

# Skylar Grayson

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My ADS

<b>Research Interests</b>	Extragalactic astronomy, computational astrophysics, galaxy evolution, active galactic nuclei, feedback processes, Sunyaev-Zel'dovich effect, X-ray astronomy, astronomy education, course-based undergraduate research experiences, online education	
<b>Education</b>	Arizona State University Tempe, AZ Doctor of Philosophy in Astrophysics Average unweighted GPA: 4.0/4.0	Aug. 2021 - Present
	Whitman College Walla Walla, WA Bachelor of Arts in Physics-Astronomy, Minors in Mathematics and French Average unweighted GPA: 3.966/4.0	Aug. 2017 - May 2021
	Universite de Nantes/IES Abroad Nantes, France Average unweighted GPA: 4.0/4.0	Jan. 2020 - May 2020
<b>Fellowships, Awards, and Honors</b>	National Science Foundation Graduate Research Fellowship ASU College Leaders Award Karen Valentine Science Communication Award (\$2,000) ASU President's Professor Award for Innovation - Online Undergraduate Research Scholars Program Graduated summa cum laude, Whitman College Inducted into Phi Beta Kappa National Honor Society Academic Distinction every semester of undergraduate studies Bates Foundation Music Scholarship (\$4,000) Walter Brattain Merit Scholarship (\$16,000) Bend Chamber of Commerce Woman of the Year-Young Hero Award (\$2,000)	2023-Present 2024 2023 2023 2021 2020 2017-2021 2018-2021 2017-2021 2017
<b>Publications</b>	<b>Grayson, S</b> , Scannapieco, E, Comparat, J, ZuHone, JA, Zhang, Y, Shreeram, S, Bruggen, M, & Bulbul, E. 2025 The hot circumgalactic medium in stacked X-rays: observations vs simulations. <i>ApJ</i> , <i>submitted</i>	
	<b>Grayson, S</b> , Simon, MN, Buxner, S, Wenger, M & Impey, C. 2025 Motivation, Demographics and Engagement During COVID-19 in an Astrobiology MOOC. <i>PRPER</i> , 21, 010109	
	<b>Grayson, S</b> , Scannapieco, E, & Dave, R. 2023 Distinguishing AGN Feedback Models with the Thermal Sunyaev-Zel'dovich Effect. <i>ApJ</i> , 957:17	
	Truong, N, <b>Grayson, S</b> et al. Comparison of XRISM velocity dispersions for a sample of galaxy clusters with predictions from cosmological simulations. <i>in prep.</i>	
	Boettcher, E et al. (incl. <b>Grayson, S</b> ). 2025 A Fast, Hot Wind from a Nuclear Starburst <i>Nature</i> , <i>submitted</i>	

Wenger, M, **Grayson, S**, Buxner, S, Impey, C, Formanek, M, & Simon, MN, Characterising the motivations of learners in a massive open online course on astronomy *International Journal of Science Education*, *submitted*

Kramer, DM et al. (incl. **Grayson, S**). 2025 Cross-correlating the patchy screening and kinetic Sunyaev-Zel'dovich effects as a new probe of reionization. *ApJ*, *submitted*

Lewis, BL et al. (incl. **Grayson, S**). 2025 Improving Undergraduate Astronomy Students' Skills with Research Literature via Accessible Summaries: An Exploratory Case Study with Astrobites-based Reading Assignments *PRPER*, 21, 010124

Hewitt, HB, Simon, MN, Mead, **Grayson, S**, C, Beall, GL, Zellem, RT, Tock, K, & Pearson, KA. 2023 Development and Assessment of a Course-Based Undergraduate Research Experience (CURE) for Online Astronomy Majors. *PRPER*, 19, 020156

#### Invited Talks

*Simulating the Impact of AGN Feedback on X-ray and tSZ Observations*, Duke University, September 2025

*Simulating the Impact of AGN Feedback on X-ray and tSZ Observations*, STARs Research Group, ASU, August 2025

*Advocating for Astronomy in the Face of Budget Cuts*, Rutgers Summer Transient Soiree, July 2025

*Constraining Feedback in Cosmological Simulations with CGM Modelling*, Rutgers Astronomy Journal Club, March 2025

*AGN Feedback Implementation in Cosmological Simulations*, Theoretical Astrophysics and Cosmology Seminar, University of Arizona, January 2024

#### First-Authored Conference Presentations

**Grayson, S.** *Simulating AGN Feedback*. SESE Research Symposium 2025 (Talk), August 2025

**Grayson, S.**, Truong, N. XRISM Collaboration *EGD Cross-target clusters project: Comparing XRISM observations with cosmological simulations*. XRISM Science Team Meeting #8 (Talk), July 2025

**Grayson, S.** *Constraining AGN Feedback Models Using CGM Observations* MIAPbP Unveiling a Universe of Black Holes: The next Generation of AGN Surveys (Talk), March 2025

**Grayson, S.** and Scannapieco, E. *Spectral Modelling of Hot Wind Outflows in M82*, XRISM Science Team Meeting #7 (Poster), February 2025

**Grayson, S.**, Scannapieco, E., and Dave, R. *Distinguishing AGN Feedback Models via the Thermal Sunyaev Zel'dovich Effect in SIMBA*, AAS (Poster), January 2024

**Grayson, S.**, Ojeda, A., Buxner, S., Wenger, M., Simon, M., and Impey, C. *Understanding the Motivations of Learners in Three Astronomy Massive Open Online Courses*, AAS (Talk), January 2024

**Grayson, S.**, Hewitt, H. B., Simon, M. N., Mead, C., Beall, G. L., Zellem, R. T., Tock, K., and Pearson, K. A. *Qualitatively Assessing An Online Research Course for*

*Astronomy Majors*, SHAW-IAU (Poster), November 2023

**Grayson, S.**, Scannapieco, E., and Dave, R. *Characterizing AGN Feedback Processes at  $z \sim 1$  with SIMBA*, SIMBA Collaboration Meeting (Talk), May 2023

**Grayson, S.**, Scannapieco, E., and Dave, R. *Modeling the Thermal Sunyaev-Zel'dovich Effect Using SIMBA*, Oases in the Cosmic Desert (Poster), February 2023

**Grayson, S.** and Gresham, M. *Exploring Bottlenecks in Asymmetric Dark Matter Bound State Formation*, Whitman College Undergraduate Research Conference (Poster and Talk), March 2021

#### Co-Authored Conference Presentations

Buxner, S., Wenger, M., **Grayson, S.**, Impey, C., Simon, M. *Massive Open Online Courses as Free Choice Learning Environments*, AAS, January 2025

Hewitt, H. B., Simon, M. N., Mead, C., **Grayson, S.** and Beall, G. *CUREing the Lack of Research Experiences for Online Astronomy Majors*, APS Four Corners Section, October 2024

Hewitt, H. B., Simon, M. N., Mead, C., **Grayson, S.** and Beall, G. *Two Semesters of Results From an Online Exoplanet Research Course for Astronomy Majors*, AAS, January 2024

Simon, M. N., Hewitt, H. B., Mead, C., **Grayson, S.** and Beall, G. *The Development and Assessment of a Course-Based Undergraduate Research Experience (CURE) for Online Astronomy Majors*, AstroEdu Conference, May 2023

#### Teaching Experience

*Co-Instructor, Astronomy 4+1 Master's Capstone Course F24 & S25*  
Arizona State University

- Designed a research project and built a syllabus for a student to complete a Master's capstone course
- Led weekly meetings to guide and assist student in the data analysis and writing process

*Sundial Academic Facilitator* August 2024  
Arizona State University

- Developed curriculum and taught a nine day science camp for incoming undergraduates identified to be in 'at risk' populations
- Worked with 30 students to develop foundation mathematical and conceptual skills for physics, astronomy, and geology degrees

*Lecture Teaching Assistant* August 2022 - May 2023  
Arizona State University

- Part-time TA for introductory astronomy lecture for non-majors
- Monitored the chat and fielded questions in Zoom during hybrid lectures twice a week
- Held office hours and was available for questions via email
- Graded weekly assignments

*Lab Teaching Assistant* August 2021 - May 2022  
Arizona State University

- TA for introductory astronomy labs for non-majors

- Worked with 60+ students in three lab sections
- Created and presented 30 minutes presentations covering the lab material and concepts each week, guided students through the lab, held office hours and was available for questions via email, and assessed student work and provided feedback

*Physics Fellow*

January 2019 - May 2021

Whitman College

- TA for introductory physics courses and 300-level Particle Physics course
- Met weekly with students to work on group homework assignments
- Helped students develop good homework and collaboration strategies

*Peer Tutor*

August 2018-May 2021

Whitman College

- Met weekly with students in physics, astronomy, and mathematics courses
- Helped with homework, developing good study habits, and tailoring practices to specific classes
- Included professional development work, meetings with professors, and providing reports on sessions

**Science  
Communication**

*Social Media*

- Platforms on TikTok (215,000+ followers), Instagram (43,000+ followers), Threads (100,000+ followers), and YouTube (17,000+ followers),
- An emphasis on sharing science in an honest and relatable way. Content focused around current science news, fun facts, and my experience as a grad student

*Astrobits Author: January 2024- Present*

- Link to my paper summaries
- Served on the DEI Committee and Co-Chaired the Education Committee beginning August 2024

*Selected Appearances*

- Invited speaker at the Oxnard Summer School Space Camp: Spoke to over 200 K-8 students over three days about space and a career in science
- Reporting on the Europa Clipper launch for Arizona State University: Included visit to the spacecraft in the JPL clean room and travel to the launch
- NASA Social for Artemis 1: One of only 100 influencers accepted to attend the launch of Artemis 1 and spend the weekend touring Kennedy Space Center and talking to NASA administration and astronauts
- Guest on Everything STEAM Podcast: Discussed my research, JWST, and science communication
- Youth STEM Matters Magazine: Interviewed by a group of young women around the world about my experience as a woman in STEM, career paths in science, and my research

**Extracurricular  
Activities and  
Outreach**

*Astronomy on Tap: Valley of the Sun Organizing Committee: Tempe, AZ, 2025-Present*

- Helped organize monthly events sharing science with the public at a local brewery
- Ran the social media and communications for an Astronomy on Tap branch

*SESE Inclusive Community Committee: Arizona State University, 2024-Present*

- Served as Graduate Student representative to help build a more inclusive department

*SESE Graduate Council:* Arizona State University, 2023-2025

- Served as Vice President and President on the council, acting as a liaison between students and faculty, planning events, and working to improve the graduate student experience
- Advocated for changes to the TA process and offer letter systems

*SESE TA Training Committee:* Arizona State University 2024-Present

- Worked with faculty and other graduate students to design and present a three-hour orientation on Teaching Assistant duties for incoming graduate students in the School of Earth and Space Exploration
- Led the training during two years of new student orientation
- Created and organized an online page of resources for TAs

*GSPA Grant Reviewer:* Arizona State University, 2023-2025

- Reviewed research grants from fellow graduate students at Arizona State University
- Provided feedback and rated  $\sim 5$  grants a month

*Local Organizing Committee Member:* XRISM Science Meeting #7 (ASU), Feb 2025

*Letters to a Pre-Scientist* 2023-2024

- Exchanged letters with an eighth grader over the course of an academic school year
- Wrote to share my experience as a STEM professional and to broaden interest in STEM careers

*SESE Open House Committee Member:* Arizona State University, 2022-2023

- Member of the committee for the School of Earth and Space Exploration's Open House, held once a semester
- Assisted in outreach and planning

*Local Organizing Committee Member:* Oases in the Cosmic Desert Meeting (ASU), Feb 2023

**Relevant Coursework**

Physics: Classical Mechanics, Thermal Physics, Acoustics, Particle Physics, Quantum Mechanics, Electricity and Magnetism, General Relativity

Astronomy: Stellar Astrophysics, Cosmology, Galactic Astronomy, Observational Astronomy, Interstellar Medium, Radiative Transfer, Astro-Statistics

Mathematics: Calculus, Differential Equations, Linear Algebra, Statistics

**Skills**

- Programming languages: Python, Wolfram, C, R
- Operating systems: Windows, Mac OS, Linux
- Software: LaTeX, SPSS, Mathematica, ParaView
- Soft Skills: Communication, Leadership, Problem Solving, Teaching/Tutoring
- Languages: French-Proficient