

# Ferdinand Ferdinand

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## EDUCATION

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### University of Illinois at Urbana-Champaign (UIUC)

Aug. 2023 - May 2027

*Bachelor of Science in Astrophysics and Data Science*

*Current GPA: 3.95/4.00*

**Relevant Coursework:** Observational Astronomy, Advanced Electromagnetism II, Quantum Physics I, Stellar Astrophysics, Nuclear and Particle Astrophysics, Foundations of Data Science in Astronomy

## RESEARCH EXPERIENCES

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### Radio Variability Search in Poststarburst (PSB) Galaxies

Jan. 2026 - Present

*Mentor: Professor K. Decker French*

*UIUC*

- Measured flux densities of 5,040 PSB galaxies across VLASS Epochs 1–4.1 using 2D Gaussian fitting to search for long-term radio variability.
- Identified 26 radio variable candidates and investigated their variability mechanisms, including TDE or AGN nuclear activities

### X-ray Supernova Analysis Pipeline (XSNAP)

Jun. 2025 - Apr. 2026

*Mentor: Dr. Wynn Jacobson-Gálan and Professor Mansi Kasliwal*

*California Institute of Technology*

- Developed XSNAP, an open-source Python pipeline to streamline data reduction and analysis of X-ray supernova for Chandra X-ray Observatory, Swift/XRT, XMM-Newton, and NuSTAR data
- Constrained supernova-circumstellar medium interactions and progenitor star's mass loss rate via PyXspec and MCMC fitting, particularly for SN 2024ggi and SN 2024iss
- Pipeline is available in [Github](#), [PyPI](#), and a dedicated [documentation website](#); A paper describing XSNAP and its application to SN 2024ggi is available in [ApJ](#)

### AGN Spectral Energy Distribution Modeling

Jan. 2025 - Dec. 2025

*Mentor: Professor Yue Shen*

*UIUC*

- Reproduced results from [Zou et al.](#) on AGN spectral energy distribution (SED) modeling using CIGALE
- Generated synthetic Type 1 and Type 2 AGN SEDs using templates from SWIRE and GALSEDATLAS to study model behavior

### Membership Study of a Septuple Open Cluster System

Aug. 2024 - Aug. 2025

*Mentor: Dr. rer. nat. Mochamad Ikbal Arifyanto*

*Bandung Institute of Technology (Remote)*

- Queried over 200,000 stars from Gaia DR3 for the cluster systems and surrounding regions via SQL
- Identified a septuple open cluster system candidate by applying agglomerative clustering to 200,000+ Gaia DR3 sources across multiple open clusters
- Derived each cluster parameters (extinction, age, metallicity, and distance modulus) via isochrone fitting

### Search of New Variable Star

Jan. 2024 - May. 2025

*Mentor: Dr. Kirill Sokolovsky*

*UIUC*

- Utilize Variability Search Toolkit (VaST) toolkit and shell scripting to analyze and visually inspect the New Milky Way survey data in search of potential new variable star
- Benchmarked Variability Search Toolkit (VaST) transient search effectiveness via injection-recovery tests and measured recovery completeness as a function of source magnitude
- Visually inspected TICA TESS images at 12-hours cadence in search of novae and stellar flares, identifying five new UV type variables and registered them to the International Variable Star Index [\[Results\]](#)

### Construct a Clean List of Bright RR Lyrae Variables

Nov. 2024 - May. 2025

*Mentor: Dr. Kirill Sokolovsky*

*Urbana, IL*

- Visually inspected stellar light curves and utilize Lafler & Kinman and Deeming FT periodogram to classify types of variable stars
- Focused on RR Lyrae variable stars, identified misclassified light curves, and documented correct classifications

## PUBLICATIONS

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**1 First-author; 1 N<sup>th</sup>-author; 2 Preprints (h-index: 1, citations: 2)**

ORCID: 0009-0008-7581-3096

### First-author:

1. *XSNAP: An X-ray Supernova Analysis Pipeline with Application to the Type II Supernova 2024ggi* [Citations: 1]. **Ferdinand**, W. V. Jacobson-Galán, et al. (2026) ApJ, 1001, 26 ([ApJ](#))

### N<sup>th</sup>-author:

2. *TCP J07222683+6220548: A New AM CVn Type System with Infrequent Outbursts* [Citations: 1]. A. Tarasenkoy, [et al. including **Ferdinand**]. (2025) RAA, 25, 075017 ([RAA](#))

### Preprints:

3. *Analysis of a Septuple Open Cluster System and Its Extended Family in Gaia DR3*. M. A. Husain, **Ferdinand**, M. I. Arifyanto, M. I. Hakim. (2026) arXiv, preprint arXiv:2604.23093 ([arXiv](#))
4. *SN 2024iss: A Multi-Wavelength Exposé of a Type IIb Supernova with an Early-Time Ultraviolet Spectrum and Shock Breakout Constraints*. R. Yete, W. V. Jacobson-Galán, **Ferdinand**, et al. (2026) arXiv, preprint arXiv:2603.20375 ([arXiv](#))

## AWARDS & FELLOWSHIPS

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Summer Undergraduate Research Fellowship (Caltech SURF)	Jun. 2026 - Aug. 2026
Summer Undergraduate Research Fellowship (Caltech SURF)	Jun. 2025 - Aug. 2025
USA Underwater Hockey National Championships: Division C, 3rd Place	Jun. 2025
Dean's List: Fall 2023, Spring 2024, Fall 2024, & Spring 2025	2023 - 2025
American Association of Variable Star Observers (AAVSO) Observer Award	Nov. 2024
International Olympiad on Astronomy and Astrophysics (IOAA): Bronze Medalist	Aug. 2023

## TELESCOPE PROPOSALS

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### Accepted Programs as Co-Investigator

- **JWST Cycle 4 (DD), Proposal ID 9492**, "From Rags to Calcium-riches: Using JWST to Constrain Progenitor Identity and Dust Formation in the Calcium-strong Transient 2025coe" (2025)

## OBSERVING EXPERIENCES

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Palomar 200-inch Hale Telescope	Wide Field Infrared Camera (WIRC), 1 night
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## RESEARCH TALKS

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### Presentations

- Caltech SURF, Aug. 2025

### Posters

- American Astronomical Society 247 Meeting, Jan. 2026
- UIUC Undergraduate Research Symposium, Apr. 2025
- Illinois Astrofest, Apr. 2025
- Illinois Astrofest, Apr. 2024

## WORK EXPERIENCES

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<b>Business Process Improvement Intern</b>	Jan. 2025 - May 2025
<i>Applied Technologies for Learning in the Arts &amp; Sciences (ATLAS)</i>	<i>Champaign, IL</i>
<ul style="list-style-type: none"><li>• Developed custom digital forms and workflows to streamline data collection and improve operational efficiency for client-facing projects</li><li>• Documented operational workflows, and best practices to support future process optimization and knowledge transfer</li></ul>	

## OUTREACH & ORGANIZATIONAL ACTIVITIES

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### Illini Underwater Hockey Club

Aug. 2025 - Present

*Secretary*

*Urbana, IL*

- Recorded meeting minutes and maintained organizational documentation
- Assisted with club communications and administrative coordination

### Indonesian Students Association in the United States

Jan. 2025 - Dec. 2025

*Website Developer*

*Remote*

- Collaborated with a three-person development team to migrate and redevelop the organization's website from TypeDream to a modern stack using React, TypeScript, Tailwind CSS, and Astro.

### USA Astronomy and Astrophysics Organization

Nov. 2024 - Present

*President, Coach, & Problem Setter*

*Remote*

- Directing the national selection process for the USA team to the 2026 IOAA, organizing and overseeing three selection rounds with a total of 400+ participants
- Designed and reviewed examination problems for the 2025 and 2026 selection processes; coached members of the 2025 USA IOAA team in stellar structure and evolution
- The 2025 US IOAA team earned 2 Gold Medals, 1 Bronze Medal, 1 Honorable Mention, Best Theory, and the Absolute Winner award [\[post\]](#)

### UIUC Department of Astronomy

Aug. 2024 - May 2026

*Grader & Tutor*

*Urbana, IL*

- Graded assignments for 100+ students in ASTR210 (Introduction to Astrophysics) and ASTR405 (Planetary Systems)
- Conducted weekly two-hour tutoring sessions in introductory astrophysics

### Physics Outreach and Instruction through New Technologies (POINT) VR

Sep. 2023 - May 2026

*Outreach & Media Coordinator*

*Urbana, IL*

- Established partnerships with local schools and community events to expand outreach opportunities for the POINT VR program
- Delivered interactive virtual-reality demonstrations and increased interests of general relativity and basic astronomy concepts to 250+ participants across the Champaign-Urbana community
- Presented and introduced POINT VR in the 2024 Illinois Astrofest

### Indonesia Astronomy Olympiads

Dec. 2021 - Present

*Mentor & Tutor*

*Remote*

- Served as the President of Alumni Association for Indonesian National Astronomy Olympiad Team in 2023 where I organized, reviewed and audited data entry of multiple National Astronomy Olympiad simulations in which participated by 300+ students throughout Indonesia
- Designed 50+ problem sets and delivered 100+ hours of lectures on advanced astrophysics topics to 100+ students across Indonesia
- Coached 20+ students; mentees achieved 1 IOAA Bronze Medal, 1 National Gold, 1 National Silver, and 2 National Bronze medals

### Additional Outreach

Seasonal

*Volunteer*

*Urbana, IL*

- [Science at the Market \(May 2024\)](#) — representing Department of Astronomy at UIUC and showing astronomy demonstrations to 380+ people

## TECHNICAL SKILLS

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**Language:** Python, Bash, SQL, HTML,  $\LaTeX$

**Python Libraries:** pandas, NumPy, Matplotlib, Seaborn, Astropy, SciPy

**Astronomy Softwares:** DS9, CASA, CARTA, Aladin, CIGALE, VaST, ASteCA