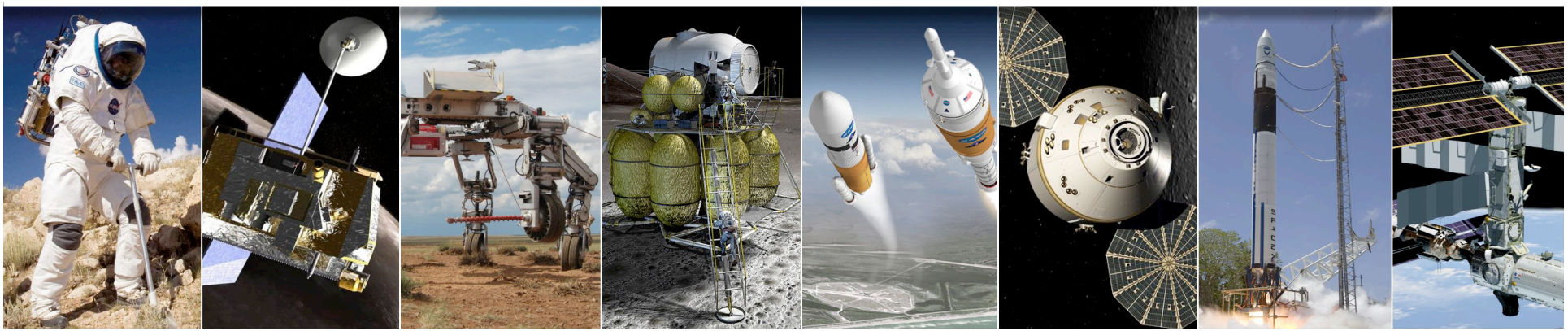
National Aeronautics and Space Administration



Exploration Overview

The Road to the Moon and Beyond

Mr. Geoff Yoder
Director, Directorate Integration Office
NASA Exploration Systems Mission Directorate

June 6, 2008

Background

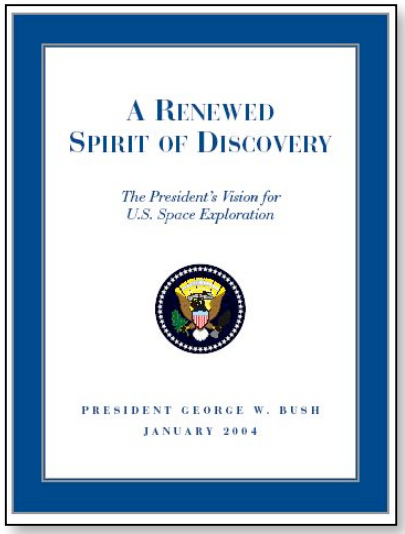
- For the past two years, the US Chamber of Commerce has hosted NASA Lunar Exploration Architecture workshops

- Output from these workshops has been directly incorporated into NASA's Lunar Architecture Plan

- Council agreed to work with NASA on Lunar Standards
  - To identify where standards would be of value
  - Candidate sources of those standards

US Policy for Space Exploration

Foundations for Exploration



NASA Authorization Act of 2005

The Administrator shall establish a program to develop a sustained human presence on the Moon, including a robust precursor program to promote exploration, science, commerce and U.S. preeminence in space, and as a stepping stone to future exploration of Mars and other destinations.

Global Exploration Strategy Themes

Human Civilization

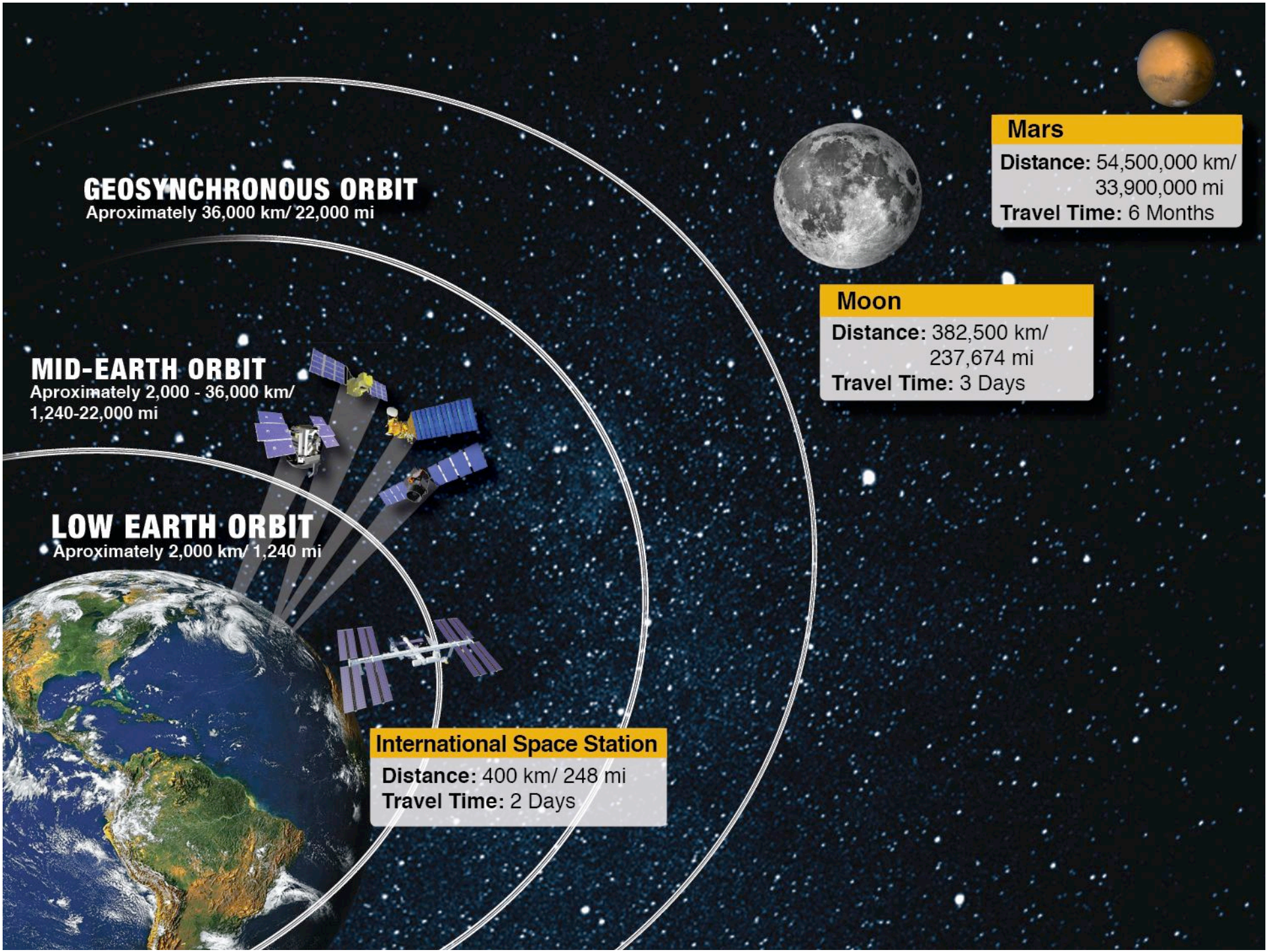
Global Partnerships

Scientific Knowledge

Economic Expansion

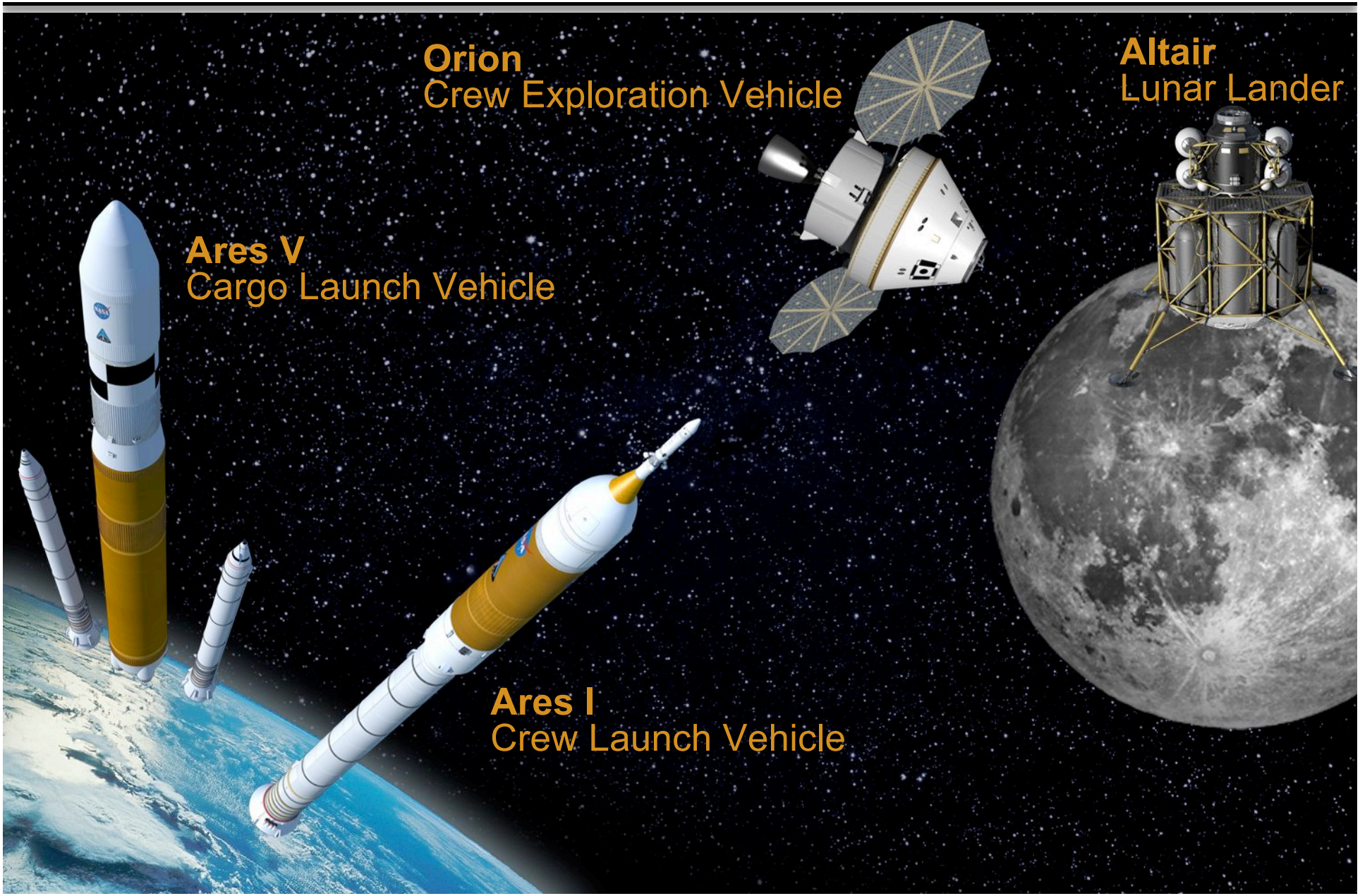
Exploration Preparation

Public Engagement


GEOSYNCHRONOUS ORBIT
Aproximately 36,000 km/ 22,000 mi
MID-EARTH ORBIT
Aproximately 2,000 - 36,000 km/
1,240-22,000 mi
LOW EARTH ORBIT
Aproximately 2,000 km/ 1,240 mi
Mars
Distance: 54,500,000 km/
33,900,000 mi
Travel Time: 6 Months
Moon
Distance: 382,500 km/
237,674 mi
Travel Time: 3 Days
International Space Station
Distance: 400 km/ 248 mi
Travel Time: 2 Days

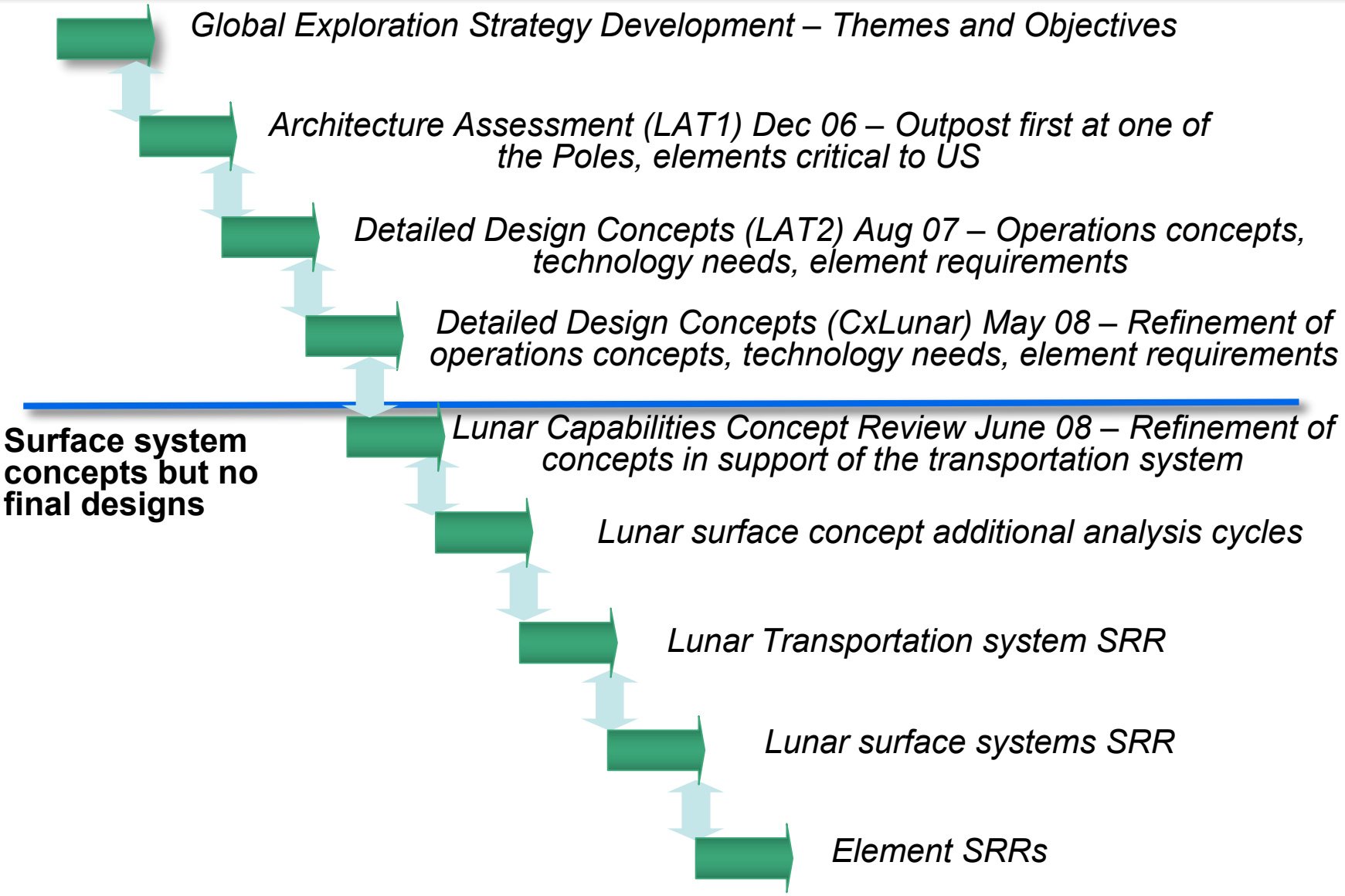
Constellation Architecture

Constellation Architecture Elements



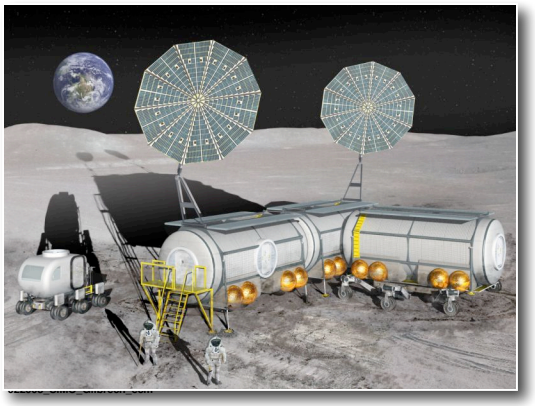
Architecture Driven By A Strategy

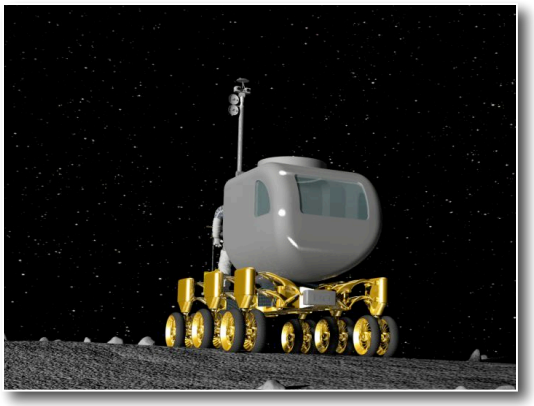
Where We Have Been and Next Steps



Architecture Desired Attributes

- ✓ Enable lunar sustained presence early
- ✓ Develop infrastructure while actively engaged in science and exploration
- ✓ Ensure architecture supports Objectives
- ✓ Support the establishment of Mars analog
- ✓ Allow the earliest partnership opportunities for commerce and International Partners
- ✓ Continuous and focused public engagement

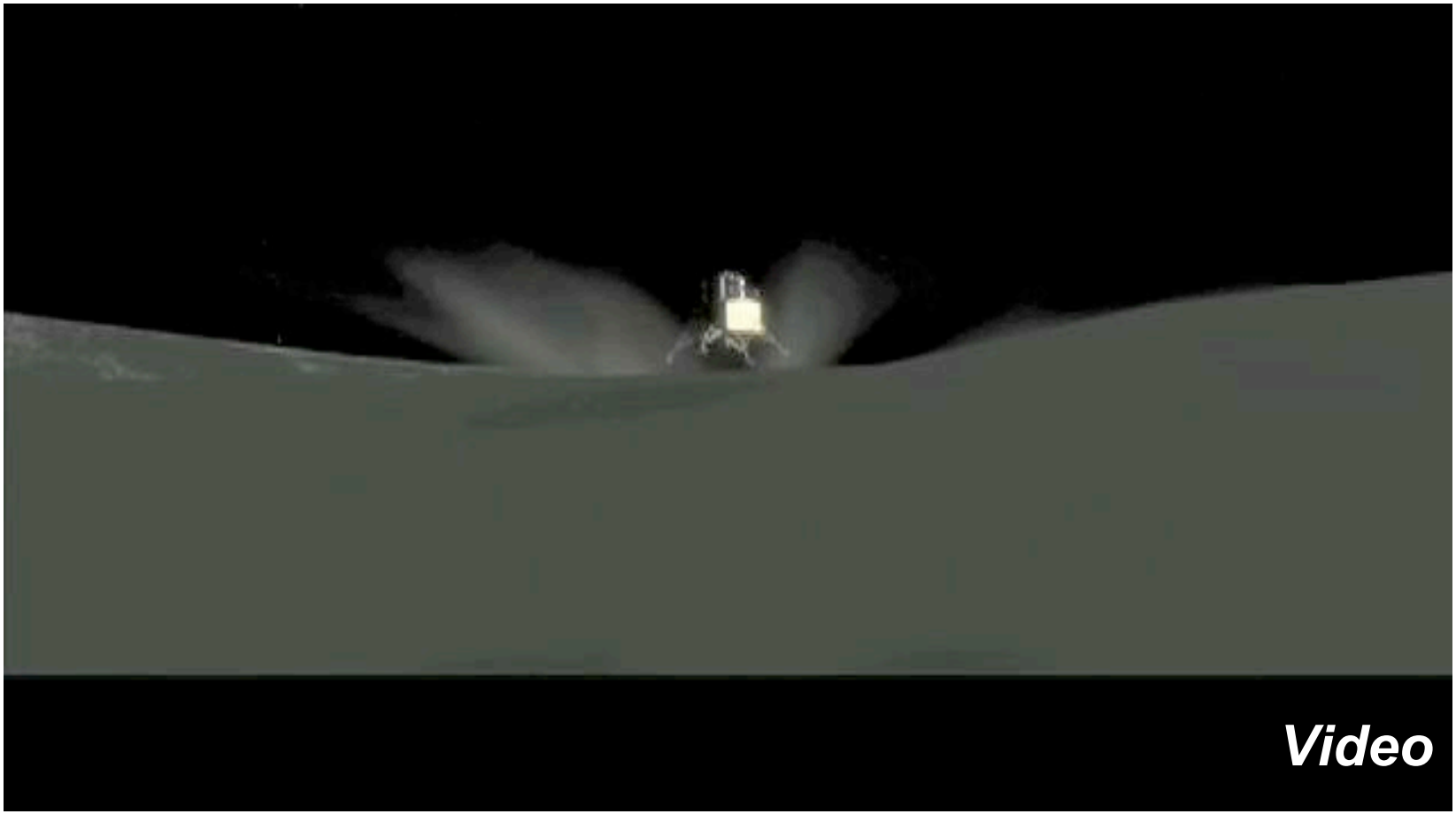




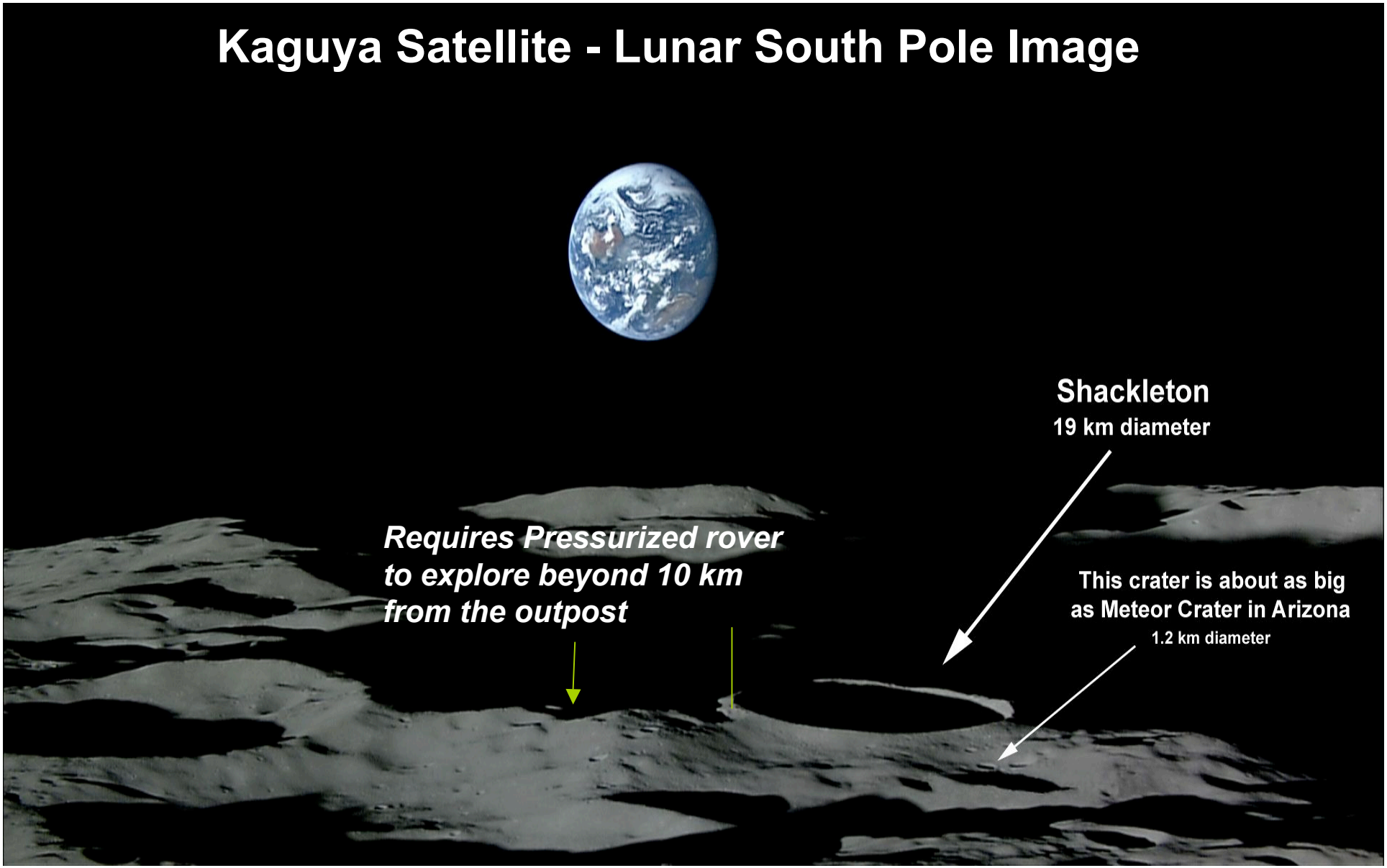
Architecture Guidelines

- In addition to supporting the basic goals and objectives of the Vision, the Architecture must have the following:
  - Programmatic Flexibility – The Architecture must be able to adapt to changes in national priorities and budgets over several election cycles
  - Participant Flexibility – The Architecture must be able to adapt to changes in external participation (Commercial or IP) and changes to their priorities
  - Exploration Flexibility – The Architecture must be able to adapt to changes in exploration priorities and changes in exploration methods

A View of Shackleton



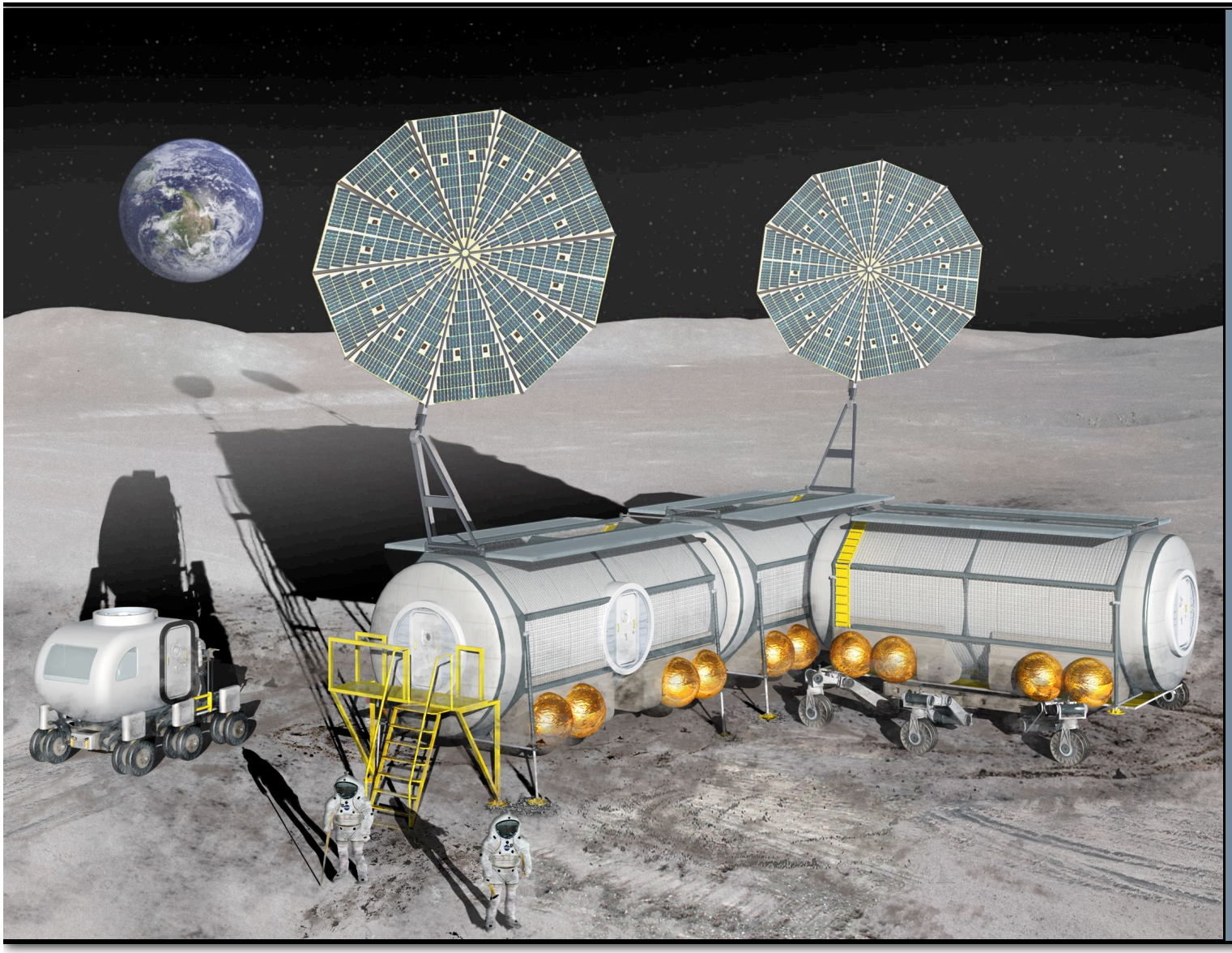
Why is a Pressurized Rover Necessary?



ATHLETE Field Test - Meteor Crater, AZ

September 3-15, 2006

Key Elements of an Outpost



Lander and Ascent vehicle

Extravehicular Activities System

Power

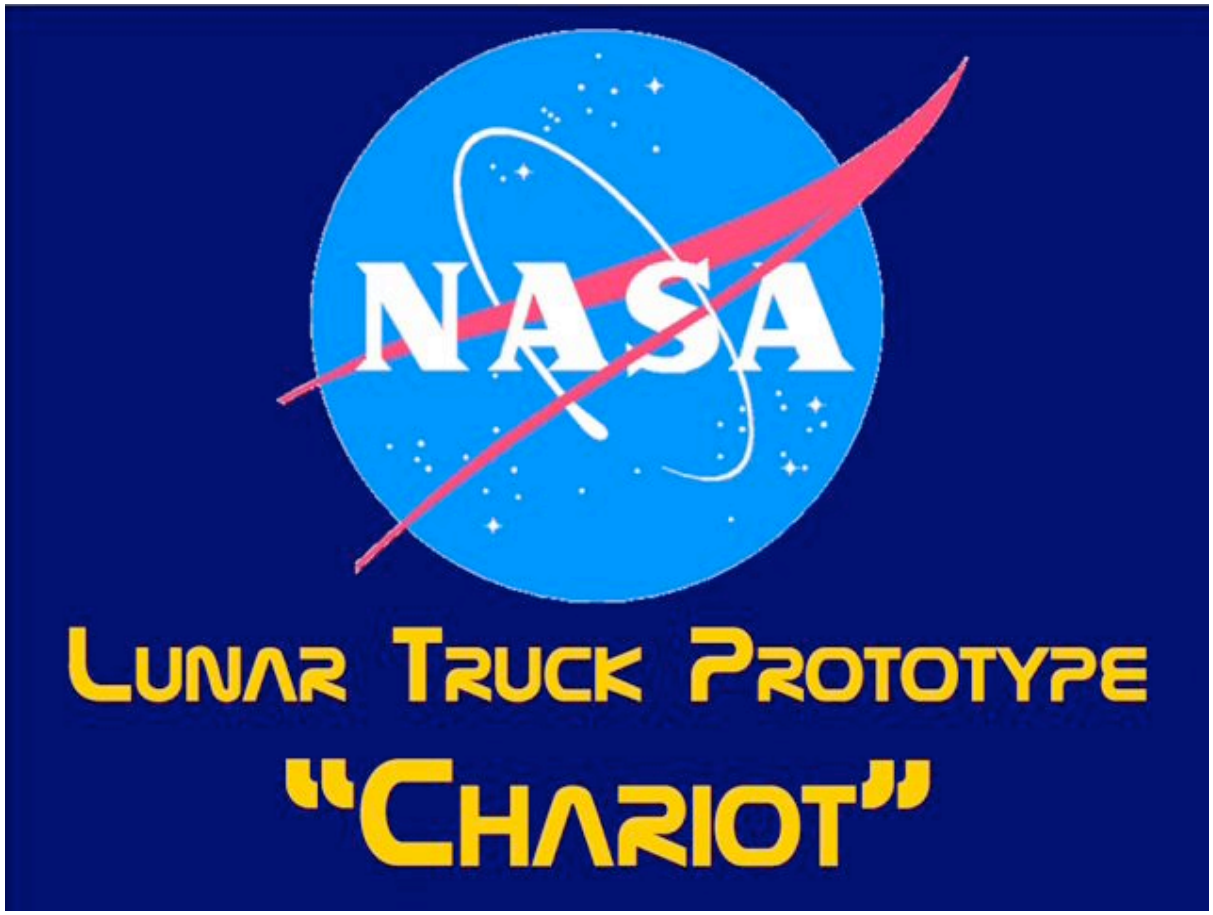
Habitation

Mobility

Navigation and Communication

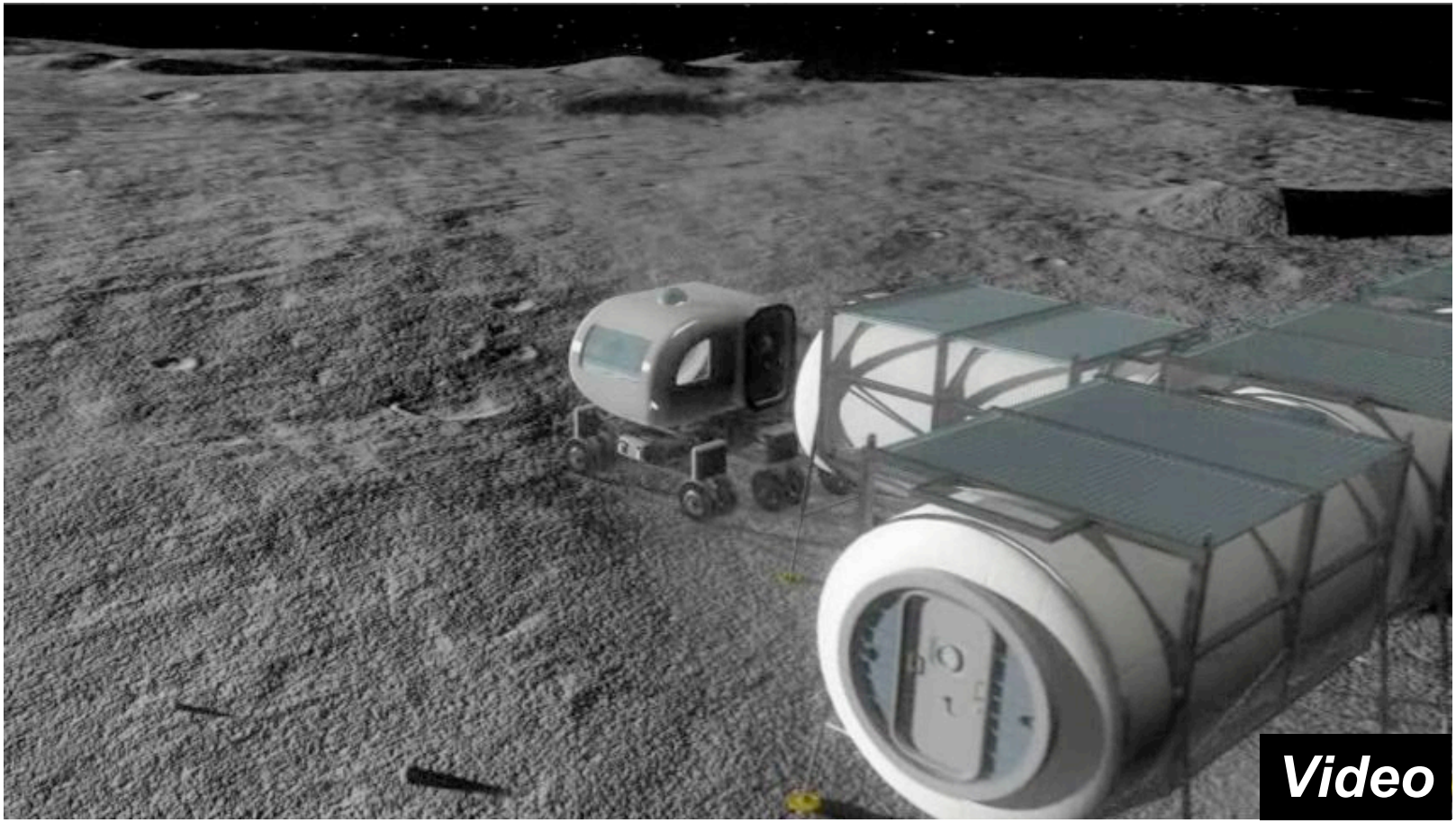
In-Situ Resource Utilization

Chassis C



Video

Pressurized Rover



Summary

- **Looking for innovative concepts and ideas**