Moira Andrews

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

Education

University of California, Santa Barbara *September 2023 - present*
PhD, Physics
Astrophysics Emphasis
Department of Physics
Advisor:, Andy 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**

- Analysis of early time 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
- An active member of the Global Supernova Project Collaboration, assists in running meetings

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**, Artale, et al. (2024), *"Galaxy populations in protoclusters at cosmic noon "* [in prep to be submitted Sep 2024]
2. Milisavljevic, et al., further authors incl. **Andrews** (2024), ApJ, *"A JWST Survey of the Supernova Remnant Cassiopeia A"*
3. Lee, et al., further authors incl. **Andrews** (2024), ApJ, *"The One-hundred-deg2 DECam Imaging in Narrowbands (ODIN): Survey Design and Science Goals"*
4. Rodriguez, Merchán, Artale, **Andrews** (2023), MNRAS, *"Anisotropic correlation functions as tracers of central galaxy alignments in simulations"*
5. Weil, Milisavljevic, Rupert, **Andrews**, et al. (2021), Transient Name Server AstroNote, 182, *"REFITT classification of SN 2021nxq (ZTF21abcpsjy)"*
6. Weil, Milisavljevic, **Andrews**, et al. (2021), Transient Name Server AstroNote, 30, *"REFITT classifications of optical transients using SOAR"*
7. Weil, Subrayan, Milisavljevic, **Andrews**, et al. (2020), Transient Name Server AstroNote, 266, *"REFITT Discovery and Classification of SN 2020zct (ZTF20acezhcf) using SOAR"*
8. Weil, Milisavljevic, **Andrews**, et al. (2020), Transient Name Server AstroNote, 243, *"REFITT classifications of optical transients using SOAR"*
9. Weil, Milisavljevic, **Andrews**, et al. (2020), Transient Name Server AstroNote, 242, *"REFITT classifications of optical transients using SOAR"*
10. Weil, Milisavljevic, **Andrews**, et al. (2020), Transient Name Server AstroNote, 232, *"REFITT classifications of optical transients using SOAR"*
11. Weil, Milisavljevic, **Andrews**, et al. (2020), Transient Name Server AstroNote, 227, *"REFITT Discovery and Classification of SN 2020zct (ZTF20acezhcf) using SOAR"*
12. Weil, Milisavljevic, **Andrews**, et al. (2020), Transient Name Server AstroNote, 225, *"REFITT classifications of optical transients using SOAR"*

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