

11 February 2020,
57th Session of COPUOS STSC, Vienna

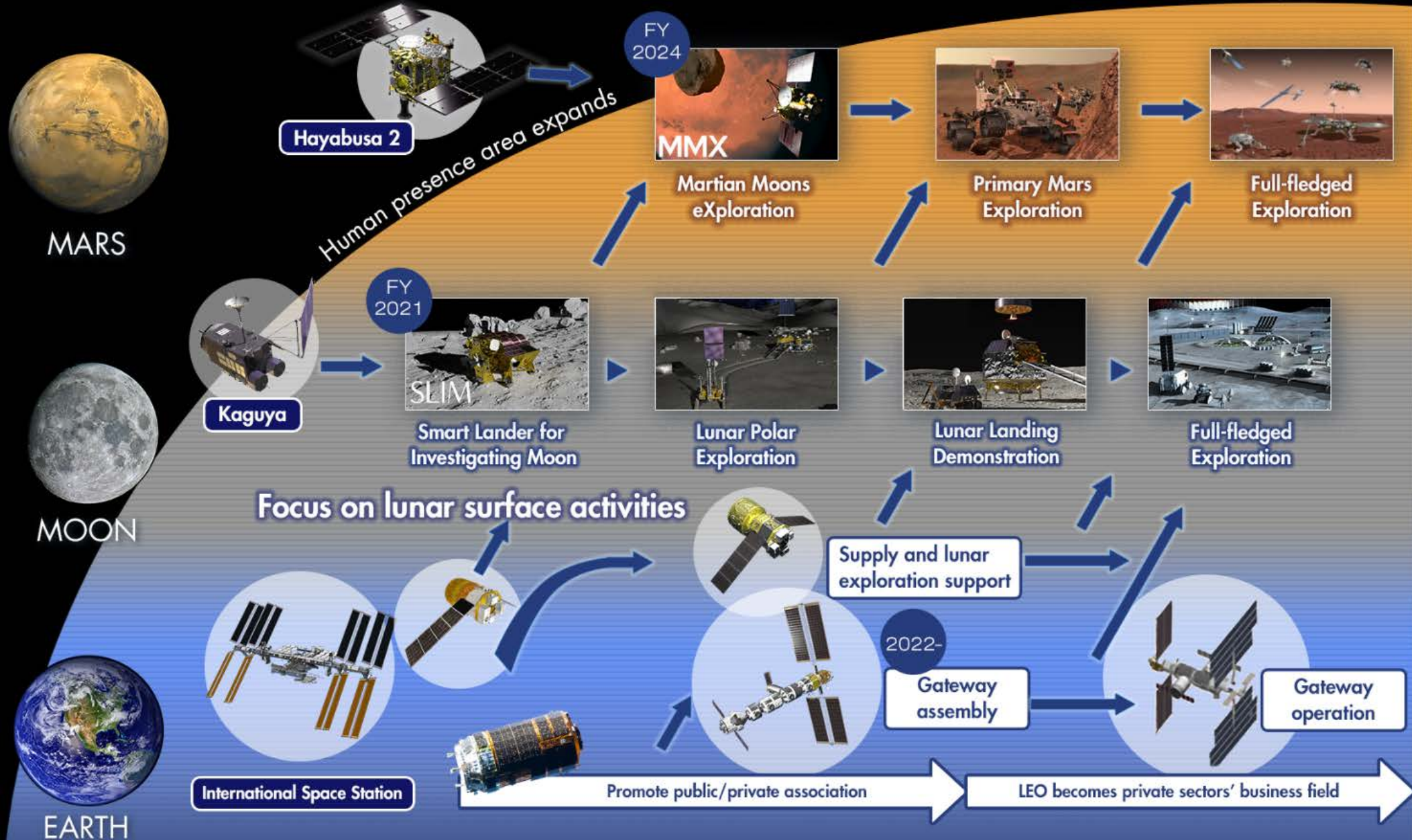
JAXA's Lunar Exploration Activities

Hiroshi Sasaki

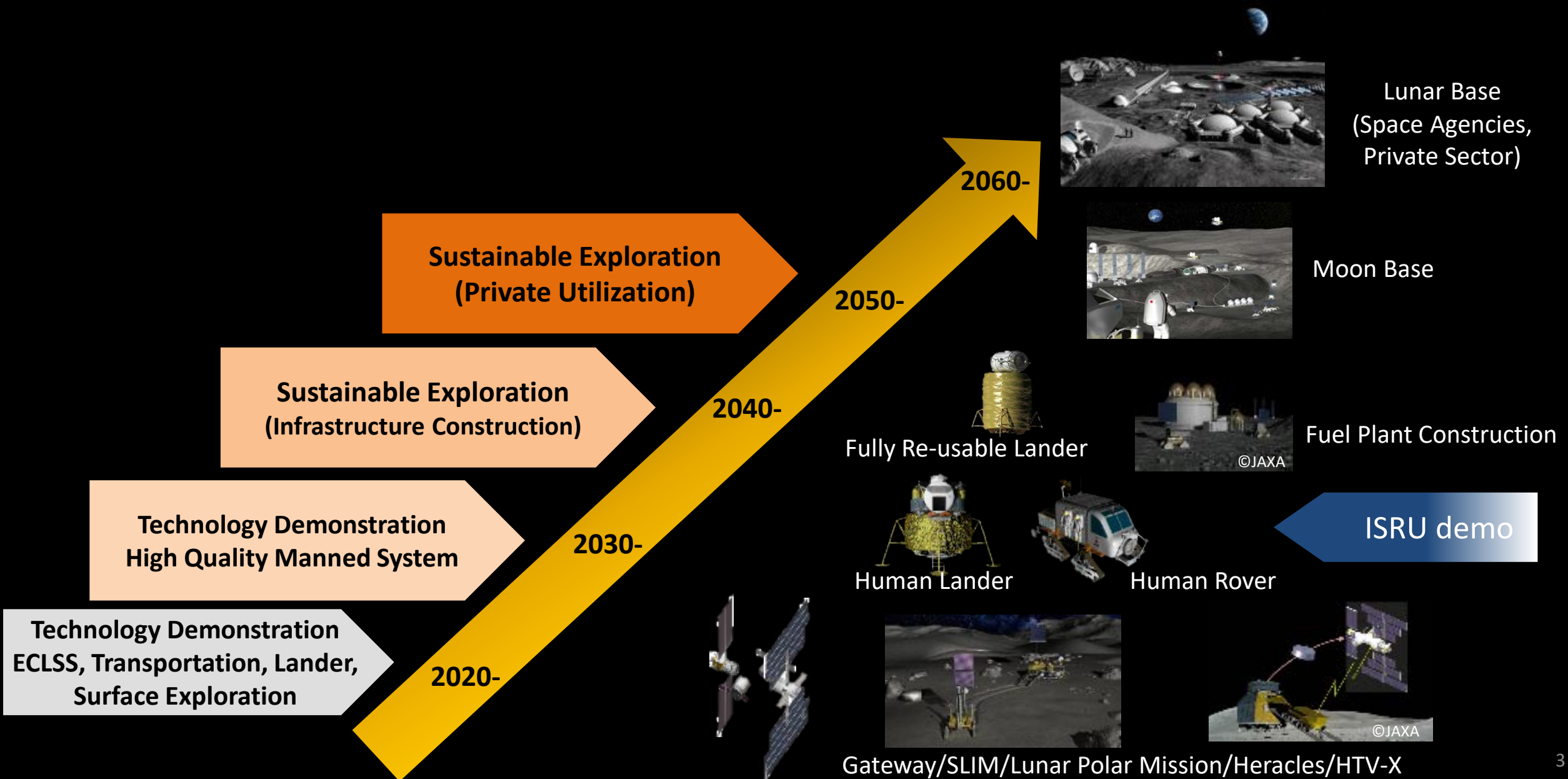
Director, JAXA Space Exploration Center (JSEC)

Japan Aerospace Exploration Agency

JAXA's Scenario for International Space Exploration



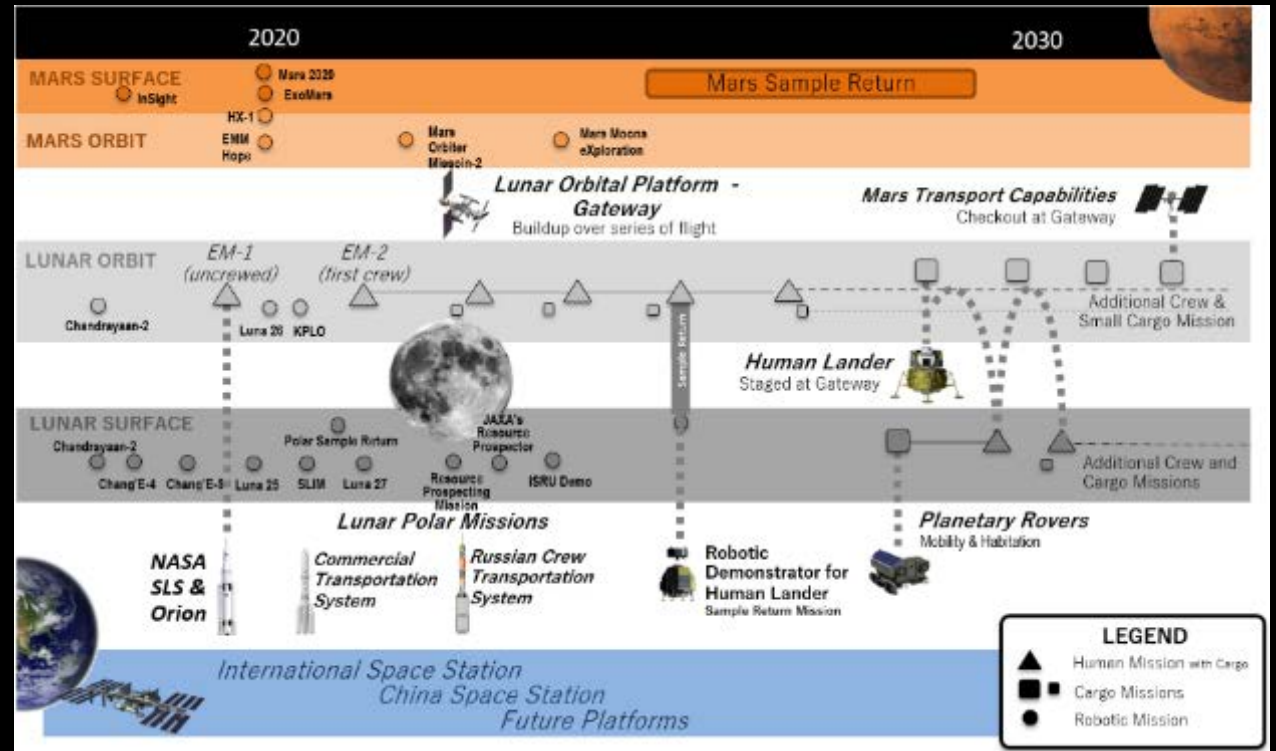
JAXA's Lunar Exploration Roadmap (Long-Term)



International Space Exploration Coordination Group (ISECG)



- ISECG is a non-political agency coordination forum of space organization from 22 countries and regions.
- JAXA is currently the chair of ISECG.
- ISECG agencies work collectively in a non-binding, consensus-driven manner towards advancing the Global Exploration Strategy.



- On October 3-4, 2019, senior managers of 11 agencies met at ISECG meeting in Tokyo to promote international efforts toward the Moon and Mars exploration.
- ISECG members affirmed:
 - The importance of collaborative approaches
 - Developing an updated reference lunar surface exploration scenario
 - The ongoing efforts in LEO to demonstrate advancing systems and technology readiness
- ISECG also expressed to engage stakeholders and to increase public support to realise sustainable exploration for future generations.



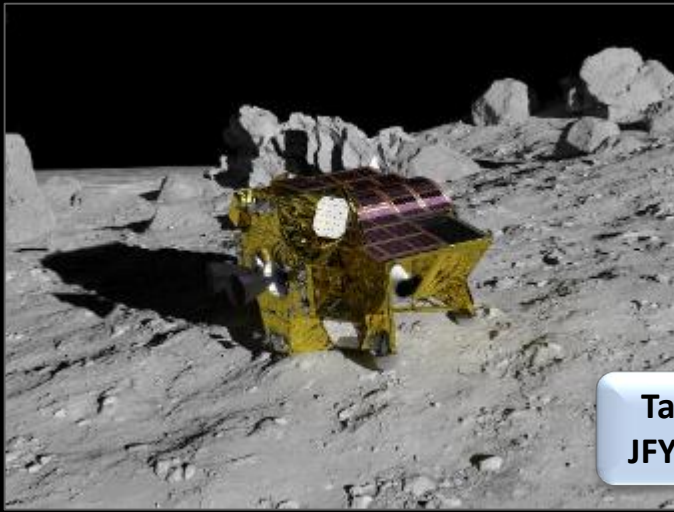
ISECG 22 Participating Agencies



SLIM

*Smart Lander for Investigating the Moon

Demonstration of pin-point lunar landing technologies

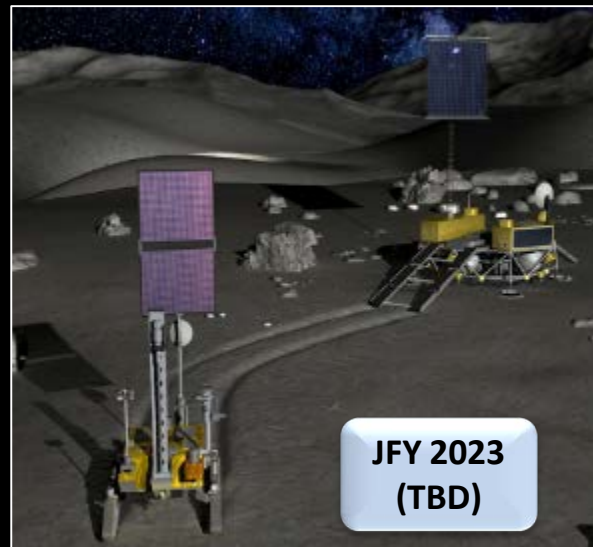


Target:
JFY 2021

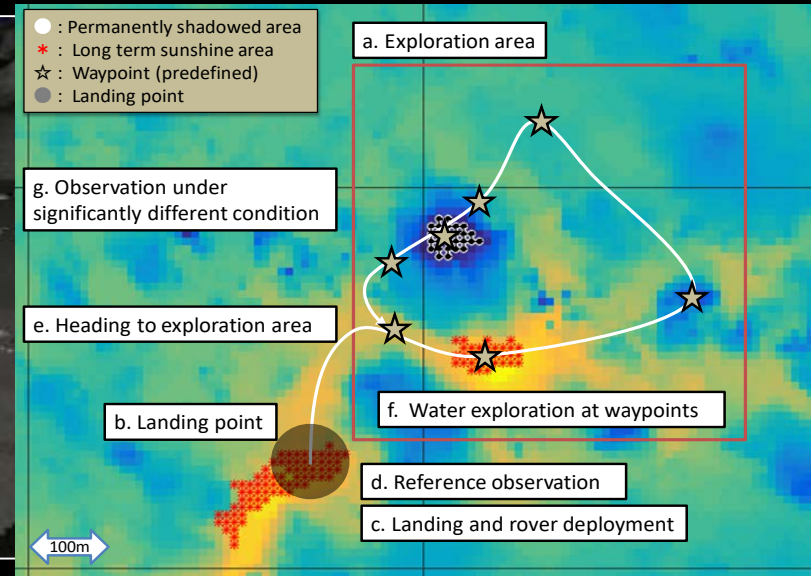
Mass	210 kg at the time of landing
Landing Accuracy	Up to 100m
Science instruments	Multi-band camera for mineralogical characterization
Science objective	Characterization of rocks from deep interior

Lunar Polar Exploration Mission

Obtain knowledge of water resource on the Moon



JFY 2023
(TBD)



- Explore lunar polar region suitability for establishing a lunar base for sustainable activities
- JAXA and ISRO are conducting joint study on lunar polar exploration mission.
- Demonstrate lunar and planetary surface exploration technologies e.g. vehicular transport and overnight survival.

Hayabusa 2

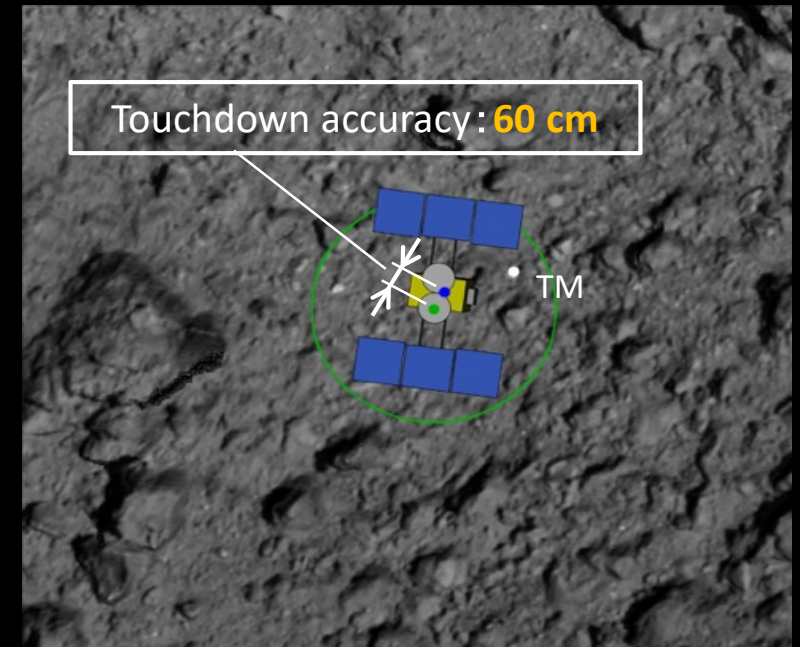
- Stayed Asteroid Ryugu for 14 months.
- 2 rovers, 1 lander and 4 target markers were delivered through the mission.
- Left Ryugu in Dec 2019, and returning to the Earth in the end of 2020.



Asteroid Ryugu and Hayabusa 2



2nd Touchdown to artificial Crater



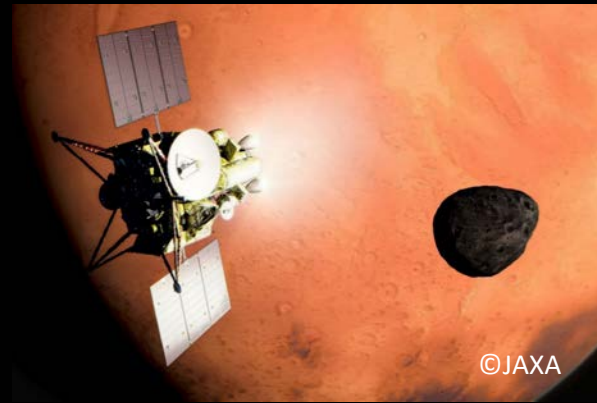
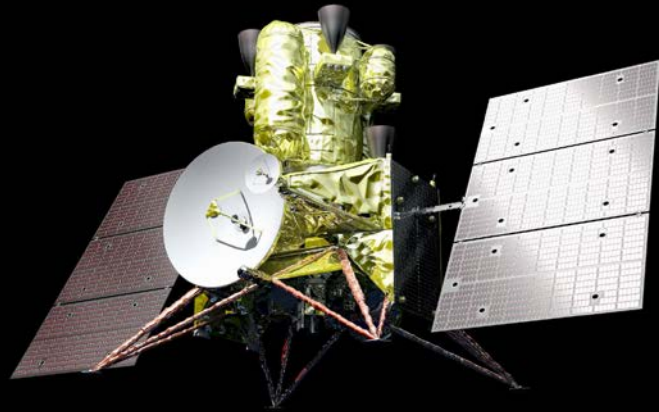
Martian Moons eXploration (MMX)

MMX (Launch Target: 2024)

- Sample return from a Martian satellite
- Jointly with NASA, ESA, CNES, and DLR



Phobos, and Deimos



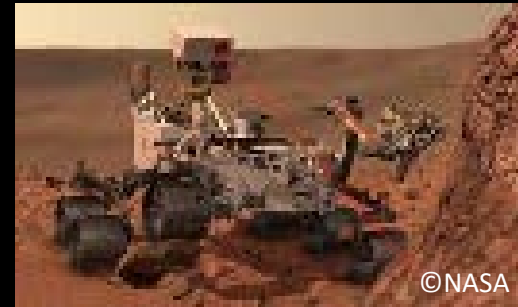
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Initial Exploration

- Following Mission is under study
- Remote Sensing Mission or Landing Mission (with pinpoint landing)



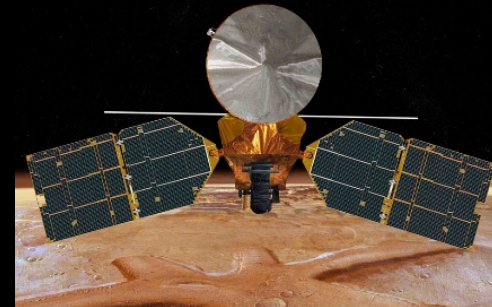
Mars



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Mass	4,000kg
Operation Period	5 years (Planned) 3 years stay
Mission Instrument	Sampler, Gamma-ray/neutron spectrometer, Visible cameras, Near-IR spectrometer, LIDAR, Dust counter, Ion mass spectrometer, etc.
Science Objective	<ul style="list-style-type: none">• Clarify the origin of Phobos/Deimos• Characterize the nature of Martian environment.



- Strategic Headquarters for National Space Policy, was held in October 2019
- The Government decided to join the international space exploration, and will proceed on coordination in the following four areas:

1. Provision of Japanese technology for Gateway Phase1
2. Logistics resupply for Gateway using HTV-X and H3
3. Sharing data and technologies for landing sites selection
4. Developing transportation vehicles for lunar surface exploration



JAXA's Contribution to Gateway

- Gateway will facilitate communication between Earth and the Moon, and contributes to the exploration of the lunar poles and the Moon's dark side.
- Japan will provide habitation technologies and logistics resupply.

Habitation technologies for Gateway Phase-1

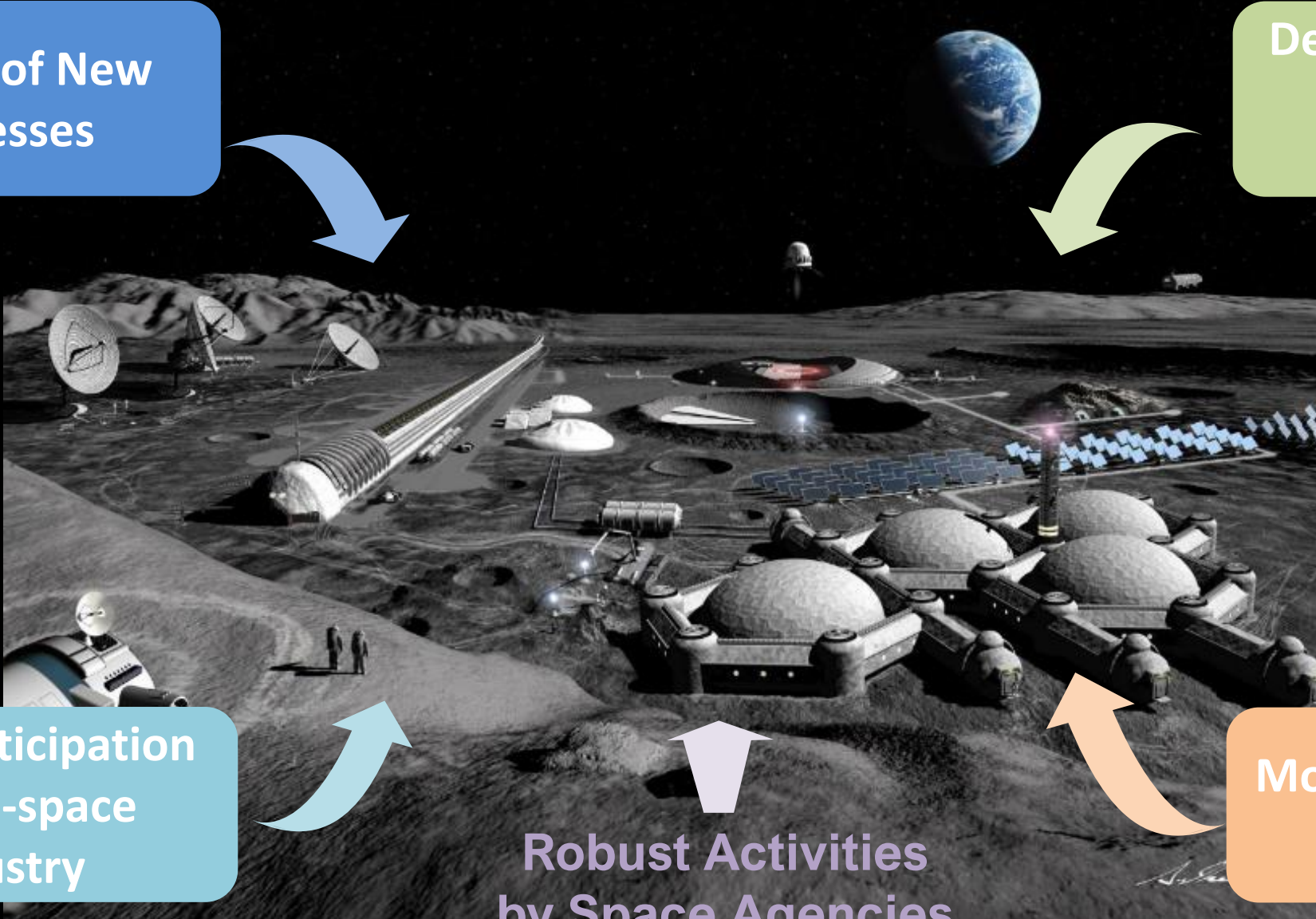
Logistics Resupply (HTV-X)

Toward Sustainable Exploration Activities



Creation of New
Businesses

Deep Collaboration
with Science
Communities



More Participation
of Non-space
Industry

More Entry of Start-
ups

Robust Activities
by Space Agencies

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- The background of the slide is a dark space scene. On the left side, a large, detailed view of the moon's surface is visible, showing numerous craters and a textured grey surface. In the center and right, a blue and white crescent of the Earth is visible against the blackness of space, which is filled with small white stars.
- We aim to advance space exploration by
 - contributing to intellectual assets
 - expanding human sphere into outer space
 - JAXA will actively participate in international discussions and advance space exploration by making the most of our scientific/technical expertise and experiences.
 - International cooperation and joint efforts of the industry, academia, governments and space agencies are the fundamental key.