HUNTER VANNIER

contact: hvannier@purdue.edu

EDUCATION

Purdue University, West Lafayette, IN — May 2025
Doctor of Philosophy, Major: Planetary Science, GPA: 4.0

Wesleyan University, Middletown, CT — May 2020
Bachelor of Arts, Major: Astronomy, Minor: Planetary Science, GPA: 3.54
Mapping the Local Interstellar Medium: Using Hubble to Look Back at the ISM Along the Sun's Historical Trajectory *(High Honors)*

Eastmont High School, East Wenatchee, WA — May 2013
High School Diploma, GPA: 3.96
Honors: Recipient of Valedictorian(2013)

RESEARCH EXPERIENCE

Graduate Research Assistant, Purdue University — Aug 2020-Present
Department of Earth, Atmospheric, and Planetary Sciences, Advisor: Briony Horgan, PhD

- Use VIS/NIR data from the *Moon Mineralogy Mapper* spacecraft to create mineralogical maps of Irregular Mare Patches on the surface of the Moon in order to constrain their age and formation mechanism.
- Participated in a four week volcanology field camp in Iceland; conducted geologic mapping of volcanic systems in challenging terrain and harsh weather using a brunton and handheld GPS unit. Rotated between 5 days camping in the field and 2 days of intense write-ups of our fieldwork.

Undergraduate Research Assistant, Wesleyan University — July 2017-Aug 2020
Department of Astronomy, Advisor: Seth Redfield, PhD

- Used high resolution UV data from *Hubble Space Telescope* to reconstruct the morphology of the local interstellar medium (LISM), focusing on eight sight lines along the Sun's historical trajectory; fit interstellar absorption features in stellar spectra using IDL programming language to obtain LISM cloud characteristics and to estimate the shrinking/expansion of our Sun's heliosphere over the last five million years
- Three discrete clouds of LISM were detected in addition to the discovery of a new astrosphere around target star GJ-173
- Completed a 10-week Research in Sciences Fellowship and presented findings at a poster presentation symposium (Summer 2018 and 2019)

Undergraduate Researcher, Wesleyan University, University of Bridgeport — April 2017-February 2020
Department of Astronomy, Advisor: Seth Redfield, PhD
School of Engineering, Advisor: Jani Pallis, PhD

- Co-lead a project that aimed to build, design, and launch a high altitude payload funded through NASA and the CT Space Grant Consortium. Presented multiple stages of design reviews to a NASA advisory board in order to attain continued funding
- Collaborated with undergraduate students from the University of Bridgeport and University of Hartford to foster interdisciplinary research; Launch balloon payloads from the Discovery Museum in Bridgeport, CT with the goal of inspiring grade school to middle school age students to pursue STEM

- Completed a 10-week Research in Sciences Fellowship and presented findings at a poster presentation symposium (Summer 2017)

Undergraduate Research Assistant, Wesleyan University May 2018-August 2020
College of the Environment, Advisor: Helen Poulos, PhD

- Conducted fire ecology fieldwork/research in the Chiricahua National Monument to measure agave mortality in response to wildfire and controlled burns
- Helped perform statistical analysis on agave mortality rates pre-fire versus post-fire to determine whether there was significant death rates from burning; found no significant mortality in agaves immediately following wildfire
- Completed a 10-week College of the Environment Internship program and presented findings at a poster presentation symposium (Summer 2018)

PUBLICATIONS

Vannier H, Horgan BH, Stopar J, (2022). Investigating the Mineralogy and Origin of Irregular Mare Patches Using the Moon Mineralogy Mapper. (*In Preparation, to be submitted to Icarus.*)

Vannier H, Redfield S, Wood B E, Mueller H R, Linsky J L, Frisch P (2021). Mapping the Local Interstellar Medium: Using Hubble to Look Back at the ISM Along the Sun's Historical Trajectory. (*In Preparation, to be submitted to the Astrophysical Journal.*)

Wood B E, Mller H R, Redfield S, Konow F, **Vannier, H**, Linsky J, et al. (2021). New Observational Constraints on the Winds of M dwarf Stars. *The Astrophysical Journal*, 915, 37, doi:10.3847/1538-4357/abfda5.

Carleo I, Youngblood A, Redfield S, Barris N C, Ayres T R, **Vannier H,** et al. (2021). A Multi-wavelength Look at the GJ 9827 system: No Evidence of Extended Atmospheres in GJ 9827 b and d from HST and CARMENES data. *The Astronomical Journal*, 161, 3, doi:10.3847/1538-3881/abdb2f

Vannier H, Redfield S (2018). Honey I Shrunk the Heliosphere! Using Hubble to Look Back at the Sun's Historical Trajectory Through the Local Interstellar Medium. *Proceedings of the 29th Keck Northeast Astronomy Consortium, 106-108*

PRESENTATIONS

52nd Lunar and Planetary Science Conference, (virtual) March 2021
Oral Presentation
Investigating the Mineralogy and Origin of Irregular Mare Patches Using the Moon Mineralogy Mapper
Presentation Date and Time: 3/19/2021; 2:30 PM - 2:38 PM
Session Title: Poster - Lunar Volcanism and Tectonics

235th Meeting of the American Astronomical Society, Honolulu, HI January 2020
Poster Presentation
Mapping the Local Interstellar Medium: Using Hubble to Look Back at the ISM Along the Sun's Historical Trajectory
Presentation Date and Time: 1/7/2020; 5:30 PM - 6:30 PM
Session Title: Poster - Molecular Clouds, HII Regions, Interstellar Medium - Poster Session
Session Location: HCC - Exhibit Hall II / III

American Geophysical Union Fall Meeting, San Francisco, CA December 2019
Poster presentation
Mapping the Local Interstellar Medium
Presentation Date and Time: 12/13/2019; 08:00 AM - 12:20 PM

Session Title: Interstellar Probe: At the Intersection of Heliophysics, Planetary Physics, and Astrophysics II Posters
Session Location: Moscone South, Poster Hall

Keck Northeast Astronomy Consortium
Oral Presentation September 2018
Honey I Shrunk the Heliosphere! Using Hubble to Look Back at the Sun's Historical Trajectory Through the Local Interstellar Medium
Poster presentation October 2017, 2019

AWARDS AND HONORS

Gerald H. Krockover Graduate Fellowship Award in K-12 Outreach April 2021

Mobile Graduate Fellowship Award in Geologic Mapping April 2021

NASA Connecticut Space Grant Consortium Student Travel Grant ($1000) November 2019

NASA Connecticut Space Grant Consortium Undergraduate Research Grant ($5000) November 2018

NASA Connecticut Space Grant Consortium Undergraduate Scholarship ($5000) September 2017

Wesleyan College of the Environment Internship Program ($4000) May-July 2018

Wesleyan Research in the Sciences Summer Fellowship ($4100) May-July 2017, 2019

PROFESSIONAL MEMBERSHIPS

Member, **American Astronomical Society (AAS)** September 2019-Present

Member, **American Geophysical Union (AGU)** September 2019-Present

Member, **Geological Society of America (GSA)** Ocotber 2020-Present

SKILLS

Computer Proficient in IDL and ENVI, Experienced in Python, and C; Familiar with Arduino, Mathematica, HTML, and R

EXTRA-CURRICULAR ACTIVITIES

Purdue EAPS anti-racism Group, Purdue University August 2021-present
Meet bi-weekly with a small group of graduate students within the Earth, Atmospheric, and Planetary Science department at Purdue to discuss readings, podcasts, and videos related to practices of environmental racism in the United States.

URGE Team Member, Purdue University January 2021-present
Meet bi-weekly with a small group of graduate students to collaborate on anti-racist policy and actionable items to implement in our geosciences department, improving diversity and inclusion in the geosciences.

GSA Treasurer, Purdue University September 2020-present
Manage spending and allocate funds for the Graduate Student Assembly (*2 hours/week*)

College of Science Graduate Rep, Purdue University September 2020-May 2021
Represent the Earth, Atmospheric, and Planetary Science department at monthly meetings with elected students and faculty from all departments in the Purdue College of Science. Discuss challenges and ways to improve the graduate department.

Varsity Ice Hockey, Wesleyan University September 2016-March 2020
Participate in off-ice training, daily practices, weekend games and video sessions (*30 hours/week*)

Title IX Leadership Council September 2019-May 2020
Responsibility to act as a liaison between Wesleyans athletic teams and the Title IX Athletics Committee, working to both lead and advance conversations about equity and inclusion within the athletic community.

Psi Upsilon, Member of the coed Xi chapter at Wesleyan University April 2018-Present
Community Service Chair; Internal House Management Committee (*3 hours/week*)

Student Athlete Support Network, Wesleyan University Spring 2018
Participated a six week series of one hour sessions to attain skills and information to familiarize myself with the signs that a teammate may be experiencing mental health concerns, and gain practice talking with teammates who are struggling.

REFERENCES

Briony Horgan, PhD
Associate Professor
Department of Earth, Atmospheric, and Planetary Sciences, Purdue University
bhorgan@purdue.edu
765-494-3258

Seth Redfield, PhD
Associate Professor of Astronomy
Department of Astronomy, Wesleyan University
sredfield@wesleyan.edu
860-685-3669

Helen Poulos, PhD
Adjunct Assistant Professor of Environmental Studies
College of the Environment, Wesleyan University
hpoulos@wesleyan.edu
860-685-4205