
Education

- 2018 **Doctor of Philosophy (Ph.D.) in Astronomy**, *New Mexico State University*, Las Cruces, NM.
Dissertation: Connecting Star Formation to Interstellar Medium Components of the Inner Halo in Nearby Galaxies
Advisor: Dr. René Walterbos
- 2015 **Master of Science (M.S.) in Astronomy**, *New Mexico State University*, Las Cruces, NM.
Advisor: Dr. René Walterbos
- 2012 **Bachelor of Science (B.S.) in Astrophysics, with Honors**, *Rutgers University*, New Brunswick, NJ.
Advisor: Dr. Eric Gawiser

Positions Held

- 2021 – **Assistant Professor & Assistant Astronomer**, *University of Arizona and Steward Observatory*, Tucson, AZ.
- Principal Investigator of the Aspera SmallSat Mission. Responsible for establishing and managing a > 30 person international team across various scientific and engineering disciplines to accomplish the goals of the Aspera Space Mission. Responsible for managing the budget for the \$20M NASA award in the NASA Astrophysics Pioneers Program.
 - Leader of the Vargas Galaxy Evolution Laboratory and Research Group. Responsible for guidance and mentorship of science post-docs, graduate students, and undergraduate students working in the lab and research group.
- 2018 – 2021 **Postdoctoral Scholar**, *University of Arizona and Steward Observatory*, Tucson, AZ.
- Professor Erika Hamden's UV/Vis instrumentation research group
- Responsible for scientific and technical development of NASA astrophysics space missions, including Hyperion: a proposed NASA Explorer-class mission in cooperation with NASA Ames Research Center, Ball Aerospace Corporation, University of Arizona, and various other institutions. Also responsible for ultraviolet IFU spectroscopy data reduction and analysis from the Cosmic Web Imager (CWI) at Palomar Observatory. Assisted the establishment of the new Hamden UV-optical laboratory, as well as mentoring and organizing a group of three graduate students in physics and optical engineering.
- 2014 – 2018 **Graduate Assistant**, *New Mexico State University*, Las Cruces, NM.
Responsible for active research in astronomy – Funded by the National Science Foundation (NSF) Graduate Research Fellowship Program (GRFP)
- 2012 – 2014 **Teaching Assistant**, *New Mexico State University*, Las Cruces, NM.
Responsible for teaching the laboratory component of the introductory astronomy course "The Planets" (ASTR 105), teaching ~60 students per semester. Office hours, grading homework and exams were also incorporated.
- 2010 – 2012 **Research Assistant**, *Rutgers University*, New Brunswick, NJ.
Assisted Dr. Eric Gawiser in various astronomy research projects, including familiarizing myself with a MCMC technique for the fitting of high-redshift galaxy SEDs. Through this work I was also responsible for writing code to identify counterpart objects within two separate catalogs of sources, so individual SEDs could be studied for objects of interest.
- 2008 **Summer Intern**, *Sabert Corporation*, Sayreville, NJ.
Summer internship assisting human resources

Research Projects

- 2019 – **P.I. of *Aspera*, a NASA SmallSat Space mission to Map the Warm-hot Circumgalactic Medium in the Nearby Universe**, *University of Arizona and Steward Observatory*, Tucson, AZ.
I formed and led an international team to develop, build, and launch an ultraviolet SmallSat mission devoted to mapping the warm-hot gas content in nearby galaxies for the first time. The *Aspera* concept was selected for funding in the inaugural NASA Pioneers call (cost cap 20M) in January of 2021. This concept was also submitted to the December 2019 NASA Astrophysics SmallSat Studies (AS3; budget ~ \$100,000) call for proposals.
- 2019, 2020 **Hubble Space Telescope Observing Proposal to Detect Fluorescent Molecular Hydrogen in Orion Clouds**, *University of Arizona and Steward Observatory*, Tucson, AZ.
I led an HST proposal to directly detect H₂ in star-forming molecular clouds in Orion. The proposed observations serve as a proof-of-concept to the overarching goals of the Hyperion SMEX mission (see below).
- 2018 – **Scientific and Technical Development of *Hyperion*, a NASA SMEX/MIDEX Mission**, *University of Arizona and Steward Observatory*, Tucson, AZ.
I am a co-investigator on the science team for the Hyperion NASA Small Explorer (SMEX) Mission, a proposed ultraviolet space telescope (P.I., Erika Hamden). The primary goals of Hyperion are to study the conditions necessary for star formation in molecular clouds by directly detecting molecular hydrogen through ultraviolet fluorescence. I was in charge of developing HI/H₂ interface science cases, and contribute to all aspects of the science sections and technical implementation. The Hyperion mission concept is in further development for submission to the NASA MIDEX call at the end of 2021.
- 2018 – **Circumgalactic Medium Properties of $z \sim 2$ Galaxies with Extended Lyman- α Nebulae**, *University of Arizona and Steward Observatory*, Tucson, AZ.
I am mentoring a graduate student (Jessica Li) to lead a discovery study of extended Lyman- α Nebulae (ELANe) in the CGM surrounding large galactic complexes hosting pairs of bright quasars at $z \sim 2$, using the Palomar Cosmic Web Imager (CWI) IFU spectrograph.
- 2014 – 2019 **Star Formation of Edge-on Galaxies and its Relation to Radio Continuum Halos**, *New Mexico State University*, Las Cruces, NM.
I led the Continuum Halos in Nearby Galaxies – an EVLA Survey (CHANG-ES) Thermal Separation Working Group on a project to adapt existing star formation rate calibrations for use in edge-on galaxies, where both H α and mid-IR emission are subject to extinction. I created spatially-resolved star formation rate maps by combining H α and WISE 22 micron imaging. These maps were then used to predict the thermal radio continuum contribution, independent of the CHANG-ES radio data, themselves. I used the thermal predictions to separate the non-thermal radio continuum component from the ensemble, and then analyzed the non-thermal spectral index behavior, and its implications on cosmic ray injection and transport.
Advisor: Dr. René Walterbos
- 2016 **Green Bank Telescope Continuum Observations of CHANG-ES Galaxies**, *New Mexico State University*, Las Cruces, NM.
I was trained and certified as a remote observer on the National Radio Astronomy Observatory (NRAO) Green Bank Telescope (GBT) in Green Bank, WV. I observed numerous CHANG-ES galaxies in L band continuum using the new Versatile GBT Astronomical Spectrometer (VEGAS) backend, as a contribution to the CHANG-ES collaboration. These single-dish data are currently being used to correct the CHANG-ES observations for short spacings.
Advisors: Dr. Amanda Kepley and Dr. René Walterbos
- 2015 – 2017 **Narrowband Apache Point Observatory Observations of 26 Edge-on Galaxies**, *New Mexico State University*, Las Cruces, NM.
Data from this project has been publicly released and is available at <https://www.queensu.ca/changes/>
I successfully proposed for, obtained, and reduced deep narrowband H α imaging for 26 of the CHANG-ES sample galaxies with the Astrophysical Research Consortium (ARC) 3.5m telescope. The observations were taken in 20 half nights of observing.
Advisor: Dr. René Walterbos

- 2012 – 2014 **Extrplanar Atomic Hydrogen in NGC 4559 and Its Relation to Star Formation**, *New Mexico State University*, Las Cruces, NM.
I used 21 cm atomic hydrogen (HI) data cubes from the Hydrogen Accretion in LOcal Galaxies Survey (HALOGAS) to construct three-dimensional models of the HI emission in a moderately inclined nearby galaxy, NGC 4559. I separated the gas residing above and below the galaxy disk, or extraplanar gas, from the HALOGAS data cube. I then used star formation tracers $H\alpha$ and the Galaxy Evolution Explorer (GALEX) far ultraviolet (FUV) data to confirm that the bulk of the extraplanar gas originated from within the disk, consistent with star formation processes. This international project involved an extended visit to Dwingeloo, The Netherlands to the Netherlands Institute for Radio Astronomy (ASTRON) to work closely with Dr. George Heald.
Advisors: Dr. George Heald and René Walterbos
- 2011 – 2012 **To Stack or Not To Stack: Spectral Energy Distribution Properties of $z=2.1$ Lyman Alpha Emitting Galaxies**, *Rutgers University*, New Brunswick, NJ.
I compared the spectral energy distribution (SED) fitting results from a Markov Chain Monte Carlo (MCMC) code called 'GalMC' for a sample of Lyman Alpha Emitting Galaxies (LAEs) that were stacked, to those of the individual objects themselves. The SEDs used were obtained from the Cosmic Assembly Near Infrared Deep Extragalactic Legacy Survey (CANDELS), the largest Hubble Space Telescope (HST) survey in history. The CANDELS data made a study of stacked versus individual object SEDs at high redshift possible for the first time.
Advisors: Dr. Eric Gawiser and Dr. Viviana Acquaviva
- 2010 – 2011 **Spectral Energy Distribution Properties of $z=3.1$ Lyman Alpha Emitting Galaxies**, *Rutgers University*, New Brunswick, NJ.
I wrote IDL code to identify potential counterpart matches of known LAEs with the CANDELS catalog of HST sources. I then used 'GalMC', to fit the CANDELS SEDs of these LAEs. This analysis made it possible to pinpoint the ages, stellar masses, and dust content of these distant galaxies.
Advisor: Dr. Eric Gawiser
- Summer 2009 **Characterizing the Radio Frequency Interference Environment Using the Small Radio Telescope**, *Rutgers University*, New Brunswick, NJ.
I used the Small Radio Telescope (SRT) to explore the radio frequency interference (RFI) environment of the central New Jersey area. This involved analyzing radio telescope data from both an analog and digital receiver. I also became familiar with installing hardware on the telescope itself, and troubleshooting both hardware and software issues.
Advisor: Dr. Carlton Pryor

Publications

First-Author and Major Contribution Peer-Reviewed Publications

- Submitted J. S. Li, C. J. Vargas, D. O'Sullivan, E. Hamden, Z. Cai, et al.
Circumgalactic Lyman-alpha Nebulae in Overdense Quasar Pair Regions Observed with the Palomar Cosmic Web Imager. *The Astrophysical Journal*, submitted with graduate student first author.
- 2023 L.Y. Lu, J. T. Li, C. J. Vargas, R. Beck, J. Bregman, R. J. Dettmar, J. English, T. Fang et al.
eDIG-CHANGES I: Extended $H\alpha$ Emission from the Extraplanar Diffuse Ionized Gas (eDIG) around CHANG-ES galaxies. *Monthly Notices of the Royal Astronomical Society*, accepted January 2023
- 2021 H. Chung, C. J. Vargas, E. Hamden
Revisiting FUSE OVI Emission in Galaxy Halos. *The Astrophysical Journal*, Vol. 916, arXiv:2103.05008
- 2021 H. Chung, C. J. Vargas, E. Hamden, T. McMahon, K. Gonzales, et al.
Aspera: the UV SmallSat Telescope to Detect and Map the Warm-hot Gas Phase in Nearby Galaxies. *SPIE*, Vol. 11819

- 2019 C. J. Vargas, R. A. M. Walterbos, R. Rand, J. Stil, M. Krause, J. T. Li, J. Irwin, R. J. Dettmar.
CHANG-ES XVII: H α Imaging of Nearby Edge-on Galaxies, New SFRs, and an Extreme Star Formation Region – Data Release 2. *The Astrophysical Journal*, Vol. 881, arXiv:1906.07763
- 2018 C. J. Vargas, S. C. Mora-Partiarroyo, P. Schmidt, R. Rand, Y. Stein, R. A. M. Walterbos, D. Wang, A. Basu, M. Patterson, A. Kepley, R. Beck, J. Irwin, G. Heald, J. T. Li, T. Wiegert.
CHANG-ES X: Spatially-resolved Separation of Thermal Contribution from Radio Continuum Emission in Edge-on Galaxies. *The Astrophysical Journal*, Vol. 853, arXiv: 1801.01892
- 2017 C. J. Vargas, G. Heald, R. A. M. Walterbos, F. Fraternali, M. Patterson, R. Rand.
HALOGAS Observations of NGC 4559: Anomalous and Extraplanar HI and Its Relation to Star Formation. *The Astrophysical Journal*, Vol. 839.
- 2014 C. J. Vargas, H. Bish, V. Acquaviva, E. Gawiser, S. Finkelstein, R. Ciardullo, M. L. N. Ashby, J. Feldmeier, H. Ferguson et al.
To Stack or Not to Stack: Spectral Energy Distribution Properties of Ly α -emitting Galaxies at z=2.1. *The Astrophysical Journal*, Vol. 783., 22 citations
- [Contributing-Author Peer-Reviewed Publications](#)
- 2022 E. T. Hamden, D. Schiminovich, S. Nikzad, N. J. Turner, B. Burkhart et al, including C. J. Vargas
Hyperion: the origin of the stars. A far UV space telescope for high-resolution spectroscopy over wide fields, *Journal of Astronomical Telescopes, Instruments, and Systems*, Vol. 8, id. 044008
- 2022 M. Stein, V. Heesen, R. J. Dettmar, et al, including C. J. Vargas.
CHANG-ES XXVI: Insights into cosmic-ray transport from radio halos in edge-on galaxies, *Astronomy & Astrophysics*, accepted October 2022
- 2022 Y. Yang, J. Irwin, J. T. Li, T. Wiegert, et al, including C. J. Vargas.
CHANG-ES XXIV: First Detection of a Radio Nuclear Ring and Potential LLAGN in NGC 5792, *The Astrophysical Journal*, Vol. 927.
- 2022 G. Heald, V. Heesen, S. Sridhar, R. Beck, et al, including C. J. Vargas.
CHANG-ES XXIII: Influence of a galactic wind in NGC 5775 *Monthly Notices of the Royal Astronomical Society*, Vol. 509.
- 2020 M. Krause, J. Irwin, P. Schmidt, Y. Stein, et al, including C. J. Vargas.
CHANG-ES XXII: Coherent Magnetic Fields in the Halos of Spiral Galaxies *Astronomy & Astrophysics*, Vol. 639, id. A112.
- 2019 A. Marasco, F. Fraternali, G. Heald, et al, including C. J. Vargas.
HALOGAS: The Properties of Extraplanar HI in Disc Galaxies *Astronomy & Astrophysics*, Vol. 631, id. A520.
- 2019 S.C. Mora-Partiarroyo, M. Krause, A. Basu et al, including C. J. Vargas.
CHANG-ES XV: Large-scale Magnetic Field Reversals in the Radio halo of NGC 4631. *Astronomy & Astrophysics*, Accepted, October 2019.
- 2019 S.C. Mora-Partiarroyo, M. Krause, A. Basu et al, including C. J. Vargas.
CHANG-ES XIV: Cosmic-ray Propagation and Magnetic Field Strengths in the Radio Halo of NGC 4631. *Astronomy & Astrophysics*, Accepted, October 2019.
- 2018 M. Krause, J. Irwin, T. Wiegert et al, including C. J. Vargas.
CHANG-ES IX: Radio Scale Heights in Relation to the Size, Star Formation, and Magnetic Fields Within a Sample of 13 Edge-on Galaxies. *Astronomy & Astrophysics*, Vol. 611.
- 2016 J. T. Li, R. Beck, R. J. Dettmar, G. Heald, J. Irwin et al. including C. J. Vargas.
CHANG-ES -VI. Probing Supernova Energy Deposition in Spiral Galaxies Through Multi-wavelength Relationships. *Monthly Notices of the Royal Astronomical Society*, Vol. 456, pp 1723 – 1783.

- 2012 V. Acquaviva, C. J. Vargas, E. Gawiser, L. Guaita.
The Curious Case of Ly α Emitters: Growing Younger from z \sim 3 to z \sim 2?. *The Astrophysical Journal*, Vol. 751.
- 2011 A. M. Koekemoer, S. M. Faber, H. Ferguson, N. A. Grogin, D. Kocevski, et al. including C. J. Vargas.
CANDELS: The Cosmic Assembly Near-infrared Deep Extragalactic Legacy Survey – The Hubble Space Telescope Observations, Imaging Data Products, and Mosaics. *The Astrophysical Journal Supplement Series*, Vol. 197.
- in prep.* R. A. M. Walterbos, C. J. Vargas, J. Irwin, D. Wang et al.
CHANG-ES C-configuration Data Release: Star Formation and Radio Halo Properties of 35 Edge-on Galaxies. *In Preparation.*

Grants, Awards, and Honors

- 2022 **Great Minds in STEM Luminary Award**, *Hispanic Engineer National Achievement Awards Conference (HENAAC)*, Luminary honorees represent professionals in science, technology, engineering and mathematics who initiate, collaborate and lead key programs and research within their companies. These individuals have made significant contributions to the Hispanic technical community as leaders and role models.
<https://greatmindsinstem.org/2022-henaac-luminary/>
- 2022 **Tucson 40 Under 40 Award**, *Tucson Hispanic Chamber of Commerce*, The Tucson 40 Under 40 Awards celebrate the rising leaders, entrepreneurs, influencers, creators, and contributors that are shaping our community and paving the way for what comes next.
<https://science.arizona.edu/news/two-college-science-faculty-selected-40-under-40-list>
- 2021 – 2026 **Aspera: Revealing the Diffuse Universe**, NASA, \$20,000,000, Astrophysics Pioneers.
I led a successful space mission proposal to develop, build, and launch the Aspera UV space telescope mission.
- 2020 **AIP Diversity Action Fund Award**, AAS/CSMA, \$15,000, CSMA Micro-grants Program.
I led a successful grant proposal to establish the CSMA micro-grants program. This program will award small grants (~ \$300) to undergraduate students to offset the costs of applying to graduate school in astronomy and astrophysics. The program will target students battling the effects of financial scarcity. This program was established in response to Factor 4 (Personal Support) of the AIP Team-Up Report.
Note: matching funds from the AAS have been acquired in 2022 to expand the program.
- 2020 **Cottrell Emerging Scholars Program: Enhancing the Successful Transition of Underrepresented Postdoctoral Scholars into the Professoriate**, *Syracuse University*.
I was selected to participate in the Cottrell Emerging Scholars Program. This program provided funding for postdocs of color to visit another institution for a mock faculty application interview. I was matched with Syracuse University for a colloquium and virtual faculty interview experience in October 2020.
- 2020 **SWHMS Graduation Keynote Speaker**, *Sayreville War Memorial High School*, Sayreville, NJ.
I was invited to deliver the 2020 virtual graduation keynote speech for SWMHS. June 11, 2020
- 2019 **Inducted into SWMHS Hall of Fame**, *Sayreville War Memorial High School*, Sayreville, NJ.
I am the youngest member to ever be inducted into the Sayreville War Memorial High School Hall of Fame.
- 2014 **National Science Foundation Graduate Research Fellowship Award**, *The National Science Foundation*.
The NSF Graduate Research Fellowship Program recognizes and supports outstanding graduate students in NSF-supported science, technology, engineering, and mathematics disciplines who are pursuing research-based Master's and doctoral degrees at accredited United States institutions. This award funded my CHANG-ES related Ph.D. research project.
- 2017 **Barry Neil Rappaport Award for Public Service**, *New Mexico State University*, Las Cruces, NM.
The Rappaport Award acknowledges outstanding public service in conjunction with strong research accomplishments at New Mexico State University Department of Astronomy

- 2015 **Zia Award for Outstanding Graduate Student Research**, *New Mexico State University*, Las Cruces, NM.
The Zia Award recognizes outstanding research and professional development at New Mexico State University Department of Astronomy
- 2008 **James Dickson Carr Scholarship**, *Rutgers University*, New Brunswick, NJ.
The James Dickson Carr Scholarship is awarded to academically promising under-represented minorities attending Rutgers University.
- 2008 **Sabert Corporation Scholarship**, *Sabert Corporation*, Sayreville, NJ.
The Sabert Corporation Scholarship is awarded to an academically outstanding graduating high school senior.

Leadership & Service

- 2022 – **Astronomy Department Representative: College of Science Faculty Council**, *University of Arizona College of Science*, I was elected to represent the Department of Astronomy to the University of Arizona's College of Science Faculty Council. **I currently serve on the DEI subcommittee tasked with forming a College-wide DEI committee.**
- 2020 – **P.I. of NASA Astrophysics Pioneers Space Mission**, *University of Arizona and Steward Observatory*, I assembled and led an international team of experts to develop a concept for a NASA astrophysics SmallSat mission (*Aspera*) to characterize warm/hot gas in nearby galaxy halos for the first time. The *Aspera* concept was selected for funding in the NASA Astrophysics Pioneers Program in January 2021.
- 2020 **Panelist for Session: Community Care as an Act of Resistance for People of Color**, *National Conference on Race and Ethnicity (NCORE)*, June 23, 2020, I was a panelist for a session designed to aid people of color in academia build community within their environments.
- 2020 – **Committee on the Status of Minorities in Astronomy (CSMA)**, *American Astronomical Society*, I currently serve as a committee member of the AAS CSMA. I co-wrote the annual 2021 budget request and am designing new CSMA program concepts to benefit minority groups in astronomy.
- 2020 **Co-Organizer of Arizona Academic CubeSat Symposium**, *University of Arizona and Steward Observatory*, I co-organized the first Arizona Academic CubeSat Symposium that took place on February 26, 2020 at the University of Arizona. This symposium was a statewide forum for members of the Arizona SmallSat community to share talks on current research, missions, procedures, and challenges related to nanosatellites. There were over 50 attendees spanning statewide research institutions and private industry.
- 2020 – **Precinct Committeeman**, *City of Tucson, AZ*, I am an elected precinct committeeman in the 99th precinct of Tucson, AZ.
- 2020 **Co-Organizer of Diversity Journal Club**, *University of Arizona and Steward Observatory*, I help to organize monthly meetings to discuss issues pertaining to diversity within Steward Observatory.
- 2019 **P.I. of NASA Astrophysics SmallSat Studies (AS3) Proposal**, *University of Arizona and Steward Observatory*, I assembled and led an international team of experts to develop a concept for a NASA SmallSat to image warm/hot gas in nearby galaxy halos for the first time. This concept was submitted to the NASA AS3 call in December 2019.
- 2019 **Hyperion SMEX Proposal HI-H₂ Interface Section Lead; Co-I**, *University of Arizona and Steward Observatory*, I led the effort for HI-H₂ interface science in the Hyperion SMEX Proposal.
- 2019 **Tucson Initiative for Minority Engagement in Science and TEchnology Program (TIMESTEP) Meeting Leader**, *University of Arizona and Steward Observatory*, I led a seminar to help teach undergraduate science majors how to find, read, and digest journal papers.

2015 – 2019 **Leader of CHANG-ES Thermal Separation Working Group**, *New Mexico State University*, I organize and lead the Thermal Separation Working Group within the CHANG-ES collaboration. The working group consisted of faculty/staff members and graduate students at various domestic and international institutions. The work done by this group eventually led to publication (listed above).

Advising & Mentoring

Postdocs,

Dr. Miriam Keppler, 2022 – present

Dr. Nicole Melso, 2021 – present.

Graduate Students,

Simran Agarwal, University of Arizona Optical Sciences Ph.D., 2021 – present

Aafaque Khan, University of Arizona Optical Sciences Ph.D., 2020 – present

Jessica Li, University of Arizona Physics Ph.D., 2019 – present.

Undergraduate Students,

Jacob Chambers, Arizona Space Grant Internship, 2022 – present

Giulia Ghidoli, 2022 – present

Gabe Noriega, 2022 – present

Ryan Pecha, 2022 – present

Ellie Wolcott, 2021 – present .

Aspera Software Summer Students,

2022 Program: Quynn Bell, Zachary Florez, Olivia Jones, Katelen Tellez (including some continuing students above).

Research Proposals

- 2023 **Co-I of James Webb Space Telescope Cycle 2 GO Proposal**, *University of Arizona*, Galaxies on the Edge: the Energetics and Physics of the Disk-Halo Interface, P.I. J. Chris Howk.
Status: submitted.
- 2023 **Co-I of James Webb Space Telescope Cycle 2 GO Proposal**, *University of Arizona*, How does a galaxy blow out bubbles? — the launching site of a nuclear outflow, P.I. Jiangtao Li.
Status: submitted.
- 2022 **Co-I of NASA Astrophysics Data Analysis Program Proposal**, *University of Arizona*, Revisiting FUSE: O VI Emission Survey in Nearby Galaxies, P.I. Haeun Chung.
Status: funded.
- 2020 **P.I. of NASA Astrophysics Pioneers Proposal (\$20M) for SmallSat mission**, *University of Arizona*, *Aspera*: Revealing the Diffuse Universe.
Status: funded. Currently in 'Phase B'.
- 2020 **Co-I of James Webb Space Telescope Cycle 1 Proposal**, *University of Arizona*, An infrared view of the disk-halo interface of a nearby galaxy, P.I. Jiangtao Li.
Status: unsupported
- 2020 **P.I. of Cycle 28 HST Observing Proposal**, *University of Arizona*, Ultraviolet Fluorescent Molecular Hydrogen Observations of a Galactic Star Forming Region.
Status: unsupported
- 2019 **P.I. of NASA Astrophysics SmallSat Studies (AS3; \$100,000) Proposal**, *University of Arizona*, *Aspera*: Unveiling Missing Gas in Galaxies.
Status: unsupported

- 2019 **P.I. of Cycle 27 HST Observing Proposal**, *University of Arizona*, Ultraviolet Fluorescent Molecular Hydrogen Observations of a Galactic Star Forming Region.
Status: unsupported
- 2019 **Co-I of NASA SMEX Mission Proposal**, *University of Arizona*, Hyperion, the Origin of the Stars, P.I. Erika Hamden.
Status: unsupported
- 2019 **Co-I of VLA Observing Proposal**, *University of Arizona*, VLA S-band Observations of Six Spiral Galaxies from the CHANG-ES Sample, P.I. Yelena Stein.
Status: observations complete

Talks

Invited Colloquia and Seminars

- 2022 Why I Stopped Waiting for Someone Else to Map the Warm-hot Circumgalactic Medium. **University of Kansas**, *Departmental Colloquium*, Lawrence, KS, April 25, 2022.
- 2022 Aspera: General Overview. **2022 Arthur M. Wolfe Symposium in Astrophysics**, *Invited Contribution*, Santa Cruz, CA, March 21-25, 2022.
- 2022 Why I Stopped Waiting for Someone Else to Map the Warm-hot Circumgalactic Medium. **University of Chicago**, *A&A Colloquium*, Chicago, IL, February 2, 2022.
- 2021 Why I Stopped Waiting for Someone Else to Map the Warm-hot Circumgalactic Medium. **Carnegie Observatories**, *Seminar*, Pasadena, CA, December 7, 2021. (Remote, due to Covid-19)
- 2021 Why I Stopped Waiting for Someone Else to Map the Warm-hot Circumgalactic Medium. **University of Michigan**, *Astronomy Department Colloquium*, Ann Arbor, MI, November 18, 2021.
- 2021 Why I Stopped Waiting for Someone Else to Map the Warm-hot Circumgalactic Medium. **New Mexico State University**, *Astronomy Department Colloquium*, Las Cruces, NM, November 12, 2021. (Remote, due to Covid-19)
- 2021 Aspera: Revealing the Diffuse Universe. **NASA Astrophysics Advisory Committee (APAC)**, *Invited Talk*, Virtual, October 15, 2021.
- 2021 Aspera: Revealing the Diffuse Universe. **NASA Cosmic Origins UVSTIG**, *QUEST Seminar*, Virtual, September 30, 2021.
- 2021 Why I Stopped Waiting for Someone Else to Map the Warm-hot Circumgalactic Medium. **University of Colorado Boulder**, *LASP Invited Seminar*, Boulder, CO, April 15, 2021. (Remote, due to Covid-19)
- 2020 Why I Stopped Waiting for Someone Else to Map the Warm-hot Circumgalactic Medium. **NASA Goddard Space Flight Center**, *Invited Seminar*, Greenbelt, MD, December 3, 2020. (Remote, due to Covid-19)
- 2020 Why I Stopped Waiting for Someone Else to Map the Warm-hot Circumgalactic Medium. **Florida International University**, *Department of Physics Seminar*, Miami, FL, November 6, 2020. (Remote, due to Covid-19)
- 2020 Why I Stopped Waiting for Someone Else to Map the Warm-hot Circumgalactic Medium. **Cornell University**, *Department of Astronomy Colloquium*, Ithaca, NY, October 29, 2020. (Remote, due to Covid-19)
- 2020 Why I Stopped Waiting for Someone Else to Map the Warm-hot Circumgalactic Medium. **Syracuse University**, *Department of Physics Colloquium*, Syracuse, NY, October 22, 2020. (Remote, due to Covid-19)

- 2019 Disk-halo interaction in nearby galaxies – New SFRs and the bright (but low surface brightness) future of UV space astronomy. **Columbia University**, *Department of Astronomy Seminar*, New York, NY, October 31, 2019.
- 2019 Disk-halo interaction in nearby galaxies – New SFRs and the bright (but low surface brightness) future of UV space astronomy. **University of Connecticut** *Department of Physics and Astronomy Seminar*, Mansfield, CT, October 23, 2019.
- 2019 Disk-halo interaction in nearby galaxies – New SFRs and the bright (but low surface brightness) future of UV space astronomy. **American Museum of Natural History**, *Astrophysics Department Colloquium*, New York City, NY, October 28, 2019.

Conference Proceedings and Public Talks

- 2021 Aspera: Revealing the Diffuse Universe *The 237th Meeting of the American Astronomical Society*, Virtual Conference, January 2021.
- 2020 Aspera: A SmallSat Concept to Map Warm/Hot Gas in Nearby Halos. *Arizona Academic CubeSat Symposium*, Tucson, AZ, February 2020.
- 2020 H α Imaging of Nearby Edge-on Galaxies, New SFRs, and an Extreme Star Formation Region (Data Release). *The 235th Meeting of the American Astronomical Society*, Honolulu, HI, January 2020.
- 2019 Disk-halo interaction in nearby galaxies – New SFRs and the bright (but low surface brightness) future of UV space astronomy. *Rutgers University, Department of Physics and Astronomy Galaxy Group Talk*, New Brunswick, NJ, October 29, 2019.
- 2019 Disk-halo interaction in nearby galaxies – New SFRs and the bright (but low surface brightness) future of UV space astronomy. *University of Massachusetts Amherst, Department of Astronomy Lunch Talk*, Amherst, MA, October 25, 2019.
- 2019 H-alpha Imaging of Nearby Edge-on Galaxies, New SFRs, and an Extreme Star Formation Region – CHANG-ES Data Release 2 *NOAO FLASH Talk*, Tucson, AZ, March 29, 2019.
- 2017 Spatially-Resolved Separation of Thermal Contribution from Radio Continuum Emission in Edge-on Galaxies. *33rd Annual New Mexico Symposium*, Socorro, NM, November 3, 2017.
- 2017 Star Formation of Edge-on Galaxies and its Relation to Radio Continuum Halos. *The 229th Meeting of the American Astronomical Society*, Grapevine, TX, January 2017.
- 2016 Star Formation of Edge-on Galaxies in CHANG-ES. *32nd Annual New Mexico Symposium*, Socorro, NM, November 4, 2016.
- 2016 Thermal Separation in CHANG-ES Galaxies. *CHANG-ES Collaboration Meeting at the University of Wisconsin Madison*, Madison, WI, July 2016.
- 2015 Counter-Rotating and Lagging Extraplanar HI in NGC 4559. *The 225th Meeting of the American Astronomical Society*, Vol. 225, Abstract #227.06, Seattle, WA, January, 2015.
- 2015 Extraplanar Gas and Radio Continuum Emission in Nearby Galaxies. *New Mexico State University Department of Astronomy Dissertation Proposal*, Las Cruces, NM, May, 2015.
- 2015 An Introduction to Thermal/Non-thermal Separation. *CHANG-ES Collaboration Meeting at Max Planck Institute for Radio Astronomy*, Bonn, Germany, July 2015.
- 2014 To Stack or Not to Stack: Spectral Energy Distribution Properties of Lyman Alpha Emitting Galaxies at $z=2.1$. *The 223rd Meeting of the American Astronomical Society*, Vol. 223, Abstract #310.04, Washington, D.C, January, 2014.
- 2014 Extraplanar Gas in the HALOGAS Galaxy NGC 4556. *CHANG-ES Collaboration Meeting at Queen's University*, Kingston, ON, Canada, July, 2014.

- 2014 To Stack or Not to Stack: Spectral Energy Distribution Properties of Lyman Alpha Emitting Galaxies at $z=2.1$. *Astronomical Society of Las Cruces*, Las Cruces, NM, April, 2014.
- 2014 To Stack or Not to Stack: Spectral Energy Distribution Properties of Lyman Alpha Emitting Galaxies at $z=2.1$. *29th Annual New Mexico Symposium*, Socorro, NM, January, 2014.
- 2013 To Stack or Not to Stack: Spectral Energy Distribution Properties of Lyman Alpha Emitting Galaxies at $z=2.1$. *The 221st Meeting of the American Astronomical Society*, Vol. 221, Abstract #112.08, Long Beach, CA, January, 2013.
- 2012 To Stack or Not to Stack: Spectral Energy Distribution Properties of High-Redshift Lyman Alpha Emitting Galaxies. *Honors Thesis Colloquium, Rutgers University Physics and Astronomy Department*, Piscataway, NJ, May, 2012.
- 2012 Exploring the Photometric Properties of $z=3.1$ Lyman Alpha Emitting Galaxies. *The 219th Meeting of the American Astronomical Society*, Vol. 219, Abstract #340.11, Austin, TX, January, 2012.
- 2011 Exploring the Photometric Properties of $z=3.1$ Lyman Alpha Emitting Galaxies. *Tri-State Astronomy Conference at the City University of New York*, New York City, NY, October, 2011.

Meeting Attendance

- 2022 **Arthur M. Wolfe Symposium in Astrophysics**, Santa Cruz, CA, March 21–25, 2022.
invited contribution
- 2021 **The 237th Meeting of the American Astronomical Society**, Virtual, January 10–15, 2021.
oral presentation
- 2020 **National Conference on Race and Ethnicity (NCORE)**, Remote, June, 23 2020.
Panelist for Session, "Community Care as an Act of Resistance for People of Color"
- 2020 **Arizona Academic CubeSat Symposium**, Tucson, AZ, February 26, 2020.
Co-organizer; session moderator; oral presentation
- 2020 **The 235th Meeting of the American Astronomical Society**, Honolulu, HI, January 4–8, 2020.
oral presentation
- 2019 **The Art of Measuring Galaxy Physical Properties**, Milan, Italy, November 18–22, 2019.
poster presentation
- 2017 **33rd Annual New Mexico Symposium**, Socorro, NM, November 3, 2017.
oral presentation
- 2017 **The 229th Meeting of the American Astronomical Society**, Grapevine, TX, January 3–7, 2017.
dissertation talk
- 2016 **32nd Annual New Mexico Symposium**, Socorro, NM, November 4, 2016.
oral presentation
- 2016 **CHANG-ES Collaboration Meeting at the University of Wisconsin Madison**, Madison, WI, July 18–22, 2016.
public talk
- 2015 **The 225th Meeting of the American Astronomical Society**, Seattle, WA, January 4–8, 2015.
oral presentation
- 2015 **CHANG-ES Collaboration Meeting at Max Planck Institute for Radio Astronomy**, Bonn, Germany, July 13–17, 2015.
oral presentation

- 2014 **The 223rd Meeting of the American Astronomical Society**, *Washington, D.C.*, January 5–9, 2014.
oral presentation
- 2014 **4th VLA Data Reduction Workshop**, *Socorro, NM*, October 27–31, 2014.
- 2014 **14th Synthesis Imaging Workshop**, *Socorro, NM*, May 13–20, 2014.
- 2014 **CHANG-ES Collaboration Meeting at Queen's University**, *Kingston, ON, Canada*, July 21–25, 2014.
oral presentation
- 2014 **29th Annual New Mexico Symposium**, *Socorro, NM*, January 17, 2014.
oral presentation
- 2013 **The 221st Meeting of the American Astronomical Society**, *Long Beach, CA*, January 6–10, 2013.
oral presentation
- 2012 **The 219th Meeting of the American Astronomical Society**, *Austin, TX*, January 8–12, 2012.
poster presentation
- 2011 **Tri-State Astronomy Conference at the City University of New York**, *New York City, NY*, October 2011.
poster presentation

Press Releases and News Articles

- 2021 **University of Arizona to Lead Space Telescope Mission to Learn How Galaxies Evolve, Form Stars**, *AZPBS, Cronkite News*, April 12, 2021.
<https://cronkitenews.azpbs.org/2021/04/12/university-of-arizona-to-lead-nasa-telescope-mission/>
- 2021 **UArizona Will Lead NASA Space Telescope Mission to Reveal Unseen, Dynamic Lives of Galaxies**, *University of Arizona Press Release*, January 7, 2021.
<https://news.arizona.edu/story/uarizona-will-lead-nasa-space-telescope-mission-reveal-unseen-dynamic-lives-galaxies>
- 2021 **NASA picks University of Arizona team to build small satellite with big mission**, *Arizona Daily Star*, January 19, 2021, *Newspaper front page*.
https://tucson.com/news/local/nasa-picks-university-of-arizona-team-to-build-small-satellite-with-big-mission/article_d3ab2c02-70c4-5fa0-baaf-87c3263bed07.htmltracking-source=home-top-story-1
- 2021 **Potentially Mind-blowing Secrets of the Universe Could be Exposed with New NASA Missions**, *Syfy Wire*, January 17, 2021.
<https://www.syfy.com/syfywire/secrets-of-the-universe-new-nasa-missions>
- 2021 **Arizona Researcher Wins \$20M NASA Mission Grant for Compact Telescope**, *Optics.org*, February 4, 2021.
<https://optics.org/news/12/2/8>
- 2021 **NASA Selects 4 Concepts for Small Missions to Study Universe's Secrets**, *NASA Press Release*, January 7, 2021.
<https://www.nasa.gov/feature/nasa-selects-4-concepts-for-small-missions-to-study-universe-s-secrets>
- 2021 **The UA to lead NASA's Aspera Mission**, *The Daily Wildcat*, January 17, 2021.
<https://www.wildcat.arizona.edu/article/2021/01/sc-aspera-mission>

- 2015 **CHANG-ES Press Release, D-Configuration Public Data Release**, October 13, 2015, I wrote the initial drafts of the D-Configuration Public Data Release Press Release, which was circulated through the National Radio Astronomy Observatory and various other science news platforms.
<https://public.nrao.edu/news/pressreleases/galaxy-halos>

Outreach

- 2022 **Negotiating Faculty Positions Panelist**, *University of Arizona Postdoctoral Affairs*, April 15, 2022.
I was on a panel to discuss experiences and strategies for negotiating faculty positions to benefit the general UA postdoc population.
- 2020 **Tucson Initiative for Minority Engagement in Science and Technology Program (TIMESTEP) Event Volunteer**, *University of Arizona: Tucson, AZ*, December 9, 2020.
I led a discussion informing undergraduate students about research opportunities both within the department and at outside institutions. There was further discussion on the benefits of becoming involved with research at the undergraduate stage.
- 2020 **Tucson Initiative for Minority Engagement in Science and Technology Program (TIMESTEP) Event Volunteer**, *University of Arizona: Tucson, AZ*, January 15, 2020.
I read over summer research applications written by undergraduate physics and astronomy students and offered them advice on their materials.
- 2019 **Tucson Initiative for Minority Engagement in Science and Technology Program (TIMESTEP) Meeting Leader**, *University of Arizona: Tucson, AZ*.
I led a meeting benefitting undergraduate astronomy majors discussing ways to find, read, and digest scientific journal papers.
- 2012 – 2018 **Campus Observatory Open House**, *NMSU: Las Cruces, NM*.
At least once each academic year, I participated in an event at Tombaugh Observatory on NMSU's campus to operate telescopes and show astronomical objects to the public.

Public School Outreach

- 2018 **Elementary School Field Trip**, *Tombaugh Observatory: Las Cruces, NM*, March 29, 2018.
I walked ~ 100 elementary school students through a scale model of the solar system during their campus field trip.
- 2018 **Math and Science Night**, *Vista Middle School: Las Cruces, NM*, March 14, 2018.
I showed middle school students hands-on astronomy demonstrations and publicly answered math and science questions.
- 2017 **Hillrise Elementary School Career Day**, *Hillrise Elementary School: Las Cruces, NM*, November 9, 2017.
I taught 6 classes of elementary school children about what astronomers study as a career. The discussion ended with a Sun viewing, using solar telescopes.
- 2017 **Elementary School Field Trip**, *Tombaugh Observatory: Las Cruces, NM*, March 3, 2017.
I taught ~ 100 elementary school students about constellation observing through interactive activities.
- 2017 **Tombaugh Science Night**, *Tombaugh Elementary School: Las Cruces, NM*, February 2, 2017.
I taught ~ 500 elementary school students and their parents about observing planets and the night sky through binoculars and simple telescopes.
- 2016 **After School Science**, *University Hills Elementary School: Las Cruces, NM*, November 2, 2016.
I taught elementary school students about meteorites, impact craters, and showed them how to safely view the sun through a solar telescope.
- 2016 **Hillrise Elementary School Career Day**, *Hillrise Elementary School: Las Cruces, NM*, October 21, 2016.
I taught elementary school students about meteorites, impact craters, and showed them how to safely view the sun through a solar telescope.

- 2016 **Enrich the Kids**, *Hillrise Elementary School: Las Cruces, NM*, July 6, 2016.
I taught elementary school students about meteorites and answered many questions about the possibilities of extraterrestrial life in the universe.
- 2015 **SEMAA After School Program**, *Tombaugh Observatory: Las Cruces, NM*, December 3, 2015.
I taught a group of visiting children about the scale of the Solar System through interactive activities.
- 2015 **Science Fair**, *Sierra Middle School: Las Cruces, NM*, February 9, 2015.
I acted as a judge for a middle school science fair, focusing on physical science and engineering projects.
- 2014 **Science Fair**, *Sierra Middle School: Las Cruces, NM*, February 6, 2014.
I acted as a judge for a middle school science fair, focusing on physical science and engineering projects.
- 2013 **Star Party**, *Dark sky site: Las Cruces, NM*, June 22, 2013.
I provided assistance at a star party for a school class.
- 2013 **Zia Middle School Campus Field Trip**, *Tombaugh Observatory: Las Cruces, NM*, April 19, 2013.
I taught groups of middle school students about meteorites while also observing the Sun through solar telescopes.
- 2013 **4th Grade Campus Field Trip**, *Tombaugh Observatory: Las Cruces, NM*, April 17, 2013.
I taught groups of elementary school students about the Sun while observing it through a solar telescope.
- 2013 **Elementary School Open House**, *Booker T. Washington Elementary School: Las Cruces, NM*, February 21, 2013.
I set up a stand at the elementary school open house to teach children and parents about astronomy. We also viewed the moon through a telescope.
- 2013 **Tombaugh Day**, *Tombaugh Elementary School: Las Cruces, NM*, February 9, 2013.
I taught students about various aspects of astronomy in honor of Clyde Tombaugh, the discoverer of Pluto.
- 2012 **SEMAA Campus Visits**, *Tombaugh Observatory: Las Cruces, NM*, November 29, 2012.
I taught groups of elementary school students about meteorites while also observing the Sun through solar telescopes.
- [Farmer's Market Astronomy](#)
- 2016 **Farmer's Market Astronomy**, *Museum of Nature and Science: Las Cruces, NM*, February 20, 2016.
I set up solar telescopes outside of the Museum of Nature and Science during the weekly Farmer's Market and showed citizens the Sun while answering astronomy-related questions.
- 2014 **Farmer's Market Astronomy**, *Museum of Nature and Science: Las Cruces, NM*, September 27, 2014.
- 2014 **Farmer's Market Astronomy**, *Museum of Nature and Science: Las Cruces, NM*, March 29, 2014.
- [Sky Safaris](#)
- 2015 **Sky Safari**, *Tombaugh Observatory: Las Cruces, NM*, January 24, 2015.
I taught the general public about astronomy, while providing telescope direction at Tombaugh Observatory.
- 2013 **Sky Safari**, *Tombaugh Observatory: Las Cruces, NM*, September 7, 2013.
- 2013 **Special Sky Safari**, *Chihuahuan Desert Nature Park: Las Cruces, NM*, July 22, 2013.
I taught the general public about astronomy at a science night event at the Chihuahuan Desert Nature Park.
- 2013 **Sky Safari**, *Tombaugh Observatory: Las Cruces, NM*, May 18, 2013.
- [Special Events](#)
- 2015 **Library Moon Viewing**, *Thomas Branigan Memorial Library: Las Cruces, NM*, September 24, 2015.
I set up telescopes near Thomas Branigan Memorial Library to observe the Moon with elementary school classes.

2014 **Partial Solar Eclipse**, *Mesilla Valley Mall: Las Cruces, NM*, October 23, 2014.

I helped teach the general public about solar eclipses, while providing people with solar viewing glasses for the partial solar eclipse.

2014 **Astronomical Society of Las Cruces Speaker**, *Dona Ana Community College: Las Cruces, NM*, April 25, 2014.

I gave a presentation to ~30 members of the Astronomical Society of Las Cruces focusing on current astronomy breakthroughs.