# Katherine A. (Wren) Suess

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wrensuess.github.io

# Research Interests

Observational galaxy formation and evolution; galaxy quenching; structural evolution of galaxies; spatially-resolved stellar population modeling; galaxy star formation histories

### Education

Ph.D. Astrophysics, University of California, Berkeley	Aug 2021
Advisor: Mariska Kriek	
Thesis: The Growth & Transformation of Galaxies Across Cosmic Time	
M.A. Astrophysics, University of California, Berkeley	May 2017
B.A. Physics, summa cum laude, University of Colorado, Boulder	May 2015
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Advisor: Jeremy Darling

Honors thesis: Identifying OH Imposters in the ALFALFA Neutral Hydrogen Survey

### Research Positions

Stanford - Santa Cruz Cosmology Fellow, UC Santa Cruz & Stanford University	2021 - present
UC Santa Cruz Chancellor's Fellow, UC Santa Cruz	2021 - present
NSF Graduate Research Fellow, UC Berkeley	2017 - 2021
Chancellor's Fellow, UC Berkeley	2015 - 2017
Undergraduate Research Assistant, CU Boulder Astrophysical & Planetary Sciences Dept	2013 - 2015
Undergraduate Research Assistant, Laboratory for Atmospheric and Space Physics (LASP)	2013 - 2015
NSF REU Research Student, LASP and NOAA Space Weather Prediction Center	Summer 2013

### Selected Awards & Honors

Hubble Fellowship	2023
Mary Elizabeth Uhl Prize for outstanding scholarly achievement by a graduate student	2021
finishing their dissertation in Astronomy or Physics	
UC Berkeley Grad Slam Semifinalist (final competition canceled due to COVID-19)	2019
Robert J. Trumpler Graduate Excellence Award	2019
Outstanding Graduate Student Instructor	2017
NSF Graduate Research Fellowship	2016
University of California, Berkeley Chancellor's Fellowship	2015
Stephen Halley White Undergraduate Research Award	2015

# PI Telescope Programs

#### Atacama Large Millimeter/submillimeter Array

- 5. **K. Suess**, R. Bezanson, R. Feldmann, J. E. Greene, M. Kriek, D. Narayanan, D. Setton, J. Spilker, P.-F. Wu, Cycle 8: 2021.1.00761.S, Quantifying the molecular gas reservoirs of post-starburst AGN hosts (14.5 hours)
- 4. K. Suess, R. Bezanson, R. Feldmann, J. E. Greene, K. Hall-Hooper, Q. Hunt, M. Kriek, D. Narayanan, D. Setton, J. Spilker, Cycle 8: 2021.1.00749.S, Mapping the molecular gas reservoirs of recently-quenched galaxies (2.6 hours)
- 3. K. Suess, R. Bezanson, R. Feldmann, J. E. Greene, K. Hall-Hooper, Q. Hunt, M. Kriek, D. Narayanan, D. Setton, J. Spilker, Cycle 7: 2019.1.00221.S, Mapping the molecular gas reservoirs of recently-quenched galaxies (11.4 hours)
- 2. K. Suess, R. Bezanson, R. Feldmann, J. E. Greene, K. Hall-Hooper, Q. Hunt, M. Kriek, D. Narayanan, D. Setton, J. Spilker, Cycle 6: 2018.1.01240.S, Mapping the molecular gas reservoir of a recently-quenched galaxy (7.0 hours)
- K. Suess, R. Bezanson, R. Feldmann, J. E. Greene, K. Hall-Hooper, Q. Hunt, M. Kriek, D. Narayanan, D. Setton, J. Spilker, Cycle 6: 2018.1.01264.S, How did molecular gas end up tens of kiloparsecs away from a massive, recentlyquenched z~0.6 galaxy? (6.5 hours)

### Gemini Observatory

1. **K. Suess**, R. Bezanson, R. Feldmann, J. E. Greene, K. Hall-Hooper, Q. Hunt, M. Kriek, D. Narayanan, D. Setton, J. Spilker, 2019B: GS-2019B-Q-232, Characterizing the sizes and morphologies of  $z \sim 0.6$  gas-rich quenched galaxies (7.7 hours)

# Hubble Space Telescope

1. **K. Suess**, J. Spilker, R. Bezanson, M. Kriek, J. Greene, Cycle 25: GO 15436, Understanding the Origin of Large Gas Reservoirs in Recently-Quenched Galaxies (3 orbits)

#### **Keck Observatory**

- 3. M. Kriek\*, **K. Suess**, R. Bezanson, J. Greene, J. Spilker, Spr 2019: U132, Testing the Quiescence of Massive, Gas-rich Post-starburst Galaxies (0.5 night, NIRES)
- 2. M. Kriek\*, **K. Suess**, R. Bezanson, J. Greene, J. Spilker, Fall 2018: U093, Testing the Quiescence of Massive, Gas-rich Post-starburst Galaxies (0.5 night, NIRES)
- 1. M. Kriek\*, **K. Suess**, R. Bezanson, J. Greene, J. Spilker, Spr 2018: U232, Testing the Quiescence of Massive, Gas-rich Post-starburst Galaxies (1 night, NIRES)
  - \*acting PI; graduate students/postdocs cannot PI UC Keck proposals

#### Lick Observatory

- 2. K. Suess, M. Kriek, K. Hall-Hooper, R. Bezanson, J. Greene, B. Holden, Fall 2018: S018, Spectroscopic Confirmation of Post-Starburst Galaxies (6 nights, Kast Spectrograph)
- 1. **K. Suess**, M. Kriek, J. Greene, R. Bezanson, Fall 2016: S018, The origin of compact quiescent galaxies as revealed by  $z \sim 0.7$  post-starburst galaxies (3 nights, ShARCS LGS)

#### Very Large Array

1. K. Suess, J. Spilker, R. Bezanson, M. Kriek, J. Greene, Spr 2018: VLA/18A-390, Understanding the Origin of Large Gas Reservoirs in Recently-Quenched Galaxies (7.5 hours; A priority)

# Co-I Telescope Programs

**Atacama Large Millimeter/submillimeter Array**: 2017.1.01109.S, 2016.1.01126.S, & 2019.1.01286.S, 2019.1.00702.S, 2021.1.00988.S, 2021.1.01535.S, 2022.1.00604.S, PIs R. Bezanson, M. Kriek, P.-F. Wu, & D. Setton, 156.8 hours.

**Gemini Observatory**: GN-2018B-Q-203 & GS-2018B-Q-104, GS-2018A-FT-112, GS-2017B-Q-35, GN-2017B-Q-37, GS-2017A-Q-56, PIs R. Bezanson & Q. Hunt, GMOS, 37.53 hours.

**Keck Observatory**: S21 U075, F20 U054, S20 U220, F19 U171, S19 U133, F18 U094, S18 U258, F17 U147, S17 U091, PI M. Kriek, 21 nights MOSFIRE & 4 nights LRIS.

Hubble Space Telescope: Cycle 28 16201, Cycle 28 16248, PI J. Spilker, WFC3 grism & imaging, 6 orbits.

James Webb Space Telescope: Cycle 1 PID 2110, PI M. Kriek, 23hr NIRSpec MOS. Member, JADES GTO collaboration & UNCOVER team.

# Additional Observing Experience:

Keck Observatory: OSIRIS (2 nights), MOSFIRE (1 night), LRIS (0.5 night) Rudolph Minkowski Observational Astronomy Workshop, Lick Observatory, 2015

# **Teaching**

ALMA Ambassador & Workshop Leader, Stanford University	2022
Graduate Student Instructor, UC Berkeley AY160: Stellar Physics	Fall 2016
Graduate Student Instructor, UC Berkeley Astro C10: Introduction to General Astronomy	Fall 2015
Splash Instructor, "How do astronomers know anything?"	Fall 2015
Learning Assistant, CU Boulder Phys 1110: Introductory Physics for Majors	Fall 2012
Director of K-12 Education, AmeriCorps with CoPIRG Energy Service Corps	Oct 2011 - May 2012

### Service & Leadership

Respect Is Part of Research: peer-led sexual assault & harassment prevention workshops for incoming physics & astronomy graduate students,

respect is part of research. com

Co-coordinator, Respect is Part of Research (with Micah Brush)

2018 - 2021

(responsibilities: develop workshop content; coordinate with university survivor support office & Title IX office; secure program funding; work with university officials, statewide Title IX

office, and graduate union to expand program to all UC Berkeley graduate departments)

Member, UC Berkeley Coordinated Community Review Team

2020-2021

for Sexual and Gender-Based Violence and Misconduct

Facilitator training lead, Harvard University Physics Department	Aug 2020
Caltech Astronomy Department  "Respect is Part of Research" – Presentation and Q&A, UC Berkeley Graduate Assembly	Feb 2020
Lead Organizer, "How to Start a Peer-Led SVSH Prevention Program" workshop (with Micah Br	
(2-day workshop attended by $\sim 25$ grad students from 10 institutions to teach	usii) 5aii 2020
the Respect is Part of Research model; 4 new RPR chapters started for Fall 2020)	
Presentation and Climate Q&A, Physics Department Faculty Retreat	Dec 2019
"Respect is Part of Research: Peer-Led Training to Improve Departmental Climate"	Oct 2019
UC Berkeley Astronomy Lunch Talks	000 <b>2</b> 010
Facilitator training lead for UC Berkeley (7 academic departments, 55 peer facilitators)	Aug 2019
Facilitator, UC Berkeley College of Chemistry Diversity & Inclusion Focus Group	Feb 2019
Respect is Part of Research Facilitator	2017 - 2021
Other Service & Leadership	
Journal Referee: ApJ, MNRAS, A&A	
NOIRLab Time Allocation Committee Panel Member (Extragalactic)	2023A - 2025A
NRAO Student Observing Support Grant Review Panel	2022
ALMA Ambassador (lead two day-long workshops to teach community members radio interferome	try, 2022
from radio basics to data reduction to writing ALMA proposals)	
Co-lead, JADES GTO Team Morphology Science Team with Prof. Erica Nelson	2021 - present
Co-lead, JADES GTO Team Quiescent Science Team with Dr. Christina Williams	2021 - present
ALMA Distributed Time Allocation Committee member	Cycle 8, 9
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UC Berkeley Astronomy Graduate Student Representative Head of prospective graduate student visit committee, UC Berkeley	2019-2020 2018, 2019
	2018, 2019 2017 - present
Graduate student mentor, Berkeley Astronomy Department Graduate Mentoring Program  Prospective graduate student visit planning committee UC Berkeley	
Prospective graduate student visit planning committee, UC Berkeley	2016 - 2017
Prospective graduate student visit planning committee, UC Berkeley Lead organizer, UC Berkeley Astronomy Department Public Liaisons	2016 - 2017 2015 - 2017
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*SCIPP seminar, UC Santa Cruz Physics Department	Jan 2022
*Colloquium, Saint Mary's University in Halifax	Sept 2021
*University of Hertfordshire Astronomy Seminar	June 2021
*CANDELS SED fitting working group meeting	$\mathrm{Apr}\ 2021$
*Colloquium, University of Sussex	Apr 2021
*Caltech Tea Talk	Dec 2020
Princeton University GalRead Seminar	Nov 2020
Hernquist Group Meeting, Harvard University	Nov 2020
*UMass Amherst Galaxy Lunch Seminar	Oct 2020
University of Arizona Galaxy Group Talk	Oct 2020
*Harvard ITC Colloquium	Oct 2020
*Carnegie Observatories Lunch Talk	Oct 2020
UC Santa Cruz Cosmology-Galaxies-IGM Seminar	Sept 2020
*Galaxy Crawl, University of Arizona	July 2020
*UC Davis Cosmology Seminar	March 2020
CASA/JILA Lunch Seminar, Boulder CO	Feb 2020
UC Berkeley Grad Student / Postdoc Seminar, How to Write a Telescope Proposal	$\mathrm{Apr}\ 2018$
UC Berkeley Astronomy Lunch Talk, Berkeley CA	Aug 2017
Conference Presentations (* invited)	
*The Growth of Galaxies in the Early Universe VII, Sesto IT upcor	ning March 2023
*First Light at Cosmic Dawn: Exploiting the James Webb Space Telescope Revolution, Bern CH	Jan 2023
*An In-Situ View of Galaxy Formation 2, Schloss Ringberg	July 2022
*Review, European Astronomical Society Annual Meeting: SS4, The Main Sequence of Star Formation	July 2022
Public Summit of the Action Collaborative on Preventing Sexual Harassment in Higher Education	Oct 2020
National Academies of Sciences, Engineering, and Medicine	
*Where the Star Formation Ends, Lorentz Center Workshop (canceled due to COVID-19)	March 2020
Galaxy Quenching and Transformation Throughout Cosmic Time, Aspen CO	Feb 2020
*The Growth of Galaxies in the Early Universe VI, Sesto IT	Jan 2020
The Art of Measuring Galaxy Physical Properties, Milano IT	Nov 2019
IAU Symposium 352: Uncovering early galaxy evolution in the ALMA and JWST era	June 2019
UC Santa Cruz Galaxy Workshop	Aug 2018

### Publications (32 total, 10 as first author; ADS)

First or second author:

- 12. Spilker, J., **K. A. Suess**, D. J. Setton, R. Bezanson et al., Star Formation Suppression by Tidal Removal of Cold Molecular Gas from an Intermediate-redshift Massive Post-starburst Galaxy, ApJ 936, 1, L11, 2022. DOI: 10.3847/2041-8213/ac75ea
- 11. Nelson, E., **K. A. Suess**, R. Bezanson, S. H. Price, JWST reveals a population of ultra-red, flattened disk galaxies at 2 < z < 6 previously missed by HST, in review at ApJL. arXiv:2208.01630
- 10. Suess, K. A., J. Leja, B. D. Johnson, R. Bezanson et al., Recovering the Star Formation Histories of Recently Quenched Galaxies: The Impact of Model and Prior Choices, ApJ 935, 2, 146. DOI: 10.3847/1538-4357/ac82b0
- 9. Suess, K. A., R. Bezanson, E. J. Nelson, D. J. Setton et al., Rest-frame near-infrared sizes of galaxies at cosmic noon: objects in JWST's mirror are smaller than they appeared, ApJL 937, 2, L33. DOI: 10.3847/2041-8213/ac8e06
- 8. Suess, K. A., M. Kriek, R. Bezanson, J. E. Greene et al., SQuIGGLE: Studying Quenching in Intermediate-z Galaxies Gas, AnguLar Momentum, and Evolution, ApJ 926, 1, 89, 2022. DOI: 10.3847/1538-4357/ac404a
- 7. Suess, K. A., M. Kriek, G. Barro, S. H. Price, Dissecting the size-mass and  $\Sigma_1$ -mass relations at 1.0 < z < 2.5: galaxy mass profiles and color gradients as a function of spectral shape, ApJ 915, 2, 87, 2021. DOI: 10.3847/1538-4357/abf1e4
- 6. Suess, K. A., M. Kriek, S. H. Price, G. Barro, Color gradients along the quiescent galaxy sequence: clues to quenching and structural growth, ApJL 899, L2, 2020. DOI: 10.3847/2041-8213/abacc9
- 5. Suess, K. A., M. Kriek, S. H. Price, G. Barro, Half-mass radii of quiescent and star-forming galaxies evolve slowly from  $0 \sim z \le 2.5$ : implications for galaxy assembly histories, ApJL 885, L22, 2019. DOI: 10.3847/2041-8213/ab4db3
- 4. Suess, K. A., M. Kriek, S. H. Price, G. Barro, Half-mass radii for  $\sim 7,000$  galaxies at  $1.0 \le z \le 2.5$ : most of the evolution in the mass-size relation is due to color gradients, ApJ 877, 103, 2019. DOI: 10.3847/1538-4357/ab1bda

- 3. Suess, K. A., R. Bezanson, J. S. Spilker, M. Kriek, J. E. Greene, R. Feldmann, Q. Hunt, D. Narayanan, Massive Quenched Galaxies at  $z\sim0.7$  Retain Large Molecular Gas Reservoirs, ApJL 846, L14, 2017. DOI: 10.3847/2041-8213/aa85dc
- 2. Suess, K. A., J. Darling, M. P. Haynes, R. Giovanelli, Identifying OH Imposters in the ALFALFA Neutral Hydrogen Survey, MNRAS 459, 220-231, 2016. DOI: 10.1093/mnras/stw666
- 1. Suess, K. A., M. Snow, R. Viereck, J. Machol, Solar Spectral Proxy IrradiaNce from GOES (SSPRING): A Model for Solar EUV Irradiance, J. Space Weather Space Clim., 6, A10, 11pp, 2016. DOI: 10.1051/swsc/2016003

#### Contributing author:

- 20. Furtak, L. J., incl. **K. A. Suess**, A variable active galactic nucleus at z = 2.06 triply-imaged by the galaxy cluster MACS J0035.4-2015, submitted to ApJ. arXiv:2303.00025
- 19. Looser, T. J., incl. K. A. Suess, Discovery of a quiescent galaxy at z = 7.3, submitted to Nature. arXiv:2302.14155
- 18. Bunker, A. J., incl. **K. A. Suess**, JADES NIRSpec Spectroscopy of GN-z11: Lyman- $\alpha$  emission and possible enhanced nitrogen abundance in a z = 10.60 luminous galaxy, submitted to ApJ. arXiv:2302.07256
- 17. Tacchella, S., incl. **K. A. Suess**, JADES Imaging of GN-z11: Revealing the Morphology and Environment of a Luminous Galaxy 430 Myr After the Big Bang, *submitted to ApJ.* arXiv:2302.07234
- 16. Williams, C. C., incl. **K. A. Suess**, JEMS: A deep medium-band imaging survey in the Hubble Ultra-Deep Field with JWST NIRCam NIRISS, *submitted to ApJL*. arXiv:2301.09780
- 15. Furtak, L. J., incl. **K. A. Suess**, JWST UNCOVER: A triply imaged faint quasar candidate at  $z_{\rm phot} \simeq 7.7$ , submitted to ApJ. arXiv:2212.10531
- 14. Giménez-Arteaga, C., incl. **K. A. Suess**, Spatially Resolved Properties of High Redshift Galaxies in the SMACS0723 JWST ERO Field, *submitted to ApJ.* arXiv:2212.08670
- 13. Curtis-Lake, E., incl. **K. A. Suess**, Spectroscopy of four metal-poor galaxies beyond redshift ten, accepted at Nature Astronomy. arXiv:2212.04568
- 12. Robertson, B., incl. **K. A. Suess**, Discovery and properties of the earliest galaxies with confirmed distances, accepted at Nature Astronomy. arXiv:arXiv:2212.04480
- 11. Verrico, M., D. J. Setton, R. Bezanson, J. E. Greene, **K. A. Suess** et al., Merger Signatures are Common but not Universal in Massive, Recently-Quenched Galaxies at  $\sim 0.7$ , submitted to ApJ. arXiv:2211.16532
- 10. Miller, T., incl. K. A. Suess, Early JWST imaging reveals strong optical and NIR color gradients in galaxies at  $z \sim 2$  driven mostly by dust, ApJ 941, 2, L37. DOI: 10.3847/2041-8213/aca675
- 9. Tacchella, S., incl. **K. A. Suess**, JWST NIRCam+NIRSpec: Interstellar medium and stellar populations of young galaxies with rising star formation and evolving gas reservoirs, *in review at ApJ.* arXiv:2208.03281
- 8. Labbe, I, P. van Dokkum, E. Nelson, R. Bezanson, K. A. Suess et al., A very early onset of massive galaxy formation, accepted to Nature. arXiv:2207.12446
- 7. Naidu, R. P., P. A. Oesch, P. van Dokkum, E. J. Nelson, **K. A. Suess** et al., Two Remarkably Luminous Galaxy Candidates at  $z \approx 11-13$  Revealed by JWST, accepted to ApJL. arXiv:2207.09434
- 6. Setton, D. J., M. Verrico, R. Bezanson, J. E. Greene, **K. A. Suess** et al., The Compact Structures of Massive  $z \sim 0.7$  Post-starburst Galaxies in the SQuIGG $\vec{L}$ E Sample, ApJ 931, 1, 51, 2022. DOI: 10.3847/1538-4357/ac6096
- 5. R. Bezanson, J. Spilker, K. A. Suess, D. J. Setton et al., Now You See It, Now You Don't: Star Formation Truncation Precedes the Loss of Molecular Gas by 100 Myr in Massive Poststarburst Galaxies at  $z\sim0.6$ , ApJ 925, 2, 153, 2022. DOI: 10.3847/1538-4357/ac3dfa
- 4. Setton, D. J., R. Bezanson, K. A. Suess et al., SQuIGG $\vec{L}$ E survey: massive  $z \sim 0.6$  post-starburst galaxies exhibit flat age gradients, ApJ 905, 79, 2020. DOI: 10.3847/1538-4357/abc265
- 3. J. E. Greene, D. Setton, R. Bezanson, K. A. Suess et al., The Role of Active Galactic Nuclei in the Quenching of Massive Galaxies in the SQUIGGLE Survey, ApJL 899, L9, 2020. DOI: 10.3847/2041-8213/aba534
- 2. Kriek, M., S. H. Price, C. Conroy, **K. A. Suess**, et al., Stellar Metallicities and Elemental Abundance Ratios of  $z \sim 1.4$  Massive Quiescent Galaxies, ApJL 880, L31, 2019. DOI: 10.3847/2041-8213/ab2e75
- 1. Hunt, Q., R. Bezanson, J. E. Greene, J. S. Spilker, **K. A. Suess**, et al., Stellar and Molecular Gas Rotation in a Recently-Quenched Massive Galaxy at  $z \sim 0.7$ , ApJL 860, L18, 2018. DOI: 10.3847/2041-8213/aaca9a

#### Grants

ALMA Ambassador Research Award (\$10,000)

NRAO Student Observing Support Award (\$10,000)

Travel Grant, Aspen Center for Physics

UC Berkeley Graduate Division Travel Grant

IAU Travel Grant

Summer 2019, Fall 2019

2019

AAS International Travel Grant	2019-1, 2019-2, 2020-1
STScI grant to support HST program GO 15436 (\$22,000)	2017
NRAO Student Observing Support Award (\$32,000)	2017
NSF Graduate Research Fellowship (3 years stipend & tuition)	2016
UC Berkeley Chancellor's Fellowship (2 years stipend & tuition)	2015
Professional and Academic Conference Endowment, CU Boulder	2014
Individual Grant, Undergraduate Research Opportunities Program, CU Boulder	2014
Research Assistantship, Undergraduate Research Opportunities Program, CU Boulder	2012

# Press

- $\bullet$  Canada Public Radio interview on "As It Happens", These red dots could change everything we think we know about how galaxies form, https://www.cbc.ca/radio/asithappens/james-webb-distant-galaxies-1.6762078
- Nature, Four Revelations from the Webb Telescope about Distant Galaxies, nature.com/articles/d41586-022-02056-5
- $\bullet \ NRAO \ Press \ Release, ALMA \ Witnesses \ Deadly \ Star-Slinging \ Tug-of-War \ Between \ Merging \ Galaxies, \ public.nrao.edu/news/almamerging-galaxies-tidal-tails/$
- AAS Nova, Sizing Up Galaxies at Cosmic Noon, https://aasnova.org/2022/12/02/sizing-up-galaxies-at-cosmic-noon/

# Skills

Computing Python, LATEX, Mathematica, bash, git
Other Software Prospector, FSPS, GALFIT, SExtractor, FAST, MESA