

Jaclyn B. Champagne

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EDUCATION

University of Texas Austin

Austin, TX

Ph.D., Astronomy

Aug. 2022

Thesis: "Constraining the Environments of Galaxy Protoclusters at $2 < z < 6$ ", Supervisor: Prof. Caitlin Casey

M.A., Astronomy

Aug. 2018

Thesis: "No Evidence for 1.2 mm Source Overdensities in the Fields of $z \geq 6$ Quasars," Supervisor: Prof. Caitlin Casey

Rutgers, State University of New Jersey

New Brunswick, NJ

B.S., Physics & Astrophysics

May 2016

Summa Cum Laude with Highest Honors in Physics,
Supervisor: Prof. Charles Keeton

EMPLOYMENT

University of Arizona Steward Observatory

Tucson, AZ

JASPER Postdoctoral Scholar

Sept. 2022–present

Supervisor: Prof. Xiaohui Fan

RESEARCH INTERESTS

Reionization-era quasar environments, galaxy protoclusters, high-redshift galaxy evolution, infrared/submm/radio observations. Collaboration membership: EREBUS, ASPIRE, COSMOS, CEERS

RESEARCH EXPERIENCE

Graduate Research Assistant

2016–2022

UT Austin, Supervisor: Prof. Caitlin Casey

Research Intern

Summer 2015

Max Planck Institute for Astronomy, Supervisor: Dr. Fabian Walter

NSF REU Scholar

Summer 2014

Cornell University, Supervisor: Prof. Dominik Riechers

Senior Peer Instructor

2014–2016

Aresty Research Center for Undergraduates, Rutgers University, Supervisor: Prof. Charles Keeton

DATA & OBSERVING EXPERIENCE

Atacama Large Millimeter Array

2019

15 hours awarded Cycle 7, PI: J. Champagne

Australian Telescope Compact Array

2019, 2020

15 nights total, PI: H. Dannerbauer

Hubble Space Telescope

2017

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| Reduction and photometry of 13 orbits ACS/WFC3 imaging in Cycle 25, PI: C. Casey | |
| Jansky Very Large Array | 2016 |
| Reduction and imaging of 46 hours total in Semester 2015B, PI: C. Casey | |
| James Webb Space Telescope | 2022 |
| Extensive custom data reduction for NIRCcam broadband imaging and grism spectroscopy for the ASPIRE medium-size program, PI: F. Wang | |
| LCO - Magellan | 2022 |
| Two nights observing on FIRE, FOURSTAR, and IMACS, PI: J. Yang | |
| Submillimeter Array | 2020 |
| 1 night awarded for SMA Interferometry School 2020 | |
| 6 tracks awarded (A-rated) Semester 2020A, PI: J. Champagne | |

AWARDS & ACHIEVEMENTS

Submillimeter Array Fellowship, 2022 (*declined*)
 NRAO Jansky Fellowship, 2022 (*declined*)
 Waterloo Centre for Astrophysics Fellowship, 2022 (*declined*)
 Beatrice Tinsley Graduate Fellowship, UT Astronomy Department, Summer 2022
 University Continuing Graduate Fellowship, UT Austin Graduate School, 2020-2021
 Professional Development Award (\$625 for conference travel), UT Austin Graduate School, 2019
 National Science Foundation Graduate Research Fellowship, Honorable Mention 2016, 2018
 Astronomy Excellence Fellowship, UT Austin College of Natural Sciences, 2016
 Chambliss Astronomy Achievement Student Award, American Astronomical Society, 2015
 Rutgers University Department of Physics Scholarships: Mohan S. Kalelkar (2016), Mary Wheeler Wigner (2015), and Noemie B. Koller (2014) Awards
 Rutgers School of Arts & Sciences Presidential Scholarship, 2012–2016

SERVICE

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| Graduate Student Representative | 2018–2019, 2021–2022 |
| ◦ Liaison between astronomy graduate students and faculty, including attendance at faculty meetings, participation in graduate admissions, representing students in faculty hiring process, and peer mediation between students; represent graduate students at UT Graduate Student Assembly | |
| Journal Referee | 2021–present |
| ◦ Scientific reviewer for the <i>Astrophysical Journal</i> , <i>Astronomy & Astrophysics</i> , and <i>Nature</i> | |

INVITED PRESENTATIONS

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| "The Varied Properties of AGN in Reionization-Era Protoclusters" | |
| <i>The Multiscale Environment of AGN Across Cosmic Time</i> | November 2025 |
| "The Richest Quasar-Anchored Protocluster at $z = 6.6$ with JWST" | |
| <i>Galaxies & Diffuse Gas in Large-Scale Overdense Environments at High Redshift: Sesto</i> | July 2024 |
| "Revealing the Environment around a Luminous $z = 6.6$ Quasar with JWST" | |
| <i>NASA/Goddard AGN Seminar</i> | May 2024 |
| "Extreme Environments at $2 < z < 7$: A Gallery of Protocluster Case Studies" | |
| <i>First Structures in the Universe 2023, Paris</i> | September 2023 |
| "A Range of Overdensity Signals in the Fields of 3 HST-Observed Quasars" | |
| <i>NOIRLab FLASH Talk</i> | March 2023 |

"The Hunt for Galaxy Protoclusters around the Earliest Quasars"

ESO Santiago AGN Meeting

December 2022

"Hunting for Ancient Galaxy Clusters in the Radio Universe"

Beatrice Tinsley Prize Lecture, UT Austin

August 2022

"A Protocluster Core Caught in the Beginning of Virialization"

Harvard CfA Galaxy Cluster Group Meeting

November 2021

"Comprehensive Gas Characterization of a $z = 2.5$ Protocluster"

Princeton University, Galread

September 2021

CONTRIBUTED PRESENTATIONS

"Large-Scale Structure Traced by [OIII] Emitters at $z = 7$ with COSMOS-3D"

COSMOS-3D/EREBUS 2025

June 2025

"Revealing the Environment around a Luminous $z = 6.6$ Quasar with JWST and ALMA"

First Gigayears, Hilo, HI

September 2024

"Investigating the Richest Protoclusters at $z > 6.5$ in the ASPIRE Survey"

Galaxies & Diffuse Gas in Large-Scale Overdense Environments at High- z , Sesto, Italy

July 2024

"Revealing the Environment around a Luminous $z = 6.6$ Quasar with JWST"

Extreme Galaxies in Extreme Environments at Extremely Early Epochs, Reykjavik

April 2024

"First Characterization of [OIII] Emitters in the Field of a $z=6.6$ Quasar"

First Light Boston, EAS Krakow

June 2023

"Searching for LBG Overdensities in the Fields of $6 < z < 7$ Quasars"

UT Austin ExGal Seminar

October 2021

"The highest redshift cluster core at $z = 2.5$: is it too good to be true?" E-poster

Protoclusters: Galaxies in Confinement

August 2020

"Molecular Gas Characterization of a Complex Galaxy Cluster Progenitor at $z = 2.5$ " Poster

2019 COSMOS Team Meeting, NYC

May 2019

IAU Symposium 352: Uncovering early galaxy evolution in the ALMA and JWST era, Porto

June 2019

"No Evidence for 1.2 mm Dust Continuum Overdensities around $z > 6$ Quasars" Poster

Astrophysical Frontiers, Portland, OR

June 2018

Large Scale Structure Summer School, Berlin, Germany

July 2018

"Molecular Gas Content of SMGs in a $z = 2.47$ Starbursting Protocluster" Poster

SMG20: Twenty Years of Submillimeter Galaxies, Durham University

August 2017

Bash Fest, University of Texas Austin

October 2017

"Simulated Observations of CO(2-1) and CO(1-0) in DSFGs at $2 < z < 4$ " Poster

next generation Very Large Array (ngVLA) Community Studies Meeting, Socorro

June 2017

PROFESSIONAL DEVELOPMENT & PUBLIC OUTREACH

Science Writing for the Public

2023–present

- Popular science articles ["Powerful black holes might grow up in bustling galactic neighborhoods"](#) and ["Why are some black holes bigger than others? An astronomer explains how these celestial vacuums grow"](#) published in The Conversation

UCSC Institute for Science & Engineer Educators Professional Development Program 2019-2025

- Inquiry Design Team Leader for an introductory engineering activity delivered to UT Austin undergraduate researchers (2025)
- Inquiry Design Team Leader for an undergraduate inquiry activity delivered to Akamai Workforce Initiative summer interns catering to Hawai’ian students (2024)
- Inquiry Design Team Member (2019), participated in 6-month inquiry teaching workshop and helped develop and deliver a galaxy spectral classification activity for TAURUS scholars

Black Hole Fusion Camp 2024

- Delivered demonstrations and lessons to 3rd-5th graders at Flandrau Planetarium’s Fusion Camp

Early Universe/RE ionization Conversations at Arizona (EURECA) 2023-present

- Co-founded and organize a biweekly seminar hosting software demonstrations, proposal writing retreats, and guest speakers focused on high-redshift science at UA

GRAdS Mingling with Postdocs Seminar (GRAMPS) 2023-present

- Co-founded and organize an informal biweekly seminar designed for networking amongst Steward graduate students and postdocs through professional development seminars and casual meetings

Computational Research Access Network (CRANE) Instructor 2022-present

- Lead instructor for Astronomy Data Analysis unit of CRANE, an NSF-supported virtual teaching network designed to provide undergraduates with computational research methods

Space Drafts Tucson 2023-present

- Help organize events and recruit speakers, sell merchandise, lead monthly public science talks including “Astronomy in the News”

TAURUS Summer Program Student Organizer 2017–2022

- Organize student seminars including research presentations, career advice panels, and observing workshops; participated in peer mentoring program

Astronomy on Tap ATX 2016–2022

- Help organize events and recruit speakers, lead social media advertising, give monthly public science talks including “Astronomy in the News”

Association of Women in Astronomy Research & Education (AWARE) 2016-2022

- Co-organize yearly Girl Day event and lead astronomy demonstrations for K-12 students

TEACHING & MENTORING

Undergraduate Research Advising

Lorraine Marcelin (*RNAAS published*)

Saksham Yadav

Teaching Assistant

2018, 2020

AST376: Observational Techniques in Astronomy, UT Austin

AST307: Introductory Astronomy, UT Austin

Python Crash Course

2017–2021

Texas Astronomy Undergraduate Research for Underrepresented Students (TAURUS)

Developed and lead a yearly 10-hour programming crash course on bash scripting and introductory Python (including lectures and exercises available publicly at github.com/jbchampagne/pythontutorials/)

Undergraduate Teaching Assistant

Fall 2015

Analyzing the Universe, Rutgers University

Refereed and Working Papers (First Author or *Student-Led)

8. Champagne, J.B. et al. *ASPIRE: The [OIII] Line Luminosity Function at $5.3 < z < 7$ in 25 Quasar Sightlines*. 2025, in prep.
7. Champagne, J.B. et al. *Spatially Resolved Molecular Gas in the Spiderweb Protocluster: No evidence for enhanced star formation efficiency in DSFGs*. 2025, to be submitted.
6. *Marcelin, L. C., **Champagne, J. B.**, et al. *Enhanced Merger Fractions in a Reionization-Era Protocluster*. 2025, RNAAS, 9, 133M
5. **Champagne, J. B.**, Wang, F, Fan, X., Hennawi, J. et al. *A Quasar-Anchored Protocluster at $z = 6.6$ in the ASPIRE Survey II. An Environmental Analysis of Galaxy Properties in an Overdense Structure*. 2025b, ApJ, 981, 114C
4. **Champagne, J. B.**, Wang, F, Zhang, H., et al. *A Quasar-Anchored Protocluster at $z = 6.6$ in the ASPIRE Survey I. Properties of [OIII] Emitters in a 10 Mpc Overdense Structure*. 2025a, ApJ, 981, 113C
3. **Champagne, J. B.**, Casey, C. M., Finkelstein, S. L., Bagley, M., Cooper, O., Larson, R., Long, A., Wang, F. *A Mixture of LBG Overdensities in the Fields of Three $6 < z < 7$ Quasars: Implications for the Robustness of Photometric Selection*. 2023, ApJ, 952, 99C
2. **Champagne, J. B.**, Casey, C. M., Zavala, J. A., Cooray, A., Dannerbauer, H., Fabian, A., Hayward, C. C., Long, A. S., Spilker, J. S. *Comprehensive Gas Characterization of a $z = 2.5$ Protocluster: A Cluster Core Caught in the Beginning of Virialization?* 2021, ApJ, 913, 110
1. **Champagne, J.B.**, Decarli, R., Casey, C. M., Venemans, B., Bañados, Eduardo, Walter, F., Bertoldi, F., Fan, X., Farina, E. P., Mazzucchelli, C., Riechers, D. A., Strauss, M. A., Wang, R., Yang, Y. *No Evidence for Millimeter Continuum Source Overdensities in the Environments of $z \geq 6$ Quasars*. 2018, ApJ, 867, 153

Refereed Papers (Co-Author, *Significant Contribution)

- Kakiichi, K. incl. JBC, et al. *JWST ASPIRE: How Did Galaxies Complete Reionization? Evidence for Excess IGM Transmission around [OIII] Emitters during Reionization*. 2025, submitted to Open Journal of Astrophysics
- Li, Z. incl. JBC, et al. *A 13-Billion-Year View of Galaxy Growth: Metallicity Gradient Evolution from the Local Universe to $z = 9$ with JWST and Archival Surveys*. 2025, submitted
- Lin, X. incl. JBC, et al. *Bridging Quasars and Little Red Dots: Insight into Broad-Line AGNs at $z = 5 - 8$ from the First JWST COSMOS-3D Dataset*. 2025a, submitted to ApJ
- Lin, X. incl. JBC, et al. *The Discovery of Little Red Dots in the Local Universe: Signatures of Cool Gas Envelopes*. 2025b, submitted to ApJ
- Manning, S. incl. JBC, et al. *SCUBADive II: Searching for $z > 4$ Dust-Obscured Galaxies via F150W-Dropouts in COSMOS-Web*. 2025, submitted to ApJ
- McKinney, J. incl. JBC, et al. *SCUBADive I: JWST+ALMA Analysis of 289 sub-millimeter galaxies in COSMOS-Web*. 2025, ApJ, 979, 229M
- Perez Martinez, J. incl. JBC, et al. *COALAS III: The ATCA CO(1-0) look at the growth and death of $H\alpha$*

emitters in the Spiderweb protocluster at $z = 2.16$. 2025, A&A, 696A, 236P

- Protušová, K. *incl. JBC, et al. A unique window into the Epoch of Reionisation: A double-peaked Lyman- α emitter in the proximity zone of a quasar at $z \sim 6.6$. 2025, submitted to A&A*
- *Pudoka, M. *incl. JBC (5/19), et al. Lyman-Break Galaxies in the Mpc-Scale Environments around Three $z \sim 7.5$ Quasars with JWST Imaging. 2025, ApJ, 987, 198*
- Shuntov, M. *incl. JBC, et al. COSMOS2025: The COSMOS-Web galaxy catalog of photometry, morphology, redshifts, and physical parameters from JWST, HST, and ground-based imaging. 2025, submitted to A&A*
- *Spilker, J. S. *incl. JBC (2/7), et al. Direct Evidence for AGN Feedback From Fast Molecular Outflows in Reionization-Era Quasars. 2025, ApJ, 982, 72S*
- *Sun, F. *incl. JBC (4/28), et al. A SPectroscopic survey of biased halos In the Reionization Era (ASPIRE): Spectroscopically Complete Census of Obscured Cosmic Star Formation Rate Density at $z = 4 - 6$, 2025a, ApJ, 980, 12S*
- Sun, F. *incl. JBC, et al. The Identification of Two JWST/NIRCam-Dark Starburst Galaxies at $z = 6.6$ with ALMA. 2025b, submitted to ApJ*
- Tanaka, T. *incl. JBC, et al. Discovery of a Little Red Dot candidate at $z \geq 10$ in COSMOS-Web based on MIRI-NIRCam selection. 2025, submitted to ApJ*
- *Zou, S. *incl. JBC, et al. Disturbed cold gas in galaxy and structure formation. 2025, submitted*
- Akins, H. *incl. JBC, et al. COSMOS-Web: The over-abundance and physical nature of “little red dots” – Implications for early galaxy and SMBH assembly. 2024, submitted to ApJ*
- Cooper, O. *incl. JBC, et al. The Web Epoch of Reionization Ly α Survey (WERLS) I. MOSFIRE Spectroscopy of $z \sim 7 - 8$ Ly α Emitters. 2024, ApJ, 870, 1, 50*
- Franco, M., *incl. JBC, et al. Unveiling the distant Universe: Characterizing $z \geq 9$ Galaxies in the first epoch of COSMOS-Web. 2024, ApJ, 973, 23F*
- Jin, X. *incl. JBC, et al. A SPectroscopic survey of biased halos In the Reionization Era (ASPIRE): JWST Supports Earlier Reionization around [OIII] Emitters. 2024, ApJ, 976, 93J*
- *Lin, X. *incl. JBC (5/36), et al. A SPectroscopic survey of biased halos In the Reionization Era (ASPIRE): Broad-line AGN at $z = 4 - 5$ revealed by JWST/NIRCam WFSS. 2024, ApJL, 974, 147L*
- Liu, W., *incl. JBC, et al. Fast Outflow in the Host Galaxy of the Luminous $z = 7.5$ Quasar J1007+2115. 2024, ApJ, 976, 33*
- Long, A. S. *incl. JBC, et al. The Extended Mapping Obscuration to Reionization with ALMA (Ex-MORA) Survey: 5 σ Source Catalog and Redshift Distribution, 2024, submitted to ApJ*
- *Pudoka, M. *incl. JBC (5/17), et al. Large Scale Overdensity of Lyman Break Galaxies Around the $z = 6.3$ Ultraluminous Quasar J0100+2802. 2024, ApJ, 968, 118*
- Wang, F. *incl. JBC, et al. A Massive Protocluster Anchored by a Luminous Quasar at $z = 6.63$. 2024, ApJL, 962, L11*
- Zhu, Y., *incl. JBC, et al. Discovery of a Unique Close Quasar–DSFG Pair Linked by a [C II] Bridge at $z = 5.63$. 2024, RNAAS, 8, 284*

- *Zou, S. *incl. JBC (5/30), et al. A SPECTROSCOPIC survey of biased halos In the Reionization Era (ASPIRE): Impact of Galaxies on the Circumgalactic Medium Metal Enrichment at $z > 6$ Using the JWST and VLT. 2024, ApJL, 963, L28*
- Akins, H. *incl. JBC, et al. Two Massive, Compact, and Dust-obscured Candidate $z \sim 8$ Galaxies Discovered by JWST. 2023, ApJ, 956, 61A*
- *Chen, Z., *incl. JBC (7/27), et al. COALAS II. Extended molecular gas reservoirs are common in a distant, forming galaxy cluster. 2023, MNRAS 527, 3*
- *Larson, R., **incl. JBC, et al. A CEERS Discovery of an Accreting Supermassive Black Hole 570 Myr after the Big Bang: Identifying a Progenitor of Massive $z > 6$ Quasars. 2023, ApJ, 953L, 29L*
- Lambrides, E., *incl. JBC, et al. Uncovering a Massive $z \sim 7.65$ Galaxy Hosting a Heavily Obscured Radio-Loud QSO Candidate in COSMOS-Web. 2023, ApJL, 961, L25*
- Magee, J. *incl. JBC, et al. Rotation Curve Measurement of Dark Matter Content of a $z=0.5$ Galaxy. 2023, RNAAS, 7, 110M*
- McKinney, J., *incl. JBC, et al.. A Near-Infrared Faint, Far-Infrared-Luminous Dusty Galaxy at $z \sim 5$ in COSMOS-Web. 2023, ApJ, 956, 72M*
- *Wang, F., *incl. JBC (6/59), et al. A SPECTROSCOPIC survey of biased halos In the Reionization Era (ASPIRE): JWST Reveals a Filamentary Structure around a $z=6.61$ Quasar 2023, ApJL, 951, L4*
- Wu, Y. *incl. JBC, et al. A SPECTROSCOPIC Survey of Biased Halos in the Reionization Era (ASPIRE): JWST Discovers an Overdensity around a Metal Absorption-selected Galaxy at $z=5.5$. 2023, ApJL, 956, 40W*
- Yang, J. *incl. JBC, et al. A SPECTROSCOPIC survey of biased halos In the Reionization Era (ASPIRE): A First Look at the Rest-frame Optical Spectra of $z>6.5$ Quasars Using JWST. 2023, ApJL, 951, L5*
- Zavala, J. A., *incl. JBC, et al. Dusty Starbursts Masquerading as Ultra-high Redshift Galaxies in JWST CEERS Observations. 2023, ApJL, 943, L9*
- Casey, C. M., *incl. JBC, et al. COSMOS-Web: An Overview of the JWST Cosmic Origins Survey. 2023, ApJ, 954, 31C*
- Long, A. S., *incl. JBC, et al. Missing Giants: Predictions on Dust-Obscured Galaxy Stellar Mass Assembly Throughout Cosmic Time. 2023, ApJ, 953, 11L*
- Zavala, J. A., *incl. JBC, et al. Probing Cold Gas in a Massive, Compact Star-forming Galaxy at $z = 6$. 2022, ApJ, 933, 242*
- Cooper, O. R., *incl. JBC, et al., Searching Far and Long I: Pilot ALMA 2mm Follow-up of Bright Dusty Galaxies as a Redshift Filter. 2022, ApJ, 930, 32*
- Casey, C. M., *incl. JBC, et al. Mapping Obscuration to Reionization (MORA): 2mm Efficiently Selects the Highest-Redshift Obscured Galaxies. 2021, ApJ, 923, 215*
- Manning, S. M., *incl. JBC, et al. Characterization of Two 2 mm-detected Optically-Obscured Dusty Star-Forming Galaxies. 2021, ApJ, 925, 23*
- Jin, S., *incl. JBC, et al. COALAS: I. ATCA CO(1-0) survey and luminosity function in the Spiderweb protocluster at $z = 2.16$, 2021, Astronomy & Astrophysics, 652, A11 **

- Zavala, J. A., incl. JBC (4/13), et al. *On the Gas Content, Star Formation Efficiency, and Environmental Quenching of Massive Galaxies in Proto-Clusters at $z \approx 2.0 - 2.5$* . **2019**, ApJ, 887, 183
- Casey, C. M., incl. JBC, et al. *Physical Characterization of an Unlensed, Dusty Star-forming Galaxy at $z = 5.85$* , **2019**, ApJ 887, 55

White Papers & Conference Proceedings

- Casey, C. M., Capak, P., Staguhn, J., Armus, L., Blain, A., Bethermin, M., **Champagne, J. B.** (7 of 27), Cooray, A., et al. *Taking Census of Massive, Star-Forming Galaxies formed < 1 Gyr After the Big Bang*. **2019**, Astro2020 White Papers, 2019arXiv190305634C
- Casey, C. M., Narayanan, D., Carilli, C., **Champagne, J. B.** (4 of 12), Hung, C.-L., Davé, R., Decarli, R., Murphy, E. J., Popping, G., Riechers, D., Somerville, R. S., Walter, F. *Imaging Cold Gas to 1 kpc Scales in High-Redshift Galaxies with the ngVLA*. **2018**, ASPC, 517, 629