BERYL HOVIS-AFFLERBACH

ASTROPHYSICS UNDERGRADUATE STUDENT

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EDUCATION

California Institute of Technology | Pasadena, CA

Bachelor of Science, Astrophysics, expected June 2023

Study abroad 1 semester at University of Edinburgh

PUBLICATIONS

Falling Prominence Motion as a Diagnostic of Coronal Mass Ejection Trajectory

Hovis-Afflerbach, B., Thompson, B. J., & Mason, E. I., submitted to *Space Weather*, under review

Two New Methods for Counting and Tracking the Evolution of Polar Faculae

Hovis-Afflerbach, B. & Pesnell, W. D., 2022, *Sol Phys*, 297, 48

Identifying and Repairing Catastrophic Errors in Galaxy Properties Using Dimensionality Reduction

Hovis-Afflerbach, B., Steinhardt, C. L., Masters, D., & Salvato, M. 2021, *ApJ*, 908, 148

The BUFFALO HST Survey

Steinhardt, C. L., et al., incl. **Hovis-Afflerbach, B**., 2020, *ApJS*, 247, 1538

AWARDS

2022 | Caltech Vodopia-Hasson Poster Competition Award

2021 | Chambliss Undergraduate Poster Award, AAS 238

2021 | Caltech Perpall Speaking Competition Semifinalist

2021 | Carnegie Observatories Summer Student Poster Award

2018 | NASA GSFC Intern Research Poster Session Finalist

2017 | NASA GSFC Intern Research Poster Session Award

RESEARCH EXPERIENCE

California Institute of Technology | Pasadena, CA

Flintridge Foundation SURF Fellow, Summer 2022

Advisors: Jim Fuller, Shing Chi Leung

- Adapted stellar evolution code MESA to model inward-moving, convectively-bounded flames in the degenerate cores of massive stars. Determined flame speed for varying conditions.

- Plan to continue project, implement as publicly-available subgrid model within MESA to enable modeling of 8-11 $M_{\odot}$ stars to the ends of their lifetimes.

Carnegie Observatories | Pasadena, CA

Arthur R. Adams Memorial SURF Fellow, Summer 2021
Alain Porter Memorial SURF Fellow, Summer 2020
Advisor: Ylva Götberg

- Ran and analyzed stellar evolution models with MESA to predict conditions (mass, metallicity) under which stars stripped by binary companions are expected not to form.
- Used binary stellar population synthesis models to investigate effect of metallicity on mass distribution of stripped stars and to test theory using new observations of stripped stars in the Small Magellanic Cloud.

NASA Goddard Space Flight Center, Solar Physics Lab | Greenbelt, MD

Research Assistant, September 2020 - May 2021
Advisors: Barbara Thompson, Dean Pesnell

- Investigated how solar prominence motion can act as early predictor of Coronal Mass Ejection deflection and behavior.
- Developed method to identify and track polar faculae on the sun and used method to investigate behavior of polar faculae over the solar cycle.

Cosmic Dawn Center, Niels Bohr Institute | Copenhagen, Denmark

David L. Glackin Memorial SURF Fellow, Summer 2019
Advisor: Charles Steinhardt

- Developed method using t-SNE (machine learning algorithm for dimensionality reduction) to identify and repair catastrophic errors in galaxy properties determined from photometry.

NASA Goddard Space Flight Center, Space Weather Lab | Greenbelt, MD

Space Weather Forecasting Intern, Summer 2018
Advisor: Barbara Thompson

- Compared behavior of solar prominences and coronal mass ejections to better understand the solar magnetic field and improve forecasting capabilities.
- Trained as independent space weather forecaster, one of five selected for work during school year (2018-2019, 12 hours/week).

NASA Goddard Space Flight Center, Solar Physics Lab | Greenbelt, MD

High School Research Intern, Fall 2016 - Summer 2017
Advisor: Barbara Thompson

- Tested and analyzed results from new method for mapping motion of solar prominences.
- Converted code for analysis from IDL to Python.

PRESENTATIONS

Caltech Summer Undergraduate Research Fellowship Seminar, 2022 - **Award**
AAS 240 Summer Meeting Poster Session, 2022
AAS 238 Summer Meeting Poster Session, 2021 - **Chambliss Award**
AGU Fall Meeting, 2021
Caltech Summer Undergraduate Research Fellowship Seminar, 2021 - **Award Semifinalist**
Carnegie Astrophysics Summer Student Internship Poster Session, 2021 - **Award**
AAS 237 Winter Meeting Poster Session, 2021
Caltech Summer Undergraduate Research Fellowship Seminar, 2020
AAS 235 Winter Meeting Poster Session, 2020
Caltech Summer Undergraduate Research Fellowship Seminar, 2019
NASA Goddard Summer Intern Poster Session, 2018 - **Award Finalist**
NASA Goddard Summer Intern Poster Session, 2017 - **Award**

FUNDING

2022 | George W. Housner Fund Recipient
2022 | Flintridge Foundation SURF Fellow
2021 | Arthur R. Adams Memorial SURF Fellow
2020 | Alain Porter Memorial SURF Fellow
2019 | George W. Housner Fund Recipient
2019 | David L. Glackin Memorial SURF Fellow
2018 | National Merit Scholar

SKILLS

Python ◆ MESA ◆ Linux ◆ IDL ◆ LaTeX ◆ Mathematica ◆ Java ◆ HTML ◆ CSS

OUTREACH, MENTORING, AND DEI

Mentor for undergraduates in Carnegie Observatories summer program, Summer 2022

- As program alum, served as mentor and resource for two students

Caltech Equity & Title IX Advocate, 2019-2022

- Provided support for peers in cases relating to Equity & Title IX violations
- Organized meetings to welcome incoming students and share Title IX resources on campus

Caltech Board of Control Representative, 2019-2022

- Heard cases regarding alleged academic Honor Code violations, >100 hours

Helped run DEI activity for Carnegie Observatories summer program, Summer 2021
College Panel for Upward Bound Students, July 2020 & 2021
Highland Park High School Girl Up International Women's Day Panelist, March 2021