Xinyu Cheng 程新宇

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地址 · **上海市杨浦区邯郸路 220 号复旦大学 5 号楼 406 室**

教育背景

不列颠哥伦比亚大学 (UBC)，*哲学博士* 2017-2021

- 方向：偏微分方程的分析与数值方法
- 博士论文：Analytical and numerical results for phase field, implicit free boundary, and fluid models.
- 导师：Prof. Li, Dong & Prof. Wetton, Brian.

不列颠哥伦比亚大学 (UBC)，*理学硕士* 2015-2017

- 方向：偏微分方程的分析与数值方法
- 硕士论文：On the Stability of a Semi-Implicit Scheme of Cahn-Hilliard Type Equations.
- 导师：Prof. Li, Dong & Prof. Wetton, Brian.

香港中文大学 (CUHK)，*理学学士* 2011-2015

- 方向：基础数学与应用数学

职业经历

复旦大学，青年研究员 2023 至今

- 单位：智能复杂体系基础理论与关键技术实验室

复旦大学，博士后研究员 2021-2023

- 单位：数学科学学院
- 合作导师：雷震

不列颠哥伦比亚大学，博士生助教讲师 2018-2019

- 单位：数学系
- 课程：Math 110/001: Differential Calculus

不列颠哥伦比亚大学，研究生助教 2015-2021

- 单位：数学系
- 课程：Math 300: Complex Analysis, Math 316: Partial Differential Equations, etc.

学术活动

讨论班报告，报告人 2023.11

- 主办方：上海科技大学数学科学研究所
- 报告题目：Analytical and numerical results of some phase field and free boundary models.

学术访问，访问学者 2023.07-2023.08

- 邀请方：华南理工大学数学学院

高维偏微分方程的分析和计算线上研讨会，报告人 2022.12

- 主办方：南方科技大学和北京师范大学（珠海校区）
- 报告题目：Trigonometric type models in the recent study of phase field problems.

学术访问，访问学者 2021.02 - 2021.04

- 邀请方：南方科技大学国际应用数学中心

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

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

- 软件：LaTeX, Mathematica, MS Office, Visual Studio
- 编程：C++, C, Matlab

研究成果

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, to appear in Calc. Var. Partial Differential Equations.

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. *Stability analysis of BDF methods for gradient flows with L^2-bounded nonlinearity*, joint with D. Li, C. Quan and W. Yang, in preparation.
8. *Energy stability and convergence of Strang splitting method for Cahn-Hilliard equation*, joint with D. Li and C. Quan, in preparation.
9. *Global well-posedness for 2D quasilinear wave equations with non-compactly supported initial data*, joint with D. Li and J. Xu, preprint.
10. *Localization for general Helmholtz*, joint with D. Li and W. Yang, submitted. ArXiv:2210.03309.
11. *Global well-posedness of a two dimensional wave-Klein-Gordon system with small non-compactly supported data*, submitted. ArXiv:2312.00821.