Siwei Luo

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University of Science and Technology of China, No.96, JinZhai Road
Baohe District, Hefei / Anhui, 230000, China

Junior Undergraduate Majoring mathematics

Date of Birth: Sep 10, 2007 | Dedicated mathematics undergraduate with hands-on research experience in kinetic theory and statistical physics.

Accomplishments

- **2025 S.-T. Yau College Student Mathematics Contest: Honorable Mention in Written Exam (Analysis and Partial Differential Equations) with rank 29 among all the undergraduates in the written exam**
- 2023 Outstanding Freshman Scholarship
- 2024 Scholarship for Hua Loo-Keng Talent Program in Mathematics
- 2024 Chen Linyi Honored Scholarship
- 2025 Huawei Scholarship
- 2025 Scholarship for Hua Loo-Keng Talent Program in Mathematics

Education

B.S. Mathematics **Sept 2023 — Present**
University of Science and Technology of China, Hefei,
Anhui, China

- **GPA: 3.98/4.30 (91.7/100)**
- Selected Coursework: Real Analysis (H) 90/100 Topology (H) 93/100 Complex Analysis (H) 95/100 Advanced Probability Theory 97/100

Research Experience

2025 Summer Research in Kinetic Theory, Institute of Mathematical Science, Chinese University of Hong Kong **Jul 2025 — Aug 2025**
Hong Kong, China

- **Advisor: Prof. Zhouping Xin and Prof. Renjun Duan**
- Worked As Honorable Research Assistent (junior)
- Studied Villani's review on Fisher information in kinetic theory
- Implemented the Fisher–entropy framework on a finite-velocity discrete kinetic model, and derived convergence and stability estimates using entropy/Fisher tools.

Boltzmann Equation with Mass Exchange (based on Degond-Liu's work), University of Science and Technology of China **Nov 2025 — Present**
Hefei, Anhui, China

- **Advisor: Prof. Shunlin Shen**
- Studied Degond-Liu's mass–exchange Boltzmann model on a mass lattice and formulated a continuous-mass Boltzmann equation as a scaling limit. Established weak compactness of (f^eps) using Dunford–Pettis type arguments and time equicontinuity from the weak formulation.
- Performed a consistency analysis of the collision operator via truncation and Riemann–sum approximations , exploiting C1-regularity of the kernel and exchange map to identify the continuous-mass limit.
- ***Work in progress:*** stability and uniqueness in a local dual (Wasserstein-type) metric and quantitative O(eps) convergence