

# XINYU CHENG 程新宇

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## 教育背景

不列颠哥伦比亚大学 (UBC), 哲学博士	2017-2021
<ul style="list-style-type: none"><li>方向：偏微分方程的分析与数值方法</li><li>博士论文：Analytical and numerical results for phase field, implicit free boundary, and fluid models.</li><li>导师：Prof. Li, Dong &amp; Prof. Wetton, Brian.</li></ul>	
不列颠哥伦比亚大学 (UBC), 理学硕士	2015-2017
<ul style="list-style-type: none"><li>方向：偏微分方程的分析与数值方法</li><li>硕士论文：On the Stability of a Semi-Implicit Scheme of Cahn-Hilliard Type Equations.</li><li>导师：Prof. Li, Dong &amp; Prof. Wetton, Brian.</li></ul>	
香港中文大学 (CUHK), 理学学士	2011-2015
<ul style="list-style-type: none"><li>方向：基础数学与应用数学</li></ul>	

## 职业经历

复旦大学, 青年研究员	2023 至今
<ul style="list-style-type: none"><li>单位：智能复杂体系基础理论与关键技术实验室</li></ul>	
复旦大学, 博士后研究员	2021-2023
<ul style="list-style-type: none"><li>单位：数学科学学院</li><li>合作导师：雷震</li></ul>	
不列颠哥伦比亚大学, 博士生助教讲师	2018-2019
<ul style="list-style-type: none"><li>单位：数学系</li><li>课程：Math 110/001: Differential Calculus</li></ul>	
不列颠哥伦比亚大学, 研究生助教	2015-2021
<ul style="list-style-type: none"><li>单位：数学系</li><li>课程：Math 300: Complex Analysis, Math 316: Partial Differential Equations, etc.</li></ul>	

## 学术活动

三亚波国际前沿论坛	2024.01
<ul style="list-style-type: none"><li>主办方：清华三亚国际数学论坛</li></ul>	
讨论班报告, 报告人	2023.11
<ul style="list-style-type: none"><li>主办方：上海科技大学数学科学研究所</li><li>报告题目：Analytical and numerical results of some phase field and free boundary models.</li></ul>	
学术访问, 访问学者	2023.07-2023.08
<ul style="list-style-type: none"><li>邀请方：华南理工大学数学学院</li></ul>	
高维偏微分方程的分析和计算线上研讨会, 报告人	2022.12
<ul style="list-style-type: none"><li>主办方：南方科技大学和北京师范大学（珠海校区）</li><li>报告题目：Trigonometric type models in the recent study of phase field problems.</li></ul>	
学术访问, 访问学者	2021.02 - 2021.04
<ul style="list-style-type: none"><li>邀请方：南方科技大学国际应用数学中心</li></ul>	

## 天津大学偏微分方程研讨会，报告人

2019.08

- 主办方：天津大学应用数学中心
- 地点：天津市
- 报告题目：Computational, Asymptotic, and Rigorous Analysis of Fully Implicit Time Stepping for Allen-Cahn Dynamics.

## 学术访问，访问学者

2019.06 - 2019.08

- 邀请方：天津大学应用数学中心

## SIAM Conference on Applications of Dynamical Systems, Invited minisymposium speaker 2019.05

- 主办方：美国工业与应用数学学会
- 地点：Snowbird, UT, US
- 报告题目：Computational, Asymptotic, and Rigorous Analysis of Fully Implicit Time Stepping for Allen-Cahn Dynamics.

## 学术访问，访问学者

2018.04

- 邀请方：美国密歇根州立大学

## 荣誉奖项以及基金

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### 复旦大学

- 中国博士后科学基金特别资助 (站中) 2022
- 中国博士后科学基金面上 2022
- 中国博士后国际交流计划引进项目 2021
- 上海市“超级博士后”激励计划 2021

### 不列颠哥伦比亚大学

- President's Academic Excellence Initiative PhD Award 2020-2021
- International Doctoral Fellowship 2017-2021
- International Tuition Award 2015-2017
- Faculty of Science Graduate Award 2015-2017

### 香港中文大学

- 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

## 相关技能

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- 软件： $\text{\LaTeX}$ , MATHEMATICA, MS OFFICE, VISUAL STUDIO
- 编程：C++, C, MATLAB

## 研究成果

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### 已发表（接收）论文

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, Comm. 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. Partial Differential Equations, 63(17), 2024.
9. *Localization for general Helmholtz*, joint with D. Li and W. Yang, to appear in J. Diff. Eqn.

#### 预印版论文

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. ArXiv:2106.16193.
6. *Uniform Boundedness of 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.