

PLANETARY GEOSCIENCE RESEARCH PROJECT

PART I – ANNOTATED BIBLIOGRAPHY

Objective: One of the major components of your grade in this course is an independent research project on the topic of **terrestrial analogs**. A terrestrial analog is an earth-based location that is used to study phenomena observed on other planets, moons, or rocky bodies of the solar system. The dry valley deserts of Antarctica, for example, serve as terrestrial analogs for cold, arid conditions expected on Mars. Likewise, volcanic terrains on Earth are a natural laboratory to learn about igneous processes operating on Venus.

The purpose of this exercise is to introduce you to planetary research and explore what processes operate on rocky solar system bodies. At the end of this exercise, you should be able to:

- Conduct a literature search for abstracts and journal articles about a planetary geoscience topic.
 - Determine which articles are most relevant to your topic.
 - Compile an annotated bibliography that describes why each article is relevant and what might be learned by reading the article.
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Background Information: What types of literature are available to the planetary scientist?

Conference Abstracts: To communicate ongoing research, scientists present their research at conferences hosted by professional organizations, e.g., Lunar and Planetary Institute (LPI), Geologic Society of America (GSA), Society for Sedimentary Geology (SEPM), American Astronomical Society (AAS), etc. Authors submit a short abstract that describes their research, which is then printed in a conference abstract volume. While conference abstracts are useful for keeping up with ongoing work, they only provide a summary and generally do not contain any data or figures.

Research Journals: Just as there are dozens of magazines about a topic (for example, race cars, women's health, pop culture, etc.), there can be many journals devoted to a single science. Some journals are meant for a broad audience, while others are focused for specialists. This type of literature is not unique to planetary geoscience; there are medical journals, engineering journals and journals for all branches of science. Many of the geologic journals are sponsored and edited by the organizations mentioned above - - LPI, GSA, SEPM, AAS, etc. Below are some journals that will be useful to you:

- Earth and Planetary Science Letters – published by Elsevier (a publishing company)
- Geology – published by GSA
- Geosphere – published by GSA
- GSA Bulletin – published by GSA
- GSA Today – published by GSA
- Icarus – published by Elsevier
- Journal of Sedimentary Research – published by SEPM
- Marine and Petroleum Geology – published by Elsevier

There are MANY other journals; this is only a short list. Please feel free to use publications from other journals in your research.

Special Volumes and Textbooks: In addition to journal articles, scientists often team up and publish special volumes on a single topic, for example 'Sedimentary Processes on Mars'. These texts, as well as subject textbooks, may have a single author or multiple authors who each contribute a chapter. The contributors are often considered experts in their field so special volumes can be very useful.

Thesis or Dissertation: Graduate students are often required to publish a Master's Thesis or Doctoral Dissertation, which is then made available to the public. These are focused on a very specific topic and can be useful for background information; however, the documents tend to be lengthy compared to journal articles.

WORKSHEET – RESEARCHING A TARGET OF INTEREST

There are a number of rocky bodies in the solar system, including planets, dwarf planets (sorry, Pluto), moons, asteroids and comets.

Visit the links in iLearn to learn more and explore the many different rocky bodies of the solar system.

Q1. What rocky body, or target, do you plan to investigate?

Q2. Has there been a mission to explore this target? If so, what is the name of the mission and what agency funded the mission (i.e., NASA, ESA, etc.)? If there are multiple missions, which missions are most recent? If there has not been a mission specifically targeting this object, has there been a fly-by or other mission that collected data?


Fill in the space below with notes about mission(s) to your target. Note the purpose of the mission, the date(s), instruments on board and important websites for the mission.

If there has not been a lander mission, orbital mission, or fly-by mission that collected some data, please consider selecting a different target.

Q3. Carefully read the Wikipedia page for a general description of your target body. What geologic processes might be operating on the surface of the body? In other words, do you see evidence for ice features? Volcanoes? Earthquakes or faults? Mountain ranges?

Q4. Of the processes you discovered for the previous question, select one process that interests you the most. You will research this process for the rest of the exercise; however, you can choose to keep this topic or change topics for your final project.

Q5. Open Google Scholar at www.scholar.google.com. Conduct a Google Scholar search for journal articles about the planetary body and process. For example, “volcanic processes on Mars” or “ice tectonics on Europa” or “mountains on Mercury”.

Use the options on the left side of the browser window to limit your results to find the most recent paper on this topic and provide the citation below. Click the symbol  to bring up proper citations for the paper. Please use Chicago Style for this question and during your research project.

Q6. Click on the article and read the abstract. Does it address the process you are interested in? Does it use data from any missions? In the space below and **in your own words**, write 1-2 sentences describing why this article is important for your research topic.

If a link is available, download a PDF copy of the article. If the article is not freely available, use TTU Interlibrary Loan to request the article. **DO NOT PURCHASE ARTICLES FOR THIS PROJECT. YOU CAN GET THEM ALL FREE THROUGH THE LIBRARY.**

Save the article and all articles you find for your project in a folder on your jump drive.

Q7. Build an annotated bibliography of 3 additional references in the space below. For each reference: (1) provide the citation in Chicago format; (2) read the abstract and write a 1-2 sentence description of the work; (3) download the article (if free) or request the article through TTU Interlibrary Loan (if not free) and add to your reference folder.