jiao, L. M. Rodrigues, C. Sun, and **Z. Yang**, *Small-amplitude finite-depth Stokes waves are transversally unstable*, **Comm. Math. Phys.**, 406, 255 (2025).

10. B. Braker, J. Bronski, V. Hur, and **Z. Yang**, *Asymptotic stability of sharp fronts: Analysis and rigorous computation*, **J. Differ. Equations**, 444, 113550 (2025).

9. **Z. Yang** and K. Zumbrun, *Multidimensional stability and transverse bifurcation of hydraulic shocks and roll waves in open channel flow*, **J. Math. Fluid Mech.**, 27, 30 (2025).

8. G. Faye, L. M. Rodrigues, **Z. Yang**, and K. Zumbrun, *Existence and stability of nonmonotone hydraulic shocks for the Saint Venant equations of inclined thin-film flow*, **Arch. Ration. Mech. Anal.**, 248, 82 (2024).

7. V. Hur and **Z. Yang**, *Unstable Stokes waves*, **Arch. Ration. Mech. Anal.**, 247, 62 (2023).

6. L. M. Rodrigues, **Z. Yang** and K. Zumbrun, *Convective-wave solutions of the Richard-Gavrilyuk model for inclined shallow water flow*, **Water Waves**, 5, 1–39 (2023).

5. S. Jung, **Z. Yang**, and K. Zumbrun, *Stability of strong detonation waves for Majda's model with general ignition functions*, **Quart. Appl. Math.**, 79, 357-365 (2021).
4. A. Sukhtayev, **Z. Yang**, and K. Zumbrun, *Spectral stability of hydraulic shock profiles*, **Phys. D**, 405, 132360 (2020).
3. **Z. Yang** and K. Zumbrun, *Stability of hydraulic shock profiles*, **Arch. Ration. Mech. Anal.**, 235, 195-285 (2020).
2. **Z. Yang** and K. Zumbrun, *Convergence as period goes to infinity of spectra of periodic traveling waves toward essential spectra of a homoclinic limit*, **J. Math. Pures Appl.**, 132, 27-40 (2019).
1. M. Johnson, P. Noble, L. M. Rodrigues, **Z. Yang**, and K. Zumbrun, *Spectral stability of inviscid roll-waves*, **Comm. Math. Phys.**, 367, 265-316 (2019).

PREPRINTS

3. **Z. Yang** and K. Zumbrun, *Orbital stability of undercompressive viscous shock waves under $L^1 \cap H^4$ perturbation*, arXiv:2501.18789.
2. V. Hur and **Z. Yang**, *Unstable capillary-gravity waves*, arXiv:2311.01368.
1. **Z. Yang**, *An alternative proof of modulation instability of Stokes waves in deep water*, arXiv:2109.12101.

GRANTS AND AWARDS

Dec. 2023	Excellent Young Scientists Fund (Overseas)
Oct. 2021	Bhatnagar Award for Outstanding Thesis in Applied Mathematics
Apr. 2019	Outstanding Thesis Award
2018-2019	College of Arts and Sciences Dissertation Research Fellowship
Summer 2018	Hazel King Thompson Summer Reading Fellowship
Spring 2018	Spring Semester Research Assistantship
Summer 2017	Hazel King Thompson Summer Reading Fellowship
Apr. 2017	Schober Travel Award
Apr. 2017	Graduate Student Travel Award
2013-2018	Full support for Math Phd program
2010-2012	People's Scholarship
2011, 2012	Major Scholarship
Dec. 2010	National College Students' Physical Competition **1st Prize**
2010, 2011	Selected in Top-notch Talent Plan of China
Sep. 2008	Chinese Physics Olympiad (CPhO) **1st Prize**
Dec. 2005	National Olympiad in Informatics in Provinces (NOIP) **1st Prize**

ACADEMIC VISITS

Jul. 12 - Jul. 26, 2025	Short term visitor, The University of Konstanz, Germany
Jan. 26 - Feb. 5, 2025	Short term visitor, Indiana University Bloomington, America
May. 29 - Jun. 7, 2024	Short term visitor, University of Rennes 1, France
Jun. 14 - Jul. 12, 2023	Short term visitor, University of Rennes 1, France
Mar. 6 - Mar. 20, 2022	Short term visitor, Indiana University Bloomington, America
Jan. 26 - Mar. 07, 2018	Summer Program at IMPA, Rio de Janeiro, Brazil

INVITED TALKS

Jul. 21, 2025	Workshop on Aspects of Mathematical Fluid Dynamics, The University of Konstanz, Germany
Jun. 4, 2025	PDE seminar, Shang Hai Jiao Tong University, Shanghai
Feb. 3, 2025	PDE seminar, IU
Jan. 28, 2025	HADES seminar, UIUC
Dec. 16-20, 2024	The 14th AIMS Conference, Abu Dhabi
Nov. 16-17, 2024	Nonlinear PDE symposium, Capital Normal University, Beijing
Sep. 26, 2024	PDE seminar, Henan normal university, Xinxiang
Jul. 15-18, 2024	Compressible Fluids and Related Problems, Tianyuan Mathematics Research Center, Kunming
Jun. 24-27, 2024	SIAM Conference on Nonlinear Waves and Coherent Structures, Baltimore
Jun. 10-14, 2024	Equadiff 2024, Karlstad University
Mar. 14, 2024	PDE seminar, Minzu university of China, Beijing
Nov. 25, 2023	Beijing Mathematical Society 2023 annual meeting, Beijing
May 12-15, 2023	The 10th Youth Academic Forum on PDEs, Xi'an
May 5, 2023	AMSS colloquium, Beijing
Nov. 17-20, 2022	CSIAM2022, Guangzhou (online)
Oct. 26-28, 2022	The Eighth Japan-China workshop, Beijing (online)
Mar. 29-Apr. 1 2022	Waves2022, Athens
Jan. 13, 2022	PDE seminar, BYU (online)
Oct. 9-10, 2021	AMS sectional meeting, Omaha (online)
Feb. 12, 2021	PDE seminar, Brown (online)
Nov. 30, 2020	PDE seminar, IU
Apr. 22, 2019	PDE seminar, IU
Jan. 29, 2019	HADES seminar, UIUC
Oct. 29, 2018	PDE seminar, IU
Jul. 12, 2018	SIAM annual meeting, Portland

TEACHING AND GRADING

Academy of Mathematics and Systems Science CAS

Fall 2025	*Asymptotic Analysis*, instructor

University of Illinois Urbana-Champaign

Spring 2022	M444 *Elementary Real Analysis*, instructor
	M447 *Real Variables*, instructor
Fall 2021	M285 *Introduction to Differential Equations*, instructor
Summer 2021	M446 *Applied Complex Variables*, instructor
Spring 2021	M553 *Partial Differential Equations*, instructor
	M444 *Elementary Real Analysis*, instructor
Fall 2020	M558 *Methods of Applied Mathematics*, instructor
Summer 2020	M416 *Abstract Linear Algebra*, instructor
Spring 2020	M285 *Introduction to Differential Equations*, instructor (two sessions)
Fall 2019	M416 *Abstract Linear Algebra*, instructor

Indiana University Bloomington

Fall 2017	M311	*Calculus III*, recitation
Spring 2017	M371	*Elementary Computational Method*, grading
	M540	*Partial Differential Equations I*, grading
Fall 2016	M413	*Introduction to Analysis I*, grading
	M471	*Numerical Analysis I*, grading
Summer 2016	M211	*Calculus I*, recitation
Spring 2016	M211	*Calculus I*, recitation (two sessions)
Fall 2015	M212	*Calculus II*, recitation (two sessions)
Summer 2015	M119	*Brief Survey of Calculus I*, instructor
Spring 2015	M211	*Calculus I*, recitation (two sessions)
Fall 2014	M413	*Introduction to Analysis I*, grading (two sessions)
Spring 2014	M415	*Elementary Complex Variables with Applications*, grading
	S343	*Honor Introduction to Differential Equation*, grading
Fall 2013	M303	*Linear Algebra for Undergraduates*, grading (two sessions)

PHD STUDENTS ADVISED

Ziang Jiao (coadvise with Feimin Huang), Ting-Yang Hsiao (coadvise with Vera Hur, Now postdoc at SISSA)