Autumn Shackelford

Department of Physics, University of Central Florida | autumn.shackelford@ucf.edu | [redacted]

EDUCATION

PhD University of Central Florida — August 2020 - August 2025
Physics, Planetary Science Track
Cumulative GPA: 3.955

BS University of Alabama in Huntsville — August 2016 - May 2020
Physics, Concentrations in **Astrophysics** and **Optics**
Cumulative GPA: 3.75 (***magna cum laude***)

RESEARCH EXPERIENCE

Postdoctoral Research Scholar — August 2025 – Present
University of Central Florida
Advisor: Dr. Kerri Donaldson Hanna

- **Research Interests:** Airless bodies, infrared spectroscopy, scanning and transmission electron microscopy, space weathering, planetary regolith properties and processes, simulated environment systems, telescopic observations, analog materials

Graduate Research Assistant — August 2020 – August 2025
University of Central Florida
Advisor: Dr. Kerri Donaldson Hanna

- Performed simulated space weathering experiments and coordinated analyses (laboratory spectroscopy, electron microscopy, etc.) on airless body regolith analogs.
- Created data reduction pipeline for mid-infrared ground-based telescopic observations.
- Assembled and operated a custom ultra-high vacuum chamber created to mimic the near-surface environments of airless planetary bodies.

TEACHING EXPERIENCE

Grader — January 2025 – May 2025
University of Central Florida Department of Physics

- Served as grader for Planetary Geophysics (AST 4152/5154)
- Aided in answering student questions on course content

HONORS, AWARDS, AND PROFESSIONAL AFFILIATIONS

University of Central Florida Alumni 30 Under 30 — 2026
Award recognizing "outstanding, highly skilled graduates of the University of Central Florida who fuel innovation, service, and economic impact in Florida and beyond."

Europlanet Early Career (EPEC) Science Flash – 1st Place Winner — 2025

Described personal research presented at the joint Europlanet Science Congress – Division for Planetary Sciences (EPSC-DPS) conference in under three minutes using only layman's terms. Awarded free registration for the conference the following year.

NASA Exploration Science Forum Student Poster Competition – 1st Place Winner 2025
Awarded $1500 prize to travel to, attend, and present at any conference.

3MT Doctoral Finalist | UCF College of Graduate Studies 2024
One of ten doctoral students selected to participate in the final round of the 3MT (Three Minute Thesis) competition at UCF, which challenges presenters to describe their dissertation research to a non-specialist audience in under three minutes.

Graduate Student of the Year | UCF Physics Graduate Student Awards 2024
Awarded to one UCF Physics graduate student per year for exemplary performance in research, teaching, and outreach.

American Geophysical Union Outstanding Student Presentation Award 2024
This honor is awarded for only the most exceptional student presentations that occurred during the American Geophysical Union (AGU) Fall 2023 Meeting in San Francisco, California.

University of Central Florida Doctoral Research Support Award 2024
$2,120 awarded by the UCF College of Graduate Studies for assistance in dissertation research expenses.

NASA SCoPE AGU SciAct Affiliate 2023
Awarded $1,671 to attend and participate in communications workshops for the educational outreach efforts of NASA's Science Activation teams at the American Geophysical Union Fall 2023 meeting in San Francisco, California.

OutREACH for the Stars Award | UCF Physics Graduate Student Awards 2023
Awarded to a graduate student that has made an effort to bring services or information about Physics (or other STEM fields) to people where those services and/or information are lacking or non-existent. Two awards per academic year.

NASA Exploration Science Forum Student Poster Competition – 3rd Place Winner 2022
Awarded $1000 prize to travel to, attend, and present at any conference.

Above and Beyond Award | UCF Physics Graduate Student Awards 2022
Awarded to one graduate student per academic year that demonstrate actions that go "above and beyond" the call of duty.

Graduate Dean's Fellowship | University of Central Florida August 2020
Awarded $5000 for academic excellence in undergraduate institution.

American Geophysical Union (AGU) July 2023 - Present
American Physical Society (APS) January 2019 - Present

Alpha Lambda Delta Honor Society April 2018 - Present
National Society of Leadership and Success (Sigma Alpha Pi) April 2018 - Present

INVITED TALKS

A. Shackelford, K.L. Donaldson Hanna, J. Gillis-Davis et al. (2025). *Space Weathering Effects on Mercurian Surface Analogs: Insights from Coordinated Spectral, Microstructural, and Chemical Analyses.* Europlanet Science Congress-Division for Planetary Sciences (EPSC-DPS). Oral presentation. **Invited.**

A. Shackelford, K.L. Donaldson Hanna, M. Horton, D. Noce (2023). *Morphological and Spectral Characterization of Lunar Regolith Breakdown Due to Water Ice.* American Geophysical Union Conference (AGU). Oral presentation. **Invited.**

ABSTRACTS/CONFERENCE PROCEEDINGS

A. Shackelford, K.L. Donaldson Hanna, J. Gillis-Davis et al. (2025). *TEM Characterization of Space Weathering Products Produced by Simulated Micrometeorite Bombardment: Insights for Mercury and Carbonaceous Asteroids.* NASA Exploration Science Forum (NESF). Poster presentation.
A. Shackelford, K.L. Donaldson Hanna, J. Gillis-Davis et al. (2025). *An Experimental Investigation into Carbon as a Space Weathering Product on Mercury and Carbonaceous Asteroids.* 56th Lunar and Planetary Science Conference (LPSC). Oral presentation.
A. Shackelford, K.L. Donaldson Hanna, J. Gillis-Davis (2024). *How Carbon May Affect Space Weathering Products on Mercury and Carbonaceous Asteroids: An Experimental Approach.* NASA Exploration Science Forum (NESF). Oral presentation.
A. Shackelford, K.L. Donaldson Hanna, J. Gillis-Davis (2024). *How Carbon May Affect Space Weathering Products on Mercury: An Experimental Approach.* Mercury 2024. Oral presentation.
B. Dotson, **A. Shackelford**, et al. (2023). *Analysis of dust samples from the Starship orbital test flight.* American Society of Civil Engineers Eastern Region Younger Member Council (ERYMC).
A. Shackelford, K.L. Donaldson Hanna (2023). *Morphological and Spectral Characterization of Lunar Regolith Breakdown Due to Water Ice.* 53rd Lunar and Planetary Science Conference (LPSC). Oral presentation.
L. Rosello Del Valle, **A. Shackelford,** et al. (2023). *Space Weathering from Mercury to Pluto: Preliminary Results from a Novel Simulated Environment Chamber.* 53rd Lunar and Planetary Science Conference (LPSC). Poster presentation.
A. Shackelford, et al. (2023). *Space Weathering on the Mercurian Surface: Shedding Light on the Darkening.* Mercury Exploration Analysis Group Meeting (MExAG). Poster Presentation.
A. Shackelford, et al. (2022). *SWEEPS: A New Space Weathering Chamber.* NASA Exploration Science Forum (NESF). Poster presentation.
A. Shackelford, K. L. Donaldson Hanna (2022). *Morphologic and Spectral Characterization of Regolith Breakdown Due to Water Ice.* LunGradCon. Oral presentation.
A. Shackelford, K. L. Donaldson Hanna (2022). *Morphologic and Spectral Characterization of Regolith Breakdown Due to Water Ice.* European Lunar Symposum (ELS). Poster presentation.
A. Shackelford, K. L. Donaldson Hanna (2022). *Morphologic and Spectral Characterization of*

Regolith Breakdown Due to Water Ice. 52nd Lunar and Planetary Science Conference (LPSC). Poster presentation.
A. Shackelford, K. L. Donaldson Hanna (2021). *Morphologic and Spectral Characterization of Regolith Breakdown Due to Water Ice.* LunGradCon. Oral presentation.
A. Shackelford, K. L. Donaldson Hanna (2021). *Morphologic and Spectral Characterization of Regolith Breakdown Due to Water Ice.* NASA Exploration Science Forum/European Lunar Symposium (NESF/ELS). Poster presentation.

PUBLICATIONS

A. Shackelford, K.L. Donaldson Hanna, J. Gilis Davis et al. (2025). *Space Weathering on Carbon-Rich Surfaces: Spectral Characterization of Fe-Poor Mercury and Carbonaceous Asteroid Analogs.* Planetary Science Journal, Volume 6, Number 254. DOI: 10.3847/PSJ/ae1131

B, Dotson, P. Metzger, J, Hafner, **A. Shackelford** et al. (2024). *A new launch pad failure mode: Analysis of fine particles from the launch of the first Starship orbital test flight.* Earth and Space 2024: Engineering for Extreme Environments (964-975). DOI: 10.1061/9780784485736.085.

A. Shackelford, K.L. Donaldson Hanna, M. Horton, D. Noce (2024). *Morphological and Spectral Characterization of Lunar Regolith Breakdown Due to Water Ice.* Planetary Science Journal, Volume 5, Number 1. DOI: 10.3847/PSJ/ad0041.

GRANT/FUNDING ACTIVITY

NASA Facility for Astromaterials Research [redacted]
PI: Autumn Shackelford
Co-Is: Kerri L. Donaldson Hanna, Jeffery J. Gillis-Davis
ARES Co-Is: Brittany A. Cymes, Lindsay P. Keller, Zia Rahman, Roy Christoffersen
Awarded time to prepare and analyze two analog samples alongside members of the Astromaterials Research and Exploration Science (ARES) Directorate at NASA Johnson Space Center. Instruments used: Focused ion beam, transmission electron microscopy, energy dispersive X-ray spectrometer.

LEADERSHIP, OUTREACH, & SERVICE TO THE COMMUNITY

Bepi Colombo Young Scientist Study Group (YSSG) Surface and Environment Interaction Studies (SEIS) Group Co-Chair August 2024- Present

Lunar Exploration Analysis Group (LEAG) Science Goals Committee
Executive Secretary – Goal 1 Panel January 2024 – Present

LunGradCon Student Organizer March 2022 – July 2025
Co-organized, hosted, and moderated LunGradCon 2022 at the University of Colorado Boulder.
Assisted in planning for LunGradCon 2023 in College Park, Maryland.
Assisted in planning for LunGradCon 2024 in St. Louis, Missouri.

Assisted in abstract acceptance for LunGradCon 2025 in Albuquerque, New Mexico.

UCF Planetary Science Journal Club Student Organizer August 2021 – May 2022
Co-organized, hosted, and moderated the weekly Planetary Science Journal Club.

UCF Women in Physics Society Vice President May 2021 – August 2023
Co-organized and occasionally lead bi-weekly meetings.

APS CUWiP Local Organizing Committee August 2021 – January 2023

- Acted as lead Graduate Student Organizer for the UCF branch of the January 2023 Conference for Undergraduate Women in Physics.
- Oversaw the recruitment of speakers and selection of session topics.
- Served as a guest speaker on four separate panels.
- Managed correspondences between local organizing committee and speakers.

MEDIA COVERAGE

AAS Nova: Water-Ice Weathering in Permanently Shadowed Craters on the Moon
WFTV: UCF partnering with NASA to help with astronauts' return to moon – WFTV
WESH: What are UCF's ties to NASA's Artemis program?
MSN: UCF students, researchers involved in Artemis program
Channel 13: UCF Assistant Professor Working with Artemis Mission and Moon Exploration
FOX and Yahoo!: UCF researchers working on new map of moon's surface (yahoo.com)
UCF Student Spotlight: UCF Grad Student Leaves No Stone Unturned to Advance Space Exploration

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TECHNICAL SKILLS, CERTIFICATIONS, AND INSTRUMENT TRAINING

Proficient: Python, C, MATLAB, Unix/Linux, MacOS, Microsoft Office Suite
Intermediate: Arduino, C++
Basic: HTML, Java, IDL

LPI Small Sample Handling Workshop 2025
Received hands-on training in the manipulation of small samples from the Astromaterials Research and Exploration Science Division at NASA's Johnson Space Center, the Department of Earth, Atmospheric, and Planetary Sciences at Purdue University, and the Lunar and Planetary Institute (LPI). Topics covered included micromanipulation of small particles (< 10 μm), ultramicrotomy, and epoxy and sulfur particle embedding. One of four selected participants.

CRLA Tutor Certification, Level 1 2020

University of Central Florida Materials Characterization Facility (MCF) Training for the following instruments:

- Zeiss ULTRA-55 FEG SEM (Scanning Electron Microscope)
- Noran System 7 EDS (Energy Dispersive X-ray Spectrometer)

- FEI 200 TEM (Focused Ion Beam Sample Preparation)
- FEI Tecnai F30 TEM (Transmission Electron Microscope)