Carnegie Institution of Washington
The Observatories
813 Santa Barbara St.
Pasadena, CA 91101
https://jamesjohnson.space

James W. Johnson Curriculum Vitae

jjohnson10@carnegiescience.edu

ACADEMIC POSITIONS

Carnegie Institution of Washington – The Observatories

Pasadena, California

2023 – Present **Postdoctoral Fellow**, Carnegie Theoretical Astrophysics Center (CTAC) Supervisor: Dr. Ana Bonaca

EDUCATION

The Ohio State University

Columbus, Ohio

July 2023 **Ph.D. in Astrophysics**, Dissertation Advisor: David H. Weinberg From Dwarfs to Spirals: Chemical Evolution of Galaxies across Stellar Mass

and the Implications for Nucleosynthesis

November 2019 M.S. in Astrophysics

Vanderbilt University

Nashville, Tennessee

May 2017 **B.A.**, Physics (major), Astronomy (minor), cum laude Highest Honors in Astronomy, Thesis Advisor: Andreas A. Berlind

Research

29	9	20	675+	15
Journal Publications	$1 \mathrm{st} \& 2 \mathrm{nd}$ \mathbf{Author}	$egin{aligned} ext{Contributing} \ ext{Author} \end{aligned}$	Citations	H-Index

Interests

Galactic chemical evolution – The Milky Way – Dwarf galaxies – The astrophysical origin of the elements – Big bang nucleosynthesis – Near field cosmology – Astronomical software

NASA ADS Libraries (A full list of my journal publications is included.)

All My Papers https://ui.adsabs.harvard.edu/public-libraries/rIqfpNKmSdaOMIAhkk2VzQ lst & 2nd Author https://ui.adsabs.harvard.edu/public-libraries/go1WSseGTMeft2SxdESAgw Co-Author https://ui.adsabs.harvard.edu/public-libraries/sZkjSf_XRSKSRykqBe6B_w

Seminars & Conference Presentations

Contributed Talk	Sloan Digital Sky Survey Collaboration Meeting	2025
Invited Seminar	University of California, Davis (Davis, CA)	2025
Invited Seminar	Stockholms Universitet, Dept. of Astronomy (Stockholm, Sweden)	2025
Invited Seminar	Uppsala Universitet, Dept. of Physics & Astronomy (Uppsala, Sweden)	2025
Poster	Small Galaxies, Cosmic Questions - II	2024
	University of Durham (Durham, United Kingdom)	

Contributed Talk	DHWFEST: Dark, Hot, Warm, and Fuzzy matter in Space and Time	ne 2024
	University of Utah (Salt Lake City, UT)	
Contributed Talk	Sloan Digital Sky Survey Collaboration Meeting	2024
Invited Seminar	Lund University, Dept. of Physics (Lund, Sweden)	2024
Contributed Talk	ADONIS: Abundance Gradients in the Local Universe	2024
	Munich Institute for Astro-, Particle, and BioPhysics (MIAPbP) (Munich, Go	ermany)
Contributed Talk	Surveying the Milky Way: The Universe in Our Own Backyard	2023
	California Institute of Technology (Pasadena, CA)	
Dissertation Talk	241 st American Astronomical Society Meeting	2023
Contributed Talk	Sloan Digital Sky Survey Collaboration Meeting	2021
Contributed Talk	Galactic Archaeology with Hermes Science Meeting	2021
Contributed Talk	Sloan Digital Sky Survey Collaboration Meeting	2020
Poster	236 th American Astronomical Society Meeting	2020
Invited Seminar	University of California, Santa Cruz (Santa Cruz, CA)	2019

Astrophysical Software Development



Versatile Integrator for Chemical Evolution (VICE)

Lead developer and license owner (Spring 2018 – Present)

Documentation: https://vice-astro.readthedocs.io Source Code: https://github.com/giganano/VICE.git

Install: https://pypi.org/project/vice

Observing Programs

PI: The First Extragalactic Measure of the Helium Isotopic Ratio – A New Test of Fundamental Physics 2024B WINERED spectrograph, 18 hours (Clay 6.5-m Telescope, Las Campanas Observatory) 2025A MIKE spectrograph, 6 hours (Clay 6.5-m Telescope, Las Campanas Observatory)

Honors & Awards

2023	CTAC Postdoctoral Fellowship, Carnegie Science	
2022	Ann S. Tuttle Paper Prize, Ohio State, Dept. of Astronomy	
	Annual award to the top graduate student-led publication of the previous year	
	Paper: Johnson J.W., et al., 2021, MNRAS, 508, 4484 (arxiv:2103.09838)	
2022 - 2023	Presidential Fellowship, Ohio State, College of Arts & Sciences	
	Financial support for final-year graduate students	
2017 - 2018	University Fellowship, Ohio State, College of Arts & Sciences	
	Financial support for first-year graduate students	
2017	Larry Ross Cathey Award, Vanderbilt, Dept. of Physics & Astronomy	
	Outstanding graduating senior studying astronomy	
Inducted 2015	Sigma Pi Sigma Physics National Honor Society, Vanderbilt Chapter	
7 of 8 semesters	Dean's List, Vanderbilt, College of Arts & Sciences	

MENTORSHIP

Cal-Bridge Summer Research Program

2025 - Present	Christopher Giudice (undergraduate), San Francisco State University
	Project: The Chemical Equilibration Timescale of the Milky Way Disk
2024 - 2025	Damien Tessmer (undergraduate), San Diego State University
	Project: Identifying trends in stellar nucleosynthesis with SDSS-V data

The Ohio State University

2021 - Present Liam O. Dubay (graduate), Dept. of Astronomy

Projects: Galactic chemical evolution in the Milky Way

(arxiv:2404.08509, 2508.00988)

2022 - Present Daniel A. Boyea (undergraduate), Dept. of Astronomy

Project: Investigating the astrophysical origin of carbon

Now: M.Sc. student at University of Victoria (Victoria, BC, Canada)

2021 – 2023 Miqaela K. Weller (graduate), Dept. of Astronomy

Projects: Investigating the astrophysical origin of helium (arxiv:2404.08765)

2022 – 2023 Lindsey Stultz (undergraduate), Dept. of Physics

Polaris Near-Peer Mentorship Program

COMMUNITY INVOLVEMENT

Carnegie Science Observatories

2024 – Present Research Mentor, Cal-Bridge Summer Research Program (2 students)

2024 Advancing Inclusive Mentoring

12+ hours of instruction and discussion on equitable mentorship practices

Polaris Near-Peer Mentorship Program

Graduate student-leg organization at Ohio State dedicated to fostering a more inclusive environment and improving retention of underrepresented minority groups in the Dept. of Physics and the Dept. of Astronomy. Website: https://u.osu.edu/polaris.

2022 - 2023 Leadership Committee (budget: \sim \$60,000/year)

2022 Academic Facilitator, Undergraduate Residential Summer Access Program Early-arrival program for first-year undergraduate students

2022 – 2023 Near-Peer Mentor (1 student)

TEACHING

Python Coding Workshops

Program Creator, six sessions, ~25 hours of instruction and exercises

Website: https://jamesjohnson.space/bootcamp

Source material: https://github.com/giganano/PythonBootcamp

2020 – 2023 Full program (annually): Summer undergraduate research students

The Ohio State University, Dept. of Astronomy 2022 **Full program**: 1st- & 2nd-year graduate students

The Ohio State University, Dept. of Astronomy

2024 Select sessions: CASSI & Cal-Bridge undergraduate research students

Carnegie Science Observatories

The Ohio State University, Department of Astronomy: Graduate Teaching Assistant

2018 - 2020	Astronomy 1101: From Planets to Cosmos	5 sections
2019	Astronomy 1142: Black Holes	1 section
2019	Astronomy 1221: Astronomy Data Analysis	1 section
2018	Astronomy 1140: Planets and the Solar System	1 section

MISCELLANEOUS

2022 - Present	Manuscript Referee: ApJ, MNRAS, PASJ, A&A	
2024 - Present	Working Group Co-Chair, Galactic Genesis, Sloan Digital Sky Survey-V	
2024 - Present	"Morning Tea" co-organizer (daily arXiv discussion), Carnegie Science	
2024-2025	External Panelist, Hubble Space Telescope Proposal Review, Cycles 32 & 33	
2021-2023	"Galaxy Hour" meeting organizer, Ohio State, Dept. of Astronomy	
2017 - 2023	Diversity Journal Club, Ohio State, Dept. of Astronomy	
June 2020	Real Scientists Germany Online Outreach	
	Blog: https://tinyurl.com/jamesjohnsonrealscientistsDE	
	Twitter: https://twitter.com/realsci_DE	
2015-2017	Undergraduate Tutor, Proctor, Grader	
	Vanderbilt University, Dept. of Physics & Astronomy	
2015	Cosmic Ray Observatory Project, Instrumentation lab	
	University of Nebraska-Lincoln, Dept. of Physics	

JOURNAL PUBLICATIONS

First & Second Author (reverse chronological order)

1. A Galactic Perspective on the (Unremarkable) Relative Refactory Depletion Observed in the Sun

Rampalli R., **Johnson J.W.**, Ness M.K., Edwards G.H., Newton E.R., Griffith E.J., Bedell M., Wang K.

2025, submitted to AAS Journals, under peer review

arxiv:2509.03577

- 2. Rising from the Ashes II: The Bar-driven Abundance Bimodality in the Milky Way
 Beane A., **Johnson J.W.**, Semenov V., Hernquist L., Chandra V., Conroy C.
 2024, ApJ, 985, 221 233
 arxiv:2410.21580
- 3. The Milky Way Radial Metallicity Gradient as an Equilibrium Phenomenon: Why Old Stars are Metal-Rich

Johnson J.W., et al. 2024, ApJ, 988, 8 – 35

arxiv:2410.13256

4. Dwarf galaxy archaeology from chemical abundances and star formation histories **Johnson J.W.**, et al.

2023, MNRAS, 526, 5084 – 5109

arxiv:2210.01816

5. Binaries drive high Type Ia supernova rates in dwarf galaxies **Johnson J.W.**, Kochanek C.S., Stanek K.Z. 2023, MNRAS, 526, 5911 – 5918

arxiv:2210.01818

 $6.\ Empirical\ constraints\ on\ the\ nucleosynthesis\ of\ nitrogen$

Johnson J.W., Weinberg D.H., Vincenzo F., Bird J.C., Griffith E.J. 2023, MNRAS, 520, 782 – 803 arxiv:2202.04666

7. Stellar migration and chemical enrichment in the Milky Way disc: a hybrid model **Johnson J.W.**, et al.

2021, MNRAS, 508, 4484 - 4511

arxiv:2103.09838

8. The impact of starbursts on element abundance ratios **Johnson J.W.**, Weinberg D.H.

2020, MNRAS, 498, 1364 - 1381

arxiv:1911.02598

9. The secondary spin bias of dark matter haloes

Johnson J.W., Maller A.H., Berlind A.A., Sinha M., Holley-Bockelmann J.K. 2019, MNRAS, 486, 1156 – 1166 arxiv:1812.02206

Contributing Author (reverse chronological order)

[C/N] Ages for Red Giants and their Implications for Galactic Archaeology
Roberts J.D., Pinsonneault M.H., Johnson J.A. Dubay L.O., Johnson J.W.
2025, submitted to AAS Journals, under peer review arxiv:2509.25321

2. Challenges to the Two-Infall Scenario by Large Stellar Age Catalogs
Dubay L.O., Johnson J.A., Johnson J.W., Roberts J.D.
2025, submitted to AAS Journals, under peer review

arxiv:2508.00988

3. The Open Cluster Chemical Abundances and Mapping Survey: VIII. Galactic Chemical Gradient and Azimuthal Analysis from SDSS/MWM DR19

Otto J.M., et al., incl. **Johnson J.W.**

2025, submitted to AAS Journals, under peer review

arxiv:2507.07264

4. The Nineteenth Data Release of the Sloan Digital Sky Survey SDSS Collaboration, et al., incl. Johnson J.W. 2025, submitted to AAS Journals, under peer review

arxiv:2507.07093

5. Sloan Digital Sky Survey-V: Pioneering Panoptic Spectroscopy Kollmeier J.A., et al., incl. **Johnson J.W.** 2025, submitted to AJ, under peer review

arxiv:2507.06989

6. Many Elements Matter: Detailed Abundance Patterns Reveal Star-formation and Enrichment Differences among Milky Way Structural Components

Griffith E.J., Hogg D.W., Hasselquist S., **Johnson J.W.**, Price-Whelan A., Sit T., Stone-Martinez A., Weinberg D.H.

2024, ApJ, 169, 280 – 297

arxiv:2410.22121

7. Modeling the Galactic Chemical Evolution of Helium Weller M.K., Weinberg D.H., Johnson J.W.

2024, MNRAS, 583, 1517 – 1534

arxiv:2404.08765

8. Galactic Chemical Evolution Models Favor an Extended Type Ia Supernova Delay-Time Distribution

Dubay L.O., Johnson J.A., Johnson J.W.

2024, ApJ, 973, 55 - 80

arxiv:2404.08059

9. The APO-K2 Catalog. II. Accurate Stellar Ages for Red Giant Branch Stars Across the Milky Way

Warfield J.T., et al., incl. **Johnson J.W.**

2024, AJ, 167, 208 - 231

arxiv:2403.03249

10. Nature vs. Nurture: Distinguishing effects from stellar processing and chemical evolution on carbon and nitrogen in red giant stars

Roberts J.D., et al., incl. Johnson J.W.

2024, MNRAS, 530, 149 - 166

arxiv:2403.03249

11. The Scale of Stellar Yields: Implications of the Measured Mean Iron Yield of Core Collapse Supernovae

Weinberg D.H., Griffith E.J., **Johnson J.W.**, Thompson T.A. 2023, ApJ, 973, 122 – 136

arxiv:2309.05719

12. Untangling the Sources of Abundance Dispersion in Low-Metallicity Stars
Griffith E.J., Johnson J.A., Weinberg D.H., Ilyin I., **Johnson J.W.**, Rodriguez-Martinez R.,
Strassmeier K.G.

2022, ApJ, 944, 47 – 67

arxiv:2210.01821

13. Birth of the Galactic Disk Revealed by the H3 Survey Conroy C., et al., incl. Johnson J.W. 2022, submitted to AAS Journals, under peer review

arxiv:2204.02989

14. Primordial Helium-3 Redux: The Helium Isotope Ratio of the Orion Nebula Cooke R.J., Noterdaeme P., **Johnson J.W.**, Pettini M., Welsh L., Peroux C., Murphy M.T., Weinberg D.H.

2022, ApJ, 932, 60 - 76

arxiv:2203.11256

15. Residual Abundances in GALAH DR3: Implications for Nucleosynthesis and Identification of Unique Stellar Populations

Griffith E.J., Weinberg D.H., Buder S., Johnson J.A., **Johnson J.W.**, Vincenzo F. 2021, ApJ, 931, 23 – 50 arxiv: 2110.06240

16. Chemical Cartography with APOGEE: Mapping Disk Populations with a Two-Process Model and Residual Abundances

Weinberg D.H., et al., incl. Johnson J.W.

2021, ApJS, 260, 32 – 77

arxiv:2108.08860

17. CNO dredge-up in a sample of APOGEE/Kepler red giants: Tests of stellar models and galactic evolutionary trends of N/O and C/N

Vincenzo F., et al., incl. Johnson J.W.

2021, submitted to MNRAS, under peer review

arxiv:2106.03912

- 19. Nucleosynthesis signatures of neutrino-driven winds from proto-neutron stars: a perspective from chemical evolution models

Vincenzo F., Thompson T.A., Weinberg D.H., Griffith E.J., **Johnson J.W.**, Johnson J.A. 2021, MNRAS, 508, 3499 – 3507 arxiv:2102.04920

20. The Similarity of Abundance Ratio Trends and Nucleosynthetic Patterns in the Milky Way Disk and Bulge

Griffith E.J., et al., incl. Johnson J.W.

2021, ApJ, 909, 77 - 101

arxiv:2009.05063