

Anthony Michael Lamantia

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RESEARCH INTERESTS

My research focuses on the intersection of planetary geology and geospatial data management. My work leverages GIS and remote sensing to produce geological maps of planetary surfaces. I seek to continue to build these skills, especially to support exploration of the Earth, Moon, Mars, and other Solar System targets.

EDUCATION

2026 – Present	PhD, Geological Sciences Arizona State University; GPA 4.0
2022 – 2026	Bachelor of Science, Geosciences, Geospatial Data Analysis Bachelor of Science, Computer Science, Cybersecurity Tennessee Tech University; GPA 3.78

EMPLOYMENT

2026 - Current	Graduate Teaching Assistant School of Earth and Space Exploration, Arizona State University Courses: Earth, Solar System & Universe, Earth, Solar System & Universe Laboratory
2023 – 2026	Undergraduate Teaching Assistant Department of Earth Sciences, Tennessee Tech University Courses: Theory of GIS I, Theory of GIS II
2023 – 2026	Undergraduate Research Assistant Department of Earth Sciences, Tennessee Technological University

ACADEMIC PROJECTS

Geologic Mapping of Lunar South Pole Boulders

2023 - Present

- NASA Tennessee Space Grant Internship, supervised by Dr. Jeannette Luna (TTU)
- Conducted geologic mapping of the Lunar South Pole using Lunar Reconnaissance Orbiter Camera (LROC) Narrow Angle Camera (NAC) imagery and digital elevation models (DEMs) to characterize surface features at meter-scale resolution.
- Cataloged ~90,000 lunar boulders across the Lunar South Pole, providing the most extensive boulder dataset to date in this region.
- Analyzed geologic context of different lunar regions to assess potential resource availability and hazards for human exploration.
- Aided in the development of the LunarTRAV GIS toolbox to plot astronaut EVA paths.
- **Conference Presentations:** Geological Society of America (2025), TTU Physics Colloquium (2025), Geological Society of America (2023), TTU Undergraduate Research Symposium (2023).
- **Publications:** Lamantia et al. (in prep) High-resolution mapping of Lunar South Pole boulders to support science and exploration, Journal of Maps.

Assessing Ecosystem Health on the Isle of Raasay, Scotland through Field-Based Approaches

2025 - 2026

- TTU Creative Inquiry Summer Experience (CISE) Grant, supervised by Dr. Samantha Allen (TTU)
- Awarded \$4,000 through TTU undergraduate student research grant.
 - Funding supported lab equipment costs, plane tickets, and hotel costs for a 12-day field work study on the Isle of Raasay, Scotland as well as analysis after the field study
- Collected water sediment samples following Pacific Northwest National Laboratory's Worldwide Hydrobiogeochemistry Observation Network for Dynamic River Systems (WHONDRS) protocol to analyze Carbon Cycling.
- Conducted biological surveys at random points on the island to analyze how the invasive *Rhododendron ponticum* could affect species diversity.
- **Conference Presentations:** TTU CISE Symposium (2025).

Using GIS to Analyze the Falling Water River Watershed near Cookeville, TN

2024 - 2024

- Civil Engineering Summer Internship, supervised by Dr. Tania Datta (TTU)
- Used remote sensing data to delineate the Falling River watershed and analyze hydrologic and geomorphic characteristics in ESRI's ArcGIS Pro.
- Processed and visualized spatial datasets, including digital elevation models (DEMs), land cover, and hydrologic networks, to model watershed boundaries and stream flow patterns.
- Assessed land use data, tree canopy, and soil characteristics to evaluate factors influencing watershed hydrology and potential environmental stressors.
- Produced detailed watershed maps and data visualizations to support local environmental management and planning efforts.
- Developed proficiency in managing, organizing, and visualizing large spatial datasets using ArcGIS Online, including feature services, layer symbology, and web-based map applications.
- **ArcGIS Hub Site Publication:** <https://falling-water-river-watershed-1-tntech.hub.arcgis.com/>

TECHNICAL SKILLS

- **Field Skills (geoscience):** constructing geologic and topographic maps, conducting biological surveys, using a Brunton compass, and collecting and preparing water sediment samples for carbon analysis.
- **Analytical Skills (geoscience/computer science):** Experience interpreting remote sensing data such as LiDAR, Digital Elevation Models (DEMs), and aerial imagery for geologic and biologic mapping
- **Computer Skills:** Microsoft Office Suite, ArcGIS, Google Earth, Microsoft Visual Studio, PyCharm, Jupyter Notebook, GitHub, Flutter, Android SDK, Windows PowerShell, Linux Bash Script, C++, Python, Dart, SQL.

RELEVANT COURSEWORK

Calculus I & II, Algebra-based Physics I & II, Linear Algebra, Statistical Methods I, Intro for Computational Programming, Physical Geology I & II, Data Structures and Algorithms, Geologic Fundamentals, Theory of GIS I & II, Cartography, Paleobiology, Advanced Historical Geology, Design of Algorithms, Object-Oriented Programming, Environmental Studies Study Abroad – Scotland, Database Management Systems, Foundations in Computer Science, Paleoclimates, Environmental Applications of GIS, Computer Networks, Computer Organization and Architecture in Assembly, AI for Geospatial Analysis, Cryptography/Network Security, Computer Operating Systems, Planetary Geology, IT Security, Geomorphology, Software and Systems Security, Software Engineering I, Geology Senior Thesis 1, Computer Architecture, Software Engineering II, Geology Senior Thesis II, Fundamentals of Planetary Geology (Graduate, ASU), Advanced Field: Tertiary Volcanism and Sedimentology (Graduate, ASU)