# Jiyun Di


CONTACT INFORMATION

Homepage: https://jiyundi.github.io/
E-mail: jiyun.di@stonybrook.edu jiyundi@email.arizona.edu
Phone: +1 (520) 304-7366 / +86 139-1921-1658


EDUCATION

**Stony Brook University**, Stony Brook, NY **August 2022 - Present**

- Master of Arts in Physics (2024)
- Cumulative GPA: 3.98 (out of 4.0)

**The University of Arizona**, Tucson, AZ **August 2018 - May 2022**

- Bachelor of Science in Astronomy (2022)
- Bachelor of Science in Mathematics (2022)
- Minor — Physics
- Cumulative GPA: 3.7 (out of 4.0)

RESEARCH EXPERIENCE

**Spectroscopic Surveys of Two Galaxy Clusters at z ∼ 0.8** **August 2020 - Present**

- Institute — Steward Observatory, The University of Arizona, Tucson, AZ
- Introduction — The double source plane gravitational lens system, "the Eye of Horus", identified by the Subaru Hyper Suprime-Cam (HSC) survey, seems to contain two high-redshift clusters at $z \sim 0.8$ with a close separation. This research confirms the existence of the two massive clusters at $z \sim 0.8$, using MMT/Binospec data. This research also examines the structure and dynamical state of this rare double-cluster system at such a high redshift by measuring spectroscopic redshifts and calculating dynamical masses
- Assets — Proficient abilities to reduce spectrum data from MMT/Binospec and Magellan/IMACS for galaxy redshifts by `IDL`-based `SpecPro` software; experienced data analysis with `IDL`, `DS9`, `Python` tools; academic journal writing in LaTeX improved scientific and creative thinking on research
- Project Supervisor — Prof. Eiichi Egami

**Kinematic Lensing on "Weighing the Giants" Galaxy Clusters** **September 2020 - Present**

- Institute — Department of Physics and Astronomy, Stony Brook University, NY
- Introduction — Observational and spectroscopic application of "Kinematic Weak Lensing", a method for breaking the degeneracy between intrinsic shape and cosmic shear, which only photometric images cannot accomplish. It can solve for intrinsic orientations of galaxy disks and shapes after the effects of cosmic shear, coming with velocity field information of the lensed galaxies.)
- Assets — Sufficient reduction experiences of popular multi-object spectroscopic instruments (e.g. Keck/DEIMOS) with the latest `Python`-based pipeline `PypeIt`; proficient workflow of galaxy redshift measurements by using `IDL`-based `SpecPro` software
- Slides — PDF link
- Project Supervisor — Prof. Anja von der Linden

PUBLICATION

[1] **Jiyun Di**, Eiichi Egami, Kenneth C. Wong, et al., "MMT/Binospec Survey of Two $z \sim 0.8$ Galaxy Clusters in the Eye of Horus Field", MNRAS, (2023).
DOI: arXiv: (available on 2023 November 27).
See pending archived paper: http://gxn.as.arizona.edu/Papers/Jiyun_Di_Binospec.pdf

## Public Talks and Formal Presentations

**Superconducting Phase in $CaH_6$ up to 215 K at 172 GPa** — **April 2023**

*The discovery of $CaH_6$ raises great prospects of expanding the extraordinary class of high-$T_c$ superhydrides to a broader variety of compounds. This probably would develop a new understanding of the interactions between electrons and other quasi-particles (e.g. phonons).*

**The Life and Times of Giant Molecular Clouds** — **April 2023**

*Giant molecular clouds (GMCs) are the sites of star formation and stellar feedback in galaxies. The observational developments have been accompanied by numerical simulations of improving resolution that are increasingly accurately accounting for the effects of the galactic-scale environment on GMCs, while simultaneously improving the treatment of the small-scale processes of star-formation and stellar feedback within them. The combination of these recent developments has greatly improved our understanding of the formation, evolution, and destruction of GMCs.*

**Low Dust and High [C II] Emission in Galaxies at $z \sim 5-6$** — **February 2023**

*Some systems are similar to low-metallicity/low-dust systems at low-z (such as the SMC). The star formation at $z = 6$ is $\sim 35\%$ less than the benchmark model.*

**Black Hole-Host Galaxy Co-evolution Relations and Modes of AGN Feedbacks** — **December 2022**

*Co-evolution between SMBHs and their hosts is still under discussion while measurements on BH-halo and BH-$\sigma$ relations at high redshifts are more available. Mechanisms such as AGN negative wind-like and positive outflow feedbacks are self-regulating processes for star formation and galaxy evolution.*

**Gunn-Peterson Effect** — **November 2022**

*An introduction to Gunn&Peterson (GP; 1965) paper with deriving GP optical depth and mentioning GP trough in high-redshift quasars ($z > 5.8$).*

**UA Astronomy Club Active Astro** — **April 2022**

*Galaxy cluster researches reveal an excellent sight to discover astronomy. This talk gives an overview of the process to work on academic research as an undergraduate at U of A. Compared with other "Active Astro" talks, the presenter also showed an interesting demo to play with spectra of distant galaxies and measure redshifts. More than 50 students and professors listened to this talk.*

## Honors and Awards

**Undergraduate Research Achievement** — **May 2022**

In recognition of outstanding achievement in undergraduate research and significant contribution and shows originality, creativity, and a level of independence appropriate to the discipline by Steward Observatory and Department of Astronomy, the University of Arizona

**Spring 2022 Math Major 4.0 GPA Award** — **May 2022**

In recognition of math majors who maintained a perfect 4.0 major GPA up to their final term, ranked by top 4 out of 75 students in Class of 2022, with a certificate and sash (academic stole) by the Department of Mathematics, the University of Arizona

**ACSS Outstanding Leader Award** — **September 2021**

Directed major writing workshops for association members, composed the database of living and study tips for new UA Chinese students, and awarded by Association of Chinese Students and Scholars, the University of Arizona

**McLean First-Generation Scholarship** — **June 2020**

In recognition of as Summa Cum Laude (4.0 GPA) in maths coursework, ranked the best from 7-8 limited and eligible U of Arizona applicants, and awarded in the amount of $2,000 by the Department of Mathematics, the University of Arizona

**ACSS Progress Award** — **May 2019**

In recognition of extraordinary progress for leadership improvement, outstanding performance as representative communicator, participation in outreach conferences, and awarded by Association of Chinese Students and Scholars, the University of Arizona

**Bronze Medal Prize in China National Astronomy Competition** **April 2016**
In recognition of a Top-50 astronomy student in China middle schools high schools, excellent performance in written exams, proficient observational operations, and rich knowledge about fundamental astronomy and astrophysics

**Encouragement Prize in China National Astronomy Competition** **April 2015**
In recognition of a Top-100 astronomy student in China middle schools and high schools, excellent performance in written exams, proficient observational operations, and rich knowledge about fundamental astronomy and astrophysics

## Teaching Experience

**Preceptor and Teaching Assistant** **August 2021 - December 2021**

- Affiliation — Department of Physics, The University of Arizona, Tucson, AZ
- Course — PHYS 241: Physics II (Introductory Electricity and Magnetism)
- Duties — Lead in-class discussions, help groups working through several-pages tutorials, and attend weekly preceptor meetings
- Hours — 50 hours in total
- Supervisor — Mr. Shawn Jackson

## Work Experiences

**Publicity Department, Association of Chinese Students and Scholars at University of Arizona** *Tucson, AZ* **June 2019 - June 2021**
Director

- Duties — Communication officer, news manager, consultant for Chinese UA student livings, website designer, several emergency mask and medical protective package distributions during the COVID-19 pandemic
- Outcomes — *Articles of Association of Chinese Students and Scholars in University of Arizona* (1st edition in simplified Chinese, effective on January 1, 2021), $\sim$ 40 WeChat first-author essays, $\sim$ 10 co-author essays
- Supervisor — Prof. Shufang Su

**Chinese Language and Culture Day, Confucius Institute, The University of Arizona** *Tucson, AZ* **November 2019**
Volunteer

- Duties — Waiter, receptionist, traditional-medicine assistant
- Hours — 12 hours in total

**Conference For Arizonian Chinese Celebrating The 70th Anniversary of People's Republic of China** *Mesa, AZ* **September 2019**
Volunteer

- Position — China national flag raiser squad captain
- Special Position — Security officer for Mr. Shi, Yuanqiang, the deputy Consul General, General of Consulate-General of People's Republic of China in Los Angeles
- Hours — 10 hours in total

## Skills

Spectroscopic Data Reduction (`IDL SpecPro`, `PypeIt`, `Bagpipe`, `Python`)
Astronomical Image Analysis (`DS9`, `AstroImageJ`, `Astropy`)
Data Analysis (`SQL/MySQL`)
Coding (Linux OS & `Python`; Computational physics courses: PHYS 105A, PHYS 305, ASTR 302)
Academic Journal Writing (MNRAS)
Bilingual (Proficient English, Native Mandarin)
LaTeX, Microsoft Office, Adobe Photoshop/Dreamweaver/Premiere/Audition/AfterEffects, etc.