Global partnership for Space Exploration

High Level Forum, November 7 2017

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JAXA

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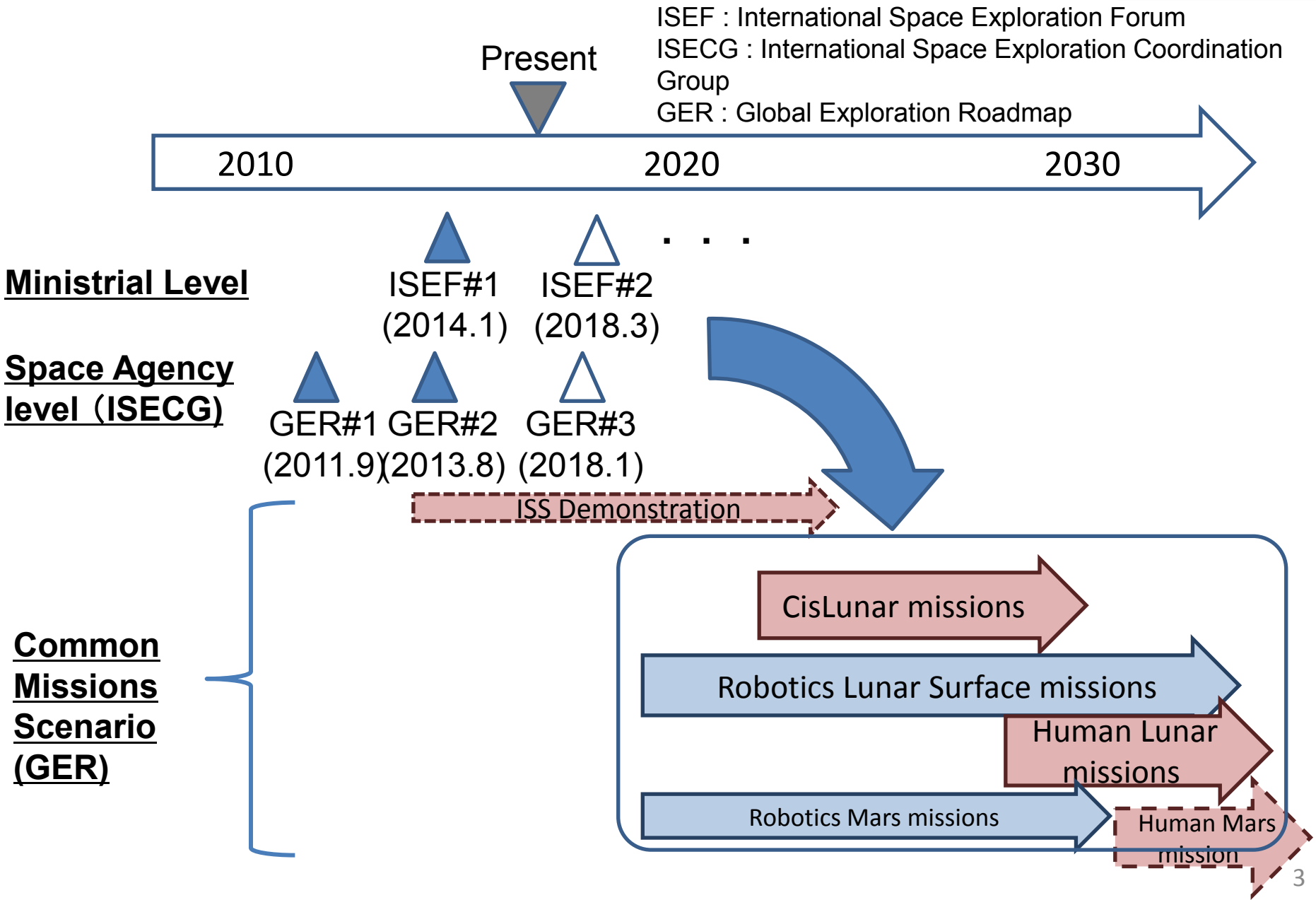
Coordination Status on International Space Exploration

Core Coordination Scheme around Space Agencies



Outline of ISECG

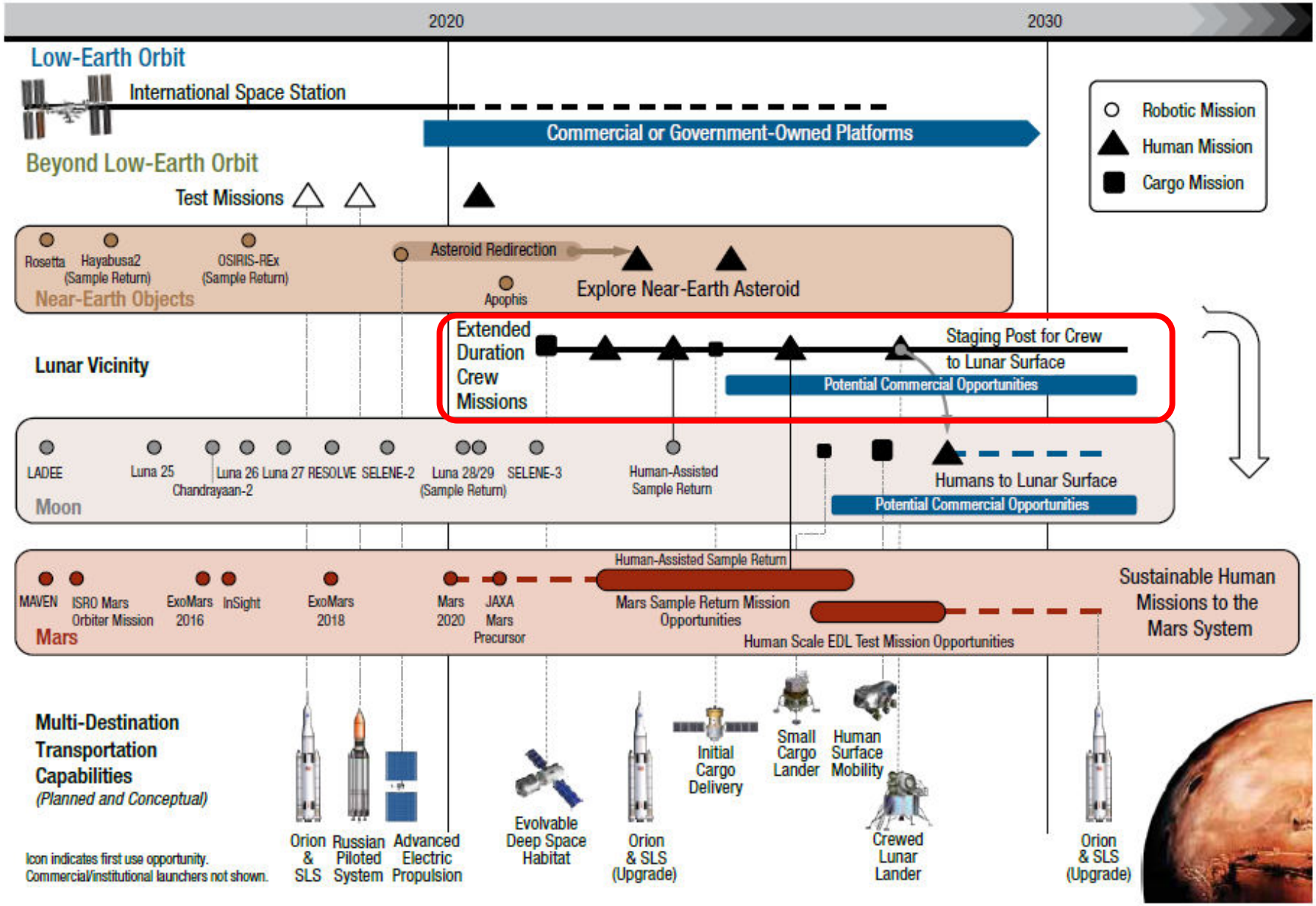
ISECG : International Space Exploration Coordination Group

- ISECG performs technical studies for internationally corroborative space exploration among space agencies.
- Participants voluntary discuss and exchange information and interests on the space exploration.
- The results and documents from the discussion are recommendation or views, and legally nonbinding.
- ISECG was established in 2007, and continues the activities with the participation of 15 agencies(*)
- Chairmanship was adopted since Jun, 2010.（1st chair was NASA, 2nd JAXA, 3rd CSA, 4th ESA, current chair is NASA）
- ISECG has been working on Global Exploration Roadmap (GER) since 2010, and published 1st iteration in 2011, and 2nd iteration in 2013.
- Publication of 3rd iteration of GER is expected in Jan., 2018.

*15 Agencies： ASI, **CNES**, CNSA, CSA, CSIRO, **DLR**, **ESA**, ISRO, **JAXA**, KARI, **NASA**, Roscosmos, SSAU, UKSA, UAE SA (alphabetical order)

Outline of GER2

Space Exploration Scenario



Outline of GER2

Major Elements

(already Planned)

NASA
SLS

NASA
Orion (4 crew)

ROSCOSMOS
Next Gen. Spaceship

ROSCOSMOS
Next Gen. Rocket

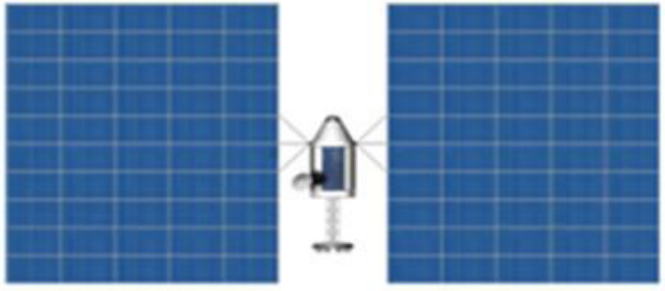
Outline of GER2

Major Elements

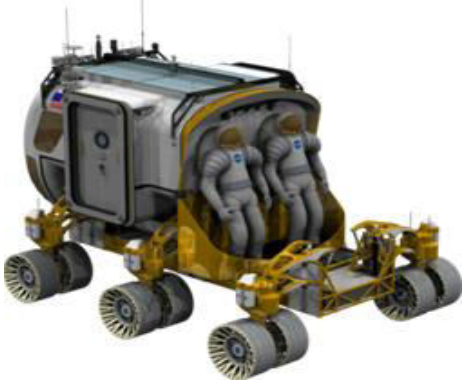
(Not planned)

Deep Space Gateway
(4 crew)

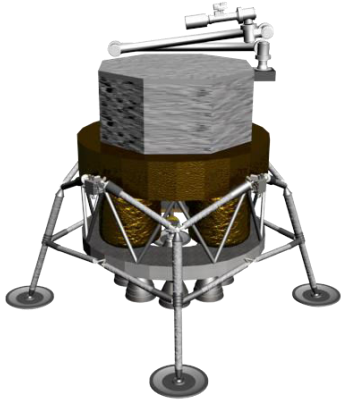
Human Lander/Ascender
(4 crew)



Solar Electric Propulsion



Pressurized Rover
(2 crew, several 100kms)



Logistic Lander

Status on GER ver.3

- Four discussion points identified toward ISEF#2 in order to define more near term scenario for International lunar exploration missions

① Robotics lunar surface missions

- Coordinate possible missions to investigate water resource on Lunar surface
- Demonstrate necessary technologies for human lunar surface missions

② Cis-Lunar missions

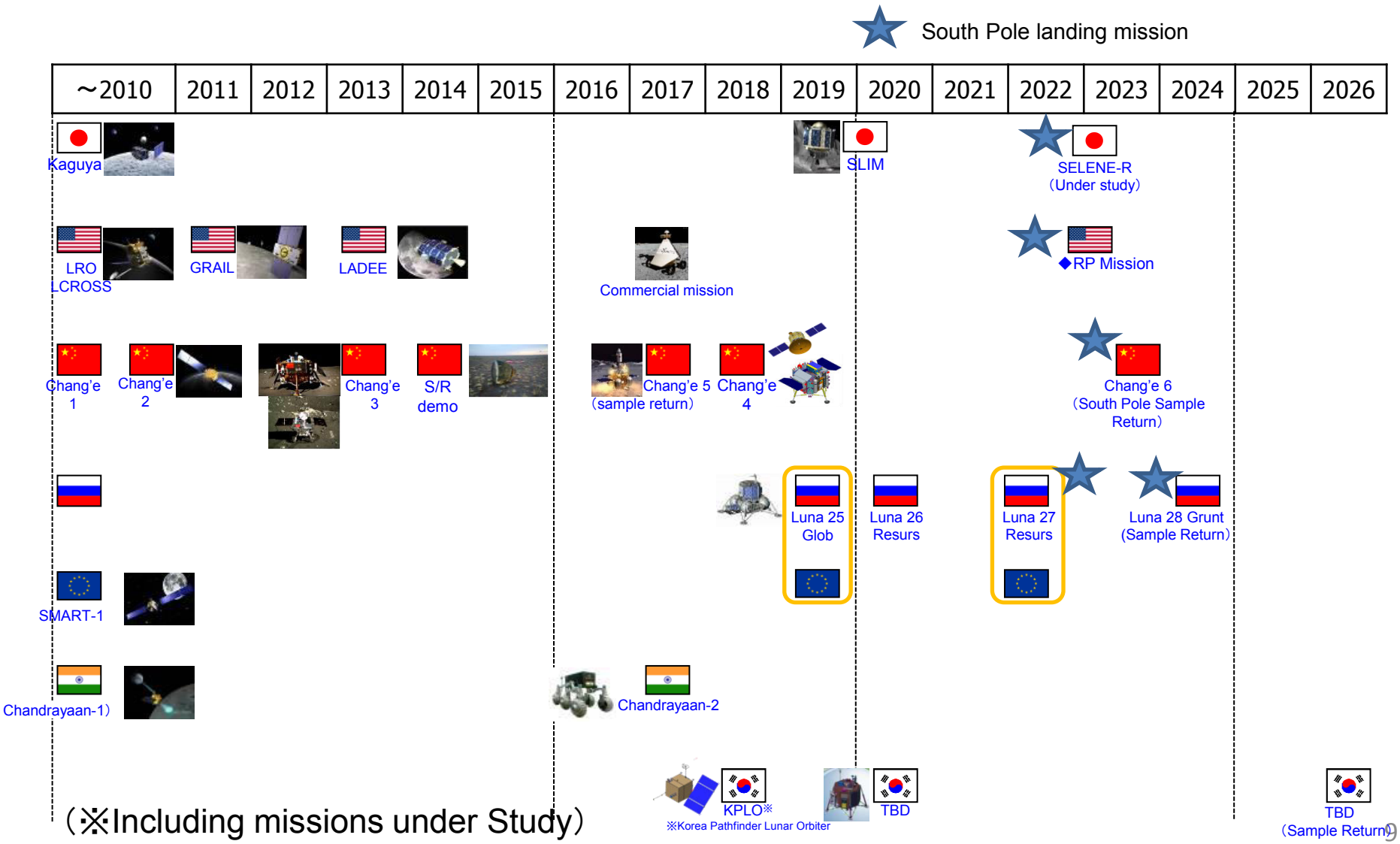
- Establish man-tended cis-Lunar station to demonstrate human technologies for human missions to Mars
- Hub station for Human Lunar surface mission

③ Human lunar surface missions and architecture

- Necessary study for human surface mission, core systems configuration, concept of Lunar lander and rover, maneuver plan toward the moon, etc.

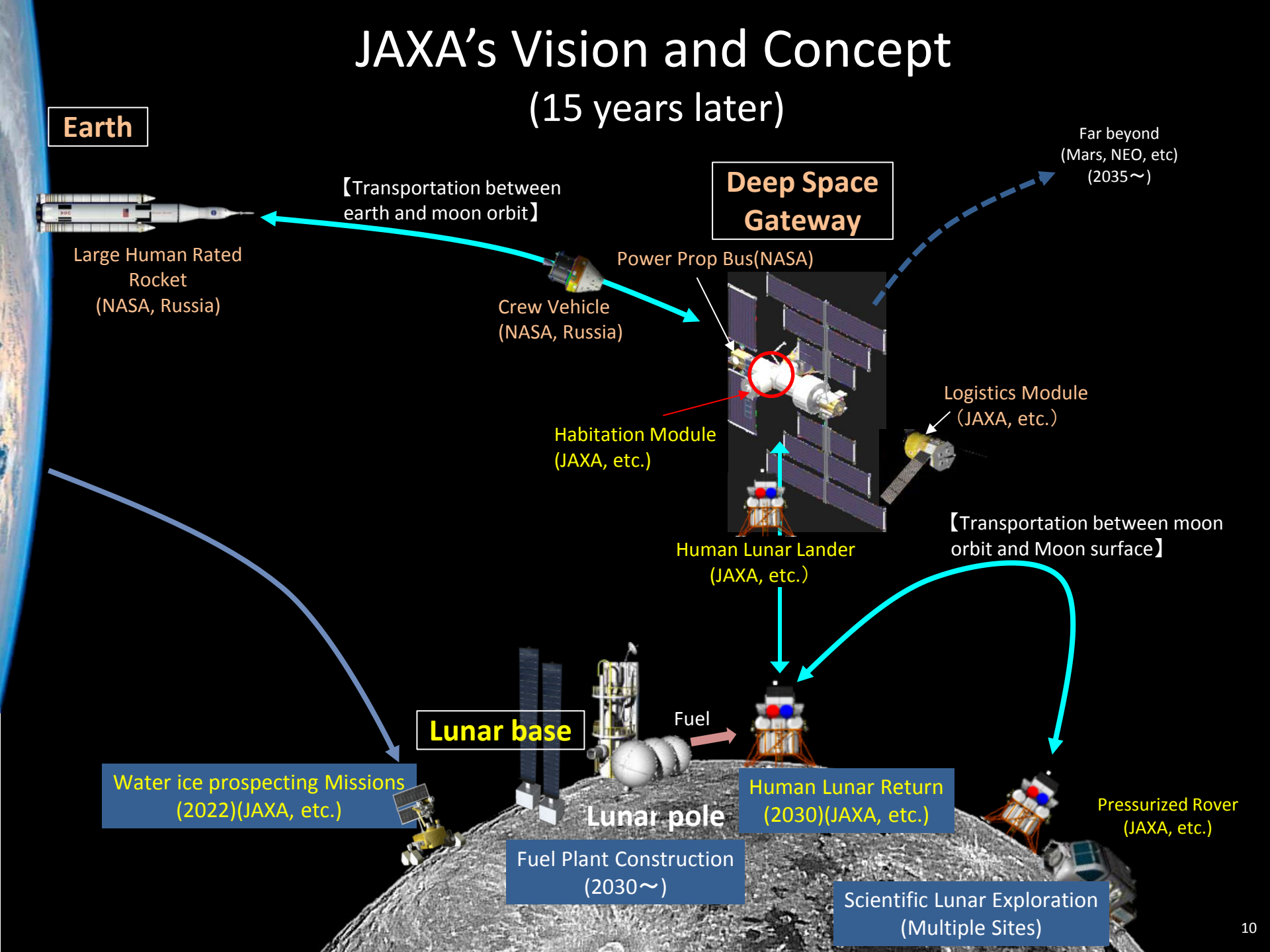
④ Scientific theme enhanced with human missions

Possible robotics missions on Lunar Surface



(※Including missions under Study)

JAXA's Vision and Concept
(15 years later)



JAXA's Scenario for Moon Exploration

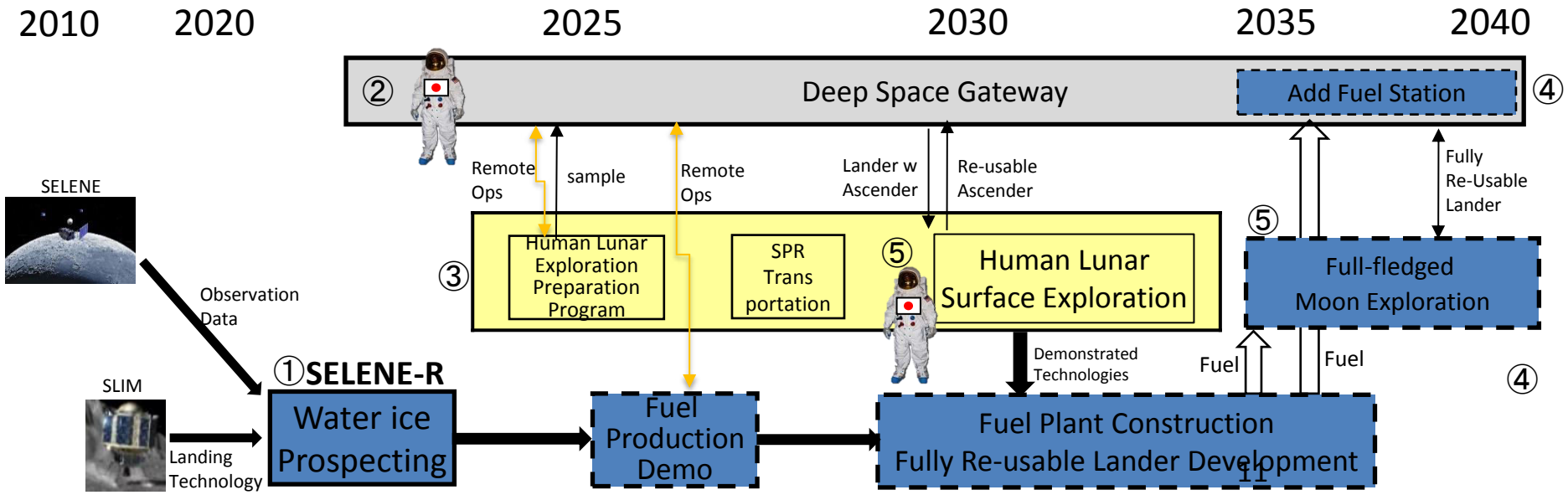
① Conduct water ice prospecting mission (should be international collaboration) to the lunar south pole in order to assess the possibility of utilizing the water for fuel.

② Participate in US led Deep Space Gateway program with key technologies, and send Japanese astronauts to deep space

③ Participate with key technologies in international Human Lunar Surface Exploration program starting with the preparatory mission in around 2025, and send Japanese astronauts to the lunar surface.

④ Construct a fuel plant at the lunar south pole by international collaboration using human abilities and robotic capabilities. Also develop a re-usable human lander and fuel station at the Deep Space Gateway.

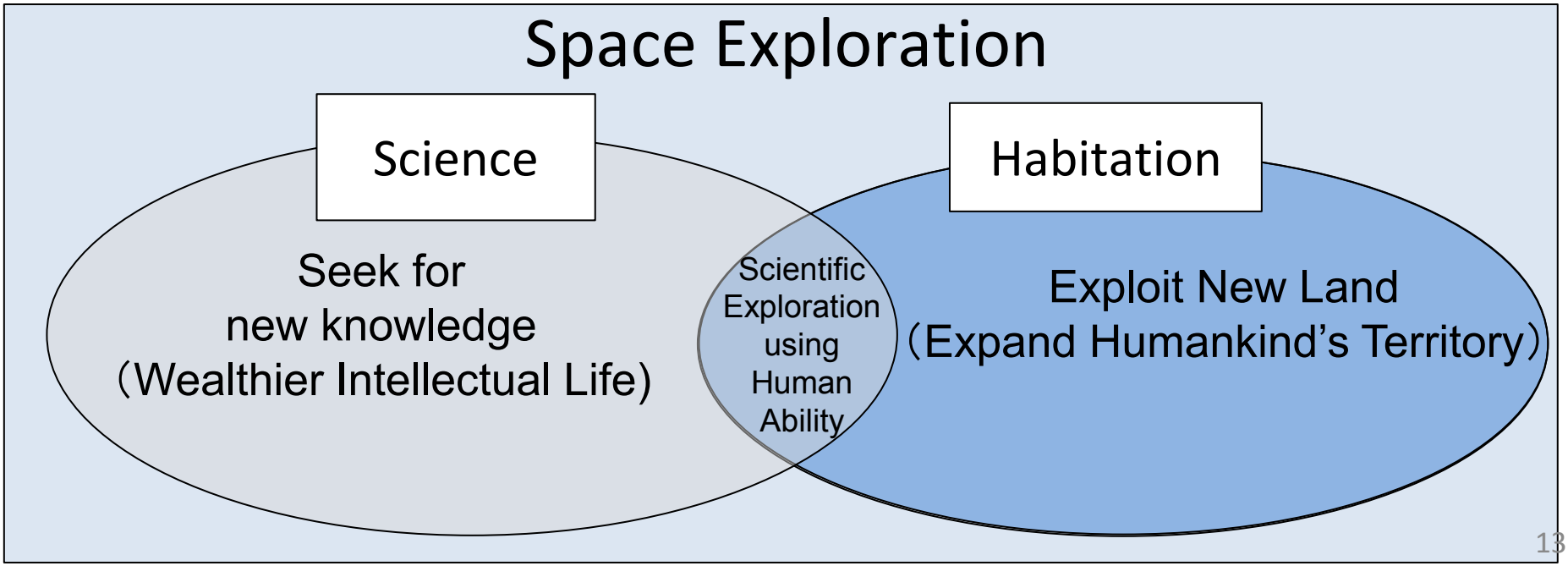
⑤ Conduct a full fledged scientific lunar exploration, resource prospecting/utilization, and moon travel.



Key elements for Global Patnership

Global benefit and vision of Space Exploration

- Benefits for humankind from Space Exploration Program
  - Scientific new knowledge to the solar system
  - **“Innovation”** in space and on earth
  - Inspiration for young generation
  - Partnership to address global challenges
- Common Vision
  - Peaceful purposes
  - Expansion of Human presence beyond Low Earth Orbit (BLEO)
  - Sustainable development for better life on Earth



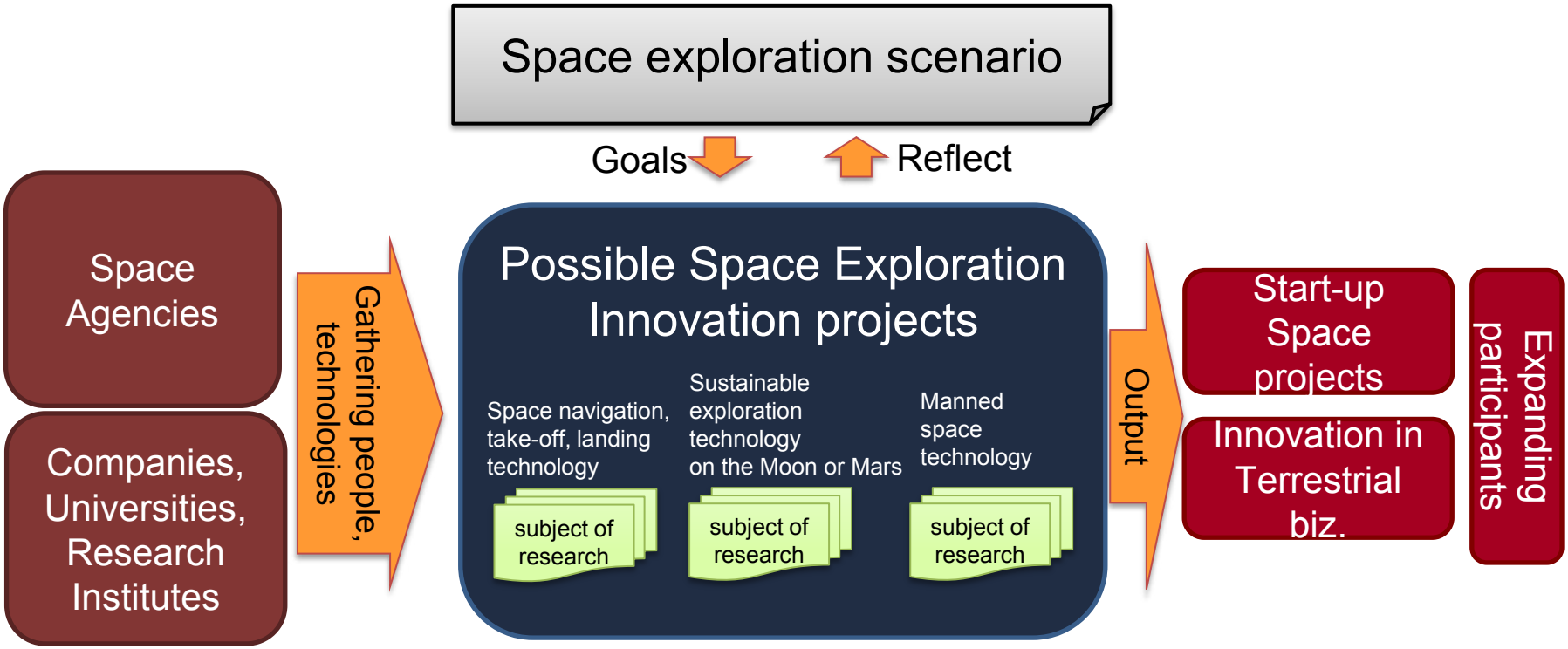
Innovation in Space and on Earth

Space exploration technology

- Expansion of space development and utilization.
- Active use of terrestrial technology.

Terrestrial technology

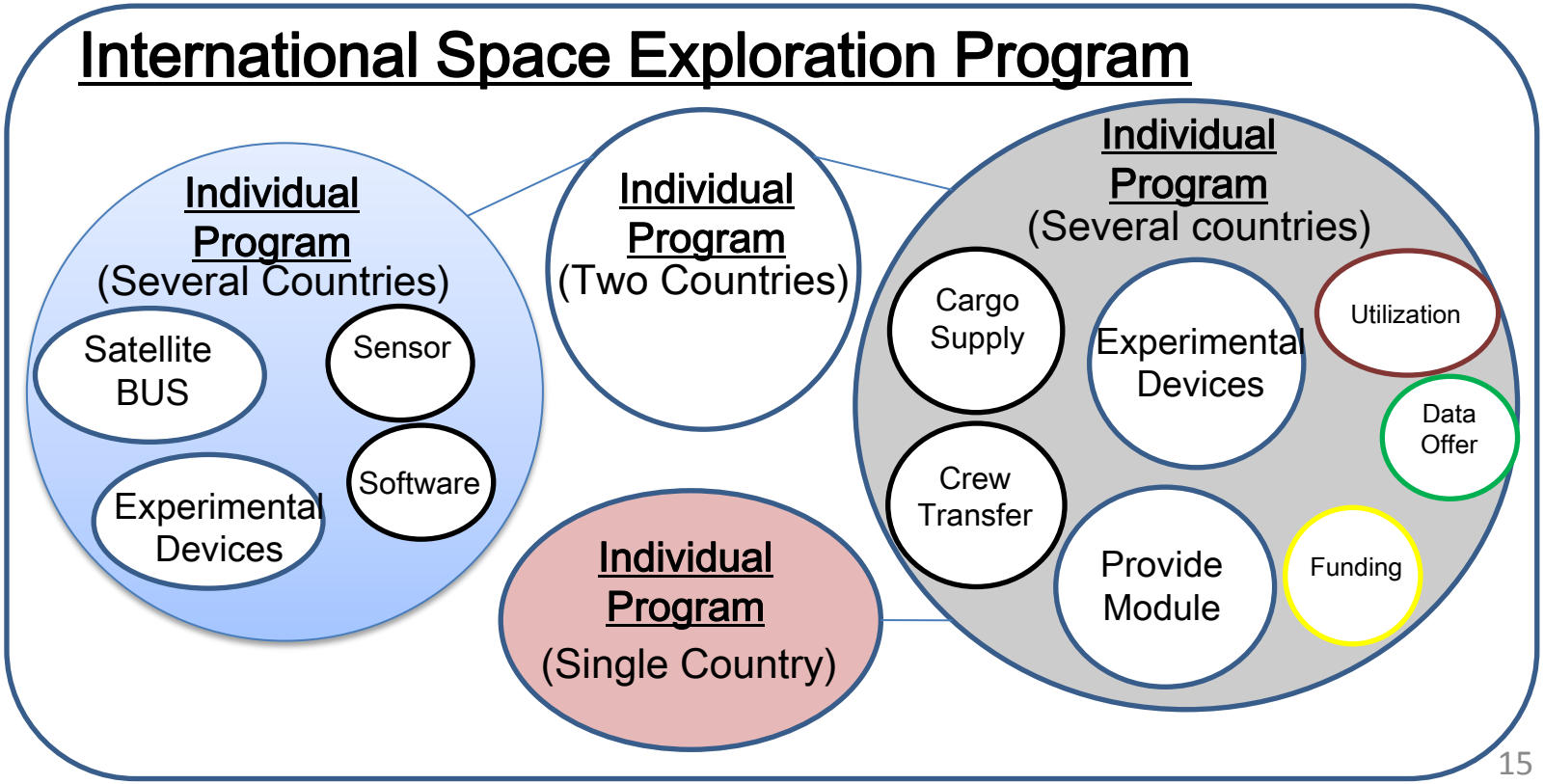
- Creation of industrial promotion and new industry by commercialization.
- Distribution of space exploration technology.



Possible Global partnership for Exploration Program

1. There would be a number of respective programs that are synergized together to form one comprehensive program based on the milestones and scenario.
2. Collaboration and corporation among participating nations are necessary to achieve the common goal efficiently.
3. Increased partnerships and various ways of contributions
   - ✓ Broaden partnerships including emerging nations
   - ✓ Participation from developing nations in collaboration with advanced nations.
4. Potential involvement of the private sector under PPP should be also considered.

Common Scenario
(GERs, etc)



Important Roles of United Nations (HSTI Initiative, Programme of Space Applications)

http://www.unoosa.org/oosa/

The United Nations/Japan Cooperation Programme on CubeSat Deployment from the International Space Station (ISS) Japanese Experiment Module (Kibo) "KiboCUBE"

Update Sept 2017: The application period for the third round of KiboCUBE has just opened. Please check back here for information about future KiboCUBE opportunities.

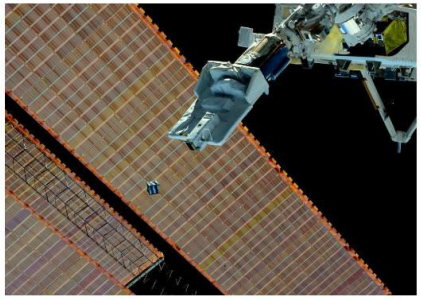
3RD ROUND: apply now!! ❯

BACKGROUND

The United Nations Office for Outer Space Affairs (UNOOSA) and the Japan Aerospace Exploration Agency (JAXA) are pleased to anno*Cube* *Japa*

Kibo JAXA to provide educational or research institutions from developing countries of United Nations membership with opportunities to deploy, from the ISS Kibo, cube satellites (CubeSats) which they develop and manufacture.

KiboCUBE (OOSA-JAXA)



Deployment of a CubeSat from the ISS. Photo: NASA/JAXA

Fellowship Programme for "Drop Tower Experiment Series" (DropTES)

THE FIFTH CYCLE OF DROPTES HAS STARTED!! FURTHER INFORMATION FOR FIFTH CYCLE IS AVAILABLE HERE.

The Drop Tower Experiment Series is a fellowship programme of the United Nations Office for Outer Space Affairs (UNOOSA) in which

DropTES (OOSA-ZARM/DLR)

In collaboration with the Center of Applied Space Technology and Microgravity (ZARM) and the German Aerospace Center (DLR), the fellowship programme offers a selected research team the opportunity to conduct its own microgravity experiments at the Bremen Drop Tower. The series of experiments will consist of four drops or catapult launches during which approximately 5 or 10 seconds of microgravity, respectively, are produced.

Orbital Space Mission
UNOOSA Call for Interest

APPLICATIONS FROM: 25 SEPTEMBER - 1 NOVEMBER 2017

Important Links:

Call for Interest and F

The United Nation rporation (SNC) to offer United Nations Member S ser® space vehicle. The mission will be open to all M d to participate. The mission will carry experiments,

Orbital Space Mission (OOSA-SNC)

The purpose of this Call for Interest (CFI) is to provide a summary of the proposed mission and to solicit information from Member States interested in providing experiments, payloads, or satellites that could be flown on this mission. The CFI also has the objective of gathering information on the interested countries so that UNOOSA may better understand the demand for this type of mission.

This mission will be the first space mission devoted to addressing the Sustainable Development Goals.

UNIS/OS/468
16 June 2016

United Nations and China agree to increased space cooperation

VIENNA, 16 June (UN Information Service) - The United Nations Office for Outer Space Affairs (UNOOSA) and the China Manned Space Agency (CMSA) have agreed to work together to develop the space capabilities of United Nations Member States via opportunities o

China Space Station (OOSA-CMSA)

Following the signing of a Framework A uty Director General of CMSA, presented the of Outer Space (COPUOS) at the UN in Vien

Under the agreements, UNOOSA and CMSA will work together to enable United Nations Member States, particularly developing countries, to conduct space experiments on-board China's space station, as well as to provide flight opportunities for astronauts and payload engineers. Both parties will also promote international cooperation in human space flight and other space activities, increased awareness of the benefits of human space technology and its applications, and capacity-building activities in space technology. CMSA will provide funding support to UNOOSA in this regard.

Common Principles for International Space Exploration

(To be discussed at ISEF2)

Examples...

- Peaceful purposes and benefits for humankind
- Science
- Implementable, evolvable, and affordable
- Aspirational and inspirational
- Respect for space policies and projects of each country/organization
- Promotion of international cooperation and collaboration
- Public engagement
- Economic expansion
- Environmental stewardship
- Continuity

Outline of ISEF2

International Space Exploration Forum (ISEF)

2nd International Spaace Exploration Forum (ISEF-2)

- Hosted by the Government of Japan
- March 3rd, 2018 in Tokyo

1st ISEF (2014, USA)

Ministerial-level meeting to build support for global cooperation in space exploration.
33 countries participated.

- **ISEF2 will bring** together **Ministers and high-level officials** from around the world to discuss the opportunities and challenges they share.
- **Side-events,** inviting representatives of universities, research institutes, companies and young generation who are interested in space exploration, will be held in conjunction with ISEF2 to enrich the ISEF2 outcomes.

Expected Outputs:

- Principles for international space exploration
- ISEF Terms of Reference (TOR)
- Joint Statement/ISEF2 Forum Summary

Y-ISEF for Young Professionals

Young professionals will work in teams to define their visions and ideas for future space exploration in a competition format.

■ Event Format and Objectives

- To gather 80 young professionals (ages 18-35) from around the world in various activities as teams, who will define their visions for space exploration.
- To encourage the development of human resources, career paths and people networks!

■ Call for Participants

- About 80 young professionals and students (18 to 35 years old)
- International business leaders in space exploration as mentors

We welcome YPs active participation from abroad!
For queries, please contact:
z-isef2@ml.jaxa.jp

■ Schedule:

- Sep-Oct. 30: Application/Registration
- Oct-Feb: Pre-event activities (Team matching, online discussion)
- Feb. 28, 2018: Technical visit (tour of JAXA's site), preparation for discussions on the following day
- Mar. 1: Y-ISEF Workshop (Ideathon)
- Mar. 2: Observation of I-ISEF
- Mar. 3: Career mentoring (AM)

Sponsors (In-kind Partners):

Please email z-isef2@ml.jaxa.jp with sponsorship inquires.

Organizers:

MEXT Ministry of Education, Culture, Sports, Science and Technology

JAXA

Supporters:

Space Generation Advisory Council

I-ISEF for Industry

Date: March 2, 2018
Place: Tokyo

Y-ISEF/I-ISEF
– ISEF2 Side Events –

Business Conference for Space Exploration -Stimulate the growth of space businesses!

■ Event Format

- Share visions and expand space exploration market as a viable business, and discuss opportunities to enter the space exploration businesses for non-space industries.
- Provide opportunities for networking among space exploration experts, business operators, entrepreneurs, government officials and other stakeholders from around the world.

■ Participants

- About 400 participants mainly from the private sector

■ Session structure (tentative)

1. What Space Exploration Means to Humankind
2. Socioeconomics and Innovation in 2030s
3. Industrialization of the development of lunar/asteroid surface, and its economic impacts
4. Space Exploration: prospects of other industries
5. Way forward: expanding the space exploration industry

Sponsors (In-kind Partners):

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Organizers:

内閣府 Cabinet Office
MEXT
経済産業省 Ministry of Economy, Trade and Industry
JAXA

Supporters:

AIAA American Institute of Aeronautics and Astronautics