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Capacity building through KiboCUBE Program

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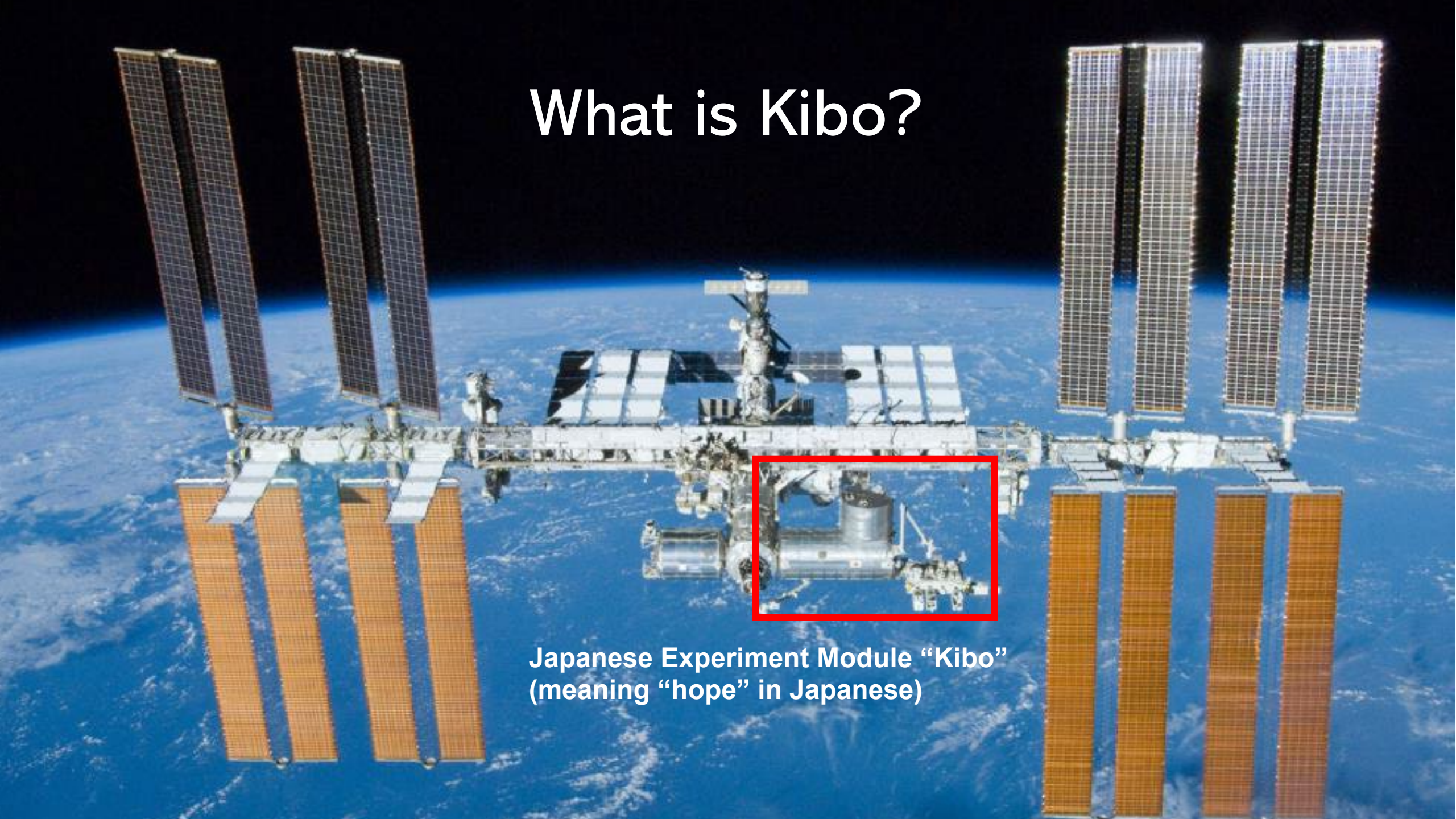
What is Kibo?



Japanese Experiment Module “Kibo”
(meaning “hope” in Japanese)

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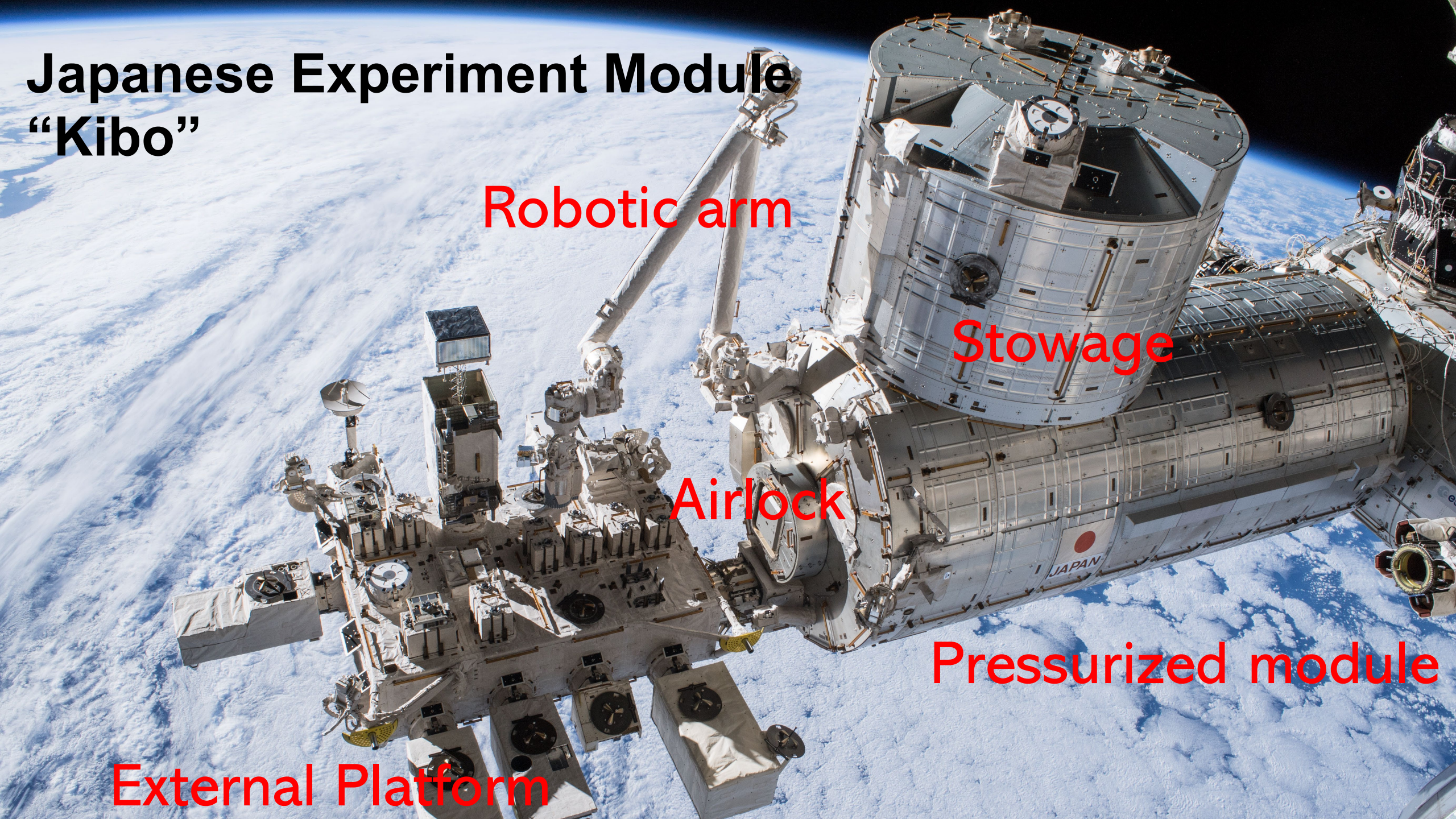


KiboCUBE is a Program based on the United Nations/Japan collaboration on 1U CubeSat Deployment from the International Space Station (ISS) Japanese Experiment Module “Kibo”.

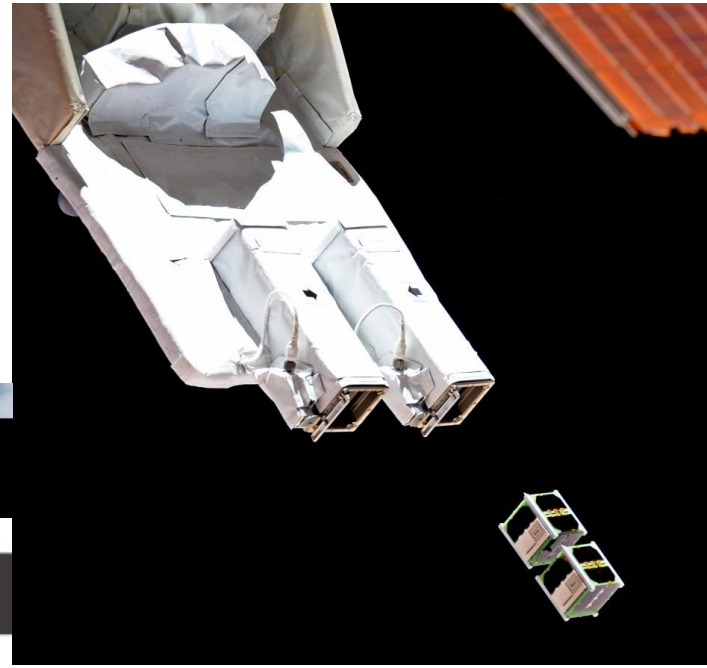
https://www.unoosa.org/oosa/en/ourwork/access2space4all/KiboCUBE/KiboCUBE_Index.html

KiboCUBE in partnership with Japan Aerospace Exploration Agency provides the opportunity to develop a cube satellite (CubeSat) and have it deployed from the International Space Station Japanese module “Kibo”.

KiboCUBE enables access to space promoting the sustainability of future space activities.

Design and develop a 1U size CubeSat. Go through safety reviews and testing.

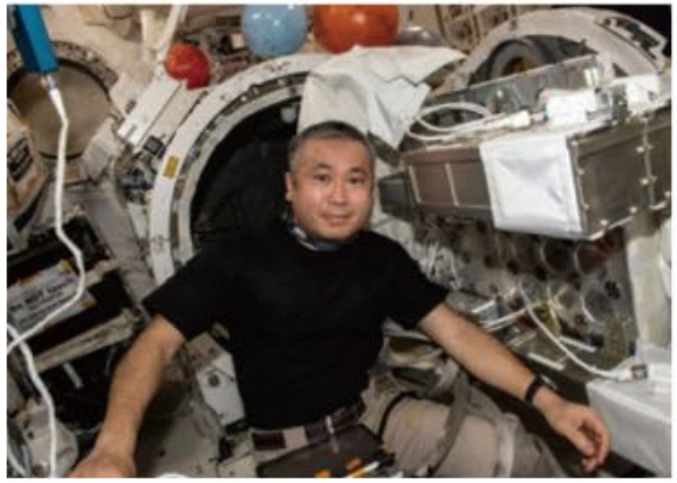
Bring it to JAXA.



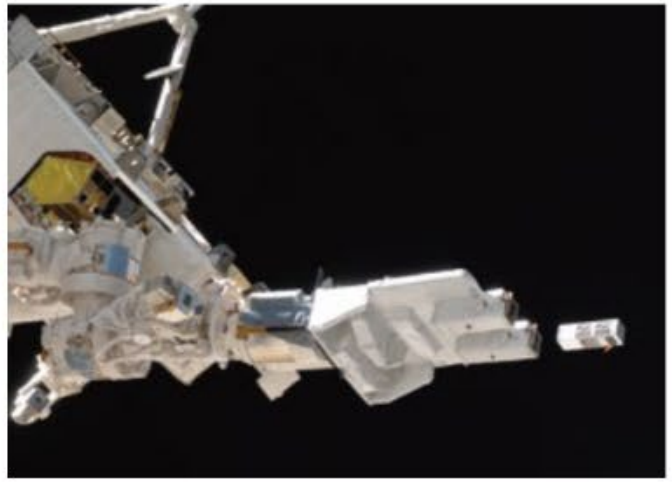
JEM Small Satellite Orbital Deployer **J-SSOD**

CubeSat deployment mission using J-SSOD

1 The satellite install case which installs CubeSats is stowed in a soft-cushion bag for shipping. The satellite install case is launched by a cargo transfer vehicle to ISS.



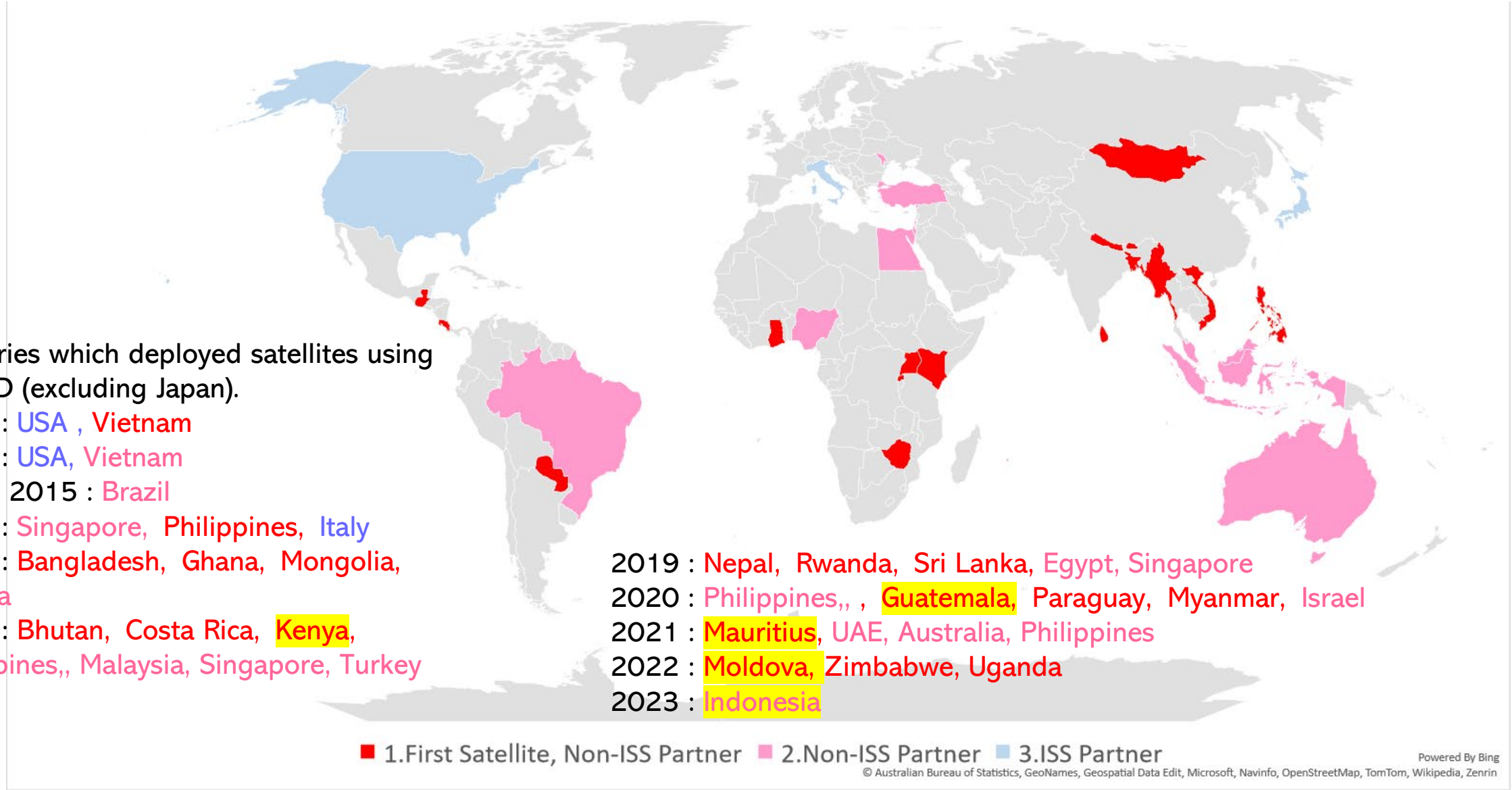
2 The satellite install case is installed on the MPEP by the crew member in Japanese Experiment Module "Kibo", and then transferred from the airlock to the outside.



3 The robotic arm of "Kibo" holds the MPEP to transfer it to the release point. The satellites are deployed by a command signal sent from ground.

Round	Awardee	Mission and Status
1	Republic of Kenya : “1KUNS-PF” University of Nairobi	To monitor agriculture and coastal areas Deployed 5th Nov. 2018
2	Republic of Guatemala : ”Quetzal-1” Universidad de Valle De Guatemala	To acquire remote sensing data for natural resource management Deployed 29th April 2020
3	Republic of Mauritius : “MIR-SAT 1” Mauritius Research and Innovation Council	To collect images and to test onboard communication Deployed 22nd June 2021
3	Republic of Indonesia: “SS-1” Surya University	To demonstrate remote communication Deployed 6th January 2023
4	Republic of Moldova : ”TUMnanoSAT” Technical University of Moldova	To demonstrate technology and test various components Deployed 12th August 2022
5	Sistema de la Integracion Centroamericana : SICA ”MORAZAN-SAT”	To monitor weather variables in remote areas providing early warning during extreme weather events In development
6	United Mexican States: ” Gxiba-1” The Universidad Popular Autónoma del Estado de Puebla	To observe active volcanoes in Mexico and analyze the ash dispersion In development
6	Republic of Tunisia : ” TUNSAT-1” Ecole Supèrieure Privée d’Ingénierie et de Technologie Appliquée	To validate of the technology which is the focus on the reliability of 1U CubeSat In development

Since 2012, 72 CubeSats from 31 countries were deployed using J-SSOD. (KiboCUBE awardees)



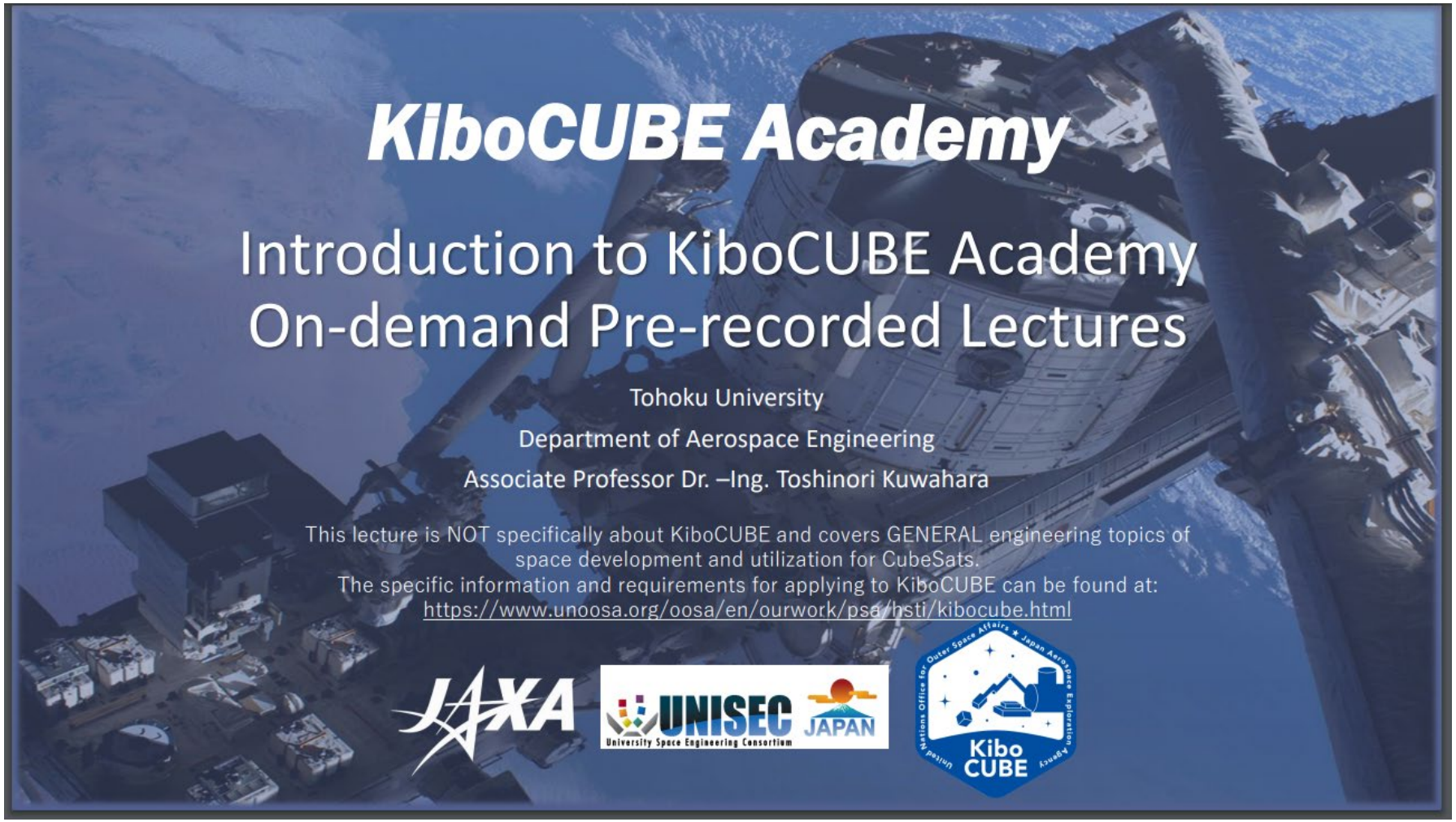
Countries which deployed satellites using J-SSOD (excluding Japan).

2012 : USA , Vietnam
2013 : USA, Vietnam
2014, 2015 : Brazil
2016 : Singapore, Philippines, Italy
2017 : Bangladesh, Ghana, Mongolia, Nigeria
2018 : Bhutan, Costa Rica, Kenya, Philippines,, Malaysia, Singapore, Turkey
2019 : Nepal, Rwanda, Sri Lanka, Egypt, Singapore
2020 : Philippines,, , Guatemala, Paraguay, Myanmar, Israel
2021 : Mauritius, UAE, Australia, Philippines
2022 : Moldova, Zimbabwe, Uganda
2023 : Indonesia

Advantages of KiboCUBE

1. Free of charge
2. Get technical support from experts (UNISEC, JAXA, Service provider)
3. Launch opportunities 3-4 times a year (even if you miss a certain flight, you don't have to wait for a long time for the next chance)
4. Low vibration during launch compared to rocket rides
5. You can see the deployment at real-time!

In support of KiboCUBE, JAXA has developed a series of free lectures in English by experts of space engineering in collaboration with UNISEC (University Space Engineering Consortium).



The free lectures are posted here !

https://www.unoosa.org/oosa/en/ourwork/access2space4all/SatDevTrack_Webinars.html#Tag1

Lecture 0 Introduction to KiboCUBE Academy (pdf and video) *updated in April 2023
Lecture 1 Introduction to Small Satellite Mission and Utilization (pdf and video) *updated April 2023
Lecture 2 CubeSats for Capacity Building (pdf and video)
Lecture 3 Overview of Project Management of Satellite Development (pdf and video)
Lecture 4 Systems Engineering for Micro/nano/pico-satellites (pdf and video)
Lecture 5 Introduction of Safety Review Process (pdf and video)
Lecture 6 CubeSat Design for Safety Requirements (pdf and video) *updated April 2023
Lecture 7 Introduction to CubeSat Technologies (pdf and video)
Lecture 8 Subsystem Lecture for CubeSat: Power Control System (pdf and video)
Lecture 9 Subsystem Lecture for CubeSat: Communication System (pdf and video)
Lecture 10 Subsystem Lecture for CubeSat: Command and Data Handling System (pdf and video)
Lecture 11 Subsystem Lecture for CubeSat: Structure System (pdf and video)
Lecture 12 Subsystem Lecture for CubeSat: Mechanism System (pdf and video)
Lecture 13 Subsystem Lecture for CubeSat: Thermal Control System (pdf and video)
Lecture 14 Subsystem Lecture for CubeSat: Attitude Control System (pdf and video)
Lecture 15 Introduction to CubeSat Environmental Testing (pdf and video)
Lecture 16: Introduction to Orbital Mechanics for Microsatellites (pdf and video)
Lecture 17: Introduction to CubeSat Operation and Ground Systems (pdf and video)
Lecture 18: Introduction to CubeSat Payload Systems (pdf and video)
Lecture 19: CubeSat System Integration and Electrical Testing (pdf and video)
Lecture 20: Space Debris Problems and Countermeasures (pdf and video) *updated April 2023
Lecture 21: Lessons Learned of CubeSat Missions (pdf and video)

Live sessions are also held a few times a year.

JAXA and UNOOSA agreed to extend the KiboCUBE program until 2030.
We will open the next round soon!

JAXA is also contributing to “Access to Space for all” in the field of STEM.

Next mission entry deadline is May 28 !
(Entry through UNOOSA has already closed)

- The Kibo Robot Programming Challenge is **an educational program.**
  - Students solve various problems by **programming free-flying robots (Astrobee and Int-Ball) in the International Space Station (ISS).**
- Participants will have the chance to learn cutting-edge methodologies and **to hone their skills in science, technology, engineering and mathematics (STEM).**


JAXA
Explore to Realize