

# Xinyu Cheng

*Ph.D. in Mathematics*

## PERSONAL DETAILS

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<i>Address</i>	Room 2004, Guanghua Tower, Fudan University, Shanghai, China
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## EDUCATION

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**Doctor of Philosophy in Mathematics** 2021/08  
*University of British Columbia*  
Area: Analysis, dynamics and numerics in PDEs  
**PhD Thesis:** Analytical and numerical results for phase field, implicit free boundary, and fluid models.  
**Advisers:** Prof. Li, Dong & Prof. Wetton, Brian

**Masters of Science in Mathematics** 2017/08  
*University of British Columbia*  
Area: Analysis, dynamics and numerics in PDEs  
**MSc Thesis:** On the Stability of a Semi-Implicit Scheme of Cahn-Hilliard Type Equations.  
**Advisers:** Prof. Li, Dong & Prof. Wetton, Brian

**Bachelor of Science in Mathematics** 2015/06  
*The Chinese University of Hong Kong*  
Areas: Computational & Applied Maths; Enrichment Stream in Maths.

## WORKING EXPERIENCE

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**Young Principal Investigator** 2023-present  
*Research Institute of Intelligent Complex Systems at Fudan University*

**Postdoc Fellow** 2021-2023  
*the School of Mathematical Sciences at Fudan University*  
**Host:** Prof. Lei, Zhen.

**Full-time Instructor** 2018-2019  
*Department of Mathematics, University of British Columbia*  
Math 110/001: Differential Calculus 2018-2019 Winter term 1

**Full-time Teaching Assistant** 2015-2021  
*Department of Mathematics, University of British Columbia*

## ACADEMIC VISITS AND EVENTS

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**Invited minisymposium speaker at CSIAM 2022** 2022/09

*China Society for Industrial and Applied Mathematics* Guangzhou, Guangdong, China

**Academic Visitor** 2021/02-2021/04

*South University of Science and Technology of China* Shenzhen, Guangdong, China

**Invited speaker at Workshop on Analysis and PDE** 2019/08

*Tianjin Center for Applied Mathematics (TCAM)* Tianjin, China

**Academic Visitor** 2019/06-2019/07

*Tianjin University* Tianjin, China

**Invited minisymposium speaker at SIAM Conference on Applications of Dynamical Systems** 2019/05

*Society for Industrial and Applied Mathematics* Snowbird, UT, US

**Academic Visitor** 2018/07

*South University of Science and Technology of China* Shenzhen, Guangdong, China

**Academic Visitor** 2018/04

*Michigan State University* East Lansing, MI, US

**PIMS Graduate Mathematical Modelling in Industry Workshop** 2016/08

*Pacific Institute for the Mathematical Sciences* Vancouver, BC, Canada

## HONORS & AWARDS

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### **Fudan University**

China Postdoctoral Science Special Fund(In-Station) 2022

China Postdoctoral Science Fund 2022

International Postdoctoral Exchange Fellowship 2021

Shanghai "Super Postdoc" Incentive Plan 2021

### **the University of British Columbia**

President's Academic Excellence Initiative PhD Award 2020,2021

International Doctoral Fellowship 2017-2021

International Doctoral Fellowship Tuition Award 2017-2021

International Tuition Award 2015-2017

Faculty of Science Graduate Award 2015-2017

### **the Chinese University of Hong Kong**

First Class Graduate Honor 2015

Morningside College Master's List 2014-2015

Science Faculty Dean's List 2014-2015

Morningside College Exchange Scholarship 2013

Wei Lun Exchange Scholarships 2013

Weishan Lake Academic Scholarship 2012,2013

## RELEVANT SKILLS

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Software: L<sup>A</sup>T<sub>E</sub>X, MATHEMATICA, MS OFFICE, VISUAL STUDIO  
Programming: C++, C, MATLAB

## PUBLICATIONS

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### Published and Accepted

1. *On the Spectral Gap of a Square Distance Matrix*, joint with D. Li, D. Shirokoff and B. Wetton, J Stat Phys, 2017, 166(3-4), 1029–1035.
2. *Asymptotic Behaviour of Time Stepping Methods for Phase Field Models*, joint with D. Li, K. Promislow and B. Wetton, J Sci Comput, 2021, 86(3), 1–34.
3. *On a parabolic Sine-Gordon model*, joint with D. Li, C. Quan and W. Yang, Numerical Mathematics: Theory, Methods and Applications, 2021, 14(4), 1068–1084.
4. *Non-uniqueness of stationary weak solutions to the surface quasi-geostrophic equations*, joint with H. Kwon and D. Li, 2021, Commun. Math. Phys. 388, 1281–1295.
5. *Global wellposedness for 2D quasilinear wave without Lorentz*, joint with D. Li, J. Xu and D. Zha, Dynam. Part. Differ. Eq., 2022, 19(2) , 123-140.
6. *On the equivalence of classical Helmholtz equation and fractional Helmholtz equation with arbitrary order*, joint with D. Li and W. Yang , to appear in Comm. Contemp. Math.
7. *Equivalent formulations of the oxygen diffusion problem and other implicit free boundary value problems and implications for numerical approximation*, joint with Z. Fu and B. Wetton, Siam J. Appl. Math., 2023, 83(1), 52-78.

### Preprints

1. *Energy stable semi-implicit schemes for Allen-Cahn and fractional Cahn-Hilliard equations*, preprint. (47 pages.)
2. *On a Sinc-type MBE model*, joint with D. Li, C. Quan and W. Yang, submitted to Siam J. Appl. Math. ArXiv:2106.16193.
3. *Uniform Boundedness of Highest Norm for 2D Quasilinear Wave*, joint with D. Li and J. Xu, submitted. ArXiv:2104.10019.
4. *Stability analysis of BDF methods for gradient flows with  $L^2$ -bounded nonlinearity*, joint with D. Li, C. Quan and W. Yang, in preparation.
5. *Energy stability and convergence of Strang splitting method for Cahn-Hilliard equation*, joint with D. Li and C. Quan, in preparation.
6. *Global well-posedness for 2D quasilinear wave equations with non-compactly supported initial data*, joint with D. Li and J. Xu, preprint.
7. *On the global well-posedness and scattering of the 3D Klein-Gordon-Zakharov system*, joint with J. Xu, submitted. ArXiv:2210.13786.
8. *Localization for general Helmholtz*, joint with D. Li and W. Yang, submitted. ArXiv:2210.03309.