Devontae C. Baxter

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Research Interests

I lead a research program centered on investigating the drivers of galaxy formation and evolution in extreme cosmic environments — from massive galaxy clusters in the nearby cosmos to overdense galaxy protoclusters in the distant universe. My work integrates computational methods, cosmological simulations, and multi-wavelength observations, and has contributed to advancing our understanding of the processes that fuel star formation in galaxies and the mechanisms that shut it down, across a wide array of environments and cosmic epochs. Alongside leading world-class science, I actively work to create inclusive STEM spaces, particularly for individuals from historically excluded backgrounds, as diversity of thought is essential to scientific progress.

Positions Held

NSF Astronomy & Astrophysics Postdoctoral Fellow at UC San Diego **July 2023 – Present**
Mentor: Alison L. Coil

Education

The University of California, Irvine **May 2023**
Doctorate of Philosophy (Ph.D.) in Physics | Advisor: Michael C. Cooper *Irvine, CA*

Georgia Institute of Technology **May 2017**
Bachelor of Science (B.S.) in Physics with highest honors | Advisor: Alberto Fernandez-Nieves *Atlanta, GA*

Publications

Summary: 14 publications (5 first-author, 9 co-author)

D. C. Baxter, et al. 2025, *Quantifying the Impact of Observational Incompleteness on Identifying and Interpreting Galaxy Protocluster Populations with the TNG-Cluster Simulation* To be submitted to ApJ in March 2025.

G. Hewitt, et al. incl. **D. C. Baxter**, 2025, *Distinct Origins of Environmentally Quenched Galaxies in the Core and Virialized Regions of Massive Clusters at* $0.8 < z < 1.5$. To be submitted to MNRAS in March 2025.

F. Giddings, et al. incl. **D. C. Baxter**, 2025, *Companion Fraction and Overdensity in the Hyperion Proto-supercluster ($z \sim 2.5$).* To be submitted to ApJ in March 2025.

H. Gully, et al. incl. **D. C. Baxter**, 2025, *Insights into Environmental Quenching at $z \sim 1$: An Enhancement of Faint, Low-mass Passive Galaxies in Clusters.* Submitted to ApJ (in review).

G. Gururajan, et al. incl. **D. C. Baxter**, 2025, *Gas Properties as a Function of Environment in the Proto-supercluster Hyperion at $z \sim 2.45$.* Submitted to A&A (in review).

L. Sandoval Ascensio, et al. incl. **D. C. Baxter**, 2025, *Caught in the Act of Quenching: A Population of Post-Starburst UDGs.* Submitted to OJAp (in review).

D. C. Baxter, et al. 2025, *The Importance of Gas Starvation in Driving Satellite Quenching in Galaxy Groups at $z \sim 0.8$.* ApJ, 979, 41.

L. Xie, G, et al. incl. **D. C. Baxter**, 2024, *The First Quenched Galaxies: When and How?* ApJL, 967, L42.

D. C. Baxter, et al. 2023, *When the Well Runs Dry: Modelling Environmental Quenching of High-mass Satellites in Massive Clusters at $z \gtrsim 1$.* MNRAS, 526, 3716

E. Kukstas, et al. incl. **D. C. Baxter**, 2023, *The GOGREEN Survey: A Critical Assessment of Environmental Trends in Cosmological Hydrodynamical Simulations at $z \approx 1$.* MNRAS, 518, 4782

D. C. Baxter, et al. 2022, *The GOGREEN Survey: The GOGREEN Survey: Constraining the Satellite Quenching Timescale in Massive Clusters at $z \gtrsim 1$.* MNRAS, 515, 5479

M. K. Rodriguez Wimberly, et al. incl. **D. C. Baxter** 2022, *Sizing from the Smallest Scales: The Mass of the Milky Way.* MNRAS, 513, 4968

D. C. Baxter, et al. 2021, *A Machine Learning Approach to Measuring the Quenched Fraction of Low-Mass Satellites Beyond the Local Group.* MNRAS, 503, 1636

S. Mahajan, et al. incl. **D. C. Baxter** 2020, *Reverse Janssen Effect in Narrow Granular Columns.* PRL, 124, 128002

Funding

Total funding awarded (accepted and declined): $629,850

National Science Foundation – *23rd Annual Symposium of the NSF Astronomy and Astrophysics Postdoctoral Fellows* ($50,000, Award# 2437597, PI: J. Moreno, co-PI: D. Baxter)

National Science Foundation – *Constraining the Cosmic Evolution of Environmental Quenching & Predicting Proto-cluster Populations* ($330,000, Award# 2303800, PI: D. Baxter)

The University of California Chancellor's Postdoctoral Fellowship Program - *Constraining the Cosmic Evolution of Environmental Quenching* ($9,850)

Sullivan Prize Postdoctoral Fellowship ($240,000, Declined)

Awards & Scholarships

Honorable Mention: UC Irvine President's Dissertation Year Fellowship ($1,000)	2022
AAS National Osterbrock Leadership Program Fellowship	2020-2023
UCI Physics & Astronomy Graduate Student Mentor Award	2020-2023
LSSTC Data Science Fellowship	2019-2022
Honorable Mention: Ford Foundation Predoctoral Fellowship	2019
UCI Eugene Cota-Robles Graduate Fellowship ($67,000)	2017-2023
Tulsa Community Foundation: AMC Cares Scholarship ($5,000)	2015-2017
Georgia Hope Scholarship ($15,000)	2015-2017

Professional Talks

Summary: 23 Talks (16 invited, 7 contributed)

Lick Observatory Summer Series Public Outreach Talk†	July 2025
Caltech Tea Talk†	May 2025
President's Postdoctoral Fellowship Program 2025 Academic Spring Retreat*	April 2025
University of Wisconsin-Madison Science Seminar†	April 2025
UC Irvine Astronomy Seminar†	April 2025
UC Riverside Astronomy Seminar†	April 2025
UC San Diego Simulations TheoRy AND more (STRAND) Meeting†	March 2025
Washington State University Physics & Astronomy Colloquium†	Nov 2024
University of Florida Astronomy Colloquium†	Nov 2024
UC Davis Cosmology and Astronomy Seminar†	Oct 2024
Ensenada San Diego Astrophysical Society Meeting*	Sep 2024
Galaxy Formation and Evolution in Southern California Conference*	Sep 2024
President's Postdoctoral Fellowship Program 2024 Academic Spring Retreat*	April 2024
AAS 243rd Meeting (Dissertation Talk)*	Jan 2024
NSF AAPF Fellows Symposium*	Jan 2024
Georgia Institute of Technology Center for Relativistic Astrophysics Seminar†	Nov 2023
UC San Diego Astronomy Colloquium†	Oct 2023
The Baryon Cycle of Protocluster Galaxies Workshop†	Oct 2023
First Structures in the Universe Conference†	Sept 2023
Inaugural Conference for Emerging Black Academics in STEM†	May 2023
AAS 240th Meeting*	June 2022
University of Kansas Astronomy Seminar†	April 2022

The Ohio State University Little Galaxies Journal Club† March 2021

†=invited; ∗=contributed

Observing Experience

W.M. Keck Observatory/MOSFIRE	1.5 nights	MOSFIRE Survey of Galaxies in Early Rich Environments	Co-I
W.M. Keck Observatory/KCWI	4.5 nights	KCWI Survey of Ultradiffuse Galaxies in the Field	Co-I
W.M. Keck Observatory/DEIMOS	3.5 nights	DEIMOS Survey of the JWST CEERS Field	Co-I
W.M. Keck Observatory/DEIMOS	6.5 nights	Constraining the Physics of Satellite Quenching at $z < 1$	Co-I

Advising Experience

Sophia Um - UCSD Astronomy & Astrophysics Undergraduate 2024-Present
I am the primary advisor guiding Sophia's project on identifying and characterizing isolated quenched dwarf galaxies in cosmological simulations. This work was recently presented at the 245th AAS meeting.

Teaching Experience

Guest Lecturer - ASTR 2 (Galaxies and the Universe) at UC San Diego	Spring 2025
Instructor - Computational Astrophysics Research Preparation Spring 2025 Workshop	May 2025
Instructor - Computational Research Access NEtwork 2025 Workshop	May 2025
Instructor - STARTastro Programming & Plotting in Python Workshop	July 2024
Instructor - Computational Astrophysics Research Preparation Spring 2024 Workshop	May 2024
Instructor - Computational Research Access NEtwork 2024 Workshop	May 2024
Teaching Assistant - UC Carpentries Fall Workshop Series	Sep 2023
Instructor - LSSTC Data Science Fellowship Program Workshop	June 2023
Instructor - Computational Research Access NEtwork 2023 Workshop	May 2023
Guest Lecturer - Physics 138 (Astrophysics of Galaxies) at UC Irvine	Winter 2020
Instructor - Physics Olympiad Winter Bootcamp at Ardent Academy for Gifted Youth	December 2019
Teaching Assistant - Physics 20E (Life in the Universe) at UC Irvine	Spring 2019
Teaching Assistant - Physics 20B (Cosmology) at UC Irvine	Winter 2019
Teaching Assistant - Physics 20D (Space Science) at UC Irvine	Fall 2018

Teaching & Mentorship Certificates

Instructor Certification from *The Carpentries* 2024
The Carpentries is a global organization that teaches coding and data science skills through hands-on workshops. This certificate recognizes the completion of pedagogical training to teach these skills to a global population of learners.

Certification in Course Design 2020
This certificate from UCI Division of Teaching Excellence and Innovation recognizes the completion of training to design effective, inclusive, and engaging courses.

Certification for the Integration of Research, Teaching and Learning 2020
This certificate from UCI Division of Teaching Excellence and Innovation recognizes the completion of training to integrate evidence-based teaching practices to enhance student outcomes.

Mentoring Excellence Program Certification 2019
This certificate from UCI Graduate Division demonstrates mastery of mentoring skills, such as cultural competence and inclusivity, effective communication, navigating power dynamics, and conflict mediation.

Service

Scientific Organizing
Organizing Committee Member - 23rd Annual NSF AAPF Postdoc Symposium (National Harbor, MD) 2024

Department Committees
UCSD Astronomy & Astrophysics Colloquium Committee Member 2024-2025

Reviewer
Hubble Space Telescope Cycle 33 TAC Expert Reviewer 2025

Future Investigators in NASA Earth and Space Science and Technology (FINESST) No-Panel Reviewer 2025
Hubble Space Telescope Cycle 32 TAC Expert Reviewer 2024

Student Organizations & Mentoring

Mentor - UCSD Astronomy & Astrophysics Postdoc-Graduate Student Mentoring Program 2025-Present

Founder and Program Director - Computational Astrophysics Research Preparation (CARP) 2023-Present
- NSF-funded coding and mentorship program for junior college transfer students.

Program Coordinator - Computational Research Access NEtwork (CRANE) 2022-Present
- International coding and mentorship program for historically underrepresented scholars.

Co-Chair - UCI Physics & Astronomy Community Excellence (PACE) Peer Mentoring Program 2020-2023
- Student-led program focused on 1-on-1 and group mentoring for first-year graduate students.

Social Event Chair - UC Irvine Physics Graduate Caucus 2018-2020

Community Outreach

Invited Speaker - AstroReach SD 2025
Volunteer - UC San Diego Cosmic Tours Portable Planetarium Shows 2025-Present
Volunteer - UC Irvine Telescope Outreach Program 2019-2020

Professional Memberships

American Astronomical Society 2020-Present
National Society of Black Physicists 2024-Present

Skills

Technical Skills: Python, LaTeX, Bash, HTML/CSS, Mathematica, Git, ADQL/SQL, Machine Learning (PyTorch, Tensorflow)
Soft Skills: Scientific communication, project management, teaching and mentoring across diverse backgrounds
Foreign Languages: Spanish (fluent), French (intermediate)

References

Reference 1
Dr. Michael Cooper
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Ph.D. Advisor

Reference 2
Dr. Alison Coil
acoil@ucsd.edu
Postdoctoral Mentor

Reference 3
Dr. Gregory Rudnick
grudnick@ku.edu
Research Collaborator