

# CHAOAN LI

Laboratory of Mathematics and Complex Systems  
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## Education

- **Beijing Normal University (BNU)** Beijing, People's Republic of China  
*M. S. - Pure Mathematics; GPA: 3.5/4* Sep. 2021 – Jul. 2024
- **University of Science and Technology Beijing (USTB)** Beijing, People's Republic of China  
*B. S. - Mathematics and Applied Mathematics; GPA: 3.94/4;* Sep. 2017 – Jul. 2021
- **University of Science and Technology Beijing (USTB)** Beijing, People's Republic of China  
*Second Major - Financial Engineering; GPA: 3.69/4;* Sep. 2018 – Jul. 2021

## Publications

- C. Li, X. Yan and D. Yang, **Anisotropic ball Campanato-type function spaces and their applications**, Anal. Math. Phys. 13 (2023), Paper No. 50, 71 pp.
- C. Li, X. Yan and D. Yang, **Fourier transform of anisotropic Hardy spaces associated with ball quasi-Banach function spaces and its applications to Hardy–Littlewood inequalities**, Acta Math. Appl. Sin. Engl. Ser. (Revised), arXiv: 2306.05840.

## Awards

- 2nd Prize Academic Innovation Award, Beijing Normal University (CNY 5,000) 2023
- 1st Prize Academic Scholarship, Beijing Normal University (CNY 12,000) 2023
- 2nd Prize Academic Scholarship, Beijing Normal University (CNY 10,000) 2022
- 1st Prize Freshman Scholarship, Beijing Normal University (CNY 10,000) 2021
- People's 1st Class Scholarship, University of Science and Technology Beijing, (CNY 3,000) 2018 - 2020

## Honors

- Outstanding TA for Undergraduate Courses, Beijing Normal University 2022
- Excellent Campers of Summer Camp, Nankai University 2021
- Excellent Campers of Summer Camp, Wuhan University 2021
- Excellent Campers of Summer Camp, Beijing Normal University 2021
- Outstanding Graduates, University of Science and Technology Beijing 2021
- 2nd Prize of Undergraduate Mathematical Contest in Modeling, Beijing 2020
- 3rd Prize of Chinese Mathematics Competitions, People's Republic of China 2018

## Research Experiences

- **Non-Smooth Atomic Decomposition of Anisotropic Triebel–Lizorkin spaces**  
*Advisor: Dachun Yang, Yoshihiro Sawano* April. 2023 – Present
  - **Non-smooth atomic decomposition:** Establish a non-smooth atomic decomposition of anisotropic Triebel–Lizorkin Spaces.
  - **Applications:** As a special case, establish a non-smooth atomic decomposition of anisotropic BMO spaces. Also presented the boundedness of Marcinkiewicz integral operators as an application.
- **Anisotropic Hardy Spaces Associated with Ball Quasi-Banach Function Spaces (BQFS)**  
*Advisor: Dachun Yang* Jan. 2022 – Oct. 2023
  - **Duality:** Introduce the anisotropic ball Campanato-type function spaces and give the dual space of anisotropic Hardy space associated with BQFS.

- **Littlewood–Paley function characterizations:** Establish the anisotropic Lusin area function, the anisotropic Littlewood–Paley  $g$ -function, and the anisotropic Littlewood–Paley  $g_\lambda^*$ -function characterizations.
- **Fourier transform:** Prove that the Fourier transform of functions coincides with a continuous function in the sense of tempered distributions.
- **Hardy–Littlewood inequalities:** Show that the Hardy–Littlewood inequality holds true for the anisotropic Hardy space associated with BQFS.
- **Boundedness of Singular Integral Operators with Rough Kernels on Triebel–Lizorkin Space**  
*Advisor: Yanping Chen* *Sept. 2020 – Jun. 2021*
  - **Boundedness of Parabolic Singular Integral Operators:** Establish the boundedness on the Triebel–Lizorkin Space of the parabolic singular integral operators with kernels in Block Space.
- **Tracking Scan of Text Mining and Machine Learning**  
*Advisor: Zhixiong Zhang* *Sept. 2019 – Sept. 2020*
  - **The Undergraduate Student Innovation Practice Program of the Chinese Academy of Sciences:** Track and scan the latest AI achievements from institutions such as MIT, Google, and Microsoft.

## Conference

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- **2023 Harmonic Analysis and Its Applications (Beijing)** Beijing, People's Republic of China  
*Participant* *Oct. 2023*
- **2023 Beijing Harmonic Analysis and Its Application** Beijing, People's Republic of China  
*Assist in Organizing & Participant* *Aug. 2023*
- **2023 International Congress of Basic Science** Beijing, People's Republic of China  
*Participant* *Jul. 2023*

## TA Experience

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- **Mathematical Analysis III** BNU  
*Organize Q & A and exercise classes for over 110 students.* *Sep. 2023 – Dec. 2023*
- **Mathematical Analysis II** BNU  
*Organize Q & A and exercise classes for over 100 students.* *Mar. 2023 – Jul. 2023*
- **Functional Analysis** BNU  
*Organize Q & A and exercise classes for over 140 students.* *Sep. 2022 – Dec. 2022*
- **Selected Topics in Harmonic Analysis (Outstanding TA in 2022)** BNU  
*Organize Q & A and exercise classes for over 100 students.* *Mar. 2022 – Jul. 2022*

## Relevant Coursework

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- Real Analysis
- Functional Analysis
- Fourier Analysis
- Function Spaces

## Skills

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- **Programming:** Proficient in Matlab and L<sup>A</sup>T<sub>E</sub>X. Familiar with R, C# and Python.
- **Languages:** English (IELTS - 6.5, GRE - 317+3.5); Chinese (Native speaker).