CURRICULUM VITAE

Bo Lin

Research Fellow
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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, and 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, and 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, and 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** and 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