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

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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.

# Astrobiology Program Leadership

Senior Scientist for Astrobiology Strategy (David Grinspoon):

"Up and out": expand the astrobiology program within NASA and beyond

Program Scientist for Astrobiology (Lindsay Hays)

"Down and in": manage existing Astrobiology research and coordination programs

Deputy Program Scientist for Astrobiology (Becky McCauley Rench)

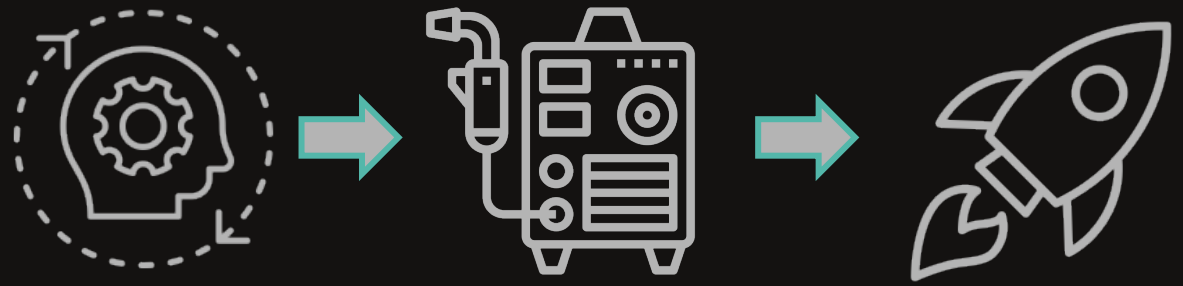
# Astrobiology Research Programs

- C.5 Exobiology (PO: Lindsay Hays)
  - Aim is to understand the origin, evolution, distribution, and future of life in the Universe. Research is centered on the origin and early evolution of life, the potential of life to adapt to different environments, and the implications for life elsewhere.
- F.4 Habitable Worlds (HW) (PO: Becky McCauley Rench)
  - Aim is to use knowledge of the history of the Earth and the life upon it as a guide for determining the processes and conditions that create and maintain habitable environments and to search for ancient and contemporary habitable environments and explore the possibility of extant life beyond the Earth.
- C.14 Planetary Science and Technology Through Analog Research (PSTAR) (PO: Becky McCauley Rench)
  - This program solicits proposals for investigations focused on exploring the relevant environments on Earth in order to develop a sound technical and scientific basis to conduct astrobiological research on other Solar System bodies.
- C.20 Interdisciplinary Consortia for Astrobiology Research (ICAR) (PO: Lindsay Hays)
  - Proposals that describe a multi-million dollar, five-year project with an interdisciplinary approach to a single, compelling question in astrobiology. For projects larger than the scope of the individual research programs, but within the scope of the Research Coordination Networks.

NfoLD
NETWORK FOR LIFE DETECTION

NfoLD is dedicated to advancing the science and technology required to search for evidence of life beyond Earth.

Our goal is to build a cohesive life detection community whose research and expertise becomes integral to all stages of astrobiology spacecraft missions, from inception to operations.



## What we do

- Advance life detection strategy & capability
- Catalyze collaboration
- Support NASA programs and missions
- Foster community development

## How we do it

- Promote discourse relevant to life detection
- Act as a **THINK-TANK** for life detection science and technology
- Bridge the research-technology development gap with SC Forums to discuss new life detection science and build collaborations
- Provide life-detection feedback to Analysis Groups
- ECR journal clubs, career development activities, communication (research nuggets)