Stakeholder Engagement on the Global Exploration Roadmap: Focus on Science
July 24, 2014
Building 152, Main Room

Meeting Objective:

The purpose of the Global Exploration Roadmap (GER) discussion is twofold:

1. To enable discussion between the NASA human space exploration planning team and solar system exploration scientists on the science enabled by the human missions (and human/robotic mission concepts) shown in the GER in order to:
    a. capture the current understanding of priority science objectives,
    b. stimulate science community reflection on new opportunities created by the presence of the crew and supporting infrastructure, and
    c. capture related considerations that can be used by human mission planners to ensure that the highest science priorities can be achieved, thereby strengthening the rationale for the international space agency investments that enable near-term human missions such as those depicted in the GER.

2. Obtain science community input and feedback on a proposed International Space Exploration Coordination Group (ISECG) 'white paper' describing an international view of science enabled by the GER that would be distributed as a companion document to the GER when the next update is released (no earlier than end 2015). Community inputs on the benefits of such a paper, its scope, possible content and the development approach are sought.

Agenda

8:30 Overview of the Global Exploration Roadmap: Roland Martinez/Kathy Laurini (NASA), Juergen Hill(DLR)/Francois Spiero (CNES)

This presentation will provide an overview of the global roadmap to the surface of Mars, expanding on the definition of the near-term missions: in the lunar vicinity, on the lunar surface and at a near-Earth asteroid returned to the lunar vicinity. Each of the 3 near-term mission themes will be described, including an overview of the possible systems and infrastructure (i.e., capabilities) available and likely mission durations. Missions beyond the lunar vicinity and lunar surface have not been elaborated in detail by ISECG at this stage. In addition, an overview of ongoing work related to the road mapping effort within ISECG will be briefly discussed.

The concept of a white paper on science enabled by the GER (as a companion product to the next GER) will be discussed and audience feedback sought on its scope, content and development approach.

9:30 Humans in Cis-Lunar Space

As cis-lunar space is seen as an important proving ground for missions further into the solar system, human missions to cis-lunar space are expected to take place starting early next decade. This session will focus on the opportunities for science that can be performed by the crew and/or from a human infrastructure in cis-lunar space. Lunar orbits such as distant retrograde, Earth-Moon Lagrange and low lunar obits will be considered.

a. Science questions and how they might be addressed by the presence of humans/human support infrastructure: David Kring (USRA)
b. Quick review of potential science areas identified through previous NASA studies: Kathy Laurini (NASA)
c. Open discussion, including discussion of these questions:
    a. Are there other ideas?
    b. Are there Earth observation investigations?
    c. Perspectives for gaining international consensus on priorities
    d. Other….

10:45 Humans on the Lunar Surface: Clive Neal, Session Host

ISECG is currently studying lunar surface access and surface exploration architectures, in order to derive key driving parameters that may be used by interested space agencies to study lunar landers or other surface infrastructure. The study may also inform requirements for a cis-lunar deep space habitat which evolves into a surface access staging node. To inform these studies, this session will review the opportunities for science that can be performed by the crew and/or human infrastructure on the lunar surface. Extended duration human missions, not permanent presence are assumed.

a. Science questions and how they might be addressed by the presence of humans/human support infrastructure: Clive Neal (Notre Dame)
b. Open discussion, including discussion of these questions:
    a. Perspectives for gaining international consensus on priorities
    b. What types of missions/capabilities are needed to achieve high priority science objectives?
    c. Other…

12:00 Lunch Break

1:15 Small Bodies/Phobos/Deimos: Dan Britt, Session Host

This session will cover science questions and opportunities associated with human presence at small bodies. Special focus will be included for Phobos and Deimos. This session will inform on-going NASA human exploration architecture mission assessments as part of an evolvable Mars campaign.

a. Science questions and how they might be addressed by the presence of humans/human support infrastructure at small bodies: Paul Abell (NASA)

b. Science questions and how they might be addressed by the presence of humans/human support infrastructure at Phobos/Deimos: Dan Britt (UCF)
c. Open discussion, including discussion of these questions and a chance to follow up with Michele Gates on her presentation given on the 23rd at the Exploration Science Forum
    a. Perspectives for gaining international consensus on priorities
    b. How can human exploration mission to Phobos complement planned Russian robotic mission?
    c. Comments/questions related to NASA ARM mission status
    d. Others?

2:30 Lunar Polar Volatiles: Kathy Laurini, Session Host

Use of local resources will be important to enable the exploration/pioneering vision of NASA and its international partners. Lunar polar volatiles are considered "low hanging fruit," are of high interest to the science community, and offer the opportunity for some lessons learned applicable to use of volatiles on Mars. For these reasons, ISECG is interested in developing an international strategy for assessing the nature, distribution and usability of lunar polar volatiles. Such a strategy is expected to advance the state of knowledge related to in-situ resource utilization, in general, and answer specific question related to the potential for using lunar volatiles in future human exploration architectures.

a. What do we know today about the nature/distribution of volatiles and what kinds of missions/infrastructure can answer open questions? : Jeff Plescia (APL)
b. NASA thoughts on an international strategy: Nantel Suzuki (NASA)
c. Open discussion, including discussion of these questions:
    a. What are key characteristics of an international strategy?
    b. Who should be involved in the discussions?
    c. How can we lower the cost barrier to encourage more missions?
    d. Other…

4:00 Wrap up and Conclusions