Moira Andrews

Email: mandrews@lco.global
Website: moira-andrews.github.io
LinkedIn: moira-andrews

Education

University of California, Santa Barbara *September 2023 - present*
Ph.D, Physics
Astrophysics Emphasis
Department of Physics
Advisor: D. Andrew Howell

Purdue University *August 2018 - May 2022*
B.S., Physics Honors
Minor: Astronomy
College of Science | Honors College
Advisor: Dan Milisavljevic

Research and Work Experience

Las Cumbres Observatory **Santa Barbara, CA**
Graduate Researcher, Advisors: *Andy Howell* [40 hr/week] **January 2024 – Present**

- Primary research focus is on the analysis of early-time observations of Type Ia Supernovae
- Reducing spectra and photometry for LCO observations, scheduling observations to follow important and interesting transients
- Active work on photometric pipeline and website development of the Supernova Exchange
- An active member of the Global Supernova Project Collaboration, prepares and assists in running biweekly meetings

University of California, Santa Barbara **Santa Barbara, CA**
Teaching Assistant [20 hr/week] **October 2023 – Present**

- PHYS 6AL (Fall 2023): Introductory algebra based physics mechanics lab aimed at biology and premed students.
- PHYS 7A (Winter 2024): Introductory calculus based physics class aimed at engineering and computer science students.
- ASTRO 2 (Spring 2024): The second half of the introductory astronomy course for a wide range of student backgrounds. During sections I discussed extragalactic astronomy and cosmology.
- PHYS 100A (Summer 2024): Introductory linear algebra class for physics majors with a focus on quantum mechanical applications.
- ASTRO 1 (Summer 2024): First half of the introductory astronomy courses, aimed at a wide range of students. During sections, I covering foundational astronomical topics from solar system objects, to extragalactic astronomy.
- PHYS 134L (Fall 2024): Observational astronomy lab, aimed at a wide range of students. I coordinated with students to schedule LCO observations and taught observational astronomy techniques.

Department of Physics & Astronomy, Purdue University **West Lafayette, IN**
Research Assistant, Advisors: *Kyoung-Soo Lee and Maria Celeste Artale* [30 hr/week] **May 2022 – Present**

- Computational analysis of protocluster merger trees using IllustrisTNG to constrain galaxy evolution
- Analyzed SUBLINK merger trees to study the evolution of LAEs in the most massive clusters identified at redshift 0
- Participated in 3 full observing runs as a member of the One-hundred-square-degree DECam Imaging in Narrowbands (ODIN) Collaboration
- Results to be presented to the community at the upcoming 241st AAS meeting in Seattle January 2023

Department of Physics & Astronomy, Purdue University **West Lafayette, IN**
Research Assistant, Advisor: *Dan Milisavljevic* [30 hr/week] **August 2022 – Present**

- Analyzed and processed James Webb Space Telescope MIRI observations of supernova remnant Cassiopeia A
- Used JWST Jdavis and JDAT Notebooks to process MIRI MRS spectral cubes
- Wrote Jupyter Notebooks to perform continuum subtraction, cross channel extraction, and identified and measured emission lines

Alignment of the central galaxies with the environment in simulations **Córdoba, Argentina**
PI: *Facundo Rodriguez, Manuel Merchán* [5 hr/week] **June 2022 – Present**
Affiliation: *Universidad Nacional de Córdoba (UNC), Observatorio Astronómico de Córdoba (OAC)*

- Calculated shape and angular momentum tensors for stellar and dark matter particles in IllustrisTNG
- Created tables of galaxy and particle data including the stellar mas, position, and computed galaxy formation time
- Coauthor on paper to be submitted to MNRAS December 2022

Center for Astrophysics | Harvard and Smithsonian **Cambridge, MA**
NSF REU Intern, Advisor: *Rainer Weinberger* [40 hr/week] **June 2021– August 2021**

- Computational analysis using python of IllustrisTNG high redshift (z = 2) quiescent galaxies, investigating the effect of mergers on galaxy quenching using stellar kinematics
- Aided in running weekly colloquiums and collaborating with other interns including ethics training
- Presented results at the public end of summer symposium

Department of Physics & Astronomy, Purdue University **West Lafayette, IN**
Undergraduate Research Assistant, Advisor: *Dan Milisavljevic* [10 hr/week] **February 2020 – Present**

- Developed photometric subtraction method for data augmentation of supernova light curves
- Conducted aperture photometry of observations obtained with robotic telescope networks

Collin's Aerospace **Windsor Locks, CT**
Electrical & Electronic Engineering Intern, Manager: *Darren Woodman* [40 hr/week] **June 2020 – July 2020**

- Student Engineering Project Program (SEPP): Data Caching, Archiving, and Transmission of High-Fidelity Data in the Event of Failure/Anomaly
- Studied radiation effects on devices in space environments, Identified radiation hardened flash memory devices and performed a trade study, Collaborated in the creation of state diagrams and VHDL designs to test the device for data failure.

Optogration Inc. **Wilmington MA**
Engineering Consultant, Manager: *Bill Clark* [12 hr/week] **July 2019 – January 2020**

- Created a LabVIEW program to congregate IV, CV, and Responsivity tests of diodes using Keithley and Agilent instruments
- Integrated use of Teledyne Dalsa's iNspect Express software for analysis and inspection of AP 200 microchips

Publications

1. **Andrews, M.**, Artale, M. C., Kumar, A., et al. 2024, Galaxy populations in protoclusters at cosmic noon, arXiv e-prints, arXiv:2410.08412, 10.48550/arXiv.2410.08412
2. Burke, **Andrews**, et al. 2024, Early lightcurves of Type Ia are consistent with nondegenerate progenitor companions [resubmitted to ApJ Sep 2024]
3. Burke, **Andrews**, et al. 2024, Companion shocking fits to the 2018 ZTF sample of SNe Ia are consistent with single-degenerate progenitor systems [resubmitted to ApJ Sep 2024]
4. Sun, H., Li, W. X., Liu, L. D., et al., further authors include **Andrews, M.** 2024, Extragalactic fast X-ray transient from a weak relativistic jet associated with a Type Ic-BL supernova, arXiv e-prints, arXiv:2410.02315, 10.48550/arXiv.2410.02315
5. Newsome, M., Arcavi, I., Howell, D. A., et al., further authors include **Andrews, M.** 2024a, Mapping the inner 0.1 pc of a supermassive black hole environment with the Tidal Disruption Event and extreme coronal line emitter AT 2022upj, arXiv e-prints, arXiv:2406.11972, 10.48550/arXiv.2406.11972
6. Milisavljevic, D., Temim, T., De Looze, I., et al., further authors include **Andrews, M.** 2024, A JWST survey of the supernova remnant Cassiopeia A, ApJL, 965, L27, 10.3847/2041-8213/ad324b
7. Lee, K.-S., Gawiser, E., Park, C., et al., further authors include **Andrews, M.** 2024, The One-hundred-deg^2 DECam Imaging in Narrowbands (ODIN): Survey design and science goals, ApJ, 962, 36, 10.3847/1538-4357/ad165e
8. Rodriguez, F., Merchán, M, Artale, M. C., & **Andrews, M.** 2023, Anisotropic correlation functions as tracers of central galaxy alignments in simulations, MNRAS, 521, 5483, 10.1093/mnras/stad924

Talks and Conference Participation

Poster Presentations:

- **241st American Astronomical Society Meeting**, Seattle, WA. *"ODIN: The cosmic history of Lyman Alpha Emitting galaxies in protoclusters in IllustrisTNG"*, January 2023

Oral Presentations:

- **Purdue University: Special Seminar**, West Lafayette, IN. *"ODIN: The cosmic history of Lyman Alpha Emitting galaxies in protoclusters in IllustrisTNG"*, September 2022
- **Center for Astrophysics | Harvard & Smithsonian Research Experience for Undergraduates Symposium**, Cambridge, MA. [Remote] *"The Effects of Mergers on Stellar Kinematics of High-Redshift TNG Galaxies"*, August 2021
- **Flash Talk in Physics Presented by Purdue Women in Physics**, West Lafayette, IN. [Remote] *"The Importance of Data Augmentation: How All-Sky Surveys Can be Leveraged in Supernova Research"*, March 2021
- **Collins Aerospace Summer Engineering Project Program (SEPP) Fair**, Cedar Rapids, IA. [Remote] *"Data Caching, Archiving, and Transmission of High Fidelity Data in the Event of Failure/Anomaly"*, July 2020

Attendance:

- **Spoken-WERRD 2022 Symposium**, [Remote], November 2022
- **Conference for Undergraduate Women in Physics at Western Michigan**, Kalamazoo, MI. [Remote], January 2020

Awards and Honors

- Roy and Sarah Johnson Purdue Bands and Orchestras Scholarship — $2,000 — August 2021
- Lijuan Wang Memorial Award — $1,000 — January 2021
- Physics Undergraduate Scholarship — $1,000 — August 2020
- Purdue University Dean's List — Fall 2018 – Spring 2022
- Purdue University Semester Honors — Fall 2018 – Spring 2022

Community Involvement/Outreach

Locking Clocks in Strong Gravity, *Galileo Unbound*, **May 16, 2021**
https://galileo-unbound.blog/2021/05/16/locking-clocks-in-strong-gravity/

- Coauthored blog post with Prof. David D. Nolte on his public blog: *Galileo Unbound*
- Based off my final project for my upper division undergraduate mechanics course
- Investigated how harmonic oscillators will synchronize in general relativistic environments
- Found that the synchronization Kuramoto Transition would become novel phenomena of a "synchronization cascade"

McCarthy Middle School STEM Fair **January, 2020**

- Ran an astronomy booth with at local middle school
- Described images of planetary nebulae, supernova remnants, galaxies, and other objects taken by a local amateur astronomer
- Taught students about astronomical phenomena and observational techniques

Skills

- **Programming** – *General*: Python 2/3, LaTeX, Google Sheets/Docs, Microsoft Office
  Astronomy Specific: Astropy, James Webb Space Telescope Data Analysis Tool (JDAT), JWST visualization tools (Jdavis), IRAF, PyRAF, SAOImage DS9, IllustrisTNG simulation suite

Leadership & Organizations

Women in Physics, Purdue University **August 2019 – May 2022**
Leadership Team (August 2019 – April 2020)

- Aided in restructuring and expanding the organization by introducing new activities and members
- Participates in club activities including the Research Blitz and social activities
- Promotes inclusivity and provides a safe space for female student body within the Department of Physics & Astronomy by coordinating with other Women in Physics members and faculty

"All-American" Marching Band (AAMB), Purdue University **August 2018 – May 2022**
Tenor Saxophone Segment Leader (August 2021 – Present)
Tenor Saxophone Assistant Segment Leader (August 2019 – March 2021)

- Evaluated candidates during band camp to select membership for the AAMB saxophone section
- Taught marching fundamentals and instructed music sectionals during daily rehearsals
- Coordinated with faculty liaison and other student leaders to efficiently run rehearsals
- Organized section activities and extra practice time outside of rehearsal

Classifications and Circulars

1. Newsome, M., **Andrews, M.**, Farah, J., Howell, D. A., et al., McCully, C. 2024b, Global SN Project transient classification report for 2024-09-30, Transient Name Server Classification Report, 2024-3794, 1
2. **Andrews, M.**, Farah, J., Howell, D. A., et al., McCully, C. 2024a, Transient classification report for 2024-09-13, Transient Name Server Classification Report, 2024-3490, 1
3. **Andrews, M.**, Farah, J., Howell, D. A., et al., McCully, C. 2024b, Transient classification report for 2024-09-12, Transient Name Server Classification Report, 2024-3471, 1
4. **Andrews, M.**, Farah, J., Howell, D. A., et al., McCully, C. 2024c, Transient classification report for 2024-09-11, Transient Name Server Classification Report, 2024-3441, 1
5. Farah, J., **Andrews, M.**, Howell, D. A., et al., McCully, C. 2024, Transient classification report for 2024-09-04, Transient Name Server Classification Report, 2024-3303, 1
6. Li, W. X., Xue, S. J., **Andrews, M.**, et al. 2024c, EP240806a: GSP optical counterpart detection, GRB Coordinates Network, 37064, 1
7. Li, W. X., Xue, S. J., **Andrews, M.**, et al. 2024d, EP240804a: GSP detects optical candidate counterpart, GRB Coordinates Network, 37044, 1
8. An, J., Xu, D., Li, W. X., et al., further authors include **Andrews, M.** 2024, EP240801a: GSP follow-up observations of the candidate counterpart, GRB Coordinates Network, 37004, 1
9. Bostroem, K. A., Kyer, R., Strader, J., et al., further authors include **Andrews, M.** 2024, DLT40 Transient Classification Report for 2024-07-24, Transient Name Server classification report, 2024-2571, 1
10. Li, W. X., Xue, S. J., **Andrews, M.**, et al. 2024e, EP240708a: GSP optical upper limit, GRB Coordinates Network, 36852, 1
11. Li, W. X., Xue, S. J., **Andrews, M.**, et al. 2024f, EP240703b: GSP optical upper limit, GRB Coordinates Network, 36836, 1
12. Li, W. X., Xue, S. J., **Andrews, M.**, et al. 2024g, EP240702a: GSP optical upper limit, GRB Coordinates Network, 36806, 1
13. Li, W. X., Xue, S. J., **Andrews, M.**, et al. 2024h, EP240618a: GSP optical upper limit, GRB Coordinates Network, 36731, 1
14. Faris, S., Arcavi, I., Gonzales, E. P., et al., further authors include **Andrews, M.** 2024a, StarDestroyers Transient Classification Report for 2024-05-31, Transient Name Server classification report, 2024-1740, 1
15. Faris, S., Arcavi, I., Gonzales, E. P., et al., further authors include **Andrews, M.** 2024b, Classification of a TDE discovered by Gaia and co-discovered by the MeerLICHT and BlackGEM transient survey, Transient Name Server AstroNote, 142, 1
16. Li, W. X., Xue, S. J., **Andrews, M.**, et al. 2024i, LXT 240528A: GSP optical upper limit, GRB Coordinates Network, 36590, 1
17. Li, W. X., Xue, S. J., **Andrews, M.**, et al. 2024j, EP240518a: GSP optical upper limit, GRB Coordinates Network, 36529, 1

18. Pellegrino, C., Arcavi, I., Howell, D. A., et al., further authors include **Andrews, M.** 2024, LIGO/Virgo/KAGRA S240422ed: Las Cumbres Observatory follow-up observations of the localization region, GRB Coordinates Network, 36480, 1

19. Li, W. X., Xue, S. J., Sun, H., et al., further authors include **Andrews, M.** 2024a, EP240414a: GSP detects optical candidate counterpart AT2024gsa, GRB Coordinates Network, 36154, 1

20. Li, W. X., Xue, S. J., Xu, D., et al., further authors include **Andrews, M.** 2024b, EP240408a: GSP optical upper limit, GRB Coordinates Network, 36079, 1

21. Weil, K. E., Milisavljevic, D., Rupert, J., et al., further authors include **Andrews, M.** 2021a, REFITT classification of SN 2021nxq (ZTF21abcpsjy), Transient Name Server AstroNote, 182, 1

22. Weil, K. E., Milisavljevic, D., **Andrews, M.**, et al. 2021b, REFITT classifications of optical transients using SOAR, Transient Name Server AstroNote, 30, 1

23. Weil, K. E., Subrayan, B. M., Milisavljevic, D., et al., further authors include **Andrews, M.** 2020a, REFITT classifications of optical transients using SOAR, Transient Name Server AstroNote, 266, 1

24. Weil, K. E., Milisavljevic, D., **Andrews, M.**, et al. 2020b, REFITT discovery and classification of SN2020abog (ZTF20acpgjac) using SOAR, Transient Name Server AstroNote, 243, 1

25. Weil, K. E., Milisavljevic, D., **Andrews, M.**, et al. 2020c, REFITT classifications of optical transients using SOAR, Transient Name Server AstroNote, 242, 1

26. Weil, K. E., Milisavljevic, D., **Andrews, M.**, et al. 2020d, REFITT classifications of optical transients using SOAR, Transient Name Server AstroNote, 232, 1

27. Weil, K. E., Milisavljevic, D., **Andrews, M.**, et al. 2020e, REFITT discovery and classification of SN 2020zct (ZTF20acezhcf) using SOAR, Transient Name Server AstroNote, 227, 1

28. Weil, K. E., Milisavljevic, D., **Andrews, M.**, et al. 2020f, REFITT classifications of optical transients using SOAR, Transient Name Server AstroNote, 225, 1