

# **The ISECG Global Exploration Roadmap**

**Status update at Target NEO2 Workshop**

**July 9, 2013**

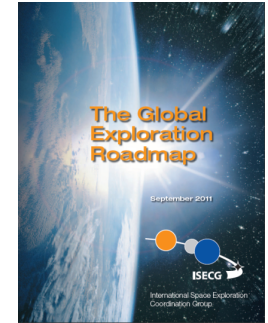
NASA/Kathy Laurini  
Human Exploration & Ops Mission Directorate

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# Global Exploration Roadmap Introduction



- ◆ **The non-binding GER enables agency discussions on important topics such as**
  - Common goals and objectives
  - Advancing long-range mission scenarios and architectures which lead to sustainable human missions to Mars
  - Opportunities for near-term coordination and cooperation on preparatory activities
- ◆ **The GER reflects importance of ISS as foundation for exploration, leading to sustainable human missions to Mars as the common driving goal**
  - Serving as a tool which supports individual agency stakeholder engagement
- ◆ **GER first released in Sept 2011, update end July 2013**



# Participating Agencies



12 space agencies participate in the GER development activity



# Common Goals and Objectives

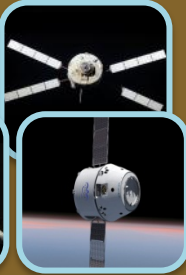
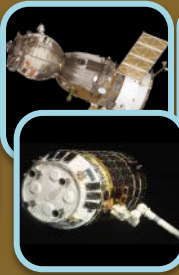


- ◆ Common goals are needed, but recognized individual agency goals are what is important to an agency
  - Search for Life
  - Extend Human Presence
  - Perform Space, Earth, and Applied Science
  - Perform Science to Support Human Exploration
  - Develop Exploration Technologies and Capabilities
  - Stimulate Economic Expansion
  - Enhance Earth Safety
  - Engage the Public in Exploration
- ◆ GER reflects common goals and supporting objectives
- ◆ No significant changes since the initial GER release

**ISS**



**Critical systems  
onboard ISS**



**Crew and Cargo  
Transportation Systems**

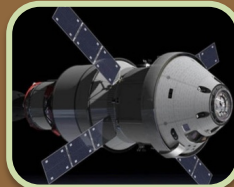
# **Capability Evolution Leading Towards Human Mars Exploration**



**Mission to Visit  
Redirected Asteroid**



**Advanced  
Electric  
Propulsion**



**NASA's SLS and  
Orion**

**To be  
supplied**

**Russian  
Piloted System**



**Surface  
Cargo  
Delivery**

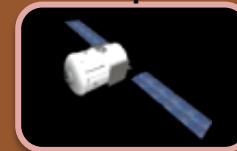


**Lunar  
Lander**

**Evolvable Deep  
Space Habitat**



**Cargo  
Delivery**



**Extended Duration  
Crew Missions**

**Human Lunar  
Surface  
Missions**

- Serve as an optional design reference for agencies to inform decisions on preparatory activities
- Conceptual missions that are considered technically feasible and programmatically implementable



Asteroid Next,  
Moon Next evolve  
to single scenario

# Near-Term Opportunities for Coordination and Cooperation

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- ◆ Significant resources are being expended around the world to prepare for human space exploration
- ◆ Agencies seek opportunities to leverage these investments through knowledge of partner priorities and partnerships: coordination and cooperation
- ◆ The Global Exploration Roadmap framework facilitates achieving alignment with emerging global consensus on exploration scenarios
- ◆ Six opportunity areas have been identified
  - Use of ISS for Exploration
  - Space Systems and Infrastructure Development
  - Robotic Precursor Missions
  - Advanced Technologies
  - Analog Activities
  - Human Health and Performance Risk Mitigation

# Conclusion

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- ◆ The updated GER intended to serve as a tool to help agencies collaboratively advance plans for future human space exploration missions and partnerships
- ◆ The first iteration of the GER was discussed with the broader community in individual or coordinated engagement activities
- ◆ Community engagement opportunities also planned for GER2
  - E.g., NASA Community Workshop on the GER (target Oct 2013-TBC)