

Skylar Grayson

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Research Interests	Extragalactic astronomy, computational astrophysics, astronomy education	
	Galaxy evolution, active galactic nuclei, feedback processes, Sunyaev-Zel'dovich effect, course-based undergraduate research experiences, online education	
Education	Arizona State University	Aug. 2021 - Present
	Tempe, AZ	
	Doctor of Philosophy in Astrophysics	
	Average unweighted GPA: 4.0/4.0	
	Whitman College	Aug. 2017 - May 2021
	Walla Walla, WA	
Fellowships, Awards, and Honors	Bachelor of Arts in Physics-Astronomy, Minors in Mathematics and French	
	Average unweighted GPA: 3.966/4.0	
	Universite de Nantes/IES Abroad	Jan. 2020 - May 2020
	Nantes, France	
	Average unweighted GPA: 4.0/4.0	
	National Science Foundation Graduate Research Fellowship	2023-Present
Research Experiences	Graduated summa cum laude, Whitman College	2021
	Inducted into Phi Beta Kappa National Honor Society	2020
	Academic Distinction every semester of undergraduate studies	2017-2021
	Walter Brattain Merit Scholarship (\$16,000)	2017-2021
	Bates Foundation Music Scholarship (\$4,000)	2018-2021
Research Experiences	Characterizing AGN feedback using SIMBA Simulations	June 2021 - Present
	Arizona State University	
	Mentored by Dr. Evan Scannapieco	
	<ul style="list-style-type: none">Studied active galactic nuclei (AGN) feedback via the Sunyaev Zel'dovich (SZ) effect as a possible solution to the cosmic downsizing problemUsed python to develop code for creating and stacking SZ maps of galaxiesCompared to millimeter-wave data from SPT and ACT and make predictions for future observations at a range of redshifts and resolutions	
	Assessing Online Research Experiences for Undergraduates	October 2021 - Present
	Arizona State University	
Research Experiences	Mentored by Dr. Molly Simon	
	<ul style="list-style-type: none">Studied the large-scale implementation of online research experiences at Arizona State's online degree programConducted interviews of students to provide qualitative data for analysisDeveloped codebook, determined inter-rater reliability, and began preliminary analysis of interviewsConducted an extensive literature review to create documentation for internal and external circulation	

- Research will be continued with programs currently in progress

Asymmetric Dark Matter

June 2020 - May 2021

Whitman College

Mentored by Dr. Moira Gresham

- Studied potential bottleneck scenarios in bound states of asymmetric dark matter
- Used Mathematica to determine conditions in our parameter space where energy conservation and cosmological requirements were met
- Calculated cross-sections and reaction rates for the formation of 2-body bound states
- Showed that if the conditions for forming a two-body state were met, there would be not bottlenecks in forming larger bound states
- Research was worked into a Senior Honors Thesis along with a review of the implications of an asymmetric dark matter model

Simulations of Physical Vapor Deposition

May 2019 - August 2019

Sandia National Laboratories

Mentored by Dr. Remi Dingreville

- Ran 10,000+ simulations of physical vapor deposition
- Studied the impact of a range of variables on a resulting surface roughness
- Wrote final report and gave a presentation on method/results

Late Stage Pharmaceuticals

May 2018 - August 2018

Lonza Bend

- Assisted with client projects including running HPLC, dissolution, and purity tests
- Developed a research project determining the robustness of a Pion Rainbow dissolution test by testing the impact of a wide range of variables
- Wrote final report and gave a presentation on method/results
- Did outreach to local elementary schools and children's fairs to generate interest in studying science

**First-Authored
Conference
Presentations**

Characterizing AGN Feedback Processes at $z \sim 1$ with SIMBA, SIMBA Collaboration Meeting (Talk), May 2023

Modeling the Thermal Sunyaev-Zel'dovich Effect Using SIMBA, Oases in the Cosmic Desert (Poster), February 2023

Exploring Bottlenecks in Asymmetric Dark Matter Bound State Formation, Whitman College Undergraduate Research Conference (Poster and Talk), March 2021

**Co-Authored
Conference
Presentations**

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

**Relevant Work
Experience**

Lecture Teaching Assistant
Arizona State University

August 2022 - Present

- 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
Arizona State University

August 2021 - May 2022

- 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
Whitman College

January 2019 - May 2021

- 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
Whitman College

August 2018-May 2021

- 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 (120,000+ followers), Twitter (6,000+ followers), YouTube (8,000+ followers), and Instagram (15,000+ 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

Appearances

- 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
- Hearst Television Interview: Appeared on a brief segment about the re-definition of Pluto as a dwarf planet on the anniversary of the IAU decision

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

Mathematics: Calculus, Differential Equations, Linear Algebra, Statistics

Skills

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

- Languages: French-Proficient

Extracurricular Activities

SESE Open House Committee Member: Arizona State University, Aug 2022 - Present

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

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

Percussionist: Whitman College Music Department, Aug 2017-May 2021

- Leader of the Percussion Ensemble: planned and led rehearsals, arranged pieces and put on a concert for the community Fall 2019, Anticipated Spring 2021
- Section Leader in Wind Ensemble Fall 2019-Spring 2021