

# LAURA D. VEGA

## CURRICULUM VITAE

### Astrophysicist | Heising-Simons Foundation Astrophysics Postdoctoral Fellow

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NASA/GSFC, Greenbelt, MD 20771

### Research Interests

My research interests include multiwavelength astronomy, late-stage stellar evolution, post-AGB binaries, circumbinary disks, and X-ray/UV flares from M-dwarf stars.

### Education

Astrophysics Ph.D., 2021 – Vanderbilt University	Advisor: Keivan Stassun
Physics M.A., 2017 – Fisk University	Advisor: Keivan Stassun
Physics B.Sc., 2013 – The University of Texas at San Antonio (UTSA)	Advisor: Eric Schlegel

### Publications ([Number] = Number of citations for refereed papers as of CV's date-of-update)

16. Vega L. D. et al. 2024, *In Prep.*; *Simultaneous TESS and Swift Observations of Wolf 359.*
15. Vega L. D. et al. 2024, *In Prep.*; *From Radio to Gamma-ray: Tracing the flares of YZ Canis Minoris Across the Spectrum.*
14. Howard, W. S. et al. 2024, Accepted for publication in AAS Journals. *Preparing for the Early eVolution Explorer: Characterizing the photochemical inputs and transit detection efficiencies of young planets using multiwavelength flare observations by TESS and Swift*
13. Paudel R. R. et al. 2024; *A Multiwavelength Survey of Nearby M Dwarfs: Optical and Near-ultraviolet Flares and Activity with Contemporaneous TESS, Kepler/K2, Swift, and HST Observations*, The Astrophysical Journal, 971, 24. [1]
12. Tovar-Mendoza, G. et al. 2023; *Enabling Stellar Flare Science in the Roman Galactic Bulge Survey: Cadence, Filters, and the Read-Out Strategy Matter*, Roman Core Community Survey White Paper. [1]
11. Wittrock, J. M. et al. 2023; *Validating AU Microscopii d with Transit Timing Variations*, The Astronomical Journal, 166, 232. [12]
10. Barclay, T. et al. 2023, Submitted to AAS Journals; *The transmission spectrum of the potentially rocky planet L 98-59 c.* [10]
9. Chavali, S. et al. 2022; *A Pilot Survey of an M Dwarf Flare Star with Swift's UV Grism*, Research Notes of the AAS, 6, 201. [3]

8. Wittrock, J. M. et al. 2022; *Transit Timing Variations for AU Microscopii b and c*, The Astronomical Journal, 164, 27. [14]
7. Gilbert, E. A. et al. 2022; *Flares, Rotation, and Planets of the AU Mic System from TESS Observations*, The Astronomical Journal, 163, 147. [48]
6. Paudel, R. R. et al. 2021; *Simultaneous Multiwavelength Flare Observations of EV Lacertae*, The Astrophysical Journal, 922, 31. [27]
5. **Vega, L. D. et al. 2021**; *Multiwavelength Observations of the RV Tauri Variable System U Monocerotis: Long-Term Variability Phenomena Can Be Explained by Binary Interactions With a Circumbinary Disk*, The Astrophysical Journal, 909, 138. (**NASA Feature**). [5]
4. Gilbert, E. A. et al. 2020; *The First Habitable Zone Earth-sized Planet from TESS. I: Validation of the TOI-700 System*, The Astronomical Journal, 160, 116. (**NASA Feature**). [97]
3. Kostov, V. B. et al. 2019; *The L 98-59 System: Three Transiting, Terrestrial-size Planets Orbiting a Nearby M Dwarf*, The Astronomical Journal, 158, 32. (**NASA Feature**). [106]
2. **Vega, L. D. et al. 2017**; *Evidence for Binarity and Possible Disk Obscuration in Kepler Observations of the Pulsating RV Tau Variable DF Cygni*, The Astrophysical Journal, 839, 48. [14]
1. Schlegel, E. M. et al. 2016; *NGC 5195 In M51: Feedback ‘Burps’ After a Massive Meal?*, The Astrophysical Journal, 823, 75. (**NASA Feature**). [11]

## Relevant Skills

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**Languages:** English; Spanish

**Computer (varying levels of proficiency):** Unix; Python; LaTeX; Lightkurve; HEASARC: FTOOLS, XSPEC; SAOImage DS9

**Data experience (varying levels of proficiency):** X-ray/Ultraviolet (NICER, *Swift*); Optical (*Kepler*, TESS, AAVSO, DASCH); and Radio (SMA)

## Fellowships/Grants

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NASA TESS Cycle 4 Guest Investigator Program	2021 - 2022
NASA TESS Cycle 3 Guest Investigator Program	2020 - 2021
NASA Minority University Research Education Project (MUREP)/Advanced STEM Training and Research (ASTAR): Harriett G. Jenkins Pre-doctoral Fellowship	2015 - 2020
Smithsonian Latino Center - LIP (Research at the Center for Astrophysics and Outreach at National Air & Space Museum)	2017, 2018, 2019
UTSA Vaughan Family Grant (AAS Conference Travel)	2011, 2012, 2014
National Institute on Minority Health and Health Disparities – Nanotechnology and Human Health Core Grant (2012 Summer Undergraduate Nanoparticles Research at UTSA)	2012
Bill & Alicia Hoover Grant (For 2010 Summer Research at UTSA)	2010

## Honors and Awards

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Most Outstanding Student Publication - Vanderbilt Physics & Astronomy Department	2018
NASA Office of Education’s MUREP: Harriett G. Jenkins Pre-doctoral Fellow	2015
Best Poster in Physics - Fisk University Science Symposium	2016
Toastmasters International - Competent Leader	2015

Toastmasters International - Competent Communicator	2015
The Sam Madrid Jr. Endowed Scholarship - UTSA	2012
The Dr. B. Thyagarajan Endowed Scholarship - UTSA	2009
Dean's List - UTSA	2007, 2008
Honor Roll - UTSA	2009, 2010, 2011

## Observation Proposals

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17. ALMA - Cycle 9 - April 2022  
Co-I: ACCEPTED; The Origin and Impact of Flares in M Dwarf Systems; PI: Meredith MacGregor
16. TESS - Cycle 5 - January 2022  
Co-I: ACCEPTED; Multiwavelength TESS-Swift-NICER Observations of Pulsations in Flares on Solar-Type Stars; PI: Teresa Monsue
15. Swift - Cycle 18 - September 2021  
Co-I: ACCEPTED; A Swift and Alma View of the Origin and Impact of M-Dwarf Flares; PI: Ward Howard
14. TESS - Cycle 4 - January 2021  
Co-I: ACCEPTED; Using Tess 20-S Cadence Data To Study Flares On M Dwarfs; PI: Rishi Paudel
13. NICER - Cycle 3 - November 2020  
Co-I: ACCEPTED; A Study of M Dwarf Flares Using Simultaneous High Cadence Multi-wavelength Data; PI: Rishi Paudel
12. XMM-Newton - Announcement of Opportunity 20 - October 2020  
Co-I: ACCEPTED; Pilot Study of RV Tau Variables: A new class of X-ray emitting stars? PI: Rodolfo Montez Jr.
11. Hubble Space Telescope Cycle 28 - October 2020  
Co-I: ACCEPTED; Confirming a Tentative Detection of an Atmosphere Around a Potentially Rocky Planet; PI: Thomas Barclay
10. Swift - Target of Opportunity - July 2020  
**PI: ACCEPTED**; 20 kilo-second UVOT observations of the AU Mic system
9. Joint TESS-Swift - Cycle 3 - January 2020  
**PI: ACCEPTED**; Exploring the Star-Planet Connection via Simultaneous TESS and Swift Observations of Highly Active M Dwarfs
8. TESS Cycle 3 - January 2020  
Co-I: ACCEPTED; Discovering Circumbinary Planets With Tess; PI: Veselin Kostov
7. NICER - Cycle 2 - November 2019  
Co-I: ACCEPTED; Multiwavelength Observations of Highly Active M Dwarfs; PI: Rishi Paudel
6. Hubble Space Telescope Cycle 27 - April 2019  
Co-I: ACCEPTED; Searching for Secondary Atmospheres in a System of Benchmark Worlds; PI: Thomas Barclay

5. NOAO - Center for High Angular Resolution Astronomy - April 2019  
Co-I: ACCEPTED; Diving into the close stellar environment of the magnetic RV Tauri star U Mon; PI: Laurence Sabin
4. SAO - Submillimeter Array - March 2019  
**PI: ACCEPTED**; Hunting for Disks Around Pulsating RV Tau Stars
3. SAO - Submillimeter Array (Filler Program) - March 2019  
Co-I: ACCEPTED; Disks around RV Tauri Variable Stars: U Mon in High Resolution; PI: Rodolfo Montez Jr.
2. SAO - Submillimeter Array (Filler Program) - October 2018  
Co-I: ACCEPTED; Disks around RV Tauri Variable Stars: U Mon (0.8 mm); PI: Rodolfo Montez Jr.
1. SAO - Submillimeter Array (Filler Program) - October 2018  
Co-I: ACCEPTED; Disks around RV Tauri Variable Stars: U Mon; PI: Rodolfo Montez Jr.

### Oral Presentations

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25. **Invited Talk:** Updates on our Multiwavelength Observations Campaign of Active M Dwarf Stars with TESS, Swift, and NICER; NASA JPL Virtual Exoplanet Lecture Series; Virtual Meeting, Pasadena, CA, Mar. 2024.
24. Exploring Flares in Simultaneous Multiwavelength Observations of Active M Dwarf Stars; NASA/CRESST II Retreat; University of Maryland, College Park, MD, Mar. 2024.
23. Is the Flaring Star Wolf 359 a Good Exoplanet Host?; American Astronomical Society, AAS 243rd Meeting. New Orleans, LA, Jan. 2024.
22. **Invited Talk:** Exploring Flares in Simultaneous Multiwavelength Observations of Active M Dwarf Stars; Penn State Center for Exoplanets and Habitable Worlds; State College, PA, Nov. 2023.
21. **Invited Talk:** Exploring Flares in Simultaneous Multiwavelength Observations of Active M Dwarf Stars; National Society of Black Physicists Conference; Knoxville, TN, Nov. 2023.
20. Exploring Flares in Simultaneous Multiwavelength Observations of Active M Dwarf Stars; [Institute for Theory and Computation Luncheon](#); Harvard-Smithsonian Center for Astrophysics, Cambridge, MA, Nov. 2023.
19. **Invited Talk:** My Research on RV Tauri Stars and M Dwarf Flares; Tecnológico de Monterrey Campus Sonora Norte, Hermosillo, Sonora, México, Oct. 2023.
18. **Invited Talk:** Exploring RV Tauri Stars: A Study of DF Cygni and U Monocerotis; Mid-Hudson Astronomical Association, Virtual Meeting, SUNY-New Paltz, New Paltz, NY, Sep. 2023.
17. Exploring Flares in Simultaneous Multiwavelength Observations of Wolf 359; Early Career Scientist Forum 2023, Sciences and Exploration Directorate 600, Goddard Space Flight Center, Greenbelt, MD, Sep. 2023.
16. **Invited Talk:** Stellar Evolution at the Crossroads: Resolving the Nature of RV Tauri Stars using Multiwavelength Observations from Kepler, XMM-Newton, DASCH, AAVSO, and the SMA; Earth and Planets Laboratory Astronomy Seminar, Carnegie Institution for Science; Washington, DC, May 2023.

15. **Invited Talk:** Simultaneous Multiwavelength TESS, Swift, and NICER Observations of Highly Active M Dwarf stars; NASA JPL Exoplanets Journal Club; Virtual Meeting, Pasadena, CA, Nov. 2022.
14. Simultaneous Multiwavelength Observations of the Highly Active M Dwarf YZ CMi; SAC-NAS, San Juan, Puerto Rico, Oct. 2022.
13. [The APS Bridge Program and my journey to the PhD](#); Session L05: Experiences from the APS Bridge Program, APS April Meeting 2022, New York, NY, Apr. 2022.
12. [Multiwavelength observations of Highly Active M Dwarf stars using Swift, TESS, and NICER](#); Ultraviolet Science at Goddard, NASA Goddard Space Flight Center, Greenbelt, MD, Apr. 2022.
11. [Simultaneous Multiwavelength Swift, TESS, and NICER Observations of Highly Active M Dwarf Stars](#); Invited Talk Colloquium, Virtual Meeting, UTSA Department of Physics & Astronomy, San Antonio, TX, Apr. 2022.
10. Resolving the Nature of RV Tauri Variable Systems Using Unprecedented Observations From the Kepler and XMM-Newton Space Telescopes; AAS Dissertation Talk, Stars IV Oral Session, AAS 238th Meeting. Virtual, Jun. 2021.
9. Stellar Evolution at the Crossroads: Resolving the Nature of RV Tauri Variable Systems Using Unprecedented Observations from Kepler and XMM-Newton Space Telescopes; Invited Talk Colloquium, Virtual Meeting, Howard University, Washington, DC, Mar. 2021.
8. Astrophysics with TESS; NASA Hyperwall; American Astronomical Society, AAS 235th Meeting. Honolulu, HI, Jan. 2020.
7. Observations of Disks Around RV Tauri Variable Stars with the Submillimeter Array; SAC-NAS Conference, the Henry B. González Convention Center, San Antonio, TX, Oct. 2018.
6. [Evidence for Disk Obscuration in Kepler Observations of the RV Tau Star DF Cyg](#); 5<sup>th</sup> Annual Astrophysics Conference - DC, The George Washington University, Washington DC, Jul. 2017.
5. [Kepler's Unprecedented High Temporal Precision Observations of the RV Tauri variable DF Cygni](#), Astronomy Journal Club, Vanderbilt University, Nashville, TN, Sep. 2016.
4. [M51 and the Effect of the Arm Resonance and Interaction on Diffuse X-ray Emission](#); American Astronomical Society, AAS 225th Meeting. Seattle, WA, Jan. 2015.
3. [Cosmic Background Radiation and the Evolution of the Universe](#); UTSA's Friday Nights, Celestial Lights Series. San Antonio, TX, April 18, 2014.
2. Diffuse X-ray & Multi-wavelength Emission in Nearby, Face-on Spiral Galaxies; San Antonio, Texas Astrophysics Researchers Meeting. San Antonio, TX, Mar. 22, 2013.
1. "Diffuse X-ray & Multi-wavelength Emission in Nearby, Face-on Spiral Galaxies" and poster presentation "Diffuse X-ray Emission and Star Clusters in Nearby, Face-on Spiral;" UTSA College of Science, COS, Research Conference. San Antonio, TX, Oct. 5, 2012.

## Poster Presentations

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20. [From Radio to X-ray: Tracing YZ CMi's Flares Across the Spectrum](#); Cool Stars 22, San Diego, California, Jun. 24-28, 2024.
19. Is the Flaring Star Wolf 359 a Good Exoplanet Host?; 2023 UMD Postdoctoral Research Symposium, University of Maryland, College Park, MD, Sep. 2023.
18. [Is the Flaring Star Wolf 359 a Good Exoplanet Host?](#); Towards Other Earths III: The Planet-Star connection, Porto, Portugal, Jul. 17-21, 2023.
17. Simultaneous Multiwavelength Swift, TESS, and NICER Observations of Highly Active M Dwarf Stars; 2022 UMD Postdoctoral Research Symposium, University of Maryland, College Park, MD, Sep. 2022.
16. [Simultaneous Multiwavelength Swift, TESS, and NICER Observations of Highly Active M Dwarf Stars](#); Cool Stars 21, Toulouse, France, Jul. 4-9, 2022.
15. [Simultaneous Multiwavelength Observations of the Highly Active M Dwarf YZ CMi](#); TESS Science Conference II, Virtual Meeting, Aug. 2021.
14. [Multiwavelength Observations of the RV Tau Variable U Monocerotis](#); American Astronomical Society, AAS 235th Meeting. Honolulu, HI, Jan. 2020.
13. [X-ray & Submillimeter Observations of the Pulsating RV Tau Variable U Mon](#); 2019 Spring Symposium - The Deaths and Afterlives of Stars; Space Telescope Science Institute; April 2019.
12. [Submillimeter Array Observations of the Large Disk Around RV Tau Star U Mon](#); 7th National Capital Area Disks Meeting; Johns Hopkins University / Space Telescope Science Institute; 26 Sep., 2018.
11. [Observations of Disks Around RV Tau Variables with the Submillimeter Array](#); Cool Stars Conference; Boston University, Boston, MA, July 2018.
10. Evidence for Disk Obscuration in Kepler Observations of the Pulsating RV Tau Variable DF Cyg; Kepler-K2 Science Conference; NASA Ames, Mountain View, CA, Jun. 2017.
9. [Evidence for Binarity in Kepler Observations of the Pulsating RV Tau Variable DF Cygni](#); American Astronomical Society, AAS 229th Meeting. Grapevine, TX, Jan. 2017.
8. [Stellar Evolution at the Crossroads: A Closer Look at the RV Tauri Variable Star DF Cygni](#); 4<sup>th</sup> Annual DC/MD/VA Astrophysics Meeting, The George Washington University, Washington DC, Jun. 2016.
7. Stellar Evolution at the Crossroads: A Closer Look at the RV Tauri Variable Star DF Cygni; Fisk University Symposium, Nashville, TN, Aug. 2015.
6. Stellar Evolution at the Crossroads: A Closer Look at the RV Tauri Variable Star DF Cygni; Fisk-Vanderbilt Masters-to-PhD Bridge Program, Research Celebration Day. Nashville, TN, Aug. 2015.
5. [Diffuse Hot Gas in M51](#); Chandra's X-ray View of Galaxy Ecosystems; Schlegel, Eric M.; **Vega, L. D.**; Moore, M.; Boston, MA. Jul. 2014.



4. [Diffuse Emission in Nearby, Face-on Spiral Galaxies](#); AAS 223rd Meeting; Schlegel, Eric M.; **Vega, L. D.**; Moore, M.; Washington, DC, Jan. 5-9, 2014.
3. [Diffuse X-ray Emission and Star Clusters in Nearby, Face-on Spiral Galaxies](#); AAS 219th Meeting. Austin, TX, Jan. 7-12 2012.
2. [X-ray Eclipses in the 2010 Outburst of the Recurrent Nova U Sco? & Observations of the 2010 January Outburst of the Recurrent Nova U Sco using NASA's Swift](#); AAS 117th Meeting; McMaster, Laura; **Vega, L.**, et al.; Seattle, WA, Jan. 9-13 2011.
1. ["X-ray Eclipses in the 2010 Outburst of the Recurrent Nova U Sco?" & "Observations of the 2010 January Outburst of the Recurrent Nova U Sco using NASA's Swift"](#); Joint Fall 2010 Meeting of the Texas Sections of the APS, AAPT, Zone 13 of SPS and the National Society of Hispanic Physicists, San Antonio, TX, October 21-23, 2010.

## Leadership & Outreach

### [Astronomy on Tap \(AoT\) Baltimore](#), Guilford Hall Brewery, Baltimore, MD, Jan 2024

- General Public Talk: "Stellar Cheers: A Toast to the Eccentricities of RV Tauri Binary Stars."

### [NASA International Space Apps Challenge – Hermosillo](#), Local Mentor and Judge, Tecnológico de Monterrey Campus Sonora Norte, Hermosillo, Sonora, México, Oct. 6–8, 2023

- Engaged with student groups, offering advice as they worked on their projects. Evaluated student presentations at the conclusion of the hackathon. Presented a talk about my academic journey to the PhD, highlighting key experiences and insights. Delivered a scientific talk to professors and graduate students at the university.

### Better Astronomy for the New Generation! (BANG!) Organizing Committee Member, Sept. 2022 - May 2023

- The University of Maryland's Astronomy Department's BANG! Seminar features speakers and discussions on issues of equity and inclusion, career paths, and soft skills for astronomers.

### Research Mentor, Oct. 2020 - Jan 2021

- Mentoring a high school senior in Madison County, VA, developing a research project on classifying M-dwarf flares based on the Solar-flare classification system.

### Colorado Springs Cool Science Festival - Zoom-a-Scientist, Oct. 2020

- Virtual (Zoom) chat sessions with children in Fairbanks, AK (3rd grade) and in Colorado Springs, CO (1st grade) about astronomy and what it's like to be a scientist.

### Smithsonian National Air & Space Museum Volunteer Astronomer, Oct. 2017 - Present

- [Astronomy Chats](#) & Hispanic Heritage Month Outreach: Innovators in Air and Space Family Day, Wash. DC.

### Barrera Veterans Elementary School - Career Day, Von Ormy, TX, May 2019

- Chat with children at different grade levels about astronomy and what it's like to be a scientist.

### Bancroft Elementary Saturday Academy - Astronomy Chat, Wash. DC, January 2019

- Visited 2nd and 3rd grade Latinx bilingual students at Bancroft Elementary to talk about astronomy and science. Presentation facilitated by the Smithsonian Air & Space Museum and sponsored

by the Smithsonian Latino Center.

**Smithsonian Astrophysical Observatory - Rising Stars Camp, St. Katharine Drexel, Roxbury Crossing, MA, July 2018**

- Facilitated a number of activities such as the use of the Micro Observatory Robotic Telescopes and software to introduce the children to the life cycle of stars, and other astronomy topics. I also gave a short talk about my research.

**Fisk-Vanderbilt Bridge Program Recruitment at SACNAS, Long Beach, CA, Oct 2016**

- Booth at SACNAS to recruit undergraduate student for the Fisk-Vanderbilt Bridge Program.

**DCA Stars at The University of Maryland - College Park, Summer 2016**

- Students and mentors met weekly and discussed our research, goals, setbacks, and successes.

**Inclusive Astronomy Conference at Vanderbilt, Nashville, TN, June 17–19, 2015**

- Volunteer host for the inaugural conference on diversity and inclusion.

**Astronomy Torus 2012 Workshop at UTSA, San Antonio, TX, December 5–7, 2012**

- International workshop focused on active galactic nuclei; Local Organizing Committee Member: Logistics planning; Registration desk.

**Toastmasters International, Oct. 2013–Present**

- Goddard Toastmasters Vice President of Public Relations (06/2022-Present); Vanderbilt Toastmasters Vice President of Public Relations (05/2015-Present); UTSA Roadrunner Toastmasters Treasurer (01/2014-07/2014); Deliver prepared and extemporaneous speeches as well as evaluating other speakers.

**Society for Advancement of Chicanos & Native Americans in Science (SACNAS)**

- Founding officer (Treasurer) for the *first* SACNAS chapter in the state of Tennessee.

**The Physics Honor Society | Sigma Pi Sigma at UTSA – President, Apr. 2013–Jan. 2014**

- Organized student study sessions for the Physics GRE; Tutored students in physics and Mathematics; Supplemental officer for Society of Physics Students: Public Relations & Secretary.

**Society of Physics Students at UTSA**

- **Outreach:** Various on-campus STEM outreach events for high school students like Nano Day with Partnership for Education & Research in Materials at UTSA & Hispanic Chamber of Commerce's CORE4 STEM Familia Day Expo at UTSA; Space Day for elementary school children at Forest Hills Public Library; Student Panelist for Engineering-Day at UTSA; On-campus liquid-nitrogen ice cream sales with physics demonstrations.

- **Public Relations Officer:** Made posters and flyers of meetings, fundraisers, talks, and events; Managed social media accounts such as SPS' Facebook page; UTSA Physics & Astronomy's "Friday Nights, Celestial Lights" monthly outreach event.



## Professional Memberships/Affiliations

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National Society of Black Physicists (NSBP)	2023 - Present
Latinx Employee Association (LEA) at UMD	2021 - Present
Vanderbilt Association of Hispanic and Latinx Alumni	2021 - Present
Sigma Xi   The Scientific Research Society ( $\Sigma\Xi$ )	2015 - Present
National Society of Hispanic Physicists (NSHP)	2013 - Present
Toastmasters International	2013 - Present
Society for Advancement of Chicanos & Native Americans in Science (SACNAS)	2013 - Present
American Physical Society (APS)	2011 - Present
American Astronomical Society (AAS)	2011 - Present
Sigma Pi Sigma   The Physics Honor Society ( $\Sigma\Pi\Sigma$ )	2011 - Present
LeaderShape Institute Alumna & Pebble Club	2011 - Present
UTSA Alumni Association	2013 - 2014
San Antonio Astronomical Association	2013 - 2014
UTSA San Antonio Texas Astrophysics Researchers (STAR)	2011 - 2014
Society of Physics Students (SPS)	2010 - 2013
National Society of Collegiate Scholars (NSCS)	2008 - 2013