



JIACHEN BAI

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iNSPIRE: Jiachen Bai

EDUCATION

Bachelor of Science | Astronomy

Sep. 2021 – Jul. 2025

GPA: 3.8/4 (2nd among 21) | School of Physics and Astronomy, Beijing Normal University (BNU)

Beijing, China

WORK EXPERIENCE

Observational Astrophysics Internship

Sep 2023 – Oct 2023

Observatorio Astrofísico de Javalambre, CEFCA

Teruel, Spain

- Using observational data to determine properties of clusters and variable stars.

Undergraduate Research Project (Group Leader)

May 2023 – May 2024

School of Physics and Astronomy, BNU

Beijing, China

- Constraining modified gravity with CC, SN, BAO, CMB.

Cosmology Internship

Jun 2024 – Aug 2024

National Astronomical Observatories, CAS

Beijing, China

- Constraining modified gravity and massive neutrinos using CMB and weak lensing.

RESEARCH INTERESTS

Dark Energy & Modified Gravity

My research focuses on understanding the nature of dark energy and exploring alternative cosmological models through modified gravity theories. I aim to investigate the dynamics driving the accelerated expansion of the universe, probing the validity of Λ CDM and exploring potential deviations.

Computational Cosmology

My work integrates data-driven approaches with traditional analytical methods to improve cosmological parameter estimation, model validation, and the understanding of gravity. I also explore the potential of AI in optimizing simulations and accelerating cosmological data analysis.

Large-scale Structure

I am deeply interested in the large-scale structure of the universe, focusing on understanding the distribution and evolution of galaxies, galaxy clusters, and cosmic voids over vast cosmic scales. My research aims to extract new information relevant to cosmological models through simulations and observations of the LSS.

PUBLICATIONS

FREmu: Power Spectrum Emulator for $f(R)$ Gravity

arXiv: 2405.05840, Published in ApJ

Jiachen Bai, Junqing Xia

Testing $f(R)$ Gravity from Cosmic Shear Measurements

arXiv: 2412.04807

Jiachen Bai, Junqing Xia, Gongbo Zhao

HONORS AND AWARDS

The BNU First Prize Scholarship (10%)

Oct 2022, 2023, 2024

Beijing Normal University

Excellent Undergraduate Research Project (10%)

May 2024

Beijing Normal University

Linbridge Prize for Excellent Undergraduate Research Projects in Astronomy and Astrophysics Sep 2024

Kavli Institute for Astronomy and Astrophysics at Peking University

National Scholarship (5%) Beijing Normal University	Oct 2024
Academic Scholarship Beijing Normal University	Oct 2024

CONFERENCES AND SEMINARS

The 3rd Undergraduate Academic Forum of the Department of Astronomy Beijing Normal University	May 2024
The 2024 PKU Undergraduate Astronomy Symposium Kavli Institute for Astronomy and Astrophysics at Peking University	Sep 2024
The 2nd Symposium on AI-Driven Astronomy University of Chinese Academy of Science	Apr 2024

SKILLS

Languages: Chinese (Native), English (IELTS: 7.5, CET6: 575)
Programming: Python, Fortran, MATLAB, Mathematica
Document Creation: Microsoft Office Suite, LaTeX, Markdown

HOBBIES

Running: 10k PB 42min30s, Half-Marathon PB 1h34min40s.
Badminton: 3rd in Jiangsu Province (my best record).
Swimming: 1k PB 22min.
Soccer: 4th in Beijing Normal University (with team Astronomy).
Basketball: I play a lot.
Music: I'm a music producer (Hip-hop and R&B).
Filming: I'm also a Youtuber, but my last video was uploaded 3 years ago...
Computer Game: I like playing Civ6 and CS2, I develop my own games too.