



EXPLORE

*EXTENDING HUMAN PRESENCE
INTO THE SOLAR SYSTEM*

Ken Bowersox

Deputy Associate Administrator
Human Exploration and Operations
NASA Headquarters, Washington, D.C.

United Nations Committee on the
Peaceful Uses of Outer Space (COPUOS)
June 12, 2019

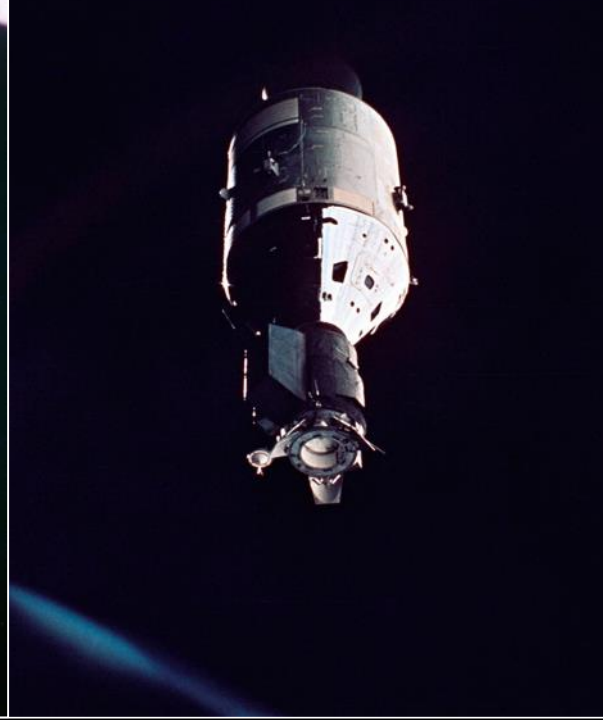


Humans are going to the Moon in the next decade
and we are going to stay.

We will use what we learn on the Moon
to take the next giant leap...

Sending astronauts to Mars
and destinations beyond.





We've been launching humans into space for more than 50 years





We've carried the dreams of nations





We've transcended international borders to build the most sophisticated in-space technology the world has ever known



A testbed for deep space exploration, there are six astronauts from three different countries living and working on station



David Saint-Jacques, CSA

Anne McClain, NASA

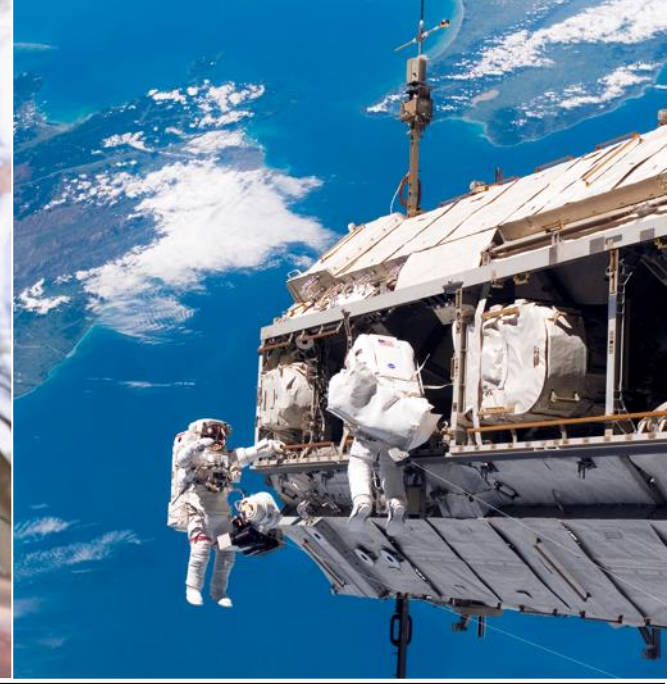
Oleg Kononenko, Roscosmos

Alexey Ovchinin, Roscosmos

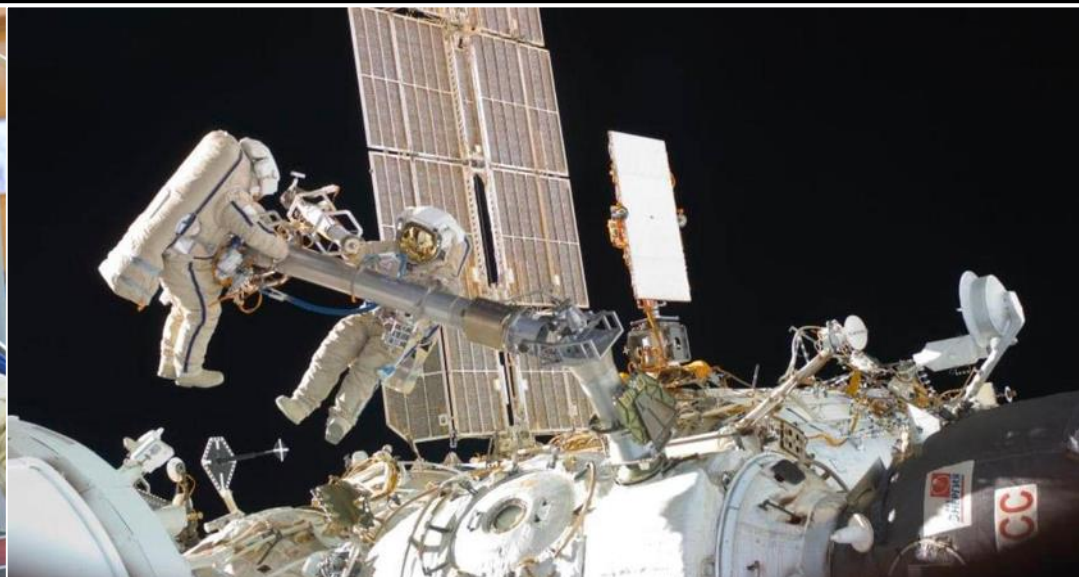
Nick Hague, NASA

Christina Koch, NASA





On Earth, there are many things that pull us apart – it is wonderful to find things like exploring space to pull us together





UNITY – DISCOVERY – HUMANITY – OPPORTUNITY



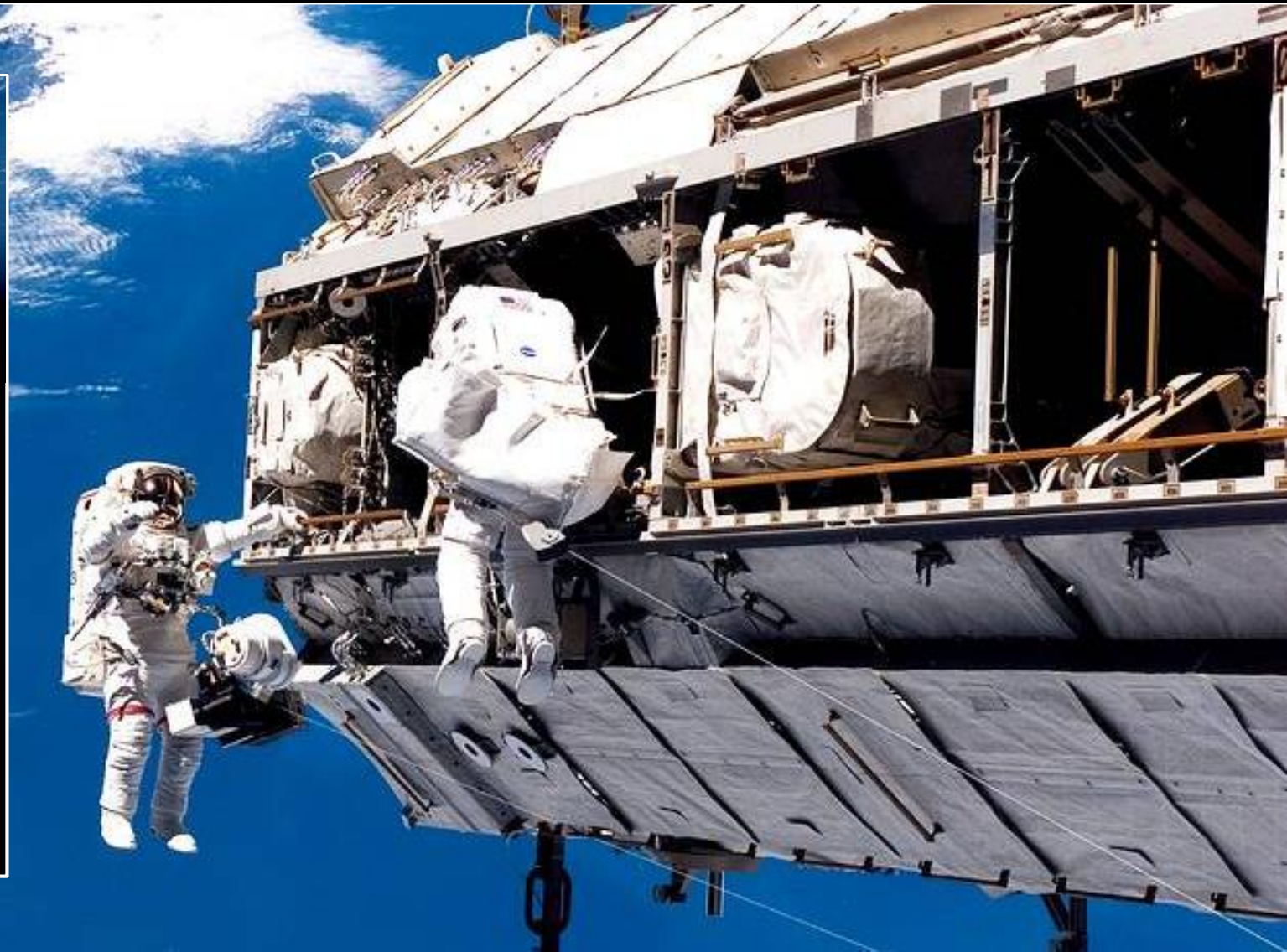
International Interoperability Standards

Preparing for deep space exploration



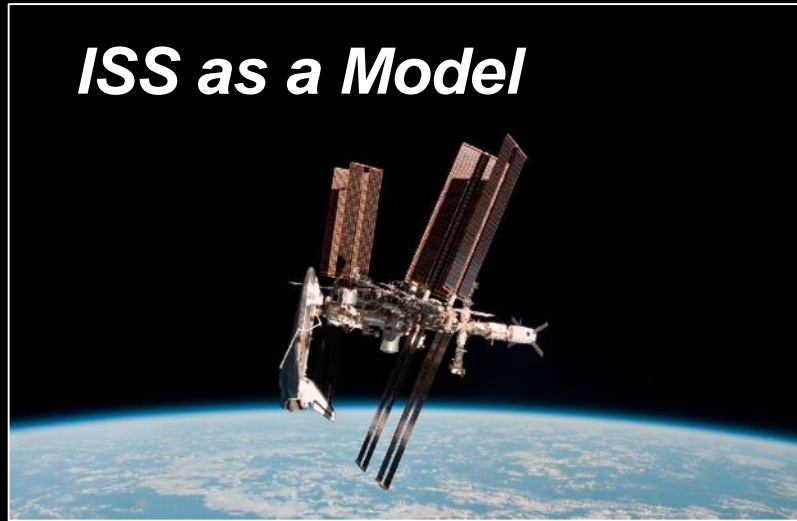
- Avionics
- Communications
- Environmental Control and Life Support Systems
- Power
- Rendezvous
- Robotics
- Thermal

www.InternationalDeepSpaceStandards.com



Open Architecture Creates Opportunity

COMMERCIAL CARGO & CREW



Cygnus (Northrop Grumman)



Dragon (SpaceX)



Dream Chaser (SNC)



Crew Dragon (SpaceX)



Starliner (Boeing)

INTERNATIONAL



Soyuz & Progress
(Roscosmos)



H-II Transfer
Vehicle (JAXA)



Orion/European
Service Module (ESA)



Gateway



Lunar Surface

Multiple providers expected in lunar orbit and on the surface

Space Policy Directive-1

Reinvigorating America's Human Space Exploration Program



“Lead an innovative and sustainable program of exploration with commercial and international partners to enable human expansion across the solar system and to bring back to Earth new knowledge and opportunities.

Beginning with missions beyond low-Earth orbit, the United States will lead the return of humans to the Moon for long-term exploration and utilization, followed by human missions to Mars and other destinations.”

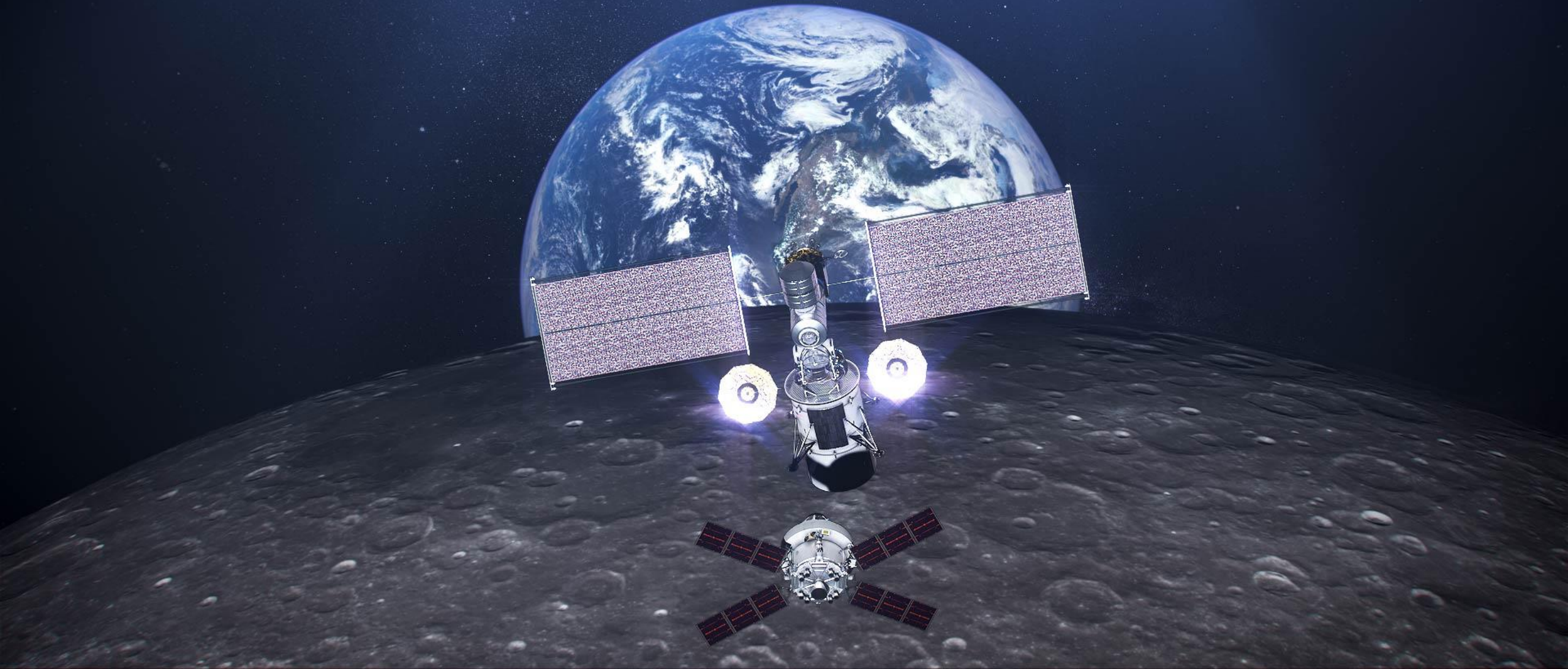
The image is a composite of two scenes. On the left, a rocket is being mated to the International Space Station (ISS) in a launch bay. The rocket has a white nose cone with the NASA logo and 'UNITED STATES' text, and a large orange boosters section. On the right, a spacecraft is shown in orbit above Earth's horizon. The spacecraft has a white nose cone with illuminated windows and solar panels. The background is the dark expanse of space with stars.

Deep Space Exploration System

Building the right system for deep space exploration

Gateway

Designing a strategic and sustainable presence in cislunar space



Developing a New Approach

1. Open to multiple destinations and missions
2. Allows human exploration to advance at sustainable pace
3. Leverages commercial and international partnerships



The background image features a collage of space-related elements: a view of Earth from space on the left, the Moon in the upper left, the International Space Station (ISS) in the upper left, the Orion spacecraft in the center, the Gateway lunar station in the lower right, and the planets Mars and Jupiter on the right side.

International Space Station

- ✓ *Testing and demonstration of Exploration Systems*
- ✓ *Open Interoperability Standards*
- ✓ *Commercial cargo and crew*

Space Launch System – For transportation augmented with commercial capability

Orion – To carry the crew to space and sustain astronauts during long-duration missions

Gateway – Enabling reusable in-space operations and opening up commercial opportunities in deep space

Human Landing System – Providing crew access to explore the surface of Earth's Moon

Mars

Vistas of opportunity and discovery



Earth

