

# Jaclyn B. Champagne

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## EDUCATION

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### University of Texas Austin

*Ph.D., Astronomy*

**Austin, TX**

*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

*B.S., Physics & Astrophysics*

**New Brunswick, NJ**

*May 2016*

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

## EMPLOYMENT

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### University of Arizona Steward Observatory

*JASPER Postdoctoral Scholar*

**Tucson, AZ**

*Sept. 2022–present*

Supervisor: Prof. Xiaohui Fan

## RESEARCH INTERESTS

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Reionization-era quasars and environments, galaxy protoclusters, cosmological large-scale structure, dusty star-forming galaxies, high-redshift galaxy evolution, infrared/submillimeter/radio observations

## RESEARCH EXPERIENCE

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### Graduate Research Assistant

UT Austin, Supervisor: Prof. Caitlin Casey

*Aug. 2016–present*

### Research Intern

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

*Summer 2015*

### NSF REU Scholar

Cornell University, Supervisor: Prof. Dominik Riechers

*Summer 2014*

### Senior Peer Instructor

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

*2014–2016*

## DATA & OBSERVING EXPERIENCE

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### Atacama Large Millimeter Array

15 hours awarded Cycle 7, PI: J. Champagne

*2019*

### Australian Telescope Compact Array

15 nights total, PI: H. Dannerbauer

*2019, 2020*

<b>Hubble Space Telescope</b>	2017
Reduction and photometry of 13 orbits ACS/WFC3 imaging in Cycle 25, PI: C. Casey	
<b>Jansky Very Large Array</b>	2016
Reduction and imaging of 46 hours total in Semester 2015B, Pi: C. Casey	
<b>James Webb Space Telescope</b>	2022
Extensive custom data reduction for NIRCam broadband imaging and grism spectroscopy for the ASPIRE medium-size program, PI: F. Wang	
<b>LCO - Magellan</b>	2022
Two nights observing on FIRE, FOURSTAR, and IMACS, PI: J. Yang	
<b>Submillimeter Array</b>	2020
1 night awarded for SMA Interferometry School 2020	
6 tracks awarded (A-rated) Semester 2020A, PI: J. Champagne	

## AWARDS & ACHIEVEMENTS

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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 astronomy graduate students in monthly meetings of the UT Graduate Student Assembly
- Journal Referee** 2021–present
- Scientific reviewer for the *Astrophysical Journal*

## PRESENTATIONS AND TALKS

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- "The Hunt for Galaxy Protoclusters around the Earliest Quasars"**  
 Invited Seminar Talk  
*ESO Santiago AGN Meeting* December 2022
- "Hunting for Ancient Galaxy Clusters in the Radio Universe"**  
 Invited Prize Lecture  
*Beatrice Tinsley Lecture* August 2022
- "A Protocluster Core Caught in the Beginning of Virialization"**  
 Invited Seminar Talk

<i>Harvard CfA Galaxy Cluster Group Meeting</i>	<i>November 2021</i>
<b>"Searching for LBG Overdensities in the Fields of <math>6 &lt; z &lt; 7</math> Quasars"</b>	
Local Seminar Talk	
<i>UT Austin ExGal Seminar</i>	<i>October 2021</i>
<b>"Comprehensive Gas Characterization of a <math>z = 2.5</math> Protocluster: A Cluster Core Caught in the Beginning of Virialization?"</b>	
Invited Seminar Talk	
<i>Princeton University, Galread</i>	<i>September 2021</i>
<b>"The highest redshift cluster core at <math>z = 2.5</math>: is it too good to be true?"</b>	
E-poster by J. B. Champagne, C M. Casey, J. A. Zavala, H. Dannerbauer, et al.	
<i>Protoclusters: Galaxies in Confinement</i>	<i>August 2020</i>
<b>"Molecular Gas Characterization of a Complex Galaxy Cluster Progenitor at <math>z = 2.5</math>"</b>	
Contributed talk+poster by J. B. Champagne, C M. Casey, J. A. Zavala, H. Dannerbauer, et al.	
<i>2019 COSMOS Team Meeting</i>	<i>May 2019</i>
<i>IAU Symposium 352: Uncovering early galaxy evolution in the ALMA and JWST era</i>	<i>June 2019</i>
<b>"No Evidence for 1.2 mm Dust Continuum Overdensities around <math>z &gt; 6</math> Quasars"</b>	
Poster by J. B. Champagne, R. Decarli, C. M. Casey, F. Walter, B. Venemans, et al.	
<i>Astrophysical Frontiers, Portland, OR</i>	<i>June 2018</i>
<i>Large Scale Structure Summer School, Berlin, Germany</i>	<i>July 2018</i>
<b>"Molecular Gas Content of SMGs in a <math>z = 2.47</math> Starbursting Protocluster"</b>	
Poster by J. B. Champagne, C. M. Casey, D. B. Sanders, C. Hales, et al.	
<i>SMG20: Twenty Years of Submillimeter Galaxies, Durham University</i>	<i>August 2017</i>
<i>Bash Fest, University of Texas Austin</i>	<i>October 2017</i>
<b>"Simulated Observations of CO(2-1) and CO(1-0) in DSFGs at <math>2 &lt; z &lt; 4</math>"</b>	
Poster by J. B. Champagne, C. M. Casey, C.-L. Hung, D. Narayanan, C. Carilli, et al.	
<i>next generation Very Large Array (ngVLA) Community Studies Meeting</i>	<i>June 2017</i>
<b>"Searching for Galaxy Overdensities in the Fields of 10 <math>z &gt; 6</math> Quasars"</b>	
Poster by J. C. Bradli, F. Walter, B. Venemans, R. Decarli, L. Zschaechner	
<i>American Astronomical Society Winter Meeting</i>	<i>January 2016</i>
<b>"Star Formation Properties in Dusty Early Universe Galaxies using Gravitational Lensing"</b>	
Poster by J. C. Bradli, D.A. Riechers, R. S. Bussmann, D. Clements, I. Perez-Fournon	
<i>American Astronomical Society Winter Meeting</i>	<i>January 2015</i>
<b>"Differential Microlensing of SDSS J0924+0129"</b>	
Poster by J. C. Bradli, C. R. Keeton	
<i>Rutgers Aresty Undergraduate Research Symposium</i>	<i>April 2014</i>

## PROFESSIONAL DEVELOPMENT & PUBLIC OUTREACH

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- 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
  - Assist in teaching seminars and administrative organization
- 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

**UCSC Institute for Science & Engineer Educators (ISEE) Professional Development Program (PDP)**  
2019, 2020

- Inquiry Design Team Leader (cancelled 2020 due to COVID-19), began development of a galaxy classification activity for undergraduates
- Inquiry Design Team Member (2019), participated in 6-month inquiry teaching workshop and helped develop and deliver a galaxy spectral classification activity for undergraduate summer scholars (TAURUS)

**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

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**Teaching Assistant** Spring 2020

AST376: Observational Techniques in Astronomy, UT Austin

**Teaching Assistant** Spring 2018

AST307: Introductory Astronomy, UT Austin

**Seminar Leader for 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/](https://github.com/jbchampagne/pythontutorials/))

**Undergraduate Teaching Assistant** Fall 2015

Analyzing the Universe, Rutgers University

## PUBLICATIONS ORCID: 0000-0002-6184-9097

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**Refereed and Working Papers (First Author)**

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**, submitted to ApJ: arxiv:2304.10437
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)

- Wang, F., Yang, J., Fan, X., Sun, F., **Champagne, J. B.** 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**, accepted to ApJL. arxiv:2304.09894
- Yang, J., Wang, F., Fan, X., Hennawi, J. F., **Champagne, J. B.** 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**, accepted to ApJL. arxiv:2304.09888
- McKinney, J., Manning, S. M., Cooper, O. R., Long, A. S., **Champagne, J. B.** et al.. *A Near-Infrared Faint, Far-Infrared-Luminous Dusty Galaxy at  $z \sim 5$  in COSMOS-Web.* **2023**, submitted to ApJ. arxiv:2304.07316v1.
- Larson, R., Finkelstein, S. L., Kocevski, D., Hutchison, T., Trump, J., **Champagne, J. B.** 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**, submitted to ApJ. arXiv:2303.08918.
- Zavala, J. A., Buat, V., Casey, C. M., Finkelstein, S. L., **Champagne, J. B.** et al. *Dusty Starbursts Masquerading as Ultra-high Redshift Galaxies in JWST CEERS Observations.* **2023**, ApJL, 943, L9
- Casey, C. M., Kartaltepe, J. S., Drakos, N. E., Franco, M., Ilbert, O., Rose, C., Cox, I. G., Nightingale, J. W., Robertson, B. E., Silverman, J. D., Koekemoer, A. M., Massey, R., McCracken, H. J., Rhodes, J., **Champagne, J. B.** et al. *COSMOS-Web: An Overview of the JWST Cosmic Origins Survey.* **2023**, in press, ApJ
- Long, A. S., Casey, C. M., Lagos, C. P., Lambrides, E. L., Zavala, J. A., **Champagne, J. B.**, Cooper, O. R., Cooray, A. R. *Missing Giants: Predictions on Dust-Obscured Galaxy Stellar Mass Assembly Throughout Cosmic Time.* **2023**, submitted, ApJ
- Zavala, J. A., Casey, C. M., Spilker, J. S., Tadaki, K., Tsujita, A., **Champagne, J. B.**, Iono, D., Kohno, K., Manning, S., Montana, A. *Probing Cold Gas in a Massive, Compact Star-forming Galaxy at  $z = 6$ .* **2022**, ApJ, 933, 242
- Cooper, O. R., Casey, C. M., Zavala, J. A., **Champagne, J. B.**, da Cunha, E., Long, A. S., Spilker, J. S., Staguhn, J. *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., Zavala, J. A., Manning, S. M., Aravena, M., Bethermin, M., Caputi, K. I., **Champagne, J. B.**, Clements, D. L., Drew, P., Finkelstein, S. L., Fujimoto, S., Hayward, C. C., Koekemoer, A. M., Kokorev, V., del Lagos, C., Long, A. S., Magdis, G. E., Man, A. W. S., Popping, G., Spilker, J.S., Staguhn, J., Talia, M., Toft, S., Treister, E., Weaver, J. R., Yun, M. *Mapping Obscuration to Reionization (MORA): 2mm Efficiently Selects the Highest-Redshift Obscured Galaxies.* **2021**, ApJ, 923, 215
- Manning, S. M., Casey, C. M., Zavala, J. A., Magdis, G. E., Drew, P. M., **Champagne, J. B.**, Aravena, M., Bethermin, M., Clements, D. L., Finkelstein, S. L., Fujimoto, S., Hayward, C. C., Hodge, J. A., Ilbert, O., Kartaltepe, J. S., Knudsen, K. K., Koekemoer, A. M., Man, A. W., Sanders, D. B., Sheth, K., Spilker, J. S., Staguhn, J., Talia, M., Treister, E., Yun, M. S. *Characterization of Two 2 mm-detected Optically-Obscured Dusty Star-Forming Galaxies.* **2021**, ApJ, 925, 23
- Zavala, J. A., Casey, C. M., Scoville, N., **Champagne, J. B.**, Chiang, Y., Dannerbauer, H., Drew, P. M., Fu, H., Spilker, J. S., Spitler, L., Tran, K. V., Treister, E., Toft, S. *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

## White Papers & Conference Proceedings

- Jin, S., Dannerbauer, H., Emonts, B., Serra, P., Lagos, C. D. P., Thomson, A. P., Bassini, L., Lehnert, M., Allison, J. R., **Champagne, J. B.**, Indermuhle, B., Norris, R. P., Seymour, N., Shimakawa, R., Casey, C. M., De Breuck, C., Drouart, G., Hatch, N., Kodama, T. Y., Macgregor, P., Miley, G., Overzier, R., Perez-Martinez, J. M., Rodriguez-Espinosa, J. M., Rottgering, H., Sanchez Portal, M., Ziegler, B. *COALAS: I. ATCA CO(1-0) survey and luminosity function in the Spiderweb protocluster at  $z = 2.16$* , **2021**, *Astronomy & Astrophysics*, 652, A11
- Casey, C. M., Zavala, J. A., Aravena, M., Bethermin, M., Caputi, K. I., **Champagne, J. B.**, Clements, D. L., da Cunha, E., Drew, P. M., Finkelstein, S. L., Hayward, C. C., Kartaltepe, J. S., Knudsen, K. K., Koekemoer, A. M., Magdis, G. E., Man, A. W., Manning, S. M., Scoville, N. Z., Sheth, K., Spilker, J. S., Staguhn, J., Talia, M., Taniguchi, Y., Toft, S., Treister, E., Yun, M. *Physical Characterization of an Unlensed, Dusty Star-forming Galaxy at  $z = 5.85$* , **2019**, *ApJ* 887, 55
- 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