



International Industry Participation in the Future of Space Exploration

*A Panel Discussion at the First Space
Exploration Conference*

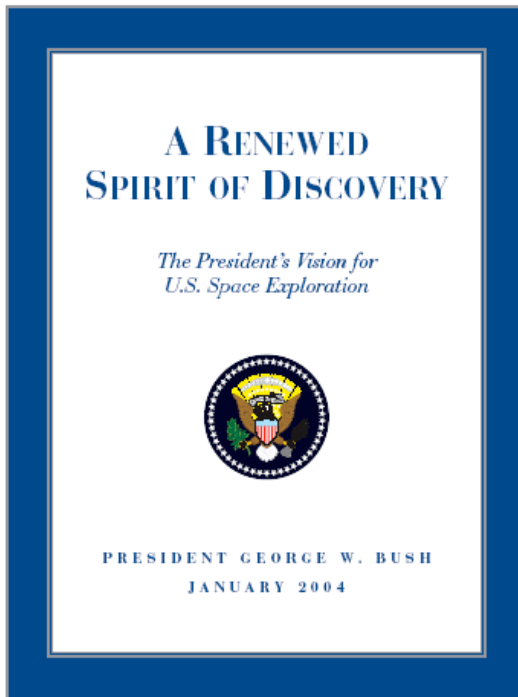


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The Vision for U.S. Space Exploration

THE FUNDAMENTAL GOAL OF THIS VISION IS TO ADVANCE U.S. SCIENTIFIC, SECURITY, AND ECONOMIC INTEREST THROUGH A ROBUST SPACE EXPLORATION PROGRAM



Implement a sustained and affordable human and robotic program to explore the solar system and beyond;

Extend human presence across the solar system, starting with a human return to the Moon by the year 2020, in preparation for human exploration of Mars and other destinations;

Develop the innovative technologies, knowledge, and infrastructures both to explore and to support decisions about the destinations for human exploration; and

Promote international and commercial participation in exploration to further U.S. scientific, security, and economic interests.



Activities directed by the Vision

- **Exploration Activities in Low Earth Orbit**
- **Space Exploration Beyond Low Earth Orbit**
- **Space Transportation Capabilities Supporting Exploration**

**The Vision directs NASA to:
“pursue opportunities for international participation”**



Activities since Jan 2004

- **Report of the President's Commission**
- **Transformation of NASA**
- **Over 125 discussions with international organizations**
 - With traditional partners and potential new partners
- **Coordination with International Space Station Partners**
 - To assess impact of Vision on ISS
 - To discuss potential cooperation in new areas
- **Continuation of operational programs**
 - Dozens have international involvement



November International Workshop

- **Over 100 participants, 19 international space organizations were represented**
- **The workshop goals:**
 - Provide a forum for NASA and international space agencies to exchange information on their individual plans for human and robotic exploration of space;
 - Allow discussion of NASA and international space agency capabilities and areas of interest with regard to cooperation in exploration systems; and
 - Identify appropriate mechanisms for follow-on discussions.



November International Workshop

- **Series of briefings from space agencies**
- **5 working groups covering:**
 - Human Exploration Objectives, Strategy, and Objectives
 - Robotic Exploration Objectives to Support Human Missions
 - Human Missions and Systems - beyond LEO
 - Exploration Systems Research & Technology Development
 - Approaches for International Collaboration
- **Panel discussions and conclusions**



Outcome of the Workshop

- Desire for long-term cooperation; discussion regarding consequences and benefits
 - Political commitment and mandate are important
- Belief that frequent coordination and communication are necessary
- Desire to continue dialogue within an international coordination mechanism to be defined
- Interest in common standards and compatibility
- Desire for equal partnership based on mutual respect



Actions From Workshop

- Development of a “core competencies matrix” for exploration
- Agreement to share roadmaps
- Agreement that current international working groups should be utilized, combined, or disbanded
 - depending on synergy with exploration goals
- Identify near-term technology opportunities for collaboration



Role of International Industry

- International Industry will play a key role
- NASA activities have included International industry since the beginning
 - 3000 international agreements since 1958
- Future participation of international industry will occur through a variety of mechanisms
 - NASA has no preconceived notion of the “ideal” model
 - Industry-to-industry arrangements could include teaming, partnering and joint ventures, among others
 - The details of the actual proposed collaboration will likely determine the best approach



Role of International Industry

- U.S. and international industry are enthusiastic:
 - Concept Exploration and Robotics Broad Agency Announcement (BAA)
 - 37 proposals; 11 selected (2 international)
 - Extramural System of Systems BAA for Spiral 2 & beyond
 - 3700 proposals: 500 selected (50+ with international participation)
 - Human and Robotic Technology BAA
 - 497 proposals; 70 selected (17 with international participation; 2 as primes)



Summary

- The President has provided NASA with clear direction, one that includes a mandate for international cooperation
- We are very encouraged by the international response and will to continue the dialogue
 - NASA expects international industry to play a major role in achieving mutually beneficial exploration goals
- Today's international industry panel discussion:
 - Is an important step in soliciting the opinions of international industry
 - Will allow a unique perspective on how international industry can participate