SARAH STAMER

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EDUCATION

University of New Mexico
Ph.D. Physics with Astrophysics Concentration — *August 2024 - Present*
M.Sc. Physics *(non-thesis)* — *August 2024 - Present*

University of Arizona
B.Sc. Astronomy (*with Honors*), B.Sc. Physics — *August 2020 - May 2024*
GPA: 3.785, *Magna Cum Laude*
Honors Thesis: Analyzing Student Reasoning In Astrobiology MOOC Writing

RESEARCH EXPERIENCE

Graduate Research Assistant — *August 2024 - Present*
Project Title: Analyzing JWST Observations of the Exoplanet LTT 9779b.
Advisor: Dr. Diana Dragomir, University of New Mexico Department of Physics and Astronomy.
- Leading transmission spectrum analysis using data from JWST/NIRSpec and the Python code package Eureka! to learn about the atmosphere of this hot Neptune exoplanet

Research Assistant — *June 2024 - August 2024*
Project Title: Scalable Grading of Student Writing.
Advisor: Dr. Chris Impey, University of Arizona Department of Astronomy/Steward Observatory.
- Compared peer grades and feedback, instructor grades and feedback, and grades and feedback generated by GPT-3.5 and GPT-4
- Compiled feedback and scores for 120 student writing assignments in three Massive Open Online Courses
- Created and implemented a method to code themes in the feedback for each of the courses' assignments

Undergraduate Research Assistant — *January 2024 - August 2024*
Project Title: Atmospheric Modeling of Post-Habitable Exoplanets with the Habitable Worlds Observatory.
Advisor: Dr. Tyler Robinson, University of Arizona Lunar and Planetary Laboratory.
- Utilized Venus and its atmosphere as an analog to explore post-habitable exoplanets and atmospheres
- Degraded model spectra based on Venusian spectra to simulate the spectra from an exoplanet mission
- Used Python code package rfast to execute atmospheric retrievals with different complexities and spectral ranges

Honors Thesis Research — *January 2023 - August 2024*
Project Title: Analyzing Student Reasoning in Astrobiology Massive Open Online Course Writing.
Advisor: Dr. Chris Impey, University of Arizona Department of Astronomy/Steward Observatory.
- Examined student versus expert reasoning on a culminating assignment within an Astrobiology Massive Open Online Course
- Characterized thousands of student writing assignments by the planet they selected and created a sub-sample for analysis
- Developed methods of coding and comparison to analyze hundreds of writing assignments to examine the content they include

Undergraduate Research Assistant — *June 2022 - May 2023*
Project Title: Combating Science Misinformation Online.
Advisor: Dr. Chris Impey, University of Arizona Department of Astronomy/Steward Observatory.
- Classified 180 articles related to physics and 115 related to astrology as real or fake science
- Found and tagged 165 claim-evidence pairs within the physics articles

- Compiled datasets containing large amounts of real and fake scientific content, and utilized ChatGPT to generate short real and fake science writing samples

National Science Foundation Research Experience for Undergraduates *May 2022 - July 2022*
Project Title: Compositional Links Between Rocky Exoplanets and their Host Stars.
Advisor: Dr. Diana Dragomir, University of New Mexico Department of Physics and Astronomy.

- One of 9 students and the only rising third-year selected for the program from 149 applicants nationwide
- Used the Python code package SPECIES to obtain stellar elemental abundances directly from spectra
- Developed software to calculate stellar molar ratios, stellar compositional mass fractions, and exoplanetary compositional mass fractions (code on Github)
- Compared compositional mass fractions numerically and graphically to examine trends (code on Github)
- Presented research to department faculty and graduate students at a final poster session for the program

NASA Space Grant Intern *August 2021 - May 2022*
Project Title: Addressing the Pandemic of Science Misinformation on the Internet.
Advisor: Dr. Chris Impey, University of Arizona Department of Astronomy/Steward Observatory.

- Selected as one of 29 STEM student interns from 152 applicants, received funding from a grant to the Arizona/NASA Space Grant Consortium
- Found and read papers on the Claim-Evidence-Reasoning Framework, and applied that knowledge while classifying 260 articles as real or fake science and while finding claim-evidence pairs within 110 of the real science articles
- De-identified and compiled 450 student writing assignments from a past general education astronomy course and utilized those assignments by finding and tagging claim-evidence pairs within the assignment content

Undergraduate Research Assistant *January 2021 - May 2021*
Project Title: Combating Science Misinformation Online and Scalable Grading of Student Writing.
Advisor: Dr. Chris Impey, University of Arizona Department of Astronomy/Steward Observatory.

- Read and classified over 140 articles on various pseudoscience topics to add to a training set for a neural network
- Wrote example assignments and found papers on writing in science-related Massive Open Online Courses (MOOCs) to begin assessing student learning through writing assignments in an Astrobiology MOOC

SELECTED HONORS & AWARDS

2023-2024	**Evelyn O. Bychinsky Promising Astronomer Award** *Awarded for outstanding achievements and promise by undergraduate students*
2023	**Astronaut Scholarship** *Awarded to 68 junior and senior STEM students from partner universities nationwide*
2023	**Phi Beta Kappa, Alpha of Arizona Chapter** *Lifetime membership in nation's most prestigious honor society; selected for exceptional academic achievement, depth and breadth of studies, and leadership capacity*
2023-2024	**Kenneth S. Krane Scholarship** *Awarded to junior and senior Physics undergraduates with a 3.5 GPA or higher*
2023	**Galileo Circle Scholarship** *Awarded to students within the College of Science for research and academics*
2023	**Goldwater Scholarship Nominee** *One of four STEM juniors and seniors nominated from the University of Arizona*
2022-2023, 2023-2024	**Glenn C. Purviance Scholarship** *Awarded as one of three outstanding Juniors in Astronomy*
2022	**Bob and Sue Vaughan Galileo Circle Endowed Scholarship** *Awarded to students within the College of Science for research and academics*
2021-2022, 2023-2024	**William Scott and Elizabeth P. Jenkins Scholarship** *Inaugural recipient, awarded for excellence in sharing astronomy with the public*

2020-2024 **Stamps Scholarship**
Awarded a full-ride scholarship, part of Arizona's inaugural Stamps Scholar cohort

2020-2024 **National Merit Finalist & University of Arizona National Merit Scholar**
Awarded scholarship and automatic admission into the W.A. Franke Honors College

TEACHING, SERVICE, & OUTREACH

UR Inspiration Volunteer Evaluator
Virtual. *October 2024*

- Provided feedback to undergraduate students presenting their research at a multi-university conference

Graduate Teaching Assistant
University of New Mexico Department of Physics and Astronomy, Albuquerque, NM. *August 2024 - Present*

- Fall 2024: TA for a section of the Introductory Astronomy Lab (ASTR 1115L) with 20+ students enrolled
- Develop and deliver presentations to students to help them understand the concepts in the week's lab, answer student questions during the lab, and grade student labs and observing projects in a timely manner

Physics and Astronomy Graduate Student Association (PandA GSA)
University of New Mexico Department of Physics and Astronomy, Albuquerque, NM. *August 2024 - Present*
2024-2025 Academic Year: *GSA Web Technology Officer and Representative to Graduate and Professional Student Association (GPSA)*

- Developing a list of resources for new and current grad students to utilize during their graduate career
- Revamping the GSA website to make it organized, up to date, and helpful for prospective grad students
- Attending monthly GPSA meetings and reporting back to the GSA cabinet on what was discussed
- Planning and hosting biweekly socials, holiday parties, events in collaboration with other departments and GSAs, and a town hall for graduate students to voice their concerns about the department

Volunteer Telescope Operator
University of New Mexico, Albuquerque, NM. *August 2024 - Present*

- Completed training on operation procedures for the 14" telescope at the UNM Campus Observatory
- Working with other operators to find and show objects of interest in the night sky, providing the public and students in astronomy courses with information on these objects as they look through the telescope
- Entertaining guests and answering their questions about astronomy as they wait in telescope lines

Astronaut Scholar Moderator, Live Chat with Astronaut Mike Fossum
Astronaut Scholarship Foundation, Virtual. *August 2024*

- Assisted with facilitating a talk and Q&A for 120 students to hear from a veteran NASA Astronaut
- Shared about my journey in science and as an Astronaut Scholar to inspire the students to pursue STEM

Tucson Initiative for Minoritized Student Engagement in Science and Technology Program (TIMESTEP) Leader
University of Arizona Department of Astronomy, Tucson, AZ. *September 2022 - May 2024*

- Served as a peer mentor to fellow astronomy and physics undergraduates by facilitating a positive community that values diversity
- Participated on six panels in meetings on navigating the first two years in the astrophysics majors, undergraduate research opportunities, presenting research, and reflections about my time as an undergraduate in astronomy and physics
- Developed and co-led a workshop for second-year students in the TIMESTEP Research Apprenticeship program on creating a research poster
- Planned the Astronomy Department's first annual Undergraduate Research Symposium in partnership with the University of Arizona Astronomy Club

NASA Partner Eclipse Ambassador
Tucson, AZ. *September 2022 - May 2024*

- Completed training on eclipse information and how to effectively share it with the public

- Worked with an amateur astronomer partner to find events to participate in, and created deliverables and activities for these events that are engaging and scientifically accurate
- Engaged with over 400 community members and visitors at the 2023 Tucson Festival of Books, with over 100 community members at the 2023 Tucson Astronomy Festival, and with over 200 community members at the 2024 Tucson Festival of Books

Volunteer Telescope Operator
Flandrau Science Center and Planetarium, Tucson, AZ. *September 2022 - February 2023*

- Completed training on how to operate the 16" telescope at the Flandrau Observatory by shadowing and assisting operators approximately two nights a month for five months
- Helped trainees gain familiarity with the telescope and night sky and make progress in their training by answering their questions and offering advice and assistance when needed
- Found and showed objects of interest in the night sky, like planets, deep-sky objects, and stars, providing the public with information on these objects as they look through the telescope

University of Arizona College of Science Ambassador
Tucson, AZ. *August 2022 - May 2024*

- Nominated by the Astronomy Department as one of their highly distinguished undergraduates in the major to assist with prospective student recruitment and community outreach
- Shared my story and answered questions in information sessions, assisted with large College of Science events, and provided tours to students and families interested in astrophysics
- Awarded the 2022-2023 VIP Visit/Chat Superstar award for hosting the most virtual video chats and in-person VIP Visits for prospective students and their families

Science Center Interpreter and Planetarium Operator
Flandrau Science Center and Planetarium, Tucson, AZ. *August 2021 - May 2024*

- Trained for three months to become a planetarium operator by learning how to operate UniView software for different shows and shadowing other operators
- Presented planetarium shows weekly on a variety of science topics, ensuring they are unique, educational and accessible to the audience, and enjoyable
- Utilized science knowledge and knowledge of the exhibits to provide different experiences to guests to enrich their understanding and appreciation of science

CONFERENCES & WORKSHOPS ATTENDED

Sagan Summer Workshop: Advances in Direct Imaging, Virtual Participation *July 2024*
243rd Meeting of the American Astronomical Society, New Orleans, LA *January 2024*

PUBLICATIONS

C. Impey, M. Wenger, N. Garuda, S. Golchin, and **S. Stamer**: *Using Large Language Models for Automated Grading of Student Writing about Science* (Submitted). DOI: 10.21203/rs.3.rs-3962175/v1.

SELECTED PRESENTATIONS & PANELS

Asterisk Indicates Presenting Author

August 2024 *Fine Tuning Large Language Models to Identify Science Misinformation*
Contributed Talk, 136th Annual Meeting of the Astronomical Society of the Pacific
M. Wenger*, C. Impey, S. Golchin, N. Garuda, **S. Stamer**, A. Danehy.
Virtual

August 2024 *Using Large Language Models to Assess Student Writing Assignments*
Contributed Talk, 136th Annual Meeting of the Astronomical Society of the Pacific
C. Impey*, N. Garuda, S. Golchin, **S. Stamer**, S. Buxner, M. Wenger.
Virtual

June 2024 *Testing Large Language Models as an Alternative to Peer Grading in Massive Open Online Courses*

Contributed Talk, 244th Meeting of the American Astronomical Society
S. Buxner*, N. Garuda, **S. Stamer**, M. Wenger, C. Impey, S. Golchin.
Madison, WI

May 2024 *Astronaut Scholar Alumni Space Panel*
Panel, U.S. Astronaut Hall of Fame Induction featuring Space Rendezvous
S. Altman (Moderator), C. Burnett, W. Jones, J. Moreno, V. Patel, E. Shafer, **S. Stamer**.
Cocoa Beach, FL (Attended virtually due to travel issues)

April 2024 *Analyzing Student Reasoning in Astrobiology MOOC Writing*
Poster, 2024 Franke Honors Pinnacle
S. Stamer*, C. Impey, M. Wenger, N. Garuda, S. Buxner.
Tucson, AZ

March 2024 *Characterizing Post-Habitable Exoplanets with Habitable Worlds Observatory*
Poster, 4th Annual Arizona Astrobiology Symposium
S. Stamer*, T. Robinson.
Tempe, AZ

October 2023 *Combating Fake Science Online*
Poster, 2023 Galileo Circle Scholar Celebration
S. Stamer*, C. Impey, M. Wenger, A. Danehy, S. Buxner, et al.
Tucson, AZ

August 2023 *Combating Fake Science Online*
Contributed Talk, 2023 Astronaut Scholar Technical Conference
S. Stamer.
Orlando, FL

January 2023 *Using Machine Learning to Detect Science Misinformation*
iPoster, 241st Meeting of the American Astronomical Society
S. Stamer*, C. Impey, M. Wenger, A. Danehy, S. Buxner, et al.
Seattle, WA

January 2023 *Super-Earths, Super-Mercuries, and Solar-Type Stars: Compositional Similarities between Rocky Exoplanets and their Host Stars*
Contributed Talk, 241st Meeting of the American Astronomical Society
S. Stamer*, D. Dragomir.
Seattle, WA

October 2022 *Super-Earths, Super-Mercuries, and Solar-Type Stars: Compositional Similarities between Rocky Exoplanets and their Host Stars*
Poster, 2022 Galileo Circle Scholar Celebration
S. Stamer*, D. Dragomir.
Tucson, AZ

April 2022 *Addressing the Pandemic of Science Misinformation on the Internet*
Contributed Talk, 31st Annual Arizona/NASA Space Grant Statewide Symposium
S. Stamer*, A. Grant*.
Tucson, AZ