

CURRICULUM VITAE

Bo Lin

Research Fellow

Department of Mathematics, National University of Singapore

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EDUCATION

- **Ph.D**, Applied Mathematics, National University of Singapore, Singapore *Aug. 2016 - Nov. 2020*
Thesis: Efficient and Accurate Parallel Simulations for Streamer Discharge in Three Dimensions
Supervisors: Professor Weizhu Bao, Professor Zhenning Cai
- **B.Sc**, Information and Computing Science, Nanjing University, China *Sep. 2012 - Jun. 2016*
- **B.Fin**, Finance (Double degree), Nanjing University, China *Sep. 2012 - Jun. 2016*

EMPLOYMENT

- Senior Research Fellow, Department of Mathematics, National University of Singapore *May. 2024 - Present*
- Research Fellow, Department of Mathematics, National University of Singapore *Dec. 2020 - Apr. 2024*

RESEARCH INTEREST

- Numerical simulation for multi-physics
- Structure-preserving algorithms for kinetic theory
- Numerical analysis for dissipative/dispersive equations

REFEREED PUBLICATIONS

Submitted

13. **Bo Lin**, Haoxuan Wang, Siyao Yang, Zhenning Cai (2024). Time-dependent regularized 13-moment equations with Onsager boundary conditions in the linear regime. Submitted.

Published and Accepted

12. Qingyuan Shi, Chijie Zhuang, **Bo Lin**, Dan Wu, Li Li, Rong Zeng (2024). Adaptive local mesh refinement in 2D finite volume method for steady state and transient simulations of semiconductor devices. Accepted in *IEEE Transactions on Magnetics*.
11. **Bo Lin**, Chijie Zhuang, and Qingyuan Shi (2024). Adaptive mesh refinement and embedded boundary method for streamer discharge simulations. Accepted in *IEEE Transactions on Magnetics*.
10. Qingyuan Shi, Yongyong Cai, Chijie Zhuang, **Bo Lin**, Dan Wu, Rong Zeng, Weizhu Bao (2024). A robust hybridizable discontinuous Galerkin scheme with harmonic averaging technique for steady state of real-world semiconductor devices. *Journal of Computational Physics*, 519, 113422.
9. **Bo Lin**, Ying Ma, and Chushan Wang (2024). A Lawson-time-splitting extended Fourier pseudospectral method for the Gross-Pitaevskii equation with time-dependent low regularity potential. *Journal of Computational Physics*, 512, 113133.

8. Weizhu Bao, **Bo Lin**, Ying Ma, and Chushan Wang (2024). An extended Fourier pseudospectral method for the Gross-Pitaevskii equation with low regularity potential. *East Asian Journal on Applied Mathematics*, 14(3), 530-550.
7. Yige Yuan, Bingbing Xu, **Bo Lin**, Liang Hou, Fei Sun, Huawei Shen, and Xueqi Cheng (2024). PDE+: Enhancing Generalization via PDE with Adaptive Distributional Diffusion. *the 38th Annual AAAI Conference on Artificial Intelligence*.
6. Zhenning Cai, **Bo Lin**, and Meixia Lin (2024). A positive and moment-preserving Fourier spectral method. *SIAM Journal on Numerical Analysis*, 62(1), 273-294.
5. Zhenning Cai, Jingwei Hu, Yang Kuang, and **Bo Lin** (2022). An entropic method for discrete systems with Gibbs entropy. *SIAM Journal on Numerical Analysis*, 60(4), 2345-2371.
4. **Bo Lin**, Chijie Zhuang (2022). Adaptive strategies to fast multipole method in photoionisation calculations for streamer discharges. *High Voltage*, 7(6), 1034-1047.
3. **Bo Lin**, Chijie Zhuang, Zhenning Cai, Rong Zeng, and Weizhu Bao (2020). Accurate and efficient calculation of photoionization in streamer discharges using fast multipole method. *Plasma Sources Science and Technology*, 29(12), 125010.
2. Chijie Zhuang, **Bo Lin**, Rong Zeng, Lei Liu, and Min Li (2020). 3-D parallel simulations of streamer discharges in air considering photoionization. *IEEE Transactions on Magnetics*, 56(3), 1-4.
1. **Bo Lin**, Chijie Zhuang, Zhenning Cai, Rong Zeng, and Weizhu Bao (2020). An efficient and accurate MPI-based parallel simulator for streamer discharges in three dimensions. *Journal of Computational Physics*, 401, 109026.

HONORS AND AWARDS

- Top Graduate Tutors (top 20% of all graduate tutors) in Department of Mathematics for Academic Year 2018/19, National University of Singapore, 2019.
- Finalist of the 7th BGCE Student Paper Prize, SIAM Conference on Computational Science and Engineering (CSE19), 2019.
- SIAM Student Travel Award, 2019.
- First-Class Prize of Outstanding Bachelor's Thesis, Nanjing University, 2016.
- Outstanding Graduate Award, Nanjing University, 2016.
- National Scholarship, China, 2014.

PROFESSIONAL ACTIVITIES

Reviewer for Journals

- SIAM Journal on Scientific Computing, Journal of Computational Physics, Information Sciences

Organized Symposia

- “Modeling and Computation for Interface Dynamics in Fluids and Solids”, The 10th International Congress on Industrial and Applied Mathematics, Tokyo, Japan, Aug. 2023.

Invited Talks

- “A structure-preserving method to the Boltzmann equation”, International Conference on Scientific Computation and Differential Equations, Singapore, Jul. 15-19, 2024.
- “Adaptive mesh refinement and embedded boundary method for streamer discharge simulations”, 21st biennial conference on electromagnetic field computation, Jeju, Korea, Jun. 2-5, 2024.

- “A positive and moment-preserving Fourier spectral method”, The 10th International Congress on Industrial and Applied Mathematics, Tokyo, Japan, Aug. 20-25, 2023.
- “Two adaptive strategies to the calculation of streamer discharges in two and three dimensions”, International Conference on Scientific Computation and Differential Equations, Reykjavík, Iceland, Jul. 25-29, 2022.
- “An entropic scheme for systems with mass conservation” (virtual), Nanjing University of Aeronautics and Astronautics, Nanjing, China, Jul. 5, 2021.
- “An adaptive mesh refinement method and its parallel implementation in plasma simulations” (virtual), Forum on fluid interface and adaptive methods (in Chinese), Beijing, China, Jun. 5, 2021.
- “A parallel simulator for streamer discharges in three dimensions”, Workshop on Modeling and Simulation for Quantum Condensation, Fluids and Information, Singapore, Nov. 18-22, 2019. (slides)
- “An efficient and accurate parallel simulator for streamer discharges in three dimensions”, The 7th NUS Graduate Symposium in Mathematics, Singapore, Apr. 22, 2019.
- “An efficient and accurate parallel simulator for streamer discharges in three dimensions ”, SIAM Conference on Computational Science and Engineering (CSE19), Spokane, Washington, USA, Feb. 25 -Mar. 1, 2019.

Improvement to Software

- PETSc version 3.10 (<https://lists.mcs.anl.gov/pipermail/petsc-announce/2018/000068.html>)
- Chombo

Professional Services

- Student Chapter Representative to SIAM Student Days, Spokane, Washington, USA, Feb. 24-28, 2019. (Funded by SIAM Chapter Representative Funding)

TEACHING EXPERIENCES

National University of Singapore

Teaching Assistant in the Department of Mathematics for the following courses:

- MA1521 Calculus for Computing, Semester 2, 2019/20
- MA2213 Numerical Analysis I, Semester 1, 2019/20
- MA1521 Calculus for Computing, Semester 1 & 2, 2018/19
- CS1231 Discrete Structures, Semester 2, 2017/18
- MA3110 Mathematical Analysis II, Semester 2, 2017/18
- MA1521 Calculus for Computing, Semester 1, 2017/18