

Alessandra Valeria Lopez M.

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EDUCATION

Williams College

B.A., Honors, Double Major: Astrophysics & Women's, Gender, and Sexuality Studies

Williamstown, MA

Sep 2022 – May 2026

Honors Theses (two):

- **Astrophysics** — *Mid-Infrared Forbidden Emission Lines and the Shape of Ionizing Spectra in Low-Metallicity LyC Emitters.*
Advisor: Dr. Anne Jaskot
- **Women's, Gender, and Sexuality Studies** — *Feminist Infrastructures of Breath, Waste, and Feeling in Orbital Design.*
Advisor: Dr. Ezra Feldman

Relevant Coursework

- **Astrophysics:** Observing and Data Analysis (ASTR 211), Interstellar Medium (ASTR 402T), Galaxy Evolution (ASTR 404T), Gravitational-Wave Astronomy (ASTR 403T), Independent Study in AGN Spectral Analysis (ASTR 497).
- **Mathematics:** Mathematical Methods for Scientists (MATH 210).

Recent Honors: Dean's List, Spring 2025 – Spring 2026.

SKILLS

Programming	Python (NumPy, SciPy, Pandas, Matplotlib, Astropy), MATLAB, LabVIEW, JavaScript/WebGL, Bash/shell, L ^A T _E X
Astronomy Software	CLOUDY photoionization code, FITS handling (Astropy), JWST and HST archival data
Languages	Spanish (native), English (fluent), French (intermediate)

RESEARCH EXPERIENCE

Center for Astrophysics | Harvard & Smithsonian

Incoming SPARK Post-Baccalaureate Researcher

PI: Dr. Lamiya Mowla

Cambridge, MA

Starting Sep 2026

- Forthcoming post-baccalaureate research on early-universe galaxy structure and stellar populations using JWST imaging and spectroscopy from the CANUCS survey; characterize the morphologies and resolved stellar populations of galaxies in the first billion years.

National Radio Astronomy Observatory (NRAO)

Research Fellow — AGN Feedback via VLASS

PI: Dr. Mark Lacy

Charlottesville, VA

Jun 2026 – Sep 2026

- Study AGN feedback by cross-matching the VLA Sky Survey (VLASS) with DESI spectroscopy; work with two samples totaling 97 [O I]-detected AGN at $0.15 < z < 0.5$, split by radio source size (10–15 kpc vs. >20 kpc).
- Perform visual quality control of VLASS radio contours overlaid on optical imaging in Topcat and Aladin to reject misidentified and multi-component radio sources before spectral analysis.
- Fit [O III] 5007 Å and [O I] 6302 Å emission line profiles with double-Gaussian decomposition in pyspeckit; classify Seyferts and LINERs with BPT diagnostics to test whether outflow velocities scale with radio source size and differ by AGN type; manuscript in preparation.

Williams College — Department of Astronomy

Honors Thesis Researcher — HST/COS and JWST/MIRI Spectroscopy of LyC Emitters

PI: Dr. Anne Jaskot

Williamstown, MA

Aug 2024 – May 2026

- Joint analysis of HST/COS far-UV data (LzLCS survey) and JWST/MIRI mid-infrared spectra for 8 Lyman-continuum-emitting galaxies; combine COS-derived LyC escape fractions with MIRI forbidden line ratios ([Ne V], [Ne III], [S IV], [S III]) to constrain the shape of the ionizing spectrum.
- Build a CLOUDY photoionization modeling pipeline in Python; run grids spanning ionization parameter, metallicity, and spectral slope, and implement chi-squared fitting across mid-IR diagnostic lines per galaxy.
- Find no systematic mid-IR diagnostic difference between LyC leakers and non-leakers across the sample, consistent with a geometric origin for LyC escape rather than an intrinsic spectral difference.

Minerva Observatory — University of Southern Queensland

Research Assistant — Hot Jupiter Radial Velocity Study

PI: Dr. Rob Wittenmyer

Toowoomba, Australia

Jul 2025 – Aug 2025

- Contribute radial velocity simulation and data analysis across 28 planetary systems; results support the conclusion that Hot Jupiter systems host inner companions at rates distinct from Cold Jupiter systems. Paper accepted in PASA (arXiv:2603.12568).

Aurelia Institute — MIT Media Lab

Boston, MA

*Software Engineer (Brooke Owens Fellow) — TESSERAE Project**Jun 2025 – Aug 2025*

- Engineer a Python ingestion pipeline at 2.5 Hz across 32+ distributed sensors; diagnose sync errors across microcontrollers and implement data-reconciliation routines.
- Configure and validate cloud-connected telemetry units for lab simulations and microgravity test environments.
- Deliver an HTML reporting system replacing hours of manual video review with per-run diagnostic plots; pipeline deployed for ISS demonstration support.

Princeton University — Department of Astrophysical Sciences

Princeton, NJ

*Research Assistant — DESI AGN Spectral Analysis**May 2024 – Dec 2024*

PI: Dr. Jenny Greene

- Build a Python emission-line fitting pipeline from scratch for DESI spectra; process 2,000+ galaxies with double-Gaussian decomposition, inverse-variance weighting, and constrained parameter optimization to extract [O III] 5008 Å and [Ne V] 3426 Å line profiles.
- Implement amplitude-to-error significance thresholds and continuum-subtraction quality checks to reject artifacts across the full sample; pipeline runs unattended and outputs per-galaxy diagnostic plots.
- Identify ~120 AGN candidates with blue-shifted [Ne V] components tracing AGN-driven outflows; work extended into a co-advised independent study at Williams College.

National Radio Astronomy Observatory (NRAO)

Charlottesville, VA

*NAC Summer Student — Telescope Siting and Observatory History**May 2023 – Aug 2023*

Advisor: Dr. Rebecca Charbonneau

- Conduct a comparative analysis of U.S. and South African telescope siting to inform next-generation project planning (ngVLA); collaborate with ngVLA managers and NRAO's DEI Committee.
- First-author publication in MIT Science Policy Review (2025) on community-consent frameworks for next-generation radio observatories. DOI: 10.38105/spr.dikhoy3qw.

DarkSide-20k International Collaboration — Williams College

Williamstown, MA

*Research Assistant — Photodetector Characterization**Nov 2022 – May 2023*

Advisor: Dr. Graham Giovanetti

- Characterize Silicon Photomultiplier (SiPM) response for a cryogenic dark matter detector; analyze pulse shapes and timing profiles from raw waveform data.
- Build LabVIEW data acquisition routines for liquid argon scintillation signals; reduce baseline noise and improve timing resolution for low-light signal discrimination.
- Hands-on photodetector calibration, electronic noise characterization, and signal-to-noise optimization relevant to space-based instrument operations.

TEACHING EXPERIENCE**Williams College — Physics & Astronomy Department**

Williamstown, MA

*Teaching Assistant (PHYS 141; ASTR 101, 104, 211)**Aug 2023 – May 2026*

- ASTR 101/104/211: lead observing nights on the 24" telescope; train students in CCD operation and calibration (bias, dark, flat-field correction), photometric reduction, and intro long-slit spectroscopy using Python/Astropy.
- PHYS 141: grade problem sets; lead weekly sections on calculus-based mechanics, oscillations, and waves.

Milham Planetarium — Williams College

Williamstown, MA

*Planetarium Presenter & Operator**Feb 2024 – May 2026*

- Operate the Zeiss Skymaster ZKP3/B projector; plan and deliver weekly shows and custom programs for school groups and the public; lead live Q&A.
- Develop bilingual (English/Spanish) show scripts on constellations, stellar evolution, and eclipses; train student volunteers; lead 2024 eclipse activities.

LEADERSHIP EXPERIENCE**Minority Coalition (MinCo) Steering Committee — Davis Center**

Williamstown, MA

*Historian**Aug 2025 – May 2026*

- Elected officer on the campus-wide Steering Board; coordinate programming for ~900 students across MinCo-affiliated organizations; liaise with the College President, Dean of the College, and OIDEI.
- Allocate a \$150,000 annual budget across events and member organizations.

NINE Hub — Central America's First Radio Astronomy Platform

Guatemala/Honduras

*Co-Founder**Feb 2024 – Present*

- Co-found with Gabriela Larios at Mariano Gálvez University to establish Guatemala's first radio astronomy program; develop step-by-step Python notebooks and open curricula for students with no prior coding background.
- Awarded \$4,000 (Williams Class of 2006 & 2009 Intl. Public Service Grant); speaker Guatemala's National Palace.

Wavelength Club — Williams College

Williamstown, MA

*Founder and President**Aug 2024 – May 2026*

- Manage a DEI-focused physics/astronomy community; recruit mentors, coordinate a yearlong speaker series, and run peer support and professional development programming for minoritized students.

PUBLICATIONS AND CONFERENCE PROCEEDINGS

Journal Publications

- Lopez Menjivar, A., Lacy, M. “Ionized Gas Outflows as a Function of Radio Source Size in Seyfert and LINER AGN.” *In preparation*, 2026. **[First Author]**
- Jaskot, A., Lopez Menjivar, A. “Mid-Infrared Diagnostics and the Shape of Ionizing Spectra in Low-Metallicity Lyman-Continuum Emitters.” *In preparation*, 2026.
- Errico, A., Wittenmyer, R., Horner, J., Carter, B., López, A. “Hot Jupiter – Cold Jupiter: A Complex Sibling Relation.” *Publications of the Astronomical Society of Australia (PASA)*, Accepted 2026. arXiv:2603.12568.
- Lopez Menjivar, A. “Postcolonial Techno-Futurism: The Challenges of Siting Telescopes on Sacred Lands.” *MIT Science Policy Review*, Aug 2025. DOI: 10.38105/spr.dikhoy3qw. **[First Author]**

Conference Proceedings

- Lopez Menjivar, A. “Automated Telemetry Analysis for Self-Assembling Space Architecture: A Python Pipeline for the TESSERAE Project.” *KNAC 2025 Proceedings*, Vassar College, Sep 2025.
- Lopez Menjivar, A. “Spectral Signatures and Galactic Outflows: Identifying Type I AGNs through Emission Line Analysis.” *KNAC 2024 Proceedings*, Colgate University, Sep 2024.

SELECTED PRESENTATIONS

National Conferences

- iPoster — Lopez Menjivar, A.; Jaskot, A. *Constraining the Ionizing Spectra of Lyman Continuum Emitters with JWST/MIRI Mid-Infrared Spectroscopy*. AAS 248, #226.08, Pasadena, CA, Jun 2026.
- iPoster — Lopez Menjivar, A. *Characterizing AGN Emission Line Profiles: [O III] and [Ne V] Dynamics through DESI Spectroscopy*. AAS 245, #355.09, Feb 2025.
- iPoster — Lopez Menjivar, A.; Charbonneau, R. *Conquest and the Cosmos: Traces of Colonialism in Ground-Based Astronomy*. AAS 243, #163.04, Jan 2024.
- Oral — Lopez Menjivar, A. *Automated Telemetry Analysis for Self-Assembling Space Architecture*. KNAC 2025, Vassar College, Sep 2025.
- Oral — Lopez Menjivar, A. *Spectral Signatures of AGN and Galactic Outflows*. KNAC 2024, Colgate University, Sep 2024.

Institutional and Invited Talks

- Oral — Lopez Menjivar, A. *Mid-Infrared Forbidden Emission Lines and the Shape of Ionizing Spectra in Low-Metallicity LyC Emitters*. Senior Honors Thesis Defense, Williams College Department of Astronomy, May 2026.
- Oral — Lopez Menjivar, A. *Constraining Ionizing Spectra in LyC-Emitting Galaxies with JWST/MIRI: Mid-Year Thesis Progress*. Williams College Department of Astronomy, Dec 2025.
- Oral — Lopez Menjivar, A. *Spectral Signatures of AGN and Galactic Outflows*. Princeton Closing, Aug 2024.
- Oral — Lopez Menjivar, A. *Nuclear Roots, Cosmic Exploration: Los Alamos and VLA in Nuevo México*. NRAO REU Closing Ceremony, Aug 2023.

HONORS AND AWARDS

- **Sigma Xi, The Scientific Research Honor Society (2026)** — Inducted for outstanding undergraduate research; nominated by faculty for demonstrated promise in scientific investigation.
- **Brooke Owens Fellowship (2025)** — Selected as 1 of ~50 from 1,000+ applicants; placed at Aurelia Institute.
- **Chambliss Astronomy Achievement Student Award, Finalist (AAS 248, 2026)** — For *Constraining the Ionizing Spectra of Lyman Continuum Emitters with JWST/MIRI Mid-Infrared Spectroscopy* (advisor: Dr. Anne Jaskot).
- **Chambliss Astronomy Achievement Student Award, Finalist (AAS 245, 2025)** — For *Characterizing AGN Emission Line Profiles: [O III] and [Ne V] Dynamics through DESI Spectroscopy* (advisor: Dr. Jenny Greene).
- **20 Twenties Award, Nominee, Class of 2026** — Aviation Week Network; nominated by Williams College (Dr. Anne Jaskot) as one of the top STEM students on course to shape the future of aerospace and defense.
- **NAC Scholar (2023)** — National Astronomy Consortium / NRAO; competitive fellowship for underrepresented students in astronomy.
- **Alumni Sponsored Internship Program (ASIP) Grant (2025)** — Williams College '68 Center for Career Exploration; competitive grant funding summer research at Minerva Observatory, Australia.
- **Class of 2006 & 2009 International Public Service Grant (2024)** — \$4,000 to launch Guatemala's first radio astronomy hub at Mariano Gálvez University.
- Additional Williams College awards: Racial Justice Summer Grant (2025), Gaudino Fellowship (2024), Jeffrey Family Scholarship (2023).