

Phylindia C. Gant

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Education

Ph.D., Geological Sciences

University of Florida

Thesis: Biosignatures on Earth and Mars

Expected May 2026

M.A., Environmental Science

University of Virginia

Thesis: Alluvial fans as potential sites for preserving biosignatures on Mars

August 2016

B.S., Interdisciplinary Science

Purdue University

Concentration: Earth and Planetary Science, Chemistry

May 2010

Professional Experience

Student Collaborator, Science Team — NASA Mars Science Laboratory

September 2023 – Present

Serve on the NASA MSL Curiosity Rover mission as a student collaborator on the Sample Analysis at Mars (SAM) instrument.

Graduate Research Assistant

August 2021 – Present

Department of Geology, University of Florida

Investigating biosignatures in iron metabolizing organisms using gas-chromatography mass spectrometry.

- Experienced in geochemical techniques including ICP-MS, GC-MS, and X-Ray Diffraction (XRD)
- Prepares and handles samples to ensure accurate and reliable geochemical analyses
- Utilizes wet chemistry techniques for qualitative and quantitative chemical analysis
- Authored standard operating procedures
- Organizes weekly lab group meetings and mentors undergraduate laboratory members

Student Collaborator, Science Team — NASA Mars 2020 Perseverance Rover

August 2021 –

Present

Serve on the NASA Mars 2020 Perseverance Rover mission as a science team member.

- Biosignatures Working Group
- Geological Context Working Group
- Diversity, Equity, and Inclusion Working Group

Rover Operations — NASA Mars 2020 Perseverance Rover

August 2021 – Present

Supports daily rover operations in the following roles:

- Tactical Documentarian (2021–present)
- Mars 2020 Mission Blog Writer

Research Technician*October 2018 – August 2021**Department of Physics, Purdue University*

Performed physical and chemical sample preparation for cosmogenic nuclide analyses by accelerator mass spectrometry.

- Physical and chemical separation of minerals from geologic matrices
- Quantitative chemical analyses of mineral separates and chemical leachates
- Chemistry techniques including ICP and X-Ray fluorescence
- Planned, constructed, operated, and maintained sophisticated laboratory instrumentation
- Supervised and trained graduate and undergraduate students in measurement and application of radionuclides
- Directed mineral separation methods: rock crushing, grain-size sorting, gravity and heavy liquid separations, acid leaching, and magnetic separation

Graduate Research Assistant*September 2016 – July 2018**Department of Earth and Planetary Sciences, Northwestern University*

- Conducted research in planetary science in the area of geodynamics
- Collected, interpreted, and evaluated data on magnetite at high pressures using facilities at Argonne National Laboratory
- Presented poster at American Geophysical Union Fall Meeting 2017

NASA Intern — Mars Spatial System Support*June 2016 – December 2016**NASA Langley Research Center*

Created MarsGIS product to aid the Evolvable Mars Campaign in choosing a human-crewed landing site on Mars.

- Digitized proposed landing site data from PDF to ArcMaps using ArcGIS 10.4.1
- Characterized data from proposed resource sites using a purpose-built database tool
- Constructed layout for universal online product usage without access to ArcGIS
- Led Space Analysis and Concept Directorate Youth Day involvement for NASA Langley Center-wide event

Research Technician*February 2015 – June 2016**Department of Neurology, University of Virginia*

Investigated the role of miRNA and protein factors in neurodegenerative disorders caused by nucleotide repeat disorders such as ALS and myotonic muscular dystrophy.

- Assisted principal investigator in designing and implementing research methods and procedures
- Mastered molecular biology techniques including PCR, electrophoresis, and RNA/DNA extraction
- Responsible for daily laboratory operations and managing available laboratory funds

Senior Associate, Chemistry*January 2012 – August 2014**SC Johnson and Son, Inc.*

Formulator within Air Care RD&E developing global products from ideation through commercialization.

- Coordinated line trials and executed all testing on new formulas including performance and stability testing
- Led cross-functional teams working closely with marketing, processing, and product supply
- Authored procedures, protocols, and specifications

Quality Assurance Laboratory Technician
Nestle Beverages / Aerotek Staffing (Contractor)

February 2011 – December 2011

- Performed chemical, physical, and quality control testing of incoming materials, packaging, and finished products to assure compliance with quality guidelines

Soil Analysis Technician
Suretech Laboratories / Aerotek Staffing (Contractor)

August 2010 – December 2010

Supported lead chemist in analyzing over 6,000 samples daily across feed ingredients, feeds, forages, and soil analysis.

- Determined elemental analysis of samples using ICP-MS
- Measured soil lime index using pH meters; weighed samples on analytical balance to measure organic content

Undergraduate Research Assistant
Departments of Earth and Planetary Science, Chemistry, and Biology — Purdue University

Fall 2006 – Spring 2010

Dr. Timothy Filley Biogeochemistry Research Laboratory

- NSF-funded; assisted in implementing analytical methods for the determination of stable and labile pools of soil organic matter
- Utilized soil preparation methods including freeze drying, grinding, weighing, and centrifugation

Dr. Joseph Francisco Physical Chemistry Research

- Constructed transitional state molecules using Gausview software
- Investigated and identified molecule groups which best drive reaction to completion

Soil Microbiology Agricultural Lab

- Measured chemicals to accurate specifications; oxidized samples under fume hoods
- Developed wet chemistry skills in titration, UV-VIS, mass spectroscopy, GC, and HPLC

Research Experience for Undergraduates (REU)
University of New Mexico / Sandia National Laboratory

Summer 2006

Project: Porphyrin-Based pH Sensing on Hydrophobic and Superhydrophilic Surfaces

- Investigated ligation state changes and color changes of tin porphyrins
- Conducted independent research on advanced pH detectors; presented findings to peers, lab members, and principal investigators
- Demonstrated proficiency using technical equipment at Sandia National Laboratory

Publications

Weng, M. and 19 other co-authors, including P. Gant. 2022. Life Underground: Investigating Microbial Communities and their Biomarkers in Mars-analog Lava Tubes at Craters of the Moon National Monument and Preserve. *Journal of Geophysical Research: Planets* 127.11.

Abstracts & Presentations

(* indicates student advisee)

- P.C. Gant, A.J. Williams. Preservation of Biosignatures in Icelandic Hot Spring Deposits Spanning Acidic to Circumneutral Conditions. Astrobiology Science Conference, May 2026. (Poster Presentation)
- P.C. Gant, A.J. Williams. Hot Springs, Cold Clues: Using GC-MS to Unearth Biosignatures in Icelandic Deposits. National Association of Black Geoscientists 44th Annual Technical Meeting, September 2025. (Oral Presentation)
- P.C. Gant, A.J. Williams. Biosignature Preservation in Acidic and Circumneutral Icelandic Hot Spring Deposits. Lunar and Planetary Science Conference, March 2025. (Oral Presentation)
- J. Ruse*, A.J. Williams, P.C. Gant, and B.J. Siew. Lipid Biosignatures in Lava Tubes: Implications for Life Detection on Mars. Lunar and Planetary Science Conference, March 2025. (Poster)
- B.J. Siew*, A.J. Williams, P.C. Gant, J.J. Buffo, and V. Hamil. Lipid Biosignatures in Alkaline Lakes: Implications for Life Detection on Mars. Lunar and Planetary Science Conference, March 2025. (Poster)
- B. Sutter, A. Williams, P. Gant, L. Chou, R.A. Lybrand, D.W. Ming, C.N. Achilles, A.C. McAdam. Soil Organic Carbon in Basaltic Soils of Iceland Revealed by GCMS-TMAH Analysis: Analytical Analog for Interpreting Curiosity Rover SAM-GCMS-TMAH Analysis of Gale Crater Materials. Lunar and Planetary Science Conference, March 2025. (Poster)
- P.C. Gant, A.J. Williams. Biosignature Preservation in Acidic and Circumneutral Icelandic Hot Spring Deposits. Astrobiology Science Conference, May 2024. (Oral Presentation)
- P.C. Gant, A.J. Williams. Assessing the Performance of TMAH Thermochemolysis on Mg-Sulfate Mars Analog Standards. Lunar and Planetary Science Conference, March 2024. (Poster)
- P.C. Gant, A.J. Williams, M.A.M. Floyd, D. Emerson. Detecting a Novel Biosignature Using Modern Spaceflight Technology. Lunar and Planetary Science Conference, March 2023. (Poster)
- P.C. Gant, A.J. Williams, M.A.M. Floyd, D. Emerson, L.L. Kivrak, L. Judge. Biosignatures in Iron Oxidizing Microbes (BIOMe) — A Study on Metabolic Processes Preserved as Biosignatures from Iron Metabolizing Microorganisms. Astrobiology Science Conference, May 2022. (Poster)
- Gant, P., J. Walsh, J. Lazarz, S.D. Jacobsen, D. Jurdy. 2017. Magnetite Equation of State: Implications for Mars' Interior and Magnetization. American Geophysical Union Fall Meeting, December 2017, New Orleans, LA. (Poster)
- Gant, P. 2016. Alluvial Fans as Potential Sites for Preservation of Biosignatures on Mars. Geological Society of America, September 2016, Denver, CO. (Poster)

Teaching Experience

Teaching Assistant — Geology 1102: Age of Dinosaurs *Spring 2025*

Teaching Assistant — Geology 3105: Evolution of Earth and Life *Fall 2022, 2024, 2025*

Teaching Assistant — Earth 101: Earth Science for the 21st Century *Fall 2017*

Undergraduate Mentoring

- Ben Siew, Fall 2024 – Spring 2025
- JJ Ruse, Fall 2024 – Spring 2025

Professional Development

- Executive Secretary, NASA Review Panel, Winter 2024
- Culturally Inclusive Planetary Engagement Workshop, Atlanta, GA, November 2024

- XX Josep Comas i Solà International School of Astrobiology, Santander, Spain, Summer 2024
- International Geobiology Summer Course, Penn State University, Summer 2023

Science Communication

- "Could People Breathe the Air on Mars?" The Conversation, 16 May 2022
- "Nobody Tell Elmo About Issole." NASA Mars 2020 Mission Blog, 2 February 2022

Awards & Fellowships

- Bouchet Graduate Honor Society, inducted Spring 2026
- NASA Scope LPSC/SciAct Affiliate and Travel Grant (\$2,000), Spring 2025
- Association for Academic Women (AAW) Honorable Mention Award, 2025
- Outreach Award, University of Florida Department of Geology, Spring 2024
- Jackson Wild Media Fellowship, 2021
- Board of Education Summer Fellowship (\$1,000), 2021
- AGU Travel Grant, 2017
- GEM University Fellow, 2016

Leadership & Service

Black Graduate Student Organization, University of Florida

- President, May 2025 – present: Leads and oversees organizational initiatives, coordinates professional development events, and represents member interests to university administration
- Vice President, June 2024 – May 2025: Planned and executed educational and recreational activities for members and community
- Treasurer, June 2023 – June 2024: Prepared and managed budget, ensured compliance with student finance office, tracked financial history
- Public Relations Chair, August 2022 – June 2024: Responsible for marketing and promoting BGSO, designing flyers, and maintaining social media and website

Science Outreach

Fall 2017 – Present

Independently organizing, coordinating, and implementing public service projects to address the underrepresentation of minorities, especially minority women, in STEM fields.

Professional Memberships

- American Geophysical Union
- Delta Sigma Theta Sorority, Inc.
- Geological Society of America
- National Association of Black Geoscientists