Zoë E. Wilbur

Graduate Assistant ● FINESST Graduate Fellow ● **University of Arizona** ● Lunar and Planetary Laboratory
Email: zewilbur@email.arizona.edu ● Website

Education

PhD in Planetary Science
University of Arizona – August 2019 to present
Advisor: Dr. Jessica Barnes

Masters en Route in Planetary Science
University of Arizona – Awarded May 2022
Advisor: Dr. Jessica Barnes

BSc in Geology, University Honors and Department Honors, Summa Cum Laude
University of Nevada, Las Vegas – December 2018
Research Advisors: Dr. Arya Udry, Dr. Shichun Huang, Dr. Oliver Tschauner

Research Experience

Graduate Assistant at Lunar and Planetary Laboratory (Aug. 2019 to present)

Investigate the magmatic, volcanic, and eruption histories of Apollo 15 and 17 basalts [as well as Apollo Next Generation Sample Analysis (ANGSA) Program samples] utilizing a coordinated analysis campaign, including the analysis of 2D and 3D modal mineralogy and grain measurements, mineral chemistry, 3D vesicle morphologies, and H isotopes.
Research Advisor: Dr. Jessica Barnes

Curation Laboratory Assistant for Jacobs- NASA Johnson Space Center (Feb. 2019- July 2019)

Utilize X-ray computed tomography to investigate the 3D modal mineralogy, porosity, and internal structures of meteorites and Apollo lunar samples. A 3D visualization of an Apollo 11 sample scanned for the 50th anniversary of the Apollo missions can be viewed here: https://ares.jsc.nasa.gov/projects/astromaterials-3d/.
Manager: Dr. Darren Locke

Planetary Geochemist Intern for Jacobs- NASA Johnson Space Center (Jan. 2018- Dec. 2018)

Investigate element partitioning of moderately volatile elements present in silicate, sulfide, and metal phases in highly reduced meteorites. Examine the petrogenesis of aubrite meteorites. Utilize the electron microprobe to analyze the major and minor elements in highly reduced mineral phases.
Mentors: Dr. Arya Udry, Dr. Kathleen Vander Kaaden, and Dr. Francis McCubbin

Undergraduate Research Assistant (Aug. 2017- Dec. 2017)

Synthesize high-pressure inclusions in minerals to understand terrestrial mantle processes.
Research Advisors: Dr. Oliver Tschauner, Dr. Shichun Haung

Fellowships

Future Investigators in NASA Earth and Space Science and Technology (FINESST)

Investigating Degassing Histories of Apollo 15 and 17 Lunar Basalts with 3D Visualization and Coordinated Microanalysis. Role: FI. Proposal Period: 2021-2023.

Hevey Mineral Sciences Graduate Fellowship, Smithsonian Institution

Investigation of Volatile-Bearing Sulfides in Reduced Meteorites. Summer 2022.

Amelia Earhart Fellow

For demonstrating superior academic record conducting research applied to space sciences. 2023.

Women's Philanthropic Education Organization (P.E.O.) Scholar

For academic excellence and achievement in a doctoral program, demonstrating the ability to make significant contributions to the field of study. 2023.

Honors & Awards

Nininger Meteorite Award
For student achievement in meteoritics embodied by original research paper, 2021/2022

Invited Speaker for *Klaus Keil Memorial Symposium: Quantitative Analysis of Planetary Materials*

Microscopy and Microanalysis Meeting, 2023

Wiley Award for Top Oral Presentation
Meteoritical Society, 2022

Meteoritical Society Meeting Travel Award
Meteoritical Society, 2022

Hitachi Electron Microscopy Scholarship

University of Arizona, 2022

Galileo Circle Scholarship
University of Arizona, 2021

Meteoritical Society Goldschmidt Award
Goldschmidt Conference, 2021

Lunar and Planetary Institute Career Development Award

Lunar and Planetary Institute, 2019

UNLV Honors College Outstanding Student Service Award

University of Nevada, Las Vegas, 2018

University of Nevada, Las Vegas Summer Undergraduate Research Funding

College of Sciences, 2018

University of Nevada, Las Vegas Research and Development Award

College of Sciences, 2017

Peer-Reviewed Journal Articles

[4] Z. E. Wilbur, J.J. Barnes, S.A. Eckley, R.A. Zeigler, J.W. Boyce, M. Brounce, J.L. Mosenfelder, C.A Crow, T. Zega (Accepted) Volatiles, vesicles, and vugs: Unraveling the magmatic and eruptive histories of Steno Crater basalts. *Meteoritics and Planetary Science*.

[3] S. R. Ramsey, A. M. Ostwald, A. Udry, E. O'Neal, J. M. D. Day, **Z. E. Wilbur**, J. J. Barnes, S. Griffin (in review) Northwest Africa 13669, a Reequilibrated Nakhlite from a Previously Unsampled Portion of the Nakhlite Igneous Complex. *Meteoritics and Planetary Science*.

[2] Z. E. Wilbur, A. Udry, F. M. McCubbin, K. E. Vander Kaaden, K. Ziegler, C. Defelice, T. J. McCoy, J. Gross, B. D. Turrin, N. J. Dygert, and C. McCoy (2022) The effects of highly reduced magmatism revealed through aubrites. *Meteoritics and Planetary Science.* doi*:* 0.1111/maps.13823

[1] A. Udry, **Z. E. Wilbur**, R. R. Rahib, F. M. McCubbin, K. E. Vander Kaaden, T. J. McCoy, K. Ziegler, J. Gross, C. Defelice, L. M. Combs, B. D. Turrin (2019) Reclassification of four aubrites as enstatite chondrite impact melts: Potential geochemical analogues for Mercury. *Meteoritics and Planetary Science*, 54 (40), 785-810.

Selected Extended Abstracts

[5] Z.E. Wilbur, J.J. Barnes, S.A. Eckley, J.W. Boyce, S. Pomeroy, M. Brounce, C.A. Crow, J.L. Mosenfelder, T.J. Zega (2022) From Source to Surface: Investigating Magmatic Lunar Volatiles. 53rd Lunar and Planetary Science Conference, Abstract #1071. (Oral).

[4] Z.E. Wilbur, J.J. Barnes, S.A. Eckley, J.W. Boyce, M. Brounce, C.A. Crow, J.L. Mosenfelder, T.J. Zega (2021) Investigating the Magmatic History of Volatiles in Apollo 17 Basalts, Apollo Next Generation Sample Analysis. 52nd Lunar and Lunar and Planetary Science Conference, Abstract #1497. (Oral)

[3] M. Brounce, J.J. Barnes, J. Boyce, **Z.E. Wilbur**, F.M. McCubbin, C. Crow, J. Mosenfelder, T. Zega, Angsa Science Team. The Oxidation State of Sulfur in Apollo Samples 71035 and 71055. 52nd Lunar and Planetary Science Conference, Abstract #1572. (Oral).

[2] Z. E. Wilbur, A. Udry, R. A. Zeigler, F. M. McCubbin, K. E. Vander Kaaden, C. DeFelice, and T. J. McCoy (2019) The geochemistry of aubrites: Investigating reduced parent bodies. 50th Lunar and Planetary Science Conference. (Poster).

[1] Z. E. Wilbur, A. Udry, F. M. McCubbin, L. M. Combs, R. R. Rahib, T. J. McCoy, and C. McCoy (2018) Aubrite and enstatite chondrite impact melt meteorites as potential analogs to Mercury. 49th Lunar and Planetary Science Conference, Abstract #1355. (Poster).

Selected Abstracts

[7] Z.E. Wilbur, J.J. Barnes, S.A. Eckley, R.A. Zeigler (2021) Investigating the petrogenesis and eruption histories of Apollo 15 and 17 Basalts. Meteoritical Society Meeting, Abstract #6130 (Poster).

[6] Z.E. Wilbur, J.J. Barnes, S.A. Eckley, R.A. Zeigler (2021) Investigating the Eruption histories of Apollo 17 Basalts Using 3D Data. Goldschmidt Conference, Abstract #7755 (Oral).

[5] S.M. Morin, J.J. Barnes, **Z.E. Wilbur**, A.C. Stadermann, K. Domanik (2021) Assessing the Volatile Inventory of Basaltic Fragments in Luna Soils. Meteoritical Society Meeting, Abstract #6229 (Poster).

[4] M Fries, F McCubbin, R. A. Zeigler, J. J. Barnes, A. Burton, A. Harrington, R. Landis, J. Mitchell, P. Niles, K. Righter, A. B. Regberg, M. Zolensky, T. Slisher, C. D. K. Herd, R. Harrington, N .Haney, D. Archer, J. Hogencamp, **Z. E. Wilbur**, L. Welzenbach, A. Steele (2019) Simulation of the cold curation preliminary examination using a cold Hamburg meteorite. 82nd Meeting of the Meteoritical Society (Poster).

[3] L. C. Welzenbach, **Z. E. Wilbur**, M. D. Fries (2019) Cold Curation Techniques: X-ray computed tomography of the Hamburg meteorite. 82nd Meeting of the Meteoritical Society (Poster).

[2] Z. E. Wilbur, A. Udry, F. M. McCubbin, K. E. Vander Kaaden, R. A. Zeigler, K. Ziegler, C. DeFelice (2019) Investigating the history of aubrites using X-ray computed tomography and bulk partition coefficients. 82nd Meeting of the Meteoritical Society (Oral).

[1] Z. E. Wilbur, A. Udry, F. M. McCubbin, K. E. Vander Kaaden, R. R. Rahib, T. J. McCoy (2018) Aubrite and enstatite

chondrite impact melt meteorites: Analogs to Mercury? Mercury: Current and Future Science of the Innermost Planet, Abstract #6034 (Poster).

Training and Workshops

Fourth Annual Small-Particle Handling Workshop, NASA Johnson Space Center, Houston, TX (Oct. 2019)

- Hands-on training in handling and the manipulation of small extraterrestrial samples

The University of Texas High-Resolution X-ray CT Facility Short Course for XRXCT data (June 2019)

- Training in the 3D visualization and analysis of high-resolution XCT data. Delves into 3D visualization, surface extraction, and segmentation.

Skills and Analytical Equipment

- Analytical Equipment: Nikon XTH 320 micro-X-ray computed tomography machine; Petrographic microscope in reflected and transmitted light; JEOL and Cameca electron microprobes and scanning electron microscopes used for mineral major and minor element analyses.
- Software: Proficient in CT Agent and CT 3D Pro reconstruction software, Volume Graphics Studio (myVGL) software, Dragonfly, Blob 3D and Quant 3D, Adobe Illustrator, Image J, Adobe Photoshop, and Microsoft Word, PowerPoint, Publisher, and Excel.

Students Mentored

Shavonne Morin – Graduate Mentor, BSc (2021)

Nicole Kerrison – Graduate Mentor, BSc (2022)

Angela Tatsch – Graduate Mentor, BSc (in progress)

Outreach

NASA SUITS (Spacesuit User Interface Technologies for Students) Geology Team Lead, 2021-2022

PLANETS (PLanetary Agender, Non-binary, womEn and Trans Scientists and Staff) Coordinator, 2022

PLANETS (PLanetary Agender, Non-binary, womEn and Trans Scientists and Staff) Member, 2019-2022

Houston Symphony Apollo Anniversary Volunteer, 2019

SWAN (Supporting Women at NASA) Organization Member, 2019

Professional Service

Meteoritical Website Committee co-editor of collection histories and initiatives directed towards non-academic members of the website (2020- present)
Executive Secretary for NASA proposal selection panel (2021)
Anonymous Proposal Reviewer for the French National Research Agency (2023)

Press Coverage

"A Rockin' Time for Space Missions" by Katherine Wright; Physics- Link to article

"USC and UA Students are Developing an AR Interface to Inform Lunar Astronauts of Location, Vitals" by USC Viterbi Staff; USC