Jia-Ming Zhu-Ge

School of Physical Sciences
University of Science and Technology of China
Hefei, Anhui, 230026, P.R.China

+86 13989786209
Jiaming Zhuge's Homepage
zhugejiaming@mail.ustc.edu.cn

Education

University of Science and Technology of China (USTC) Anhui, China
Wang Shouguan Talent Program in Astronomy, School of Physical Science
Bachelor of Science in Astronomy (expected) *Sep. 2019 – Jul. 2023*

- Overall GPA: **3.8**/4.3 (**3.77**/4.0)

Research Interests

High-energy Astrophysics, Multi-messenger Astronomy, Machine Learning, Compact Object, Star, AGN

Awards & Honors

National Astronomical Observatories Scholarship 2022
National Astronomical Observatories, Chinese Academy of Sciences (CAS)

Outstanding Student Scholarship 2022, 2021, 2020
University of Science and Technology of China (USTC)

Second Prize in China Undergraduate Physics Tournament in Anhui Province 2021
Department of Education of Anhui Province

First Prize in Anhui College Students' Mathematics Competition 2020
Department of Education of Anhui Province

Papers

Identifying the physical origin of gamma-ray bursts with supervised machine learning
Jia-Wei Luo, Fei-Fei Wang, **Jia-Ming Zhu-Ge**, Ye Li, Yuan-Chuan Zou, Bing Zhang,
Submitted to MNRAS Nov. 2022, arxiv.org/abs/2211.16451

Machine learning classification of CHIME fast radio bursts: II. Unsupervised Methods
Jia-Ming Zhu-Ge, Jia-Wei Luo, Bing Zhang,
Monthly Notices of the Royal Astronomical Society, Volume 519, Issue 2, February 2023, Pages 1823–1836,
https://doi.org/10.1093/mnras/stac3599

Machine learning classification of CHIME fast radio bursts: I. Supervised Methods
Jia-Wei Luo, **Jia-Ming Zhu-Ge**, Bing Zhang,
Monthly Notices of the Royal Astronomical Society, Volume 518, Issue 2, January 2023, Pages 1629–1641,
https://doi.org/10.1093/mnras/stac3206

Research Experience

Assessing the Detection Capability of the Extreme Ultraviolet Radiation of Active Galactic Nuclei by the China Space Station Telescope (CSST) Hefei, China
Advisors: **Prof. Zhenyi Cai** (CAS Key Laboratory for Research in Galaxies & Cosmology, USTC) *Jul. 2022 - Present*

- Derived cosmological quantities and k correction
- Simulated the observed capability of CSST for the QSOs in different redshifts, based on the luminosity function and transmission curve
- Planned to consider more corrections and to write paper

Identifying the Physical Origin of GRB with Machine Learning Methods Las Vegas, America
Advisors: **Prof. Bing Zhang** (Nevada Center for Astrophysics, University of Nevada) *Aug. 2022 - Nov. 2022*

- Assisted to select the features of GRBs and gave advice about feature importance in a supervised way
- Revealed the physical origin of GRBs with unsupervised machine learning
- Paper: 2211.16451(arxiv) (**Submitted, 3rd author**)

Machine Learning Classification of CHIME Fast Radio Bursts Las Vegas, America
Advisors: **Prof. Bing Zhang** (Nevada Center for Astrophysics, University of Nevada) *Apr. 2022 - Aug. 2022*

- Undertook the unsupervised machine learning way
  Derived and calculated the physical features, tested and selected machine learning models
- Participated in the supervised machine learning way
  Tested the models and checked features, overlapped the result with unsupervised one
- Successfully classified FRBs and concluded the number of types in FRBs
  Presented the list of repeaters candidates and reported it in the FAST group meeting
- Papers: mnras/stac3206 (**Accepted, 2nd author**), mnras/stac3599 or 2210.02471(arxiv) (**Accepted, 1st author**)

Period Search of Fast Radio Bursts in Milliseconds Scale Hefei, China

Advisors: **Prof. Zigao Dai**, **Dr. Shuqing Zhong** (Department of Astronomy, USTC) *Feb. 2022 - Apr. 2022*

- Utilized three different algorithms to search periods in FRB121102, FRB190520B, FRB20201124A
- Crossing checked and modified the code to be available on the millisecond scale
- Found different periods in days scale, but no milliseconds periods

Academic Projects

***Electromagnetism A:* Conditions and errors of electric multipole expansion** Hefei, China

Advisors: **Prof. Chunkai Xu** (Department of Modern Physics, USTC) *Feb.2021 - Aug.2021*

- Derived the electric multipole expansion to high order
- Programmed and visualize the expansion approximation in Matlab
- Derived the expression of the error in different orders and visualized them
- Academic achievement: Electromagnetism A (95)

***Freshman Seminar:* Recognize handwriting numbers by Neural Network** Hefei, China

Advisors: **Prof. Rui Yan** (Department of Modern Mechanics, USTC) *Nov. 2019 - May 2020*

- Read related books and papers to learn the neural network
- Programmed the neural network in C language, including initialization, training and testing, based on the MNIST database
- Achieved an accuracy of 97%. Academic achievement: Freshman Seminar (A+)

Selected Courses

Electromagnetism A (95)	Computer Programming A (90)	Function of Complex Variable A (90)
Electrodynamics (91)	Theoretical Mechanics A (94)	Equations of Mathematical Physics A (90)
Quantum Mechanics (90)	Introduction to Astronomy (98)	*The Theory of General Relativity (89)
*Galactic Astronomy (89)	*Observational Astrophysics (91)	*The Physics of Compact Objects (In progress)

**Represent graduate course*

Teaching Assistant

Introduction to Astronomy (Fall 2022) Sep. 2022 - Jan. 2023

Instructor: Prof. **Yongquan Xue** (Department of Astronomy, USTC)

- Credit 2; Class: 112 juniors; Course Website

Electromagnetism A (Spring 2022) Feb. 2022 - Aug. 2022

Instructor: Prof. **Chunkai Xu** (Department of Modern Physics, USTC)

- Credit 4; Class: 122 juniors

Extracurricular Activities & Interests

Volunteer in "Daily Up" program to take care of children with intellectual disabilities	Jan. 2021 - Jun. 2021
Taking sign language lessons given by the Volunteer Association (also as a member)	Jan. 2021 - Jun. 2021
Volunteer in welcoming activities for the new students	Sep. 2020
Member of the Student Union in the School of Engineer Science	Sep. 2019 - Jun. 2020

Skills & Tests

Programming: C, Python, LaTeX, MATLAB, Markdown

TOEFL: 98 (best score 102). *R*: 29; *L*: 26 (highest: 28); *S*: 22 (highest: 23); *W*: 21 (highest: 22)