

Yadong Liu

Curriculum Vitæ

School of Mathematical Sciences
Nanjing Normal University
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“Ein Mathematiker ist eine Maschine, die Kaffee in Theoreme umwandelt” - Alfréd Rényi

Personal Information

Gender Male
Birth November 27, 1996 (Yancheng, Jiangsu, P.R. China)
Nationality Chinese
Homepage <https://yadongliu-math.github.io/>

Appointment

2024.01 – Now **Lecturer, Nanjing Normal University**, Nanjing, China
2023.08 – 2023.12 **Wissenschaftlicher Mitarbeiter (Postdoc)**
University of Regensburg, Regensburg, Germany
Supported by startup funding of RTG 2339 *Interfaces, Complex Structures, and Singular Limits* of the German Research Foundation (DFG)
2020.10 – 2023.07 **Wissenschaftlicher Mitarbeiter (Research Assistant)**
University of Regensburg, Regensburg, Germany
In RTG 2339 *Interfaces, Complex Structures, and Singular Limits* of the German Research Foundation (DFG)

Education

2020.10 – 2023.07 **Dr. rer. nat. in Mathematics**
University of Regensburg, Regensburg, Germany
Dissertation: Analysis of fluid-structure interaction problems with growth
Grade: *magna cum laude*
Supervisors: Prof. Dr. Helmut Abels & PD Dr. Maria Neuss-Radu
Defense Committee: Bernd Ammann, Helmut Abels, Matthias Hieber, Harald Garcke, Bogdan Matioc.
2018.09 – 2020.06 **M.Sc. in Mathematics**
Nanjing University of Information Science and Technology, Nanjing, China
2015.09 – 2018.06 **B.Sc. in Mathematics and Applied Mathematics**
Nanjing University of Information Science and Technology, Nanjing, China
2014.09 – 2015.07 **Undergraduate study in Physics**
Nanjing University of Information Science and Technology, Nanjing, China

Research Interests

Analysis of nonlinear partial differential equations

- Fluid-structure interactions: bulk-surface, bulk-bulk, well-posedness, incompressible/compressible, singular limits (low Mach number, high Reynolds number)
- Two-phase flows: diffuse interface models, viscoelastic fluids, well-posedness, long time dynamics, sharp interface limit

Publications & Preprints

◦ Preprints

15. H. Abels, M. Fei, **Y. Liu** and M. Moser, Higher Order Convergence for the Sharp Interface Limit of 3D Navier–Stokes/Allen–Cahn Systems, (2026) arXiv: 2606.30532.
14. M. Fei, X. Fei, **Y. Liu** and H. Wu, Global weak solutions to a diffuse-interface model for quasi-incompressible two-phase flows with unmatched densities and singular potential, (2026) arXiv: 2604.26660.

◦ Publications in Peer-Reviewed Journals

13. M. Fei, X. Fei, D. Han and **Y. Liu**, Weak solutions and incompressible limit of a quasi-incompressible Navier–Stokes/Cahn–Hilliard model for viscous two-phase flows, to appear in **SIAM J. Math. Anal.** (2025) arXiv: 2508.08090.
12. P. Knopf and **Y. Liu**, A Thermodynamically Consistent Free Boundary Model for Two-Phase Flows in an Evolving Domain with Bulk-Surface Interaction, to appear in **Interface Free Bound.** (2026) arXiv: 2507.01618.
11. **Y. Liu**, S. Mitra and Š. Nečasová, Weak solutions and singular limits for a compressible fluid-structure interaction problem with slip boundary conditions, **SIAM J. Math. Anal.** **58** (2026), no. 3, 2536–2577. DOI: 10.1137/25M1736827
10. M. Fei, X. Fei, D. Han and **Y. Liu**, Local-in-time existence of strong solutions to a quasi-incompressible Cahn–Hilliard–Navier–Stokes system, **Zeitschrift für Angewandte Mathematik und Mechanik** **106** (2026), no. 5, e70443, 1–24. DOI: 0.1002/zamm.70443
9. **Y. Liu** and D. Trautwein, On a diffuse interface model for incompressible viscoelastic two-phase flows, **J. Nonlinear. Sci.** **35** (2025), no. 12, 1–71. DOI: 10.1007/s00332-024-10103-w
8. H. Abels, **Y. Liu** and Š. Nečasová, Low mach number limit of a diffuse interface model for two-phase flows of compressible viscous fluids, **GAMM-Mitteilungen** (2024), e202470008, 1–15. DOI: 10.1002/gamm.202470008.
7. H. Abels and **Y. Liu**, Short time existence of a quasi-stationary fluid-structure interaction problem for plaque growth, **Adv. Nonlinear Anal.** **12** (2023), no. 1, 20230101. DOI: 10.1515/anona-2023-0101.
6. H. Abels and **Y. Liu**, On a fluid-structure interaction problem for plaque growth: cylindrical domain, **J. Differential Equations** **345** (2023), 334–400. DOI: 10.1016/j.jde.2022.11.046
5. H. Abels and **Y. Liu**, On a fluid-structure interaction problem for plaque growth, **Nonlinearity** **36** (2023), 537–583. DOI: 10.1088/1361-6544/aca5e1
4. Y. Zheng, W. Liu and **Y. Liu**, Equivalence between internal observability and exponential stabilization for suspension bridge problem, **Ric. Mat.** **71** (2022), no. 2, 711–721. DOI: 10.1007/s11587-021-00566-4
3. W. Liu, Y. Luan, **Y. Liu** and G. Li, Well-posedness and asymptotic stability to a laminated beam in thermoelasticity of type III, **Math. Methods Appl. Sci.** **43** (2020), no. 6, 3148–3166. DOI: 10.1002/mma.6108
2. **Y. Liu** and W. Liu, Blood flow analysis in tapered stenosed arteries with the influence of heat and mass transfer, **J. Appl. Math. Comput.** **63** (2020), no. 1-2, 523–541. DOI: 10.1007/s12190-020-01328-5

1. **Y. Liu** and W. Liu, Chaotic behavior analysis and control of a toxin producing phytoplankton and zooplankton system based on linear feedback, *Filomat* **32** (2018), no. 11, 3779–3789. DOI: 10.2298/fil1811779l

Academic Activities

◦ Research stays

- July–Aug. 2026 Tianyuan Mathematics Research Center, Kunming, China
Visiting Scholars Program: *Multiscale dynamics and singular limits of two-phase flows*
- Apr., May 2026 School of Mathematics and Statistics, Anhui Normal University, Wuhu, P.R. China
Host Professor: Prof. *Mingwen Fei*, Ph.D.
- June 2025 Fakultät Mathematik, Universität Regensburg, Regensburg, Germany
Host Professor: Prof. Dr. *Helmut Abels*
- Mar. 2025 School of Mathematical Sciences, Fudan University, Shanghai, P.R. China
Host Professor: Prof. *Hao Wu*, Ph.D.
- Jan., Nov., 2025 School of Mathematics and Statistics, Anhui Normal University, Wuhu, P.R. China
Host Professor: Prof. *Mingwen Fei*, Ph.D.
- Oct. 2024 School of Mathematics and Statistics, Anhui Normal University, Wuhu, P.R. China
Host Professor: Prof. *Mingwen Fei*, Ph.D.
- June 2024 Fakultät Mathematik, Universität Regensburg, Regensburg, Germany
Host Professor: Prof. Dr. *Helmut Abels*
- Nov. 2023 Institute of Mathematics, Czech Academy of Sciences, Prague, Czech Republic
Host Professor: RNDr. *Šárka Nečasová*, DSc
- Oct. 2023 Institute for Analysis, Karlsruhe Institute of Technology, Karlsruhe, Germany
Host Professor: JProf. Dr. *Xian Liao*
- Aug. 2023 School of Mathematical Sciences, Fudan University, China
Host Professor: Prof. *Hao Wu*, Ph.D.
- Nov. 2022 Institute of Mathematics, Czech Academy of Sciences, Prague, Czech Republic
Host Professor: RNDr. *Šárka Nečasová*, DSc
- Apr.–June 2022 Institute of Mathematics, Czech Academy of Sciences, Prague, Czech Republic
Host Professor: RNDr. *Šárka Nečasová*, DSc

◦ Organisation of meetings

- Sept. 2026 The 17th International Conference on *Free Boundary Problems*, Berlin, Germany
Co-organized the minisymposium: Fluid-Structure Interactions
- Oct. 2022 Annual Meeting of RTG 2339 *IntComSin*, Weltenburg
Co-organized and contributed talk
- Apr. 2022 Workshop on *Analysis of Fluid and Elastic Bodies Interactions*, Regensburg
Co-organized and contributed talk

◦ Invited talks

- Mar. 2027 Conference on *Regularity, effective behavior and asymptotic flows for models of fluid mechanics*, Marseille Luminy, France
- Feb. 2027 International Conference on the Mathematics of *Interfaces, Complex Structures, and Singular Limits*, Erlangen, Germany

- Sept. 2026 Minisymposia: *Phase Transitions and Pattern Formation and Phase Field Methods in Real-World Applications* at the 17th International Conference on *Free Boundary Problems*, Berlin, Germany
- Sept. 2026 Minisymposia: *Phase Transitions and Pattern Formation and Phase Field Methods in Real-World Applications* at the 17th International Conference on *Free Boundary Problems*, Berlin, Germany
- July 2026 Special Sessions *Phase-field models and their singular limits* and *Mathematical Insights into Phase-Field Models* at *The 15th AIMS conference*, Athens, Greece
- May 2026 Workshop on *PDEs and Stochastic PDEs in Material Science and Statistical Mechanics*, CUHKSZ, Shenzhen, China
- Jan. 2026 International Conference on *Variational Methods in Fluid and Solid Mechanics*, Tsinghua Sanya International Mathematics Forum, Sanya, China
- Nov. 2025 Workshop on *Nonlinear Partial Differential Equations*, Soochow University, Suzhou, China
- June. 2025 *Mathematics with Applications 2025*, Funchal, Madeira, Portugal
- Mar. 2025 *Mathematics Integrated Seminar*, School of Mathematical Sciences, Fudan University, China
- Oct. 2024 *Youth Seminar on Differential Equations*, Anhui Normal University, Wuhu, China
- July 2024 Workshop on *Partial Differential Equations and Its application*, Southwestern University of Finance and Economics, Chengdu, China
- Apr. 2024 *Youth Seminar on Differential Equations*, Anhui Normal University, Wuhu, China
- Nov. 2023 Seminar on *Partial Differential Equations*, Institute of Mathematics, Czech Academy of Sciences, Prague, Czech Republic
- Oct. 2023 Seminar of the Work Group *Nonlinear Partial Differential Equations*, Karlsruhe Institute of Technology, Karlsruhe
- Aug. 2023 *ICIAM 2023*, 10th International Congress on Industrial and Applied Mathematics, Waseda University, Tokyo, Japan
- Minisymposium *Modeling and Computation for Interface Dynamics in Fluids and Solids*
- Aug. 2023 *Mathematics Integrated Seminar*, School of Mathematical Sciences, Fudan University, China
- Dec. 2022 SEU Yau Center *Geometry and PDE Weekend Seminar*, Nanjing, China (online)
- Apr. 2022 Working Seminar on Partial Differential Equations, Institute of Mathematics, Czech Academy of Sciences, Prague, Czech Republic
- **Participants and talks**
- Nov. 2024 Conference on *Mathematics of fluids in motion: Recent results and trends*, CIRM, Marseille Luminy, France
- Small talk
- Oct. 2024 *The Seventh National Doctoral Forum on Partial Differential Equations*, Shenzhen University, Shenzhen, China
- Contributed talk
- June 2024 *Equadiff 2024*, Karlstad, Sweden
- Contributed talk
- May 2024 *The 5th International Symposium on Biological Mathematics and Medical Applications*, Nanjing, China

- Contributed talk
- May 2024 *11th Youth Forum of Partial Differential Equations*, Wuhu, China
- Nov. 2023 International Workshop *Vector- and Tensor-Valued Surface PDEs*, Dresden
Contributed talk
- Oct. 2023 Oberwolfach Seminar: *Recent Topics on the Navier-Stokes Equations*, Oberwolfach
Small talk
- Sept. 2023 11th GAMM Workshop on *Analysis of PDEs*, Eichstätt
Contributed talk
- Sept. 2023 Workshop on *Energetic Methods for Multi-Component Reactive Mixtures: Modelling, Stability, and Asymptotic Analysis*, WIAS Berlin
Contributed talk
- June 2023 Shocking Developments: *New Directions in Compressible and Incompressible Flows: A Conference in Honor of Alexis Vasseur's 50th Birthday*, Max Planck Institute for Mathematics in the Sciences, Leipzig
- May 2023 The GAMM Annual Meeting 2023, Dresden
Contributed talk in Session *Applied Analysis*
- Mar. 2023 Workshop on *Analysis of PDEs*, Karlsruhe
- Aug. 2022 Conference on *Mathematical Fluid Mechanics*, Prague, Czech Republic
Contributed talk
- Aug. 2022 The GAMM Annual Meeting 2022, Aachen
Contributed talk in Session *Applied Analysis*
- Aug. 2022 Hausdorff School on *Geometric Analysis and Nonlinear PDEs*, Bonn
Poster
- June 2022 Lake Como School of Advanced Studies *Mathematical Models for Bio-Medical Sciences*, Como, Italy
Contributed talk
- May 2022 International Symposium on *Biological Mathematics and Medical Applications*, NUIST, Nanjing, China (online)
Contributed talk at Graduate Forum
- May 2022 Conference *Nonlinear PDEs in Fluid Dynamics*, CIRM, Marseille Luminy, France
- Apr. 2022 Research school *Mathematical Advances in Geophysical Flows*, CIRM, Marseille Luminy, France
Small talk
- Mar. 2022 SIAM Conference on *Analysis of Partial Differential Equations*, Berlin (online)
- Mar. 2022 Workshop on *Mathematical Methods for Complex Phenomena*, Regensburg
Contributed talk
- Mar. 2022 Workshop on *PDEs for Surfaces and Interfaces*, Regensburg
- Oct. 2021 9th GAMM Workshop on *Analysis of PDEs*, Freiburg
- Oct. 2021 Annual Meeting of RTG 2339 *IntComSin*, Weltenburg (talk)
- Sept. 2021 International Conference *Free Boundary Problems*, Berlin (online)
- Aug. 2021 Summer School *Fluids under Control*, Prague (online)
- Aug. 2021 Germany-Japan Workshop on *Problems Related to Free Boundaries and Moving Contact Lines*, Tokyo (online)

Oct. 2020 TES Student Compact Course *Variational Methods for Fluids and Solids*, Berlin (online)

Teaching

- **Instructor**

Fall 26/27 Calculus I-1 (for NNU-Macquarie joint institute)
Spring 26 Calculus I-2 (for NNU-Macquarie joint institute)
Fall 25/26 Ordinary Differential Equations (for math students)
Calculus I-1 (for NNU-Macquarie joint institute)
Spring 25 Advanced Mathematics II-2 (for engineering students, only two weeks)

- **Teaching Assistant**

Fall 24/25 Mathematical Analysis III (for math students)
Spring 24 Mathematical Analysis II (for math students)

Journal Referee

Communications in Partial Differential Equations, Acta applicandae mathematicae, Applied mathematical modelling, Chaos, solitons and fractals, Journal of elliptic and parabolic equations, Mathematical methods in the applied sciences, Physics of fluids.

Honors & Awards

Nov. 2021 **Excellent academic degree master's thesis** of Jiangsu Province, Jiangsu Academic Degree Committee
Oct. 2019 **National Scholarships for Graduate Students**, Ministry of Education of the People's Republic of China
Oct. 2019 **First Prize**, Postgraduate Scholarship, Nanjing University of Information Science and Technology
Oct. 2019 **National Second Prize**, 16th National Graduate Mathematical Modeling Contest
June 2018 **Outstanding Graduates**, Nanjing University of Information Science and Technology
Apr. 2017 **Meritorious Winner**, Mathematical Contest In Modeling/Interdisciplinary Contest In Modeling
Oct. 2016 **National First Prize**, Contemporary Undergraduate Mathematical Contest in Modeling
Nov. 2015 **First Prize**, Merit Scholarship, Nanjing University of Information Science and Technology

Languages & Skills

Languages Chinese Mandarin (Native)
Yancheng dialect (Native)
English (Fluent)
German (Elementary)
Programing MATLAB, Mathematica, SPSS

References & External Links

○ References

- Prof. Dr. **Helmut Abels**
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- RNDr. **Šárka Nečasová**, DSc.
Institute of Mathematics
Czech Academy of Science
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115 67 Praha 1, Czech Republic
matus@math.cas.cz
- Prof. Dr. **Harald Garcke**
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Universität Regensburg
Universitätsstraße 31
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- PD Dr. **Maria Neuss-Radu**
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FAU Erlangen-Nürnberg
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- Prof. **Wenjun Liu**
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Nanjing University of Information Science and Technology
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Nanjing 210044, China
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○ External Links

- School of Mathematical Sciences, Nanjing Normal University
- Research Training Group 2339 (RTG 2339) *Interfaces, Complex Structures, and Singular Limits*
- GAMM Activity Group *Analysis of Partial Differential Equations*
- Fakultät für Mathematik, Universität Regensburg