# Xiaoqian Xu

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## EMPLOYMENT

Assistant Professor, Duke Kunshan University, Jul 2019-present
Postdoctoral Associate, Carnegie Mellon University, Sep 2016-Jun 2019
Postdoc Fellow, ICERM, Brown University, Jan 2017-Jun 2017

## EDUCATION

Ph.D., Mathematics, University of Wisconsin -– Madison, May 2016
*Advisors: Alexander Kiselev and Andrej Zlatoš*
Thesis: *Singularities and mixing in fluid mechanics.*
M.S., Mathematics, University of Wisconsin — Madison, May 2014
B.S., Mathematics (Prof. Shing-Tung Yau Honors Class), July 2011, Zhejiang University, China
*Advisor: Silei Wang*

## RESEARCH INTERESTS

Partial Differential Equations, Fluid Dynamics, Active Scalar, Mixing, Time-fractional Equations

## SELECTED PUBLICATIONS (authors listed in alphabetical order)

1. A. Kiselev, X. Xu, *Suppression of chemotactic explosion by mixing*, Archive for Rational Mechanics and Analysis 222.2 (2016): 1077-1112.

2. G. Iyer, A. Kiselev, X. Xu, *Lower bounds on the mix norm of passive scalars advected by incompressible enstrophy-constrained flows*, Nonlinearity 27 (2014) 973-985.

3. G. Iyer, X. Xu, A. Zlatos, *Convection-Induced Singularity Suppression in the Keller-Segel and Other Non-linear PDEs*, Trans. Amer. Math. Soc. 374 (2021), 6039-6058

4. X. Xu, *Fast growth of the vorticity gradient in symmetric smooth domains for 2D incompressible ideal flow*, Journal of Mathematical Analysis and Applications 439.2 (2016): 594-607.

5. Y. Feng, B. Hu, X. Xu, *Suppression of epitaxial thin film growth by mixing*, arXiv preprint arXiv:2011.14088 (2020). Journal of Differential Equations, in press.

6. Y. Feng, B. Hu, X. Xu, Y. Zhang *Global existence of a non-local semilinear parabolic equation with advection and applications to shear flow.*, arXiv preprint arXiv:2107.05081 (2021).

7. T. Do, V. Hoang, M. Radosz, X. Xu, *One-dimensional model equations for hyperbolic fluid flow*, Nonlinear Analysis: Theory, Methods & Applications 140 (2016): 1-11.

8. Y Feng, L Li, J Liu, X Xu, *Continuous and discrete one dimensional autonomous fractional*

*ODEs*, Discrete & Continuous Dynamical Systems-B (2017): 603-630.

9. Y. Feng, B. Hu, X. Xu, *Dissipation enhancement by mixing for evolution p–Laplacian advection equations.*, arXiv preprint arXiv:2104.12578 (2021).

10. T. Do, A. Kiselev, X. Xu, *Stability of Blow-up for a 1D model of axisymmetric 3D Euler*, Journal of Nonlinear Science 28, no. 6 (2018): 2127-2152.

## HONORS AND AWARDS

- Key program of Ministry of Science and Technology of China - Young Scientists Program. Co-PI with PI Zhennan Zhou (Peking University), co-PI Liu Liu (Chinese University of Hong Kong).
- Kunshan Shuangchuang Program, Kunshan city.
- National Natural Science Foundation of China, Youth program. Starting from Jan 2022.
- DKU Faculty Scholarship and Travel Award (FSTA), Duke Kunshan University, 2021/22
- Jiangsu Shuangchuang PhD, Jiangsu Province, 2020
- Vilas Conference Presentation Fund, University of Wisconsin-Madison, 2016
- Excellence in Research Award, Department of Mathematics, University of Wisconsin-Madison, 2015
- Chancellor's Opportunity Award, University of Wisconsin-Madison, 2012
- Excellent Graduates of Zhejiang Province, 2011
- Li & Fung fellowship, 2010
- Science and Technology Innovation Programs funds for college students of Zhejiang Province, 2010
- Special scholarship for freshman of Zhejiang University, 2007

## TALKS
- Seminar, Xihua University, Oct 2021
- Suzhou Area Youth Mathematicians Workshop, Kunshan, Sep 2021
- Summer school short course, University of Electronic Science and Technology of China, Aug 2021
- Workshop on Free Boundary and Stability Problems, Hangzhou, Jul 2021
- Seminar, IAPCM, Jun 2021
- Seminar, Beihang University, Jun 2021
- Seminar, Wuhan University, May 2021
- Analysis & PDE Webinar, Online, April 2021
- Seminar, Peking University, Dec 2020
- Suzhou Area Youth Mathematicians Workshop, Kunshan, Nov 2020
- Seminar, Shanghai Jiaotong University, Nov 2020
- AMS Fall Eastern Virtual Sectional Meeting, special session on turbulence and mixing in fluid dynamics, Oct 2020
- Seminar, University of Electronic Science and Technology of China, Chengdu, Nov 2019

- Seminar, Sichuan University, Chengdu, Nov 2019
- Seminar, Sichuan Normal University, Chengdu, Nov 2019
- AMS Sectional Meeting: Special Session on Nonlocality in Models for Kinetic, Chemical, and Population Dynamics, University of Michigan, Ann Arbor, Oct 2018
- PDE Seminar, Duke University, Mar 2018
- AMS Joint Mathematics Meeting: AMS Special Session on Mathematical Fluid Mechanics: Analysis and Applications, Jan 2018
- Seminar, Zhejiang University, Dec 2017
- PDE Seminar, Brown University, Feb 2017
- Young Researchers Workshop, Duke University, Nov 2016
- Colloquium, Missouri University of Science and Technology, Oct, 2016
- CNA seminar, Carnegie Mellon University, Sep 2016
- Colloquium, University of Wisconsin-Milwaukee, Apr 2016
- Analysis Seminar, University of Wisconsin-Milwaukee, Apr 2016
- AMS Sectional Meeting: Special Session on PDE Analysis in Fluid Flows, University of Georgia, Athens, Mar 2016
- Special Seminar, University of Alberta, Feb 2016
- AMS Joint Mathmatics Meeting: AMS Special Session on Equations of Fluid Motion, Seattle, WA, Jan 2016
- Analysis Seminar, University of Wisconsin-Madison, Oct 2015
- AMS Sectional Meeting: Special Session on Nonlinear Conservation Laws and Applications, University of Nevada, Las Vegas, Apr 2015
- Texas PDE Conference, University of Houston, Mar 2015
- Fifth Annual Oklahoma PDE Workshop, Feb 2015
- Young Researchers Workshop: Multiscale phenomena: modeling, analysis and computation, College Park, MD, Oct 2014
- SIAM Chicago Area Student Conference, Northwestern University, Apr 2014
- Summer School short talk, Stanford University, Aug 2013

**TEACHING EXPERIENCE**

*Instructor,* Duke Kunshan University

- 2019 Fall MATH 101 Calculus
- 2020 Spring MATH 401 Abstract Algebra
- 2020 Spring MATH 403 Partial Differential Equations
- 2020 Fall MATH 105 Calculus
- 2020 Fall MATH 105 Calculus
- 2021 Spring MATH 401 Abstract Algebra
- 2021 Spring MATH 403 Partial Differential Equations

*Instructor,* Carnegie Mellon University

- 2019 Spring 21-111 Differential Calculus
- 2018 Fall 21-370 Discrete-Time Finance
- 2018 Spring 21-241 Matrix and Linear Transformation
- 2017 Fall 21-476- Introduction to Dynamical System
- 2016 Fall 21-260- Differential Equations

*Teaching Assistant,* University of Wisconsin-Madison

- 2016 Spring MATH 319 - Techniques in Ordinary Differential Equations
- 2015 Fall MATH 320 - Differential Equation and Linear Algebra
- 2013 Fall MATH 211 - Business Calculus
- 2012 Fall MATH 221 - Calculus and Analytic Geometry
- 2011 Fall MATH 221 - Calculus and Analytic Geometry

## ACADEMIC VISITS

Missouri University of Science and Technology, Nov 2019
Duke University, Mar 2018
Rice University, Dec 2015
Caltech, Oct 2015
Rice University, Aug 2014 - July 2015
Carnegie Mellon University, Apr 2014
Carnegie Mellon University, Feb 2013
University of Hong Kong (undergraduate transfer program), January-June 2010

## PROFESSIONAL DEVELOPMENT

- Public talk at Duke Math Meet, Kunshan, Aug 2020
- MAA MathFest 2015, Great Talks for a General Audience: Coached Presentations by Graduate Students, Marriott Wardman Park, Washington, DC, Aug 2015
- Coordinator of a student seminar in Analysis for sophomores, Zhejiang University, 2010

## SERVICE

- Referee for Journal of Functional Analysis, SIAM Journal of Mathematical Analysis, Nonlinearity, Journal of Nonlinear Science, Journal of Differential Equations, Annals of Partial Differential Equations etc.
- Member of University Colloquium Committee
- Member of IRB, Duke Kunshan University
- Organizer of Workshop on Dissipated System, Oct 2021
- Oeganizer of Pi Day events, Mar 2021
- Member of Falculty Council, Fall 2020
- Organizer of the launching program of Zu Chongzhi Math center and Workshop on Frontiers in Mathematics and Its Application Oct 2019
- Organizer of AIM SQuaREs program: Towards a 3D Euler singularity, May 2018, Aug 2019

- Co-organizer of Special Session "Nonlocal PDEs in Fluid Dynamics" in AMS Sectional Meeting, Sep 2017
- Mentor of Directed Reading Program, 2015 Fall
- Judge in MAA Student Paper Sessions, Aug 2015
- Judge in Rice Undergraduate Research Symposium, Apr 2015
- Co-organizer of Mega Math Meet, May 2014
- Volunteer of International Congress of Chinese Mathematicians (ICCM) , Hangzhou, China, Dec 2007