ANNASTASIA HAYNIE

PHD CANDIDATE

CONTACT

717-309-5026

ahaynie@usc.edu

github.com/annahaynie

Los Angeles, CA

EDUCATION

PhD, Physics

University of Southern California

08/2018 - 05/2024

USC - Carnegie Observatories Fellow
Advised by Dr. Anthony Piro
Advanced to Candidacy 08/2021

B.S., Physics

University of South Carolina

08/2014 - 05/2018

Frank and Nina Avignone Fellow
Advised by Dr. Steve Rodney
Minor, Astronomy

SKILLS

- Python, C/C++
- Jupyter, Matplotlib, Seaborn, SciPy, Pandas
- Git
- Technical Writing
- Data Analysis & Modeling
- Problem Solving
- Critical and Creative Thinking
- Mentoring
- Science Communication

PERSONAL PROJECTS

IBM Data Science Certificate Program

- Comprehensive program covering key concepts and practical skills in data science.
- Gain hands-on experience through real-world projects using various IBM databases.
- Highlighted skills:
  - Data analysis
  - Machine learning
  - Data visualization
  - Python programming
  - R programming
  - SQL querying
- Problem-solving in data-driven contexts.

AWS Fundamentals Specialization Program

- Series of courses to enhance skills in cloud computing with AWS services
- Hands-on experience with designing, deploying, and managing applications on AWS

WORK EXPERIENCE

Graduate Student Researcher

University of Southern California & Carnegie Observatories 05/2019-Present

- Develop methods for analyzing and interpreting data through a combination of semi-analytic and numerical modeling that are faster than more sophisticated numerical modeling with comparable accuracy in preparation for a ~6 orders of magnitude increase in observations with upcoming telescope surveys.
- Utilize Python packages and libraries to constrain the Bayesian posteriors of analytic models that are calibrated to numerical simulations.
- Visualize data in Jupyter Notebooks to convey findings for both publication and communication with collaborators and general audiences.
- Integrate new models into existing software to optimize performance and accuracy.
- Demonstrated ability to learn new skills to solve problems and achieve project goals.
- Authored 2 peer-reviewed papers published in The Astrophysical Journal as the primary researcher with a 3rd paper as primary researcher currently in progress, and contribute work to large collaborations.
- Awarded the Women in Science & Engineering Graduate Merit Award for outstanding research and outreach in May 2022.

Graduate Teaching Assistant

University of Southern California 08/2018-12/2019

- Instructed approximately 75 students per semester in Astronomy 100: Introduction to Astronomy and Astronomy 200: Life in the Universe.
- Guided students through 7 lab projects per semester and additionally a semester-long project for students in Astro 200.
- Tutored students outside of class in math, physics, science communication, and general topics in astronomy.

Outreach and Mentorship

Graduate Association for Student in Physics, President August 2019 – August 2022
Department of Physics and Astronomy, University of Southern California

- Oversaw the peer mentorship program to help acclimate incoming PhD students to the department.
- Organized graduate students to advocate for and develop an updated graduate curriculum that is more representative of the research diversity in the department.
- Worked with faculty on the Climate Committee to improve the social climate, equity, and inclusion within our department to aid in the recruitment, support, and retention of underrepresented minority students in physics.
- Since retiring from this position, I have become the Senior Advisor to the new leadership.

Skype a Scientist Program August 2019 – Present

- Connect with K-12 classrooms across the globe to give grade level-appropriate research presentations, have question and answer discussions about various STEM topics, and explore the pathways to become a scientist.

Letters to a Pre-Scientist Program August 2020 – Present

- Volunteer as a Pen Pal for LPS to be paired elementary school students in low-income schools.
- Exchange letters with the students throughout the academic year to address various topics in STEM and help broaden their understand of what it means to have a career in STEM.

CASSI Peer Mentor Program Summers 2019, 2020, 2021, 2022 , 2023
Carnegie Observatories

- Mentored 4 undergraduate students during summer research internships at Carnegie Observatories.
- Assisted in their learning of research-related skills such as public speaking, science communication, science writing, visualizations, and preparing a research talk.

Women in Science and Engineering, Liaison August 2020 – August 2021
University of Southern California

- Collaborated with 15 graduate women in various STEM departments to plan and execute a series of social and professional development events for graduate women in STEM.
- These events included practice research talks, DEI workshops on microaggressions, and mentorship workshops.

PUBLICATIONS

W. V. Jacobson-Galan, ..., **A. Haynie**, et. al., "Final Moments II: Observational Properties and Physical Modeling of CSM-Interacting Type II Supernovae", 2024, in prep.

A. Haynie & A. L Piro, "Estimating Ejecta Masses of Stripped Envelope Supernovae Using Late-Time Light Curves," 2023, Ap. J., 956, 98.

A. Haynie & A. L. Piro, "Shock Breakout in Dense Circumstellar Material with Application to PS1- 13arp," 2021, Ap. J., 910, 128.

A. L. Piro, **A. Haynie**, & Y. Yao, "Shock Cooling Emission from Extended Material Revisited," 2021, Ap. J., 909, 209.