The ISECG Global Exploration Roadmap

NASA/K. Laurini
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In developing the *Global Exploration Strategy*, agencies agreed to establish a coordination mechanism to advance opportunities for coordination and cooperation

- ISECG “terms of reference” were developed along these lines
- First meeting took place in November 2007

**ISECG is an agency coordination forum**

- Focus is on exchange of information regarding current and future plans, and developing products considered important and timely to inform individual agency decision making
- Avoid duplication with other existing agency coordination forums

**ISECG chairmanship rotates approximately once per year**
The first iteration of the Global Exploration Roadmap (GER) was released by ISECG in September 2011
- Second iteration planned Sept 2012

The GER reflects the international effort to collaboratively define technically feasible and programmatically implementable exploration mission scenarios with the common goal of humans on the surface of Mars
- Asteroid Next, Moon Next

A non-binding reference for agencies to inform near-term decisions related to exploration preparatory activities
12 space agencies participated in the GER development
The GER Framework

◆ Three major areas of international discussion
  • Goals and objectives
  • Mission scenarios which are technically feasible and programmatically implementable
  • Near-term collaboration and cooperation of preparatory activities
Global Exploration Roadmap: Exploration Pathways

Near-term Focus on Guiding Capabilities, Technologies and Leveraging ISS

Long-term Focus is Discovery Driven and Enhanced by Emerging Technologies

Mars: Ultimate Goal for All Scenarios

Deep Space Habitat at Earth-Moon Lagrange Point
## Destination Assessment

<table>
<thead>
<tr>
<th>Key Objectives</th>
<th>Mars</th>
<th>Moon</th>
<th>Near-Earth Asteroid</th>
<th>LaGrange Points/Cis-Lunar Space</th>
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</thead>
<tbody>
<tr>
<td>Search for Life</td>
<td>Characterize availability of water and other resources</td>
<td>Demonstrate innovative deep space exploration technologies and capabilities</td>
<td>Expand capability of humans to operate in this strategic region beyond low-Earth orbit</td>
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<td>Advance understanding of planetary evolution</td>
<td>Test technologies and capabilities for human space exploration</td>
<td>Advance understanding of these primitive bodies in solar system evolution and origin of life</td>
<td>Demonstrate innovative deep space exploration technologies and capabilities</td>
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<tr>
<td>Learn to live on other planetary surfaces</td>
<td>Advance understanding of solar system evolution</td>
<td>Test methods to defend the Earth from risk of collisions with near-Earth asteroids</td>
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<td>Utilize the Moon’s unique importance to engage the public</td>
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<td>Significant technology advancements essential for safe and affordable missions</td>
<td>Expenses associated with extended surface activities</td>
<td>Need to better understand and characterize the NEA population</td>
<td>Understand the benefit of human presence vs. robots</td>
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<td>Radiation risks and mitigation techniques must be better understood</td>
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<td>Technology advancements are needed before missions to NEA</td>
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<td>Highly reliable space systems and infrastructure are needed</td>
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<td>Demonstrated ability to use local resources is essential</td>
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Common goals are needed, but recognize that individual agency goals are what is important to an agency

- Search for Life
- Extend Human Presence
- Perform Space, Earth, and Applied Science
- Perform Science to Support Human Exploration
- Develop Exploration Technologies and Capabilities
- Stimulate Economic Expansion
- Enhance Earth Safety
- Engage the Public in Exploration

These are to be iterated and will reflect agency/national priorities
Strategic Principles

- Capability driven framework – follow a step-wise approach to evolving capabilities
- Exploration value – generate public benefits and meet exploration objectives
- International partnerships – provide early and sustained opportunities for diverse partners
- Robustness – provide resilience to programmatic and technical challenges
- Affordability – take into account budget constraints
- Human/Robotic partnership – maximize synergy
Seeking Community Engagement

◆ The GER will be updated by agencies to reflect evolving policies and plans and consensus on exploration scenario planning work

◆ Multiple opportunities to input are expected with each GER iteration

◆ Main expectations for second iteration, planned for Sept 2012
  • Reflecting consensus on any updates to Asteroid Next and Moon Next scenarios
  • Reflecting any ISS Partnership decisions regarding additional uses of ISS for exploration
  • 2nd iteration will maintain at least 2 mission scenarios considered technically feasible and programmatically implementable

◆ IAF/AIAA Global Space Exploration Conference (GLEX) May 2012