Xinyu Cheng

Ph.D. in Mathematics

PERSONAL DETAILS

Address	Room 406, No.5 Building, Fudan University, Shanghai, China
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EDUCATION

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

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

Invited speaker at the Fourth international symposium on modeling, analysis and applications in biomathematics 2024/06
Harbin Engineering University *Harbin, Heilongjiang, China*

Invited speaker at nonlinear analysis seminars 2024/06
Wuhan University of Technology *Wuhan, Hubei, China*

Seminar talk speaker 2023/11
Institute of Mathematical Sciences, ShangTech University *Shanghai,China*

Seminar talk speaker 2023/07
School of Mathematics, South China University of Technology *Guangzhou, Guangdong, China*

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

Fudan University

Young Scientists Fund of NSFC	2024
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

Software: LaTeX, Mathematica, MS Office, Visual Studio
Programming: C++, C, Matlab

PUBLICATIONS

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.

8. *On the global well-posedness and scattering of the 3D Klein-Gordon-Zakharov system*, joint with J. Xu, Calc. Var. Part. Diff. Eqn., 63(17), 2024.

9. *Localization for general Helmholtz*, joint with D. Li and W. Yang, to appear in J. Diff. Eqn.

Preprints

1. *Unconditionally stable exponential integrator schemes for the 2D Cahn-Hilliard equation,* preprint, submitted.

2. *Energy stable semi-implicit schemes for the 2D Allen-Cahn and fractional Cahn-Hilliard equations,* preprint, submitted.

3. *Energy stable semi-implicit schemes for the 3D Allen-Cahn equation,* preprint, submitted.

4. *Second order energy stable semi-implicit schemes for the 2D Allen-Cahn equation,* preprint, submitted.

5. *On a Sinc-type MBE model*, joint with D. Li, C. Quan and W. Yang, submitted to Siam J. Appl. Math. ArXiv:2106.16193.

6. *Uniform boundedness of the highest norm for 2D quasilinear wave*, joint with D. Li and J. Xu, submitted. ArXiv:2104.10019.

7. *Energy stability and convergence of Strang splitting method for Cahn-Hilliard equation*, joint with D. Li, in preparation.

8. *Global well-posedness for 2D quasilinear wave equations with non-compactly supported initial data*, joint with D. Li and J. Xu, preprint.

9. *Global well-posedness of a two dimensional wave-Klein-Gordon system with small non-compactly supported data*, submitted. ArXiv:2312.00821.

ACADEMIC SERVICE

I have refereed articles for publications in Physica Scripta, IMA Journal of Numerical Analysis, Advances in Computational Mathematics, Fractional Calculus and Applied Analysis, Dynamics of Partial Differential Equations.