

David J. Setton

Curriculum Vitae

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Research focus: observational galaxy formation and evolution through cosmic time

Education

- 2019– Present **University of Pittsburgh**, Ph.D Candidate in Physics.
Advisor: Professor Rachel Bezanson
- May 2019 **University of Pittsburgh**, M.S. in Physics.
- May 2017 **University of Arizona**, B.S. in Physics and Astronomy.
Advisor: Professor Gurtina Besla
Thesis: Characterizing the Bow Shock of the Large Magellanic Cloud

Research Experience

- May 2018–Present **The Age Gradients, Structures, and Evolution of Post-starburst Galaxies.**
Studying the rapid pathway galaxies take into quiescence by analyzing the structures of post-starburst galaxies in the SQuIGGLE Sample and the number density of rapidly quenched galaxies as a function of cosmic time using the DESI Suvey.
Advisor: Professor Rachel Bezanson
- Jan 2016–Present **Characterizing the Large Magellanic Cloud Bow Shock.**
Used high resolution hydrodynamic simulations to characterize the size, shape, and observability of the a predicted bow shock that should precede the LMC's motion into the Milky Way potential.
Advisor: Professor Gurtina Besla
- July–November 2016 **Separating AGN and Starburst Activity using Spatially Resolved Spectroscopy.**
Created a pipeline to spatial pixels of galaxies in the SAMI survey by their spectral line ratios to characterize emission sources.
Advisor: Professor Lisa Kewley
- Sep. 2014 - May 2015 **High-z Galaxies in the Hubble Frontier Fields.**
Created a software pipeline to photometrically identify high-z galaxies in the Hubble Frontier Fields.
Advisor: Dr. Christopher Willmer

Accepted Telescope Programs/Observing

Hubble Space Telescope

- Principle **SNAP (409 Orbits)**, Cycle 30: 17110, Total budget: \$202,893.
- Investigator "Post-starbursts from DESI: Timing quenching and morphological transformation at $1 < z < 1.3$ "

Atacama Large Millimeter/submillimeter Array

- Principle **27.9 hours**, Cycle 9: 2022.1.00604.S.
- Investigator "Timing the Disappearance of Molecular Gas in Post-Starburst Galaxies"
- Principle **37.6 hours**, Cycle 8: 2021.1.01535.S.
- Investigator "Timing the Disappearance of Molecular Gas in Post-Starburst Galaxies"
- Principle **14.4 hours**, Cycle 8: 2021.1.00988.S.
- Investigator "Tracing the molecular gas in tidal tails of recently quenched galaxies"
- Co- Investigator **14.5 hours**, Cycle 8: 2021.1.00761.S.
- "Quantifying the molecular gas reservoirs of post-starburst AGN hosts"

Other facilities

- Co- Investigator **48 hours**, *CHANDRA*, Cycle 24: 24700092.
"A CHANDRA View of Massive Post-Starburst Galaxies"
- Co- Investigator **45 hours**, *VLA*, Semester 2022A: VLA/22A-362.
"Timing the Onset of Radio-Mode Feedback with High-z Post-starbursts"

Observing Experience

- 1.5 Nights **Magellan/FIRE**, *Upcoming*, Jan. 2023.
" $H\alpha$ Fluxes of SQuIGGLE ALMA and CHANDRA Targets"
- 1.5 Nights **Magellan/FIRE**, Feb./Mar. 2022.
" $H\alpha$ Fluxes of SQuIGGLE ALMA and CHANDRA Targets"
- 1 Night **Keck/NIRES**, June 2018.
" $H\alpha$ Fluxes of SQuIGGLE ALMA Targets"

Scholarships, Honors, and Grants

- 2023-2025 **HST-GO #17110 Grant**, \$202,893.
- Summer 2023 **Zaccheus Daniel Fellowship**, ~ \$13,000.
- Spring 2023 **PITT PACC Graduate Fellow**, ~ \$13,000.
- Fall 2022 **ALMA Student Observing Support**, ~ \$35,000.
- Fall 2021 **PITT PACC Graduate Fellow**, ~ \$12,000.
- Mar. 2021 **Thomas-Lain Fund Scholarship Essay Competition**, \$2000.
- Feb. 2020 **Martin and Beate Block Winter Award**, \$500.
- Acad. Year 16-17 **Cubic Corporation Scholarship**, ~ \$2000.
- Acad. Year 16-17 **Krane Scholarship**, ~ \$2000.
- Acad. Year 16-17 **Phi Beta Kappa Travel Grant**, ~ \$1000.
- Acad. Year 16-17 **Glenn C. Purviance Scholarship**, ~ \$3500.
- Acad. Year 15-16 **Galileo Circle Scholarship**, ~ \$5000.
& 16-17 Highest Honor Awarded by University of Arizona College of Science
- Fall 2016 **Honors College Study Abroad Scholarship**, ~ \$1000.
- Fall 2016 **Donna Swaim Travel Abroad Scholarship**, ~ \$500.
Awarded to 2 of 83 Applicants
- Acad. Year 14-15 **Angelos C. Langadas Scholarship**, ~ \$2000.
- Acad. Year 14-15 **Arizona Space Grant Internship**, ~ \$3500.

Talks and Presentations

- December 2022 **DESI Collaboration Meeting**, *Invited Plenary Speaker*, Cancun, Mexico.
- November 2022 **DESI Research Forum**, *Invited Speaker*, Online.
- November 2022 **NOIRLab FLASH Talk**, *Invited Speaker*, Tucson, Arizona.
- October 2022 **HSC+PFS+Rubin Meeting**, *Invited Speaker*, Princeton University.
- October 2022 **Extragalactic Seminar**, *Invited Speaker*, Texas A&M.
- October 2022 **Extragalactic Seminar**, *Invited Speaker*, University of Texas Austin.
- September 2022 **Galaxy Group Seminar**, *Invited Speaker*, University of Michigan.
- September 2022 **Epoch of Galaxy Quenching 2022**, *Speaker*, Cambridge, U.K..
- July 2022 **A Holistic View of Stellar Feedback and Galaxy Evolution**, *Speaker*, Collegio Papio, Ascona, Switzerland.
- May 2022 **AstroPGH Data Science Bootcamp**, *Guest Lecture*, University of Pittsburgh.

- Nov 2021 **KooGiG-Junior Workshop**, *Speaker*, Kavli Institute for Astronomy and Astrophysics.
- May 2021 **STSci Multi-Object Spectroscopy Workshop**, *Speaker*, Space Telescope Institute.
- April 2021 **Galaxy Lunch**, *Invited Speaker*, UMass Amherst.
- March 2021 **McWilliams Computing Seminar**, *Invited Speaker*, Carnegie Mellon University.
- October 2020 **Intro to Astronomy Seminar Series**, *Invited Speaker*, Bridgewater State University.
- May+June 2020 **AstroPGH Data Science Bootcamp**, *Guest Lectures*, University of Pittsburgh.
- Feb. 2020 **Aspen Galaxy Quenching Workshop**, *Poster*, Aspen Center for Physics.
Awarded "Martin and Beate Block Winter Award for Promising Young Physicists"
- Feb. 2020 **3 Minute Thesis Competition**, *Talk*, University of Pittsburgh.
Department Competition Winner
- Jan. 2017 **229th Meeting of the American Astronomical Society**, *Poster*, Grapevine, TX.
- May 2016 **Lucy Engal Undergraduate Physics Symposium**, *Talk*, University of Arizona.
- Mar. 2016 **2nd Magellanic Clouds Workshop**, *Talk*, University of Arizona.
- May 2015 **Lucy Engal Undergraduate Physics Symposium**, *Talk*, University of Arizona.
Awarded "Best Undergraduate Talk"
- Apr. 2015 **Arizona Space Grant Symposium**, *Talk*, Arizona State University.

Teaching Experience

- Acad. Year 19-20 **AP Physics C: Mechanics + Electricity & Magnetism**, *Tutor*.
- Acad. Year 18-19 **Deitrich School of Arts and Sciences Teaching Assistant Mentor**, *Pitt*.
- Spring 2018 **ASTRON 0089: Stars, Galaxies, and Cosmos**, *Teaching Assistant*, *Pitt*.
Received Myron P. Garfunkel Excellence in Graduate Student Teaching Award
- Fall 2017 **ASTRON 0088: Stonehenge to Hubble**, *Teaching Assistant*, *Pitt*.
- Fall 2017 **ASTRON 0087: Basics of Spaceflight**, *Teaching Assistant*, *Pitt*.
- Spring 2017 **PHYS 141: Introduction to Mechanics**, *Preceptor*, U.Arizona.
- Spring 2017 **PHYS 241: Introduction to Electricity & Magnetism**, *Preceptor*, U.Arizona.

Students Supervised

- Mar. 2020-Aug. 2022 **Maggie Verrico**, *University of Pittsburgh Undergraduate*.
Studying the Sizes and Structures of $z \sim 0.7$ Post-Starburst Galaxies
Now a graduate student at the University of Illinois Urbana-Champaign
- May 2022-Present **Anika Kumar**, *University of Pittsburgh Undergraduate*.
Studying the Source Properties of the Post-Starburst Host Galaxies of Gas Rich Companions
- July 2022-Present **Erin Stumbaugh**, *University of Pittsburgh Undergraduate*.
Studying the Environments of Post-Starburst Galaxies Using HSC Imaging

Service

- Referee: ALMA Distributed TAC**, *Proposal Reviewer*.
Astrophysical Journal, *Referee*.
- Aug. 2019-July 2021 **Association of Physics and Astronomy Graduate Students**, *Co-President*.
- Summers 19, 20, 21 **Pitt Galaxy Journal Club**, *Founding Organizer*.
Graduate student led journal club focused on seminal galaxy papers

Outreach

- Apr. 2022 **ACCelerate Festival Presenter**, *Smithsonian National Museum of American History*.
Presenter: Making the Largest Maps of the Universe
- Apr. 2019 & 2020 **Pittsburgh Public School Research Symposium Judge**, *Taylor Allderdice High School*.
2020: Chair of Judging Committee
- Nov. 2018 **Astronomy on Tap Pittsburgh**, *Franktuary*, Speaker.
"The Puzzling Counter Intuitiveness of Special Relativity"
- Aug. 2015 - May 2017 **College of Science Ambassador**, *University of Arizona*.
Recruitment and outreach events to recruit STEM undergraduates from Arizona high schools
- Sep. 2014 - May 2017 **Steward Observatory Telescope Operator**, *University of Arizona*.
Operated the 21" telescope on campus for undergraduate classes and public visit nights

References

- Graduate Thesis Advisor **Rachel Bezanson**, *Associate Professor, University of Pittsburgh*.
rachel.bezanson@pitt.edu
- Graduate Thesis Committee Member **Jenny E. Greene**, *Professor, Princeton University*.
jgreene@astro.princeton.edu
- Graduate Thesis Committee Member **Jeffrey A. Newman**, *Professor, University of Pittsburgh*.
janewman@pitt.edu
- Undergraduate Thesis Advisor **Gurtina Besla**, *Associate Professor, University of Arizona*.
gbesla@email.arizona.edu

Publications

Publications in each are listed in reverse chronological order in each section. Papers led by a student under close supervision by D.S. indicated with an asterisk (*)

Lead Author:

3. DESI Survey Validation Spectra Reveal an Increasing Fraction of Recently Quenched Galaxies at $z \sim 1$
Setton, David J.; Dey, Biprateep; ; Khullar, Gourav; Bezanson, Rachel; Newman, Jeffrey A.; et al. 2022
Submitted to the Astrophysical Journal Letters (arXiv:2212.05070)
2. The Compact Structures of Massive $z \sim 0.7$ Post-Starburst Galaxies in the SQuGGLE Survey
Setton, David J.; Verrico, Margaret; Bezanson, Rachel; Greene, Jenny E.; Suess, Katherine A.; Feldmann, Robert; Goulding, Andy D.; Hall-Hooper, Khalil; Kado-Fong, Erin; Kriek, Mariska; Narayanan, Desika; Spilker, Justin S. 2022
The Astrophysical Journal, 931, 51
1. SQuGGLE Survey: Massive $z \sim 0.6$ Post-Starburst Galaxies Exhibit Flat Age Gradients
Setton, David J.; Bezanson, Rachel; Suess, Katherine A.; Hunt, Qiana; Greene, Jenny E.; Kriek, Mariska; Spilker, Justin S.; Feldmann, Robert; Narayanan, Desika 2020
The Astrophysical Journal, 905, 79

Second and Third Author:

4. *Merger Signatures are Common, but not Universal, in Massive, Recently-Quenched Galaxies at $z \sim 0.7$
Verrico, Margaret; **Setton, David J.**; Bezanson, Rachel; Greene, Jenny E.; Suess, Katherine A.; Goulding, Andy; Spilker, Justin S.; Kriek, Mariska; Feldmann, Robert; Narayanan, Desika 2022
Submitted to the Astrophysical Journal (arXiv:2211.16532)
3. Schrodinger's Galaxy Candidate: Puzzlingly Luminous at $z \sim 17$, or Dusty/Quenched at $z \sim 5$?
Naidu, Rohan P.; Oesch, Pascal A.; **Setton, David J.**; Matthee, Jorjyt; Conroy, Charlie; Johnson, Benjamin D.; Weaver, John R.; Bouwens, Rychard J.; Brammer, Gabriel B.; Dayal, Pratika; et al. 2022
Submitted to the Astrophysical Journal (arXiv:2208.02794)
2. Star Formation Suppression by Tidal Removal of Cold Molecular Gas from an Intermediate-Redshift Massive Post-Starburst Galaxy
Spilker, Justin S.; Suess, Katherine A.; **Setton, David J.**; Bezanson, Rachel; Feldmann, Robert; Greene, Jenny E.; Kriek, Mariska; Lower, Sidney; Narayanan, Desika; Verrico, Margaret 2022
The Astrophysical Journal 936 L11
1. The Role of Active Galactic Nuclei in the Quenching of Massive Galaxies in the SQuGGLE Survey
Greene, Jenny E.; **Setton, David J.**; Bezanson, Rachel; Suess, Katherine A.; Kriek, Mariska; Spilker, Justin S.; Goulding, Andy D.; Feldmann, Robert 2020
The Astrophysical Journal, 899, L9

Contributing Author:

7. The JWST UNCOVER Treasury survey: Ultradeep NIRSpect and NIRCams Observations before the Epoch of Reionization
Bezanson, Rachel; Labbe, Ivo; Whitaker, Katherine E.; Leja, Joel; Price, Sedona H.; Franx, Marijn; Brammer, Gabe; Marchesini, Danilo; et al. 2022 (including **Setton, David J.**)
Submitted to the Astrophysical Journal (arXiv:2212.04026)
6. JWST reveals a population of ultra-red, flattened disk galaxies at $2 < z < 6$ previously missed by HST
Nelson, Erica J.; Suess, Katherine A.; Bezanson, Rachel; Price, Sedona H.; van Dokkum, Pieter; Leja, Joel; Whitaker, Bingjie Wang Katherine E.; Labbé, Ivo; et al. 2022 (including **Setton, David J.**)
Submitted to the Astrophysical Journal (arXiv:2208.01630)

5. Rest-frame near-infrared sizes of galaxies at cosmic noon: objects in JWST's mirror are smaller than they appeared
 Suess, Katherine A.; Bezanson, Rachel; Nelson, Erica J.; **Setton, David J.**; Price, Sedona H.; van Dokkum, Pieter ; Brammer, Gabriel; Labbe, Ivo; Leja, Joel; Miller, Tim B.; Robertson, Brant; et al. 2022
Accepted to the Astrophysical Journal (arXiv:2207.10655)
4. Two Remarkably Luminous Galaxy Candidates at $z \approx 11 - 13$ Revealed by JWST
 Naidu, Rohan P.; Oesch, Pascal A.; van Dokkum, Pieter; Nelson, Erica J.; Suess, Katherine A.; Whitaker, Katherine E.; Allen, Natalie; Bezanson, Rachel; et al. 2022 (including **Setton, David J.**)
Accepted to the Astrophysical Journal (arXiv:2207.09434)
3. Recovering the star formation histories of recently-quenched galaxies: the impact of model and prior choices
 Suess, Katherine A.; Leja, Joel; Johnson, Benjamin D.; Bezanson, Rachel; Greene, Jenny E.; Kriek, Mariska; Lower, Sidney; Narayanan, Desika; **Setton, David J.**; Spilker, Justin S. 2022
The Astrophysical Journal, 935, 146
2. SQuGGLE: Studying Quenching in Intermediate- z Galaxies: Gas, Angular Momentum, and Evolution
 Suess, Katherine A.; Kriek, Mariska; Bezanson, Rachel; Greene, Jenny E.; **Setton, David J.**; Spilker, Justin S.; Feldmann, Robert F.; Goulding, Andy D.; Johnson, Benjamin D.; Leja, Joel; Narayanan, Desika; Hall-Hooper, Khalil; Hunt, Qiana; Lower, Sidney; Verrico, Margaret 2022
The Astrophysical Journal, 926, 89
1. Now you see it, now you don't: H_2 in massive post-starburst galaxies at $z \sim 0.6$ 2022
 Bezanson, Rachel; Spilker, Justin S.; Suess, Katherine A.; **Setton, David J.**; Feldmann, Robert; Greene, Jenny E.; Kriek, Mariska; Narayanan, Desika; Verrico, Margaret 2022
The Astrophysical Journal, 925, 153

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