JACK THOMAS WARFIELD

Department of Astronomy, PO Box 400325, 530 McCormick Road, Charlottesville, VA 22904
jtw5zc@virginia.edu ◇ jackwarfield.com

EDUCATION & RESEARCH EXPERIENCE

The University of Virginia
Ph.D. in Astronomy — *expected May 2026*
M.S. in Astronomy — *May 2022*
I have been working to find accurate proper motions for dwarf galaxies in the Local Group by combining HST Treasury observations and JWST ERS observations with data from the Gaia survey to find accurate proper motions for these satellites. I am also using HST-based photometry of Andromeda satellites to measure age and metallicity gradients.
Advisor: Nitya Kallivayalil

The Ohio State University
B.S. in Physics and Astronomy & Astrophysics — *May 2020*
with honors research distinction
Thesis Title: *An Intermediate-Age α-Rich Galactic Population Beyond the Solar Neighborhood*
Thesis Advisors: Marc Pinsonneault, Jennifer Johnson, Joel Zinn

PUBLICATIONS (ADS Query)

21 total, 5 first-author, h-index: 12 (NASA ADS, October 2025)

21. **J. T. Warfield, K. A. McKinnon, S. T. Sohn, et al., *The Proper Motion of Draco II with HST using multiple reference frames and methodologies*, in prep, 2025.**
20. C. T. Garling, N. Kallivayalil, K. B. W. McQuinn, et al., *Measuring Resolved Star Formation Histories from High-Precision Color-Magnitude Diagrams with StarFormationHistories.jl*, ApJS 277, 61G, 2025.
19. R. E. Cohen, K. B. W. McQuinn, A. Savino, et al., *The JWST Resolved Stellar Populations Early Release Science Program. VIII. The Spatially Resolved Star Formation History of WLM*, ApJ 981, 153C, 2025.
18. A. Savino, M. Gennaro, A. E. Dolphin, et al., *The JWST Resolved Stellar Populations Early Release Science Program. VII. Stress Testing the NIRCam Exposure Time Calculator*, ApJ 970, 36S, 2024.
17. M. L. Boyer, G. Pastorelli, L. Girardi, et al., *The JWST Resolved Stellar Populations Early Release Science Program. VI. Identifying Evolved Stars in Nearby Galaxies*, ApJ 973, 120B, 2024.
16. H. Richstein, N. Kallivayalil, J. Simon, et al., *Deep Hubble Space Telescope Photometry of LMC and Milky Way Ultra-Faint Dwarfs: A careful look into the magnitude-size relation*, ApJ 967, 72R, 2024.
15. D. R. Weisz, A. E. Dolphin, A. Savino, et al., *The JWST Resolved Stellar Populations Early Release Science Program. V. DOLPHOT Stellar Photometry for NIRCam and NIRISS*, ApJS 271, 47W, 2024.
14. **J. T. Warfield, J. C. Zinn, J. Schonhut-Stasik, et al., *The APO-K2 Catalog. II. Accurate Stellar Ages for Red Giant Branch Stars Across the Milky Way*, ApJ 967, 72R, 2024.**

13. J. Schonhut-Stasik, J. C. Zinn, K. G. Stassun, et al., *The APO-K2 Catalog. I. 7,673 Red Giants with Fundamental Stellar Parameters from APOGEE DR17 Spectroscopy and K2-GAP Asteroseismology*, AJ 167, 50, 2024.

12. K. McQuinn, M. Newman, A. Savino, et al., *The JWST Resolved Stellar Populations Early Release Science Program. IV. The Star Formation History of the Local Group Galaxy WLM*, ApJ 961, 16, 2024.

11. C. Jennings, A. Savino, D. Weisz, et al., *The Hubble Space Telescope Survey of M31 Satellite Galaxies. III. Calibrating the Horizontal Branch as an Age Indicator for Nearby Galaxies*, arXiv:2311.16397, Submitted to AJ.

10. J. J. Han, A. Dey, A. M. Price-Whelan, et al., *NANCY: Next-generation All-sky Near-infrared Community surveY*, arXiv:2306.11784, Roman Core Community Survey white paper, 2023.

9. **J. T. Warfield, H. Richstein, N. Kallivayalil, et al., *The JWST Resolved Stellar Populations Early Release Science Program. III. Photometric Star-Galaxy Separations for NIRCam*, Res. Notes AAS 7, 2, 2023.**

8. D. Weisz, K. McQuinn, A. Savino, et al., *The JWST Resolved Stellar Populations Early Release Science Program II. Survey Overview*, ApJS 268, 15W, 2023.

7. **J. T. Warfield, N. Kallivayalil, P. Zivick, et al., *HubPUG: Proper Motions for Local Group Dwarfs observed with HST utilizing Gaia as a Reference Frame*, MNRAS, 519, 1189, 2023.**

6. H. Richstein, E. Patel, N. Kallivayalil, et al., *Structural parameters and possible association of the Ultra-Faint Dwarfs Pegasus III and Pisces II from deep Hubble Space Telescope photometry*, ApJ, 933, 217, 2022.

5. Abdurro'uf, K. Accetta, C. Aerts, et al., *The Seventeenth Data Release of the Sloan Digital Sky Surveys: Complete Release of MaNGA, MaStar and APOGEE-2 Data*, ApJS 259, 35, 2022.

4. J. C. Zinn, D. Stello, Y. Elsworth, et al., *The K2 Galactic Archaeology Program Data Release 3: Age-abundance patterns in C1-C8, C10-C18*, ApJ 926, 191, 2022.

3. **J. T. Warfield, J. C. Zinn, M. H. Pinsonneault, J. A. Johnson, D. Stello, Y. Elsworth, R. A. García, T. Kallinger, S. Mathur, B. Mosser, R. L. Beaton, and D. A. García-Hernández, *An Intermediate Age Alpha-Rich Galactic Population in K2*, AJ 161, 100, 2021.**

2. J. C. Zinn, D. Stello, Y. Elsworth, et al., *The K2 Galactic Archaeology Program Data Release 2: Asteroseismic Results from Campaigns 4, 6, & 7*, ApJS 251, 23, 2020.

1. M. S. Haseman, P. Saadaktia, **J. T. Warfield**, J. Lawrence, A. Harnandez, G. E. Jellison, L.A. Boatner, and F. A. Selim, *Optical and electrical properties of Sn-doped ZnO single crystals*, Journal of Electronic Materials 47, 1497, 2018.

OBSERVING PROPOSALS

7. N. Kallivayalil, S. T. Sohn, A. Wetzel, et al.; *Dynamically Mapping the Satellite Galaxies in the Outer Halo of the Milky Way*; HST Cycle 33, ID. #18068.

6. P. Bennet, E. Patel, et al.; *The Mysterious Death of a Lonely Dwarf: Who Quenched Cetus?*; HST Cycle 33, ID. #18032.

5. P. Bennet, E. Patel, et al.; *Proper Motions of the M31 Satellites: The missing pieces of the 6D puzzle*; HST Cycle 33, ID. #18029.

4. P. Bennet, R. van der Marel, et al.; *Enabling cross instrument proper motions with Draco dSph and NGC 2419*; HST Cycle 32, ID. #17926 & JWST Cycle 3, ID. #9225.

3. P. Bennet, R. van der Marel, et al.; *20 Years of time baseline, The 3D kinematics of Centaurus A*;HST Cycle 32, ID. #17925.

2. **J. T. Warfield, N. Kallivayalil, H. Richstein, et al.; *Moving beyond the Milky Way: Enabling Cross-Observatory Proper Motion Determinations with HST and JWST*; HST Cycle 31, ID. #17473 & JWST Cycle 2, ID. #4570.**

1. L. Strigari, W. Cerny, A. Drlica-Wagner, et al.; *Creating a Standardized Sample of Milky Way Satellite Galaxy Binary Fraction Measurements*; HST Cycle 30, ID. #17056.

AWARDS & HONORS

Jefferson Scholars Foundation Dissertation Year Fellowship	2025
Emma Williams Prize: outstanding research of a 4th year graduate student	2024
The Raven Society (Inductee)	2023
L. Earl Slusher Scholarship in Astronomy	2019
Summer Undergraduate Research Program Astronomy Undergraduate Scholarship	2019
Honors & Scholars Enrichment Grant	2017

TEACHING EXPERIENCE

Course Grader *Aug. 2024 - Dec. 2024*
The University of Virginia
Courses: Astronomy 1210

Grading for undergraduate non-major general education course.

Course Grader *Jan. 2023 - May 2023*
The University of Virginia
Courses: Astronomy 5450 & Physics 5640

Grading for graduate level courses on high-energy astrophysics and computation physics.

Graduate Teaching Assistant *Aug. 2020 - Dec. 2020*
The University of Virginia
Course: Astronomy 1230

Oversaw night labs and grading for undergraduate non-major observational astronomy course.

Undergraduate Teaching Assistant *Jan. 2020 - May 2020*
The Ohio State University Department of Astronomy
Courses: Astronomy 1221, 5681

Lecture assistant, tutor, and grader for Astronomy/Physics major introductory data analysis and programming course. Undergraduate teaching assistant and grader for upper-division major stellar structure and nucleosynthesis course.

Undergraduate Teaching Assistant *Aug. 2019 - Dec. 2019*
The Ohio State University Department of Astronomy
Course: Astronomy 3350

Lecture assistant, tutor, and grader for Astronomy major data analysis and programming course.

Physics Tutor *Sept. 2017 - May 2019*
The Ohio State University Department of Physics
Courses: Physics 1201, 1202, 1251, 1252

Open tutoring for introductory non-major and major physics courses.

Instructional Assistant *Jan. 2017 - May 2017*
The Ohio State University Department of Astronomy
Course: Astronomy 1140

Prepared materials, assisted in lecture, and graded assignments for a general education astronomy course.

Supplemental Instructor *Jan. 2016 - May 2016*
Bowling Green State University Learning Commons
Course: Physics 2010

Designed and ran 3 weekly sessions to go over material being covered in an introductory non-major physics course.

PRESENTATIONS

Galactic Frontiers II: Dwarf Galaxies in the Local Volume and Beyond *June 2025*
Beyond the Milky Way: Proper Motion Measurements in the Era of JWST

The Colonnades Senior Living *Oct. 2024*
Out of Sight, Front of Mind: The Puzzle of Dark Matter

JHU/STScI Galaxy Journal Club *May 2024*
The Milky Way and Beyond: Probing Near-Field Cosmology from Proper Motion Measurements in the Local Group

Galactic Frontiers: Dwarf Galaxies in the Local Volume and Beyond *July 2023*
HubPUG: Utilizing Gaia as a Reference Frame to Measure Proper Motions for Local Group Dwarfs with HST

AAS 241 *Jan. 2023*
HubPUG: *Combining* HST *and* Gaia *data to Measure Proper Motions for Local Group Dwarfs*

SDSS-IV & V Collaboration Meeting *June 2020*
Revealing an Intermediate Age Population of Alpha-Rich Red Giants in the K2 *Fields*

AAS 235 *Jan. 2020*
Revealing an Intermediate Age Population of Alpha-Rich Red Giants in the K2 *Fields*

OUTREACH

Dark Skies Bright Kids (DSBK)
Member *Oct. 2020 - Present*
DSBK is an astronomy outreach organization primarily run by graduate students at the University of Virginia seeking to enhance science education in Virginia elementary schools. We run programs for students in the Charlottesville area during the academic year as well as week-long summer camps for students across Virginia.

The Astronomical Society at The Ohio State University
Member *Aug. 2016 - July 2020*
Secretary *May 2017 - May 2019*

President *May 2019 - July 2020*

Organized roof nights and astronomy talks for undergraduate and community audiences. Organized a welcome event for incoming undergraduate Astronomy students for the Department of Astronomy. Worked with other student organizations and university departments to organize and secure funding for a yearly trip to the Green Bank Observatory for undergraduate astronomy majors.

Polaris

Mentor *Aug. 2019 - May 2020*

Polaris offers mentoring for first- and second-year undergraduate physics and astronomy majors by graduate and senior undergraduate students. I worked individually with a freshman student to help them navigate through their first year at Ohio State and find opportunities to best achieve their goals. In the spring 2020 semester, I guided them through a small research project in astronomy working with APOGEE and Kepler asteroseismology data.

TECHNICAL SKILLS

Programming Languages	Python, C++, Wolfram Language (Mathematica), Julia, bash
Markup Languages	LaTeX, HTML, CSS, PHP