

KENNETH WAYNE CARRELL

CONTACT INFORMATION	ASU Station #10904 San Angelo, TX 76909	<i>Phone:</i> (325) 942-2136 <i>E-mail:</i> kenneth.carrell@angelo.edu
EDUCATION	TEXAS TECH UNIVERSITY, Lubbock, Texas USA Ph.D., Physics, December 2009 <ul style="list-style-type: none">• Dissertation Topic: <i>Red Clump Stars in the Sagittarius Tidal Streams</i>• Advisor: Professor Ronald J. Wilhelm M.S., Physics, Non-Thesis, May 2004 B.S., Physics, <i>Cum Laude</i> , Minor in Mathematics, May 2002	
EXPERIENCE	ANGELO STATE UNIVERSITY, San Angelo, Texas USA <i>Associate Professor of Physics & Planetarium Director</i> August 2022 to Present <i>Assistant Professor of Physics & Planetarium Director</i> August 2016 to July 2022	
	IRION COUNTY ISD, Mertzon, Texas USA <i>Classroom Teacher</i> August 2015 to July 2016 <i>Classroom Teacher / Coach</i> August 2008 to December 2010	
	CH4 LABS, LLC, Mertzon, Texas USA <i>Lab Manager</i> February 2014 to August 2015	
	MAX PLANCK INSTITUTE FOR ASTRONOMY, Heidelberg, Germany <i>Postdoc</i> July 2013	
	NATIONAL ASTRONOMICAL OBSERVATORIES, CHINESE ACADEMY OF SCIENCES, Beijing, China <i>LAMOST Postdoctoral Fellow</i> March 2011 to June 2013	
	TEXAS TECH UNIVERSITY Lubbock, Texas USA <i>Teaching Assistant / Graduate Part-time Instructor</i> August 2005 to May 2008 <i>Student Research Assistant / Research Assistant</i> January 2001 to May 2005	
OBSERVING PROPOSALS AND RUNS	MCDONALD OBSERVATORY Ft. Davis, Texas USA <ul style="list-style-type: none">• I have had multiple successful proposals submitted to McDonald Observatory. I have also been granted many unallocated nights to continue the projects from the proposals. I have used all three telescopes available at the observatory to outside astronomers: the 2.7m, the 2.1m, and the 0.8m.	
	OLDER THAN 5 YEARS I have had several successful proposals and observing runs to observatories spread across the entire Earth, including: <ul style="list-style-type: none">• KITT PEAK NATIONAL OBSERVATORY Tucson, Arizona USA• CERRO TOLOLO INTER-AMERICAN OBSERVATORY La Serena, Chile• THE ANGLO-AUSTRALIAN TELESCOPE Siding Spring Observatory, Australia• THE MMT OBSERVATORY Tucson, Arizona USA	

STUDENT
RESEARCH
PROJECTS

YEARLONG FACULTY-MENTORED UNDERGRADUATE RESEARCH GRANTS:

- Brandon Santana & Taylor Spoo, 2017-2018
- Aaron Smith, 2017-2018
- Michaela Allen, 2018-2019
- Rebeca Soto Armendariz, 2019-2020 & 2020-2021
- Jackie Gray-Cherry, 2019-2020 & 2020-2021
- Garath Vettters & Alexandra Vishnevskaya, 2021-2022
- Andrew Tom & Garath Vettters, 2022-2023
- Yoojin Choi, 2023-2024

ONE SEMESTER FACULTY-MENTORED UNDERGRADUATE RESEARCH GRANTS:

- Youngsang (Eric) Ji, Spring 2022

OTHER RESEARCH STUDENTS:

- Adam DeLoach & Johnny Ross, 2018-2019
- Troy Long & Youngsang (Eric) Ji, Fall 2021
- Krischelle Rubner, Spring 2022
- Troy Long, Spring 2022
- Yoojin Choi, Fall 2022
- Stasha Youngquist, Fall 2023

FUNDED GRANTS

Department of Education, Education Innovation and Research Program

- SCALING AN INNOVATIVE STEM AND COMPUTING EDUCATION SUPPORT (STEMACES) MODEL FOR IMPROVED SCIENCE LEARNING (IN PARTNERSHIP WITH SONOMA STATE UNIVERSITY) (2024 - 2028)

National Science Foundation LEAPS-MPS Program, Award #2137787

- LEAPS-MPS: A SYSTEMATIC INVESTIGATION OF TRANSIENT BEHAVIOR IN RR LYRAE VARIABLE STARS (January 1, 2022 - December 31, 2023)

Sloan Digital Sky Survey Faculty and Student Team Initiative

- DO ALL GLOBULAR CLUSTERS HAVE MULTIPLE STELLAR POPULATIONS? (July 1, 2023 - June 30, 2024)
- ELEMENTAL ABUNDANCE CHARACTERISTICS OF DISTINCT STELLAR POPULATIONS IN NGC3201 (July 1, 2022 - June 30, 2023)
- CALIBRATING METAL ABUNDANCES OF RR LYRAE USING APOGEE AND TESS DATA (May 15, 2021 - June 30, 2022)

Preparing for Astrophysics with LSST

- BUILDING A DIVERSE GENERATION OF RUBIN SCIENTISTS KICKSTARTER GRANT (April 1, 2022 - August 1, 2022)

Angelo State University Faculty Research Enhancement Program

- MEASUREMENTS OF THE GRAVITATIONAL DEFLECTIONS OF STARS DURING THE 2024 TOTAL SOLAR ECLIPSE (September 1, 2023 - August 31, 2024)
- VARYING VARIABLES: CHANGES IN RR LYRAE IN TESS DATA (September 1, 2020 - August 31, 2021)
- A DETAILED STUDY OF SHOCKWAVES IN RR LYRAE STARS (September 1, 2018 - August 31, 2019)

- Carrell, K.** et al. “Caught in the Act: Observations of the Double-mode RR Lyrae V338 Boo During the Disappearance of a Pulsation Mode” 2024, *The Astrophysical Journal*, accepted
- Carrell, K.**, Gray Cherry, J., & Gillespie, C. “The Discovery of New Binary Systems Using Value-Added Catalogs and TESS Data” 2022, *The Astronomical Journal*, 164, 77, doi:10.3847/1538-3881/ac7d53
- Carrell, K.**, et al. “The Changing Lightcurve of the Double-mode RR Lyrae Variable Star V338 Boo” 2021, *The Astrophysical Journal Letters*, 916, L12, doi:10.3847/2041-8213/ac1202, *Erratum: ApJL* 954, 34, doi:10.3847/2041-8213/acf133
- Carrell, K.**, Chen, Y.Q., & Zhao, G. “Metallicity Gradients of Disk Dwarf Stars” 2012, *The Astronomical Journal*, 144, 185, doi:10.1088/0004-6256/144/6/185
- Carrell, K.**, Wilhelm, R., & Chen, Y.Q. “Red Clump Stars in the Sagittarius Tidal Streams” 2012, *The Astronomical Journal*, 144, 18, doi:10.1088/0004-6256/144/1/18
- Spalding, E., et al. “rrlfe: Software for Generating and Applying Metallicity Calibrations for RR Lyrae Variable Stars Across a Wide Range of Phases and Temperatures” 2024, *Monthly Notices of the Royal Astronomical Society*, 527, 828, doi:10.1093/mnras/stad3199
- Dittrich, W.A., Berry, R., Bruns, D., & **Carrell, K.** “Modern Eddington Experiment 2024 (MEE2024)” 2024, *Bulletin of the AAS*, 56, 3, id.2024i3n002 doi:10.3847/25c2cfcb.3ff37cfa
- Wilhelm, R., **Carrell, K.**, et al. “Modulation of the Blazhko Cycle in LS Her” 2023, *The Astronomical Journal*, 165, 194, doi:10.3847/1538-3881/acc4ba
- Di Criscienzo, M., et al. “Light-curve Recovery with the Vera Rubin Observatory’s LSST. I. Pulsating Stars in Local Group Dwarf Galaxies” 2023, *The Astrophysical Journal Supplement Series*, 265, 41, doi:10.3847/1538-4365/acb825
- Vetters, G., Vishnevskaya, A., Ji, E.Y., & **Carrell, K.** “The Cosmic Ray Rate in Earth’s Atmosphere” 2023, *J. Undergrad. Rep. Phys.*, 33, 100005, doi:10.1063/10.0022469
- Zhang, Z., Shi, W.B., Chen, Y.Q., Zhao, G., **Carrell, K.**, & Zhang, H.P. “The Substructures in the Anticenter Region of the Milky Way” 2022, *The Astrophysical Journal*, 933, 151, doi:10.3847/1538-4357/ac7231
- Naegeli, K.M., Lehto, H.L., & **Carrell, K.W.** “The Gravitational Effects on the Volcanism of Io” 2019, *50th Lunar and Planetary Science Conference*, 2132, 2800
- Zhang, X., et al. “The properties of red giant stars along the Sagittarius tidal tails” 2017, *Astronomy & Astrophysics*, 597, 54, doi:10.1051/0004-6361/201629051
- Rahimi, A., **Carrell, K.**, & Kawata, D. “Numerical simulation of a possible origin of the positive radial metallicity gradient of the thick disk” 2014, *Research in Astronomy and Astrophysics*, 14, 11, doi:10.1088/1674-4527/14/11/004
- Chen, Y.Q., et al. “Red Giant Stars from Sloan Digital Sky Survey. I. The General Field” 2014, *The Astrophysical Journal*, 795, 52, doi:10.1088/0004-637X/795/1/52
- Tan, K., Chen, Y.Q., **Carrell, K.**, Zhao, J.K., & Zhao, G. “Red Giant Stars from the Sloan Digital Sky Survey. II. Distances” 2014, *The Astrophysical Journal*, 794, 60, doi:10.1088/0004-637X/794/1/60
- Yang, F., et al. “Hydrogen lines in LAMOST low resolution spectra of RR Lyrae stars” 2014, *New Astronomy*, 26, 72, doi:10.1016/j.newast.2013.06.002

- Chen, Y.Q., Zhao, G., **Carrell, K.**, Zhao, J.K., & Tan, K.F. “The CH(G) Index as a New Criterion for Selecting Red Giant Stars” 2013, *The Astrophysical Journal*, 765, 156, doi:10.1088/0004-637X/765/2/156
- Zhang, Y.Y., **et al.** “DA White Dwarfs Observed in the LAMOST Pilot Survey” 2013, *The Astronomical Journal*, 146, 34, doi:10.1088/0004-6256/146/2/34
- Shi, W.B., Chen, Y.Q., **Carrell, K.**, & Zhao, G. “The Kinematics and Chemistry of Red Horizontal Branch Stars in the Sagittarius Streams” 2012, *The Astrophysical Journal*, 751, 130, doi:10.1088/0004-637X/751/2/130
- Liu, C., **et al.** “A Resonant Feature Near the Perseus Arm Revealed by Red Clump Stars” 2012, *Astrophysical Journal Letters*, 753, L24, doi:10.1088/2041-8205/753/1/L24
- Chen, Y.Q., Zhao, G., **Carrell, K.**, & Zhao, J.K. “The Metallicity Gradient of the Thick Disk Based on Red Horizontal-branch Stars from SDSS DR8” 2011, *The Astronomical Journal*, 142, 184, doi:10.1088/0004-6256/142/6/184
- Powell, W.L., Wilhelm, R.J., & **Carrell, K.** “An Investigation of the Canis Major Over-density” 2008, *New Horizons in Astronomy: Frank N. Bash Symposium 2007 ASP Conference Series*, 393, 251

- Abdullin, S., **et al.** “The CMS barrel calorimeter response to particle beams from 2 to 350 GeV/c” 2009, *The European Physical Journal C*, 60, 359
- Abdullin, S., **et al.** “Design, performance, and calibration of the CMS hadron-outer calorimeter” 2008, *The European Physical Journal C*, 57, 653
- Chatrchyan, S., **et al.** “The CMS experiment at the CERN LHC” 2008, *Journal of Instrumentation*, 3, S08004
- Abdullin, S., **et al.** “Design, performance, and calibration of CMS hadron-barrel calorimeter wedges” 2008, *The European Physical Journal C*, 55, 159
- Akchurin, N., **et al.** “Comparison of high-energy hadronic shower profiles measured with scintillation and Cherenkov light” 2008, *Nuclear Instruments and Methods in Physics Research Section A*, 584, 304
- Abdullin, S., **et al.** “Design, performance, and calibration of CMS forward calorimeter wedges” 2008, *The European Physical Journal C*, 53, 139
- Akchurin, N., **et al.** “Separation of scintillation and Cherenkov light in an optical calorimeter” 2005, *Nuclear Instruments and Methods in Physics Research Section A*, 550, 185
- Akchurin, N., **et al.** “Comparison of high-energy electromagnetic shower profiles measured with scintillation and Cherenkov light” 2005, *Nuclear Instruments and Methods in Physics Research Section A*, 548, 336
- Akchurin, N., **et al.** “Hadron and jet detection with a dual-readout calorimeter” 2005, *Nuclear Instruments and Methods in Physics Research Section A*, 537, 537
- Akchurin, N., **et al.** “Electron detection with a dual-readout calorimeter” 2005, *Nuclear Instruments and Methods in Physics Research Section A*, 536, 29
- Akchurin, N., **et al.** “Muon detection with a dual-readout calorimeter” 2004, *Nuclear Instruments and Methods in Physics Research Section A*, 533, 305
- Acosta, D., **et al.** “Measurement of the mass difference $m(D_s^+) - m(D^+)$ at CDF II” 2003, *Physical Review D*, 68, 072004

NON-REFEREED
PUBLICATIONS

- Carrell, K.** et al. “The Annular Solar Eclipse of October 2023 at Angelo State University: Creating a Memorable Viewing Event for the Entire Community” 2024, *Bulletin of the American Astronomical Society, Bulletin of the AAS*, 56, 3, id.2024i3n016, doi:10.3847/25c2cfef.8c2fd963
- Carrell, K.** “ATARRI: A TESS Archive RR Lyrae Classifier” 2021, *Astrophysics Source Code Library*, ascl:2105.003
- Shi, W., Chen, Y., **Carrell, K.**, & Zhao, G. “The kinematics and chemistry of the Sagittarius streams” 2013, *Proceedings of the International Astronomical Union*, 289, 422
- Chao, L., **et al.** “The Galactic rotation curve from red clump stars” 2013, *Proceedings of the International Astronomical Union*, 9, 424
- Chao, L., **et al.** “The 3-D extinction law in the 2nd quadrant of the Galactic disk” 2013, *Proceedings of the International Astronomical Union*, 9, 423
- Powell Jr., W.L., Wilhelm, R., **Carrell, K.**, & Westfall, A. “New Findings for the Blue Plume Stars in the Canis Major Over-Density” 2008, *arXiv: astro-ph*, 0803.1509
- Wilhelm, R., **et al.** “Identification of RR Lyrae Variables in SDSS from Single-Epoch Photometric and Spectroscopic Observations” 2007, *arXiv: astro-ph*, 0712.0776
- CMS HCAL Collaboration.** “Design, Performance, and Calibration of CMS Hadron Endcap Calorimeters” 2008, *CMS Note*, 2008, 010
- CMS HCAL Collaboration.** “Energy Response and Longitudinal Shower Profiles Measured in CMS HCAL and Comparison With Geant4” 2007, *CMS Note*, 2006, 143
- Baiatian, G., **et al.** “Synchronization and Timing in CMS HCAL” 2007, *CMS Note*, 2006, 139

INVITED TALKS

- Colloquium at the Texas Tech University Department of Physics and Astronomy, “Studying the Milky Way Disk in the Era of Large Optical Surveys”, December 5, 2017
- Building Astronomy in Texas Symposium, “Studying the Milky Way Disk in the Era of Large Optical Surveys”, January 26, 2019

PRESENTATIONS

- **Carrell, K.** “STEMACES: Expanding opportunities in STEM+C for rural, under-represented, and high-need eighth-grade students in Texas and California” 2024, *Joint Spring Meeting of the Texas Sections of APS, AAPT, & Zone 13 of the SPS*, 81
- **Carrell, K.** “Reproducing the Eddington Experiment with Modern Telescopes and Cameras” 2024, *Joint Spring Meeting of the Texas Sections of APS, AAPT, & Zone 13 of the SPS*, 80
- **Carrell, K.**, Wilhelm, R., Tom, A., Choi, Y., Diaz Hernandez, A., Ryu, S., & Taylor, J. “Caught in the Act: Observations of the Double-mode RR Lyrae V338 Boo During a Mode-switching Event” 2024, *American Astronomical Society Meeting #243*, 207.14
- **Carrell, K.**, Wilhelm, R., Choi, Y., Lockett, J., Taylor, J., & Youngquist, S. “Transient Changes in TESS Lightcurves of RR Lyrae” 2023, *American Astronomical Society Meeting #241*, 303.05
- **Carrell, K.**, Wilhelm, R., Olsen, F., Tom, A., Vettters, G., & McElhannon, A. “The

- Changing Lightcurve of the Double-mode RR Lyrae Variable Star V338 Boo” 2022, *American Astronomical Society Meeting #240*, 204.14
- **Carrell, K.** & Wilhelm, R. “Horizontal Branch and Red Clump Stars in the Southern Arm of the Sagittarius Stream” 2007, *American Astronomical Society Meeting #211*, 104.11
 - **Carrell, K.** & Wilhelm, R. “Substructure in the Galactic Halo” 2007, *American Astronomical Society Meeting #209*, 27.09
 - **Carrell, K.** & Wilhelm, R. “Substructure in the Galactic Halo” 2006, *Joint Fall Meeting of the Texas Sections of APS, AAPT, & Zone 13 of the SPS*, AP1.002
 - **Carrell, K.** “DREAM (Dual-REAdout Module) calorimeter module” 2003, *Joint Fall Meeting of the Texas Sections of APS, AAPT, & Zone 13 of the SPS*, D3.004
 - **Carrell, K.** “Reconstruction of the B+ meson with Recent CDF Data” 2002, *Joint Spring Meeting of the Texas Sections of APS, AAPT, & Zone 13 of the SPS*, CA.002
 - Dole, E., **Carrell, K.**, & Long, T. “The Wide Binary Test: Is Standard Gravity Supported?” 2024, *Joint Spring Meeting of the Texas Sections of APS, AAPT, & Zone 13 of the SPS*, 73
 - Lockett, J., Choi, Y., Ryu, S., Taylor, J., Beaton, R., & **Carrell, K.**, “Searching for Multiple Stellar Populations in Globular Clusters in APOGEE” 2024, *American Astronomical Society Meeting #243*, 458.15
 - Ryu, S., Choi, Y., Patterson, A., Lockett, J., & **Carrell, K.** “Double-mode RR Lyrae Variables in TESS Selected by GAIA” 2023, *Joint Meeting of the Texas Section of the APS, Texas Section of the AAPT, & Zone 13 of the SPS*, J01.00025
 - Choi, Y., Lockett, J., Ryu, S., Taylor, J., Beaton, R., & **Carrell, K.**, “Searching for Multiple Stellar Populations in Globular Clusters in APOGEE” 2023, *Joint Meeting of the Texas Section of the APS, Texas Section of the AAPT, & Zone 13 of the SPS*, J01.00013
 - Lockett, J., **Carrell, K.**, Wilhelm, R., Choi, Y., Taylor, J., & Youngquist, S. “Transient Changes in TESS Lightcurves of RR Lyrae” 2023, *Texas Academy of Science Annual Meeting*, #335
 - Choi, Y., **Carrell, K.**, Braga, V., Dall’Ora, M., & Di Criscienzo, M. “RR Lyrae in Local Group Dwarf Galaxies” 2023, *Texas Academy of Science Annual Meeting*, #261
 - Taylor, J., Ryu, S., **Carrell, K.**, & Beaton, R. “Elemental Abundance Characteristics of Distinct Stellar Populations in NGC3201” 2023, *Texas Academy of Science Annual Meeting*, #254
 - Vettters, G., Tom, A., & **Carrell, K.** “Constructing and Testing a Large-scale Diffusion Cloud Chamber” 2023, *Texas Academy of Science Annual Meeting*, #73
 - Vettters, G., Vishnevskaya, A., Ji, E.Y., & **Carrell, K.** “Detecting Cosmic Rays on Earth’s Surface and Above” 2023, *Texas Academy of Science Annual Meeting*, #78
 - Taylor, J., Ryu, S., **Carrell, K.**, & Beaton, R. “Elemental Abundance Characteristics of Distinct Stellar Populations in NGC3201” 2023, *American Astronomical Society Meeting #241*, 401.23
 - Diaz Hernandez, A., Olsen, F., **Carrell, K.**, Beaton, R., & Brownstein, J. “Metallicity Determinations of RR Lyrae on the APOGEE2 Scale Using TESS Lightcurves” 2022, *American Astronomical Society Meeting #240*, 204.15
 - Soto Armendariz, R. & **Carrell, K.** “The Precise Orbital Period of HAT-P-36-b” 2021, *Joint Spring Meeting of the Texas Sections of APS, AAPT and Zone 13 of the SPS*, C13.00010
 - Vettters, G., Hennig, W., Olsen, F., Tom, A., & **Carrell, K.** “Analyzing RR Lyrae Stars Using TESS Data” 2021, *Joint Spring Meeting of the Texas Sections of APS, AAPT and Zone 13 of the SPS*, C13.00006
 - Gray-Cherry, J. & **Carrell, K.** “Finding Variable Sources in Large Data Sets” 2021, *Joint Spring Meeting of the Texas Sections of APS, AAPT and Zone 13 of the SPS*, C13.00008

- Santana-Nolan, B., Spoo, T., **Carrell, K.**, & Bankert, J. “Identifying Milky Way Stellar Populations Through Kinematics Derived from Catalog Data” 2018, *Joint Spring Meeting of the Texas Sections of APS, AAPT & Zone 13 of the SPS*, D1.00007
- Liu, C., van de Ven, G., Fang, M., Wu, Y., **Carrell, K.**, & Xue, X.X. “The Galactic Rotation Curve from Red Clump Stars” 2014, *International Astronomical Union Symposium #289*, 424, doi:10.1017/S174392131300690X
- Liu, C., Fang, M., Wu, Y., **Carrell, K.**, Xue, X.X., van de Ven, G. “The 3-D Extinction Law in the 2nd Quadrant of the Galactic Disk” 2014, *International Astronomical Union Symposium #289*, 423, doi:10.1017/S1743921313006893
- Shi, W.B., Chen, Y.Q., **Carrell, K.**, & Zhao, G. “The Kinematics and Chemistry of the Sagittarius Streams” 2013, *International Astronomical Union Symposium #289*, 422, doi:10.1017/S1743921312021862
- Powell, W.L., Wilhelm, R.J., **Carrell, K.W.**, & White, J.K. “A Photometric Study of Blue Plume Stars in the Canis Major Over-density” 2013, *American Astronomical Society Meeting #221*, 254.12
- Wilhelm, R.J., Marchante, M.C., **Carrell, K.W.**, Shetrone, M., & MacQueen, P. “Determining Stellar Parameters with the VIRUS-P”, 2007, *American Astronomical Society Meeting #211*, 104.15
- Powell, W.L., Wilhelm, R., & **Carrell, K.** “An Investigation of the Canis Major Overdensity” 2007, *Joint Spring Meeting of the Texas Sections of APS, AAPT & Zone 13 of the SPS*, F6.005
- Powell, W.L., Wilhelm, R., & **Carrell, K.** “An Investigation of the Canis Major Overdensity” 2007, *American Astronomical Society Meeting #211*, 14.01