

# Yifu Zhou

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## Contact Information

E-mail: yzhou173@math.jhu.edu

Office: 419 Krieger Hall

Phone: (410) 516-7729

Department of Mathematics

Johns Hopkins University

3400 N. Charles Street

Baltimore, MD 21218

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## ACADEMIC APPOINTMENT

**Johns Hopkins University**, Baltimore, USA

*J.J. Sylvester Assistant Professor*

August 2020 – present

Mentor: Professor Yannick Sire

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## EDUCATION

**University of British Columbia**, Vancouver, Canada

*Ph.D. in Mathematics*

January 2017 – July 2020

Thesis title: *New gluing methods and applications to nonlinear elliptic and parabolic equations*

Advisor: Professor Juncheng Wei

**Wuhan University**, Wuhan, China

*M.Sc. in Mathematics*

September 2014 – December 2016

Thesis title: *Lower bounds of eigenvalues for a class of finitely degenerate elliptic operators*

Advisor: Professor Hua Chen

**Wuhan University**, Wuhan, China

*B.Sc. in Mathematics*

September 2010 – June 2014

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## RESEARCH INTERESTS

Nonlinear partial differential equations, energy critical and supercritical heat equations, harmonic map heat flows, nematic liquid crystal flows, Keller–Segel systems, fractional non-local equations, construction of solutions, concentration and blow-up phenomena for elliptic and parabolic PDEs.

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## PUBLICATIONS AND PREPRINTS

1. Chen-Chih Lai, Juncheng Wei and Yifu Zhou, *Global existence of free-energy solutions to the 2D Patlak–Keller–Segel–Navier–Stokes system with critical and subcritical mass*, preprint, arXiv:2101.08306, 2021.
2. Manuel del Pino, Chen-Chih Lai, Monica Musso, Juncheng Wei and Yifu Zhou, *New type II finite time blow-up for the energy supercritical heat equation*, preprint, arXiv:2006.00716, 2020.
3. Manuel del Pino, Monica Musso, Juncheng Wei, Qidi Zhang and Yifu Zhou, *Type II finite time blow-up for the three dimensional energy critical heat equation*, preprint, arXiv:2002.05765, 2020.

4. Chen-Chih Lai, Fanghua Lin, Changyou Wang, Juncheng Wei and Yifu Zhou, *Finite time blow-up for the nematic liquid crystal flow in dimension two*, preprint, arXiv:1908.10955, 2019.
5. Juan Davila, Manuel del Pino, Juncheng Wei and Yifu Zhou, *Singularity formation for the three-dimensional axisymmetric harmonic map heat flow into  $\mathbb{S}^2$* , preprint, 2019.
6. Monica Musso, Yannick Sire, Juncheng Wei, Youquan Zheng and Yifu Zhou, *Infinite time blow-up for the fractional heat equation with critical exponent*, Math. Ann. 375 (2019), no.1–2, 361–424.
7. Chunhua Wang, Juncheng Wei, Suting Wei and Yifu Zhou, *Infinite time blow-up for critical heat equation with drift terms*, Calc. Var. Partial Differential Equations 59 (2020), no. 1, Paper No. 3.
8. Manuel del Pino, Monica Musso, Juncheng Wei and Yifu Zhou, *Type II finite time blow-up for the energy critical heat equation in  $\mathbb{R}^4$* . Discrete Contin. Dyn. Syst. 40 (2020), no. 6, 3327–3355.
9. Yannick Sire, Juncheng Wei and Yifu Zhou, *Infinite time blow-up for the critical mean field type flow*, in preparation.
10. Guoyuan Chen, Juncheng Wei and Yifu Zhou, *Finite time blow-up for the fractional critical heat equation in  $\mathbb{R}^n$* , Nonlinear Anal. 193 (2020), 111420.
11. Guoyuan Chen, Juncheng Wei and Yifu Zhou, *Bubbling along boundary geodesics for Lane–Emden–Fowler problem near the second critical exponent in dimensions 6 and 7*, preprint, 2018.
12. Hua Chen and Yifu Zhou, *Lower bounds of eigenvalues for a class of bi-subelliptic operators*, J. Differential Equations 262 (2017), no. 12, 5860–5879.

## EMPLOYMENT

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- **University of British Columbia**  
 Research Assistant and Teaching Assistant January 2017 – July 2020
- **Wuhan University**  
 Research Assistant May 2015 – December 2016  
 Teaching Assistant September 2015 – December 2015  
 Teaching Assistant September 2014 – December 2014

## ACADEMIC VISITS AND EVENTS

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- Academic Visitor September 2–18, 2019  
*Johns Hopkins University* *Baltimore, MD, USA*
- Academic Visitor September 19–21, 2019  
*Courant Institute of Mathematical Sciences* *New York, NY, USA*
- Academic Visitor September 22–28, 2019  
*Purdue University* *West Lafayette, IN, USA*
- PDE seminar, Purdue University September 26, 2019  
 Title: *Finite time singularities for the nematic liquid crystal flow in dimension two*

- Math Department Colloquium, UBC March 27, 2020  
Title: *Graduate Research Award: On the singularity formation for the nematic liquid crystal flows* (Cancelled due to COVID-19)

## CONFERENCE ATTENDED

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- Advanced PDE seminar on elliptic and parabolic equations and free boundary problems, Zhejiang University  
*May 19 – June 1, 2019*
- PIMS Mini-workshop on calculus of variations and partial differential equations around the work of Alessio Figalli, University of British Columbia  
*February 8–9, 2019*
- Pacific Northwest Geometry Seminar (PNGS), University of British Columbia  
*March 3–4, 2018*
- CRG Conference on Geometric Analysis, University of British Columbia  
*July 24–28, 2017*
- Third Sino–Chilean Conference on Nonlinear Partial Differential Equations and Nonlinear Analysis, Wuhan University  
*December 9–12, 2016*
- Recent Trends in Nonlinear Elliptic Equations and Nonlinear Analysis, Wuhan University  
*December 21–24, 2015*
- International Conference on Kinetic Equations and Related Topics, Wuhan University  
*September 13–19, 2015*

## TEACHING EXPERIENCE

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- Spring 2021: Calculus I (Biology and Social Sciences) (AS.110.106), JHU
- Fall 2020: Calculus I (Biology and Social Sciences) (AS.110.106), JHU
- Term 2 2019: Instructor, Integral Calculus (MATH 101), UBC
- Term 1 2019: Workshop Leader, Differential Calculus (MATH 110), UBC
- Term 1 2019: Teaching Assistant, Math Learning Centre, UBC
- Term 2 2018: Teaching Assistant, Green's Functions and Variational Methods (MATH 401), UBC
- Term 1 2018: Teaching Assistant, Elementary Differential Equations I (MATH 215), UBC
- Term 1 2018: Teaching Assistant, Math Learning Centre, UBC
- Term 2 2017: Teaching Assistant, Partial Differential Equations (MATH 257), UBC
- Term 1 2017: Teaching Assistant, Differential Equations (MATH 256), UBC
- Term 1 2017: Teaching Assistant, Math Learning Centre, UBC
- Term 2 2016: Teaching Assistant, Matrix Algebra (MATH 221), UBC
- Term 2 2016: Teaching Assistant, Math Learning Centre, UBC

- Term 1 2015: Teaching Assistant, Advanced Mathematics, WHU
- Term 1 2014: Teaching Assistant, Advanced Mathematics, WHU

## **HONORS AND AWARDS**

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- Graduate Research Award, UBC November 2019
- Stanley M Grant Scholarship in Mathematics, UBC May 2020
- President's Academic Excellence Initiative PhD Award, UBC May 2020
- International Tuition Award, UBC January 2017 – July 2020
- Faculty of Science PhD Tuition Award, UBC January 2017 – July 2020
- Graduate Academic Innovation Award, Wuhan University November 2017
- Scholarship for Graduate Students, Wuhan University September 2014 – September 2016
- Scholarship for Undergraduate Students, Wuhan University September 2010 – September 2013

## **RELEVANT SKILLS**

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- Language: English (fluent), Mandarin Chinese (native language)
- Software:  $\LaTeX$ , Mathematica (basic)