

Welcome to the Science and Planetary Protection in Advance of Human Missions Seminar

Day 2

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Overview

- This week's seminar is intended to inspire abstracts for the October 30-Nov 1 workshop – so be **INSPIRED!!**
- This is the first in a series of Mars Surface Science Workshops
 - Share other topics you would like to see in this series!

Sponsoring Organizations

Office of Planetary Protection, Mars Exploration Program, Astrobiology Program, & NfoLD

Science Organizing Committee

Nick Benardini, NASA, HQ, Office of Planetary Protection

Becky McCauley Rench, NASA, HQ, Mars Exploration Program/Astrobiology Program

Erin Lalime, NASA, HQ, Office of Planetary Protection

Andy Spry, SETI Institute

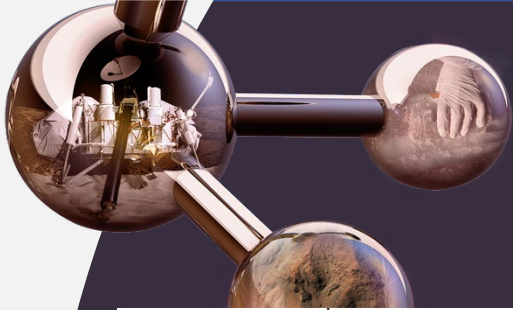
Sarah Johnson, Georgetown University, NfoLD

Bob Collom, NASA, HQ, SMD Policy



Assumptions to Guide Discussion

1. The discussion is one step in an ongoing conversation – the direct outcome of this discussion will not include a specific position or stance. Rather it will be captured in a workshop report.
2. Human spaceflight hardware leaks (in nominal and off-nominal operation), so the old robotic paradigm of managing a fixed bioload is inappropriate.
3. This seminar/workshop is not focused on safety of crew at Mars or on their travel to/from Mars.
4. The introduction of a maintained temperate terrestrial environment at the Martian surface affords the opportunity for many more organisms (in type and quantity) to escape into the Martian environment.
5. This exploration is taking place in the context that Mars Sample Return (MSR) is moving forward or has already happened, but humans have not yet reached the surface. Focus should be on what additional robotic research could be done prior to crewed landing.
6. Humans will arrive at Mars in late 2030s.
7. Knowledge gaps need to be mitigated before landing to protect science return and the Earth.
8. Information from a precursor landing site at Mars will influence risk analysis for planetary protection.



Day 1 recap

1:30 p.m.

Planetary Protection for Crewed Mars Missions and Relevance to Mars Science

Dr. Nick Benardini | Planetary Protection Officer, Headquarters

Vicky Hamilton | Planetary Geologist, Southwest Research Institute

1:50 p.m.

Science Objectives for Human Surface Missions

Kelsie Krafton | Board Program Officer, National Academies Space Studies Board

2:10 p.m.

Can Terrestrial Life Survive on Mars?

Dr. Andy Schuerger | Assistant Professor, University of Florida

2:30 p.m.

Understanding the Transport of Microorganism on Mars

Scot Rafkin | Senior Research Scientist, SETI Institute

- What are the priority knowledge gaps in our understanding of survival of terrestrial microbes, building on the existing literature
- What measurements do we want to prioritize and what research can we conduct in advance of human arrival on Mars to ensure future science integrity?
- What tools (incl. crew-robot interface) could crew utilize on the surface to preserve scientific integrity of samples?



Day 2 Itinerary

1 p.m.	Welcome Erin Lalime Acting Deputy Planetary Protection Officer
1:10 p.m.	Target Locations for the Search for Life Amy Williams Associate Professor of Geology, University of Florida, Sample Analysis at Mars Instrument Team Member
1:30 p.m.	Human Impacts at Mars and Necessary Baseline Measurements Aaron Regberg Geomicrobiologist, Planetary Protection Lead, Astromaterials Acquisition and Curation Office, Johnson Space Center
1:50 p.m.	Tools and Operations to Monitor Human Health and Human Impacts Dr. Sarah Wallace Technical Lead, Microbiology Laboratory Johnson Space Center
2:10 p.m.	Break

2:20 p.m.

Brainstorming Session(s) and Key Questions

- What aspects of guidance for crewed science missions could use further discussion, are missing, and/or work well?
- What are the prioritized science tasks to achieve before humans arrive?
- What scientific research is desired to be conducted before humans arrive and will it inform the activities of the human explorers once they are on the surface?
- What research will the crew themselves be doing, and how will forward and backward contamination control be incorporated into those research (e.g. science and engineering) activities?

3:50 p.m.

Key Takeaways

Bob Collom | Integration Lead, Science and Exploration

4:10-5:15
p.m.

Next Steps

Becky McCauley Rench | Program Scientist, Mars Science Laboratory

- October Workshop
- Call for Abstracts

Breakout groups

- During break, everyone will be automatically moved into breakout rooms
- Each breakout room/group has a name from one of the samples collected on Mars by Perseverance rover
 - Learn a little bit about your groups sample!
 - Check your room name and the name on your google docs notes to make sure they match.
 - Choose a note taker and presenter
- Return to the main room at 4:10

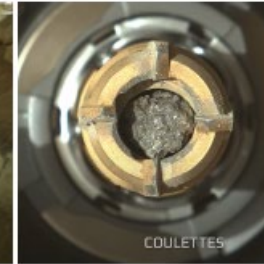
Breakout Notes

Day: 1

Group: Coulettes

<https://www.jpl.nasa.gov/videos/meet-the-mars-samples-salette-and-coulettes-samples-4-and-5>

Breakout Session Leader: Erin Lalime



Coulettes

Sample No. 5

Feature Name: Brec

Sample Type: Rock Core

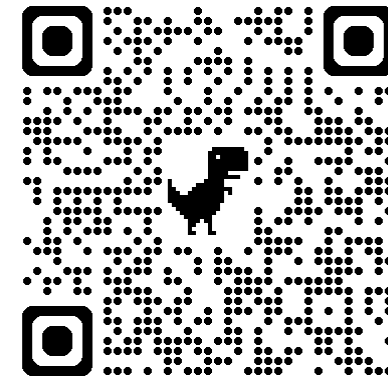
Sol Sealed: 271

Date Sealed: Nov. 24, 2021

Rock Type: Igneous

Sample Height: 3.3 cm (1.30 in)

Current Location: Sample Depot



<https://science.nasa.gov/mission/mars-2020-perseverance/mars-rock-samples/>