

# Hollis Akins

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## Education

- June 2022 – **University of Texas at Austin**, *Harrington Graduate Fellow*, Austin, TX.  
Present Ph.D. Astronomy, expected May 2027
- Aug 2018 – **Grinnell College**, *Dean's Scholar*, Grinnell, IA.  
May 2022 B.A. Physics (with Honors) GPA: 4.00/4.00
- Aug 2014 – **The Early College at Guilford**, Greensboro, NC.  
May 2018 Public high-school dual-enrollment program with Guilford College GPA: 3.95/4.00

## Research Experience

- June 2022 – **Harrington Graduate Research Fellow**, UT Austin Dept. of Astronomy, Austin, TX.  
Present *Observing galaxies at the epoch of reionization with JWST and ALMA* Advisor: Caitlin Casey
- May 2019 – **Research Assistant**, Grinnell College Dept. of Physics, Grinnell, IA.  
May 2022 *Environmental quenching of simulated dwarf satellite galaxies* Advisor: Charlotte Christensen
- May 2021 – **DAWN-IRES Scholar**, Cosmic Dawn Center, Copenhagen, Denmark.  
Aug 2021 *The multiphase ISM of a  $z > 7$  galaxy seen by ALMA* Advisors: Seiji Fujimoto, Kristian Finlator
- May 2020 – **REU Student**, University of Florida Dept. of Astronomy, Gainesville, FL.  
Aug 2020 *Impacts of dust on mock observations of the UVJ diagram* Advisor: Desika Narayanan
- May 2018 – **Research Assistant**, Guilford College Cline Observatory, Greensboro, NC.  
Aug 2018 *An automated image calibration and stellar photometry pipeline* Advisor: Don Smith

## Awards & Recognitions

- Apr 2024 NSF Graduate Research Fellowship National Science Foundation
- Jun 2022 Donald D. Harrington Fellowship UT Austin College of Natural Sciences
- May 2022 Andrew W. Archibald Prize for Highest Scholarship Grinnell College
- May 2022 H. George Apostle Prize in Physics Grinnell College
- Mar 2021 Barry M. Goldwater Scholarship Goldwater Foundation
- Feb 2021 Chambliss Astronomy Achievement Award (Honorable Mention) American Astronomical Society
- May 2020 Joseph F. Wall '41 Phi Beta Kappa Scholar's Award Phi Beta Kappa of Iowa
- Aug 2018 Dean's Scholarship Grinnell College
- Aug 2018 National Merit Scholarship Grinnell College
- Mar 2018 Mathworks Math Modeling Challenge (Honorable Mention) SIAM

## Teaching/Mentoring Experience

- Fall 2023– **Mentor**, Graduate-Undergraduate Mentoring in Astronomy (GUMMY) Program UT Austin
- Summer 2023 **Informal Mentor**, Department of Astronomy REU Program UT Austin
- Spring 2022 **Lab Assistant** for PHY-337: Optics & Wave Phenomena Lab Grinnell College

2018–2020	<b>Student Mentor</b> , <i>Data Analysis and Social Inquiry Lab (DASIL)</i>	Grinnell College
Fall 2020	<b>Course Mentor</b> for PHY-116: <i>The Universe and its Structure</i>	Grinnell College
Spring 2020	<b>Lab Assistant</b> for PHY-234: <i>Mechanics</i> (computational lab)	Grinnell College
Fall 2019, 2020	<b>Teaching Assistant</b> for SST-125: <i>Introduction to Geographic Information Systems</i>	Grinnell College
Fall 2017	<b>Teaching Assistant</b> for ART-130: <i>Photography I</i>	Guilford College

## **Publications**

**1<sup>st</sup>-authored** Total citations on first-authored publications: 146, *h*-index: 4 [ADS]

- Jun 2024 **Akins, H. B.**, Casey, C. M., Lambrides, E. et al. "COSMOS-Web: The over-abundance and physical nature of 'little red dots'—Implications for early galaxy and SMBH assembly." (submitted to ApJ; arXiv: [2406.10341](#))
- Sep 2023 **Akins, H. B.**, Casey, C. M., et al. "Two massive, compact, and dust-obscured candidate  $z \simeq 8$  galaxies discovered by *JWST*." *The Astrophysical Journal*, 956, 61, doi: [10.3847/1538-4357/acef21](#)
- Jul 2022 **Akins, H. B.**, Fujimoto, S., Finlator, K. et al. "ALMA reveals extended cool gas and hot ionized outflows around a typical star-forming galaxy at  $z = 7.13$ " *The Astrophysical Journal*, 934, 64, doi: [10.3847/1538-4357/ac795b](#)
- Apr 2022 **Akins, H. B.**, Narayanan, D., Whitaker, K. E. et al. "Quenching and the UVJ diagram in the SIMBA cosmological simulations." *The Astrophysical Journal*, 929, 94, doi: [10.3847/1538-4357/ac5d3a](#)
- Mar 2021 **Akins, H. B.**, Christensen, C. R., Brooks, A. M. et al. "Quenching timescales of dwarf satellites around Milky Way-mass hosts." *The Astrophysical Journal*, 909, 139, doi: [10.3847/1538-4357/abe2ab](#)
- May 2018 **Akins, H. B.** & Smith, D. A. "Imaging planets from imaginary worlds." *The Physics Teacher*, 56 (7), 486–487. doi: [10.1119/1.5055339](#)

## **2<sup>nd</sup>-authored**

- Aug 2023 Casey, C. M., **Akins, H. B.**, Shuntov, M., et al. "COSMOS-Web: Intrinsically Luminous  $z \gtrsim 10$  Galaxy Candidates Test Early Stellar Mass Assembly." (submitted to ApJ; arXiv: [2308.10932](#))
- Aug 2023 Franco, M., **Akins, H. B.**, Casey, C. M., et al. "Unveiling the distant Universe: Characterizing  $z \geq 9$  galaxies in the first epoch of COSMOS-Web." (submitted to ApJ; arXiv: [2308.00751](#))
- Dec 2019 Smith, D. A. & **Akins, H. B.** "Automated data reduction at a small college observatory." *Journal of the American Association of Variable Star Observers (JAAVSO)*, 47 (2), 248–253.

## **Contributed**

- Oct 2023 McKinney, J., Manning, S. M., Cooper, O. R. et al. (including **Akins, H. B.**) "A Near-Infrared Faint, Far-Infrared-Luminous Dusty Galaxy at  $z \sim 5$  in COSMOS-Web" *The Astrophysical Journal*, 956, 72, doi: [10.3847/1538-4357/acf614](#)
- Oct 2023 Fujimoto, S., Finkelstein, S. L., Burgarella, D. et al. (including **Akins, H. B.**) "ALMA FIR View of Ultra High-redshift Galaxy Candidates at  $z \sim 11$ –17: Blue Monsters or Low- $z$  Red Interlopers?" *The Astrophysical Journal*, 955, 130, doi: [10.3847/1538-4357/aceb67](#)
- Sep 2023 Cooper, O. R., Casey, C. M., **Akins, H. B.** et al. "The Web Epoch of Reionization Lyman- $\alpha$  Survey (WERLS) I. MOSFIRE Spectroscopy of  $z \sim 7$ –8 Lyman- $\alpha$  Emitters." (submitted to ApJ; arXiv: [2309.06656](#))
- Sep 2023 Casey, C. M., Kartaltepe, J. S., Drakos, N. E. et al. (including **Akins, H. B.**) "COSMOS-Web: An Overview of the *JWST* Cosmic Origins Survey" *The Astrophysical Journal*, 954, 31, doi: [10.3847/1538-4357/acc2bc](#)

- Aug 2023 Lambrides, E., Chiaberge, M., Long, A. et al. (including **Akins, H. B.**) "Uncovering a Massive  $z \sim 7.65$  Galaxy Hosting a Heavily Obscured Radio-Loud QSO Candidate in COSMOS-Web." (submitted to ApJL, arXiv: [2308.12823](#))
- May 2023 Barro, G., Perez-Gonzalez, P. G., Kocevski, D. D. et al. (including **Akins, H. B.**) "Extremely red galaxies at  $z = 5-9$  with MIRI and NIRSpect: dusty galaxies or obscured AGNs?" (submitted to ApJ, arXiv: [2305.14418](#))
- May 2023 Killi, M., Watson, D., Fujimoto, S. et al. (including **Akins, H. B.**) "A solar metallicity galaxy at  $z > 7$ ? Possible detection of the [N II] 122  $\mu\text{m}$  and [O III] 52  $\mu\text{m}$  lines." *Monthly Notices of the Royal Astronomical Society*, 521, 2, 2526, doi: [10.1093/mnras/stad687](#)
- Apr 2023 McKinney, J., Finnerty, L., Casey, C. M. et al. (including **Akins, H. B.**) "Broad Emission Lines in Optical Spectra of Hot, Dust-obscured Galaxies Can Contribute Significantly to JWST/NIRCam Photometry." *The Astrophysical Journal Letters*, 946, L39, doi: [10.3847/2041-8213/acc322](#)
- Oct 2021 Whitaker, K. E., Narayanan, D., Williams, C. et al. (including **Akins, H. B.**) "Exotic molecular gas to dust mass ratios predicted in quiescent galaxies." *The Astrophysical Journal Letters*, 922, L30, doi: [10.3847/2041-8213/ac399f](#)
- Aug 2021 Bakx, T. J. L. C., Sommovigo, L., Carniani, S. et al. (including **Akins, H. B.**) "Accurate dust temperature determination in a  $z = 7.13$  galaxy." *Monthly Notices of the Royal Astronomical Society: Letters*, 508, 1, doi: [10.1093/mnrasl/slab104](#)

## --- **Presentations**

- Apr 2024 "ALMA+JWST resolve the stars & ISM of MAMBO-9, a massive, merging dusty starburst at  $z = 5.85$ " Poster presented at "Extreme Galaxies" (Reykjavik, Iceland)
- Mar 2024 "The nature of the compact, extremely red objects discovered by *JWST*: dusty AGN or nuclear starbursts?" Talk presented at the Aspen Winter Workshop "The Physics and Impact of Astrophysical Dust" (Aspen, CO, USA)
- Jan 2024 "A large population of luminous, dust-reddened AGN in the early universe? Insights from the COSMOS-Web survey." Invited talk presented at the 243rd meeting of the AAS, special session "First Results from COSMOS-Web: The *JWST* Cosmic Origins Survey" (New Orleans, LA, USA)
- Nov 2023 "A complete baryonic census of a merging dusty starburst at  $z \sim 6$  from ALMA and *JWST*." Talk presented at "Resolving the Extragalactic Universe with ALMA & *JWST*" (Waseda University, Tokyo, Japan)
- July 2023 "Two massive, compact, and dust-obscured candidate  $z \simeq 8$  galaxies discovered by *JWST*." Poster presented at "*JWST* turns one: the birth and growth of galaxies" (Sexten, Italy)
- May 2023 "Two massive, compact, and dust-obscured candidate  $z \simeq 8$  galaxies discovered by *JWST*." Talk presented at the COSMOS team meeting (Rochester, NY)
- May 2023 "Two massive, compact, and dust-obscured candidate  $z \simeq 8$  galaxies discovered by *JWST*." Talk presented at the CEERS team meeting (Austin, TX)
- June 2022 "ALMA reveals extended cool gas and hot ionized outflows around a typical star-forming galaxy at  $z = 7.13$ ." Poster session and **press conference** presented at the 240th meeting of the American Astronomical Society (Pasadena, CA)
- Sept 2021 "ALMA reveals multiphase gas outflows in an individual star-forming galaxy at Cosmic Dawn." Talk presented at the Physics Department Seminar, Grinnell College (Grinnell, IA)
- Sept 2021 "ALMA reveals extended gas and dust emission around the  $z = 7.13$  galaxy A1689-zD1." Talk presented at the Cosmic DAWN Center "Cake Talks" (remote)

- Jan 2021 “Quenching and the UVJ diagram in cosmological simulations.” Poster session presented at the 237th Meeting of the American Astronomical Society (remote)
- Aug 2020 “Quenching timescales of dwarf satellites in cosmological simulations of Milky Way-mass galaxies.” Poster session presented at the STScl Symposium, “The Local Group: Assembly and Evolution” (remote)
- Jul 2020 “Star formation quenching and the UVJ diagram in the SIMBA cosmological simulations.” Talk presented to the University of Florida Department of Astronomy and REU cohort (remote)
- Feb 2020 “Quenching timescales of dwarf satellites around Milky Way-mass host galaxies,” Talk presented at the Physics Department Seminar, Grinnell College (Grinnell, IA)
- Jan 2020 “Quenching timescales of dwarf satellites around Milky Way-mass hosts.” Poster session presented at the 235th Meeting of the American Astronomical Society (Honolulu, HI)

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## Press

- Jun 2024 “‘Little red dot’ galaxies are breaking theories of cosmic evolution,” **article** in *New Scientist* featuring my 2024 COSMOS-Web paper
- Jun 2022 “Undergraduate Researcher Captures Young Galaxy’s Coming of Age,” **press release** via NRAO

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## Outreach

- 2018–2020 **Member**, *Grinnell Astronomy Group*.
- Spring 2019 **Instructor** for *Observational Astronomy*, Grinnell Experiential College Program.
- Spring 2019 **Science Editor**, *Grinnell Undergraduate Research Journal*.