

# J-CUBE Project's International Collaborative Partner Matching System Announcement of Registration

## 1. Project description

The Japan Aerospace Exploration Agency (JAXA) and the University Space Engineering Consortium (UNISEC) have announced CubeSat deployment opportunities from the Japanese Experiment Module (Kibo) aboard the International Space Station (ISS) [1] for Japanese universities/colleges. This program is called J-CUBE, based on the MOU (Memorandum of Understanding), which cites the “Comprehensive collaboration agreement on CubeSat release from ISS-Kibo for academic research and capacity building” signed between UNISEC and JAXA on April 1, 2021.

The J-CUBE program aims to realize a sustainable and evolutionary international collaboration, create a capacity-building system utilizing domestic universities' technological capabilities, and ensure the continued popularity of Japanese universities as international collaborative partners by enhancing their satellite development and operations technology. The program has two application parts: the construction of international collaborative relationships' category and building domestic capacity's category. Both are open only to UNISEC-Japan's universities, institutions, and technical colleges. Under this MOU, the winner will be awarded a unique fee launch opportunity of up to 12 U/year (or 6 satellites per year). The satellite size must be 1–3 U.

## 2. Registration

This announcement informs potential organizations interested in applying to the J-CUBE program as the international collaboration partners of the UNISEC-Japan organization. To apply under the international collaborative relationships' category, applicants must have the technical and financial ability to conduct the proposed research and development, and understand this program's purpose.

UNISEC has organized a J-CUBE office to operate this project. Figure 1 summarizes the structure and roles within the related organizations. The J-CUBE office provides announcements and invitations to J-CUBE launch opportunities. The office also runs a matchmaking system to match international partners to an applicant (a Japanese organization), and provides consulting services to the applicants. The J-CUBE office will examine the applications and forward the results for JAXA's consideration. The applicant (a Japanese organization) and JAXA will make a charged contract for launch after confirming the suitability of the selection results.

For this announcement, the J-CUBE office accepts potential partners' applications and provides opportunities to find collaborators through the matching system.

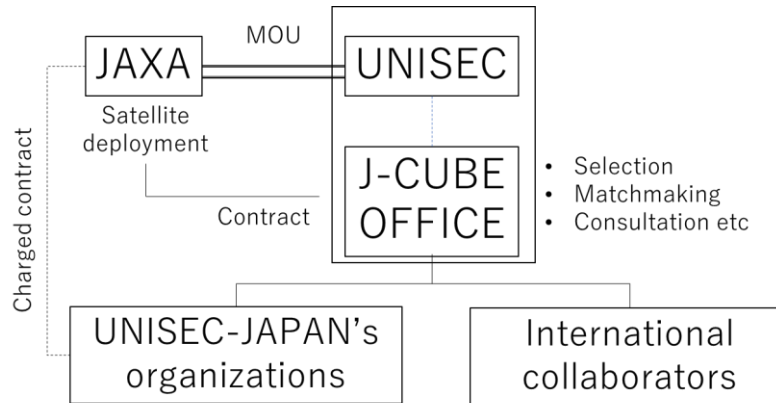


Figure 1 Structure of J-CUBE program

### 3. Application period

- October 25, 2021 to October 31, 2022

### 4. Eligibility

- Organizations with basic engineering skills and knowledge that are willing to undertake CubeSat with UNISEC-Japan's universities, institutes, and technical colleges
- Organizations that can make an application that satisfies Japanese security export control
  - All applications are checked based on the Foreign Exchange and Foreign Trade Act (1949) and its relevant legislation, as required by the Ministry of Economy, Trade, and Industry (METI).
  - Please check the following information:
    - <http://www.meti.go.jp/policy/anpo/law05.html#user-list>
    - <https://www.meti.go.jp/policy/anpo/englishpage.html>
  - The proposed mission must—
    - Not be against public order or morals
    - Obey the Basic Act on Space (Act No.43 per the cabinet office), Article 2: Basic Principles on Space Development and Use
    - Not be used for political or religious activity
    - Obey all pertinent laws and regulations

### 5. Application Requirements

Applicants must meet all the following requirements:

- Understanding the purpose of this program and having the resources to contribute
- Following instructions from the J-CUBE office and future collaborators
- Submitting the application form
- Scheduling the satellite deployment by March 2024.

## **6. Application & Matching Procedure**

Applications will be accepted online through the J-CUBE office website. The office will screen documents submitted with the applications and perform the following collaboration matching procedure to validate the application. The matching procedure will continue until January 31, 2023.

- A) Send application
  - Fill in the registration form and submit it to the J-CUBE office
- B) Screen documents
  - The J-CUBE office checks all documents
- C) Pick the potential partners
  - The J-CUBE office selects potential Japanese partner
- D) Confirm availability of the Japanese partner
  - The J-CUBE office sends the details of the international partner to the Japanese organization
  - The Japanese organization performs initial checks of the terms and conditions of the international partners
- E) Make adjustments to detailed terms and conditions for making contracts

## **7. Responsibilities of Applicants**

- Make a prompt, sincere, and appropriate response in making the contract
- Report promptly to the J-CUBE office in case of canceling the registration

## **8. Terms and Conditions**

- Existing collaboration teams, which have not used a matchmaking system, can also apply to the J-CUBE program.
- The J-CUBE office initiates collaboration work by introducing potential collaborators. The J-CUBE office, UNISEC, JAXA, and future collaborators do not in any way guarantee success in concluding contracts, nor are they responsible for the success of the CubeSat project.
- This registration is only for initiating a contract with a potential collaborator. It does not guarantee launch opportunities.
- The J-CUBE office, UNISEC, JAXA, and future collaborator may terminate the provisions of the matching opportunity at any time, should the registration info involve misstatements or violate the terms and conditions.
- The J-CUBE office, UNISEC, and JAXA are not involved with the contract details between the applicant and collaborators, such as ownership of the spacecraft, operation right or duty of the spacecraft, or intellectual properties during the development and operations. The contract must reflect only the responsibilities between the applicant and collaborators.

## **9. Application**

Applications will be accepted through the J-CUBE office.

Contact address: e-mail: [info-jcube@unisek.jp](mailto:info-jcube@unisek.jp)

### Attachment

[1] Overview of JEM Small Satellite Orbital Deployer (J-SSOD)

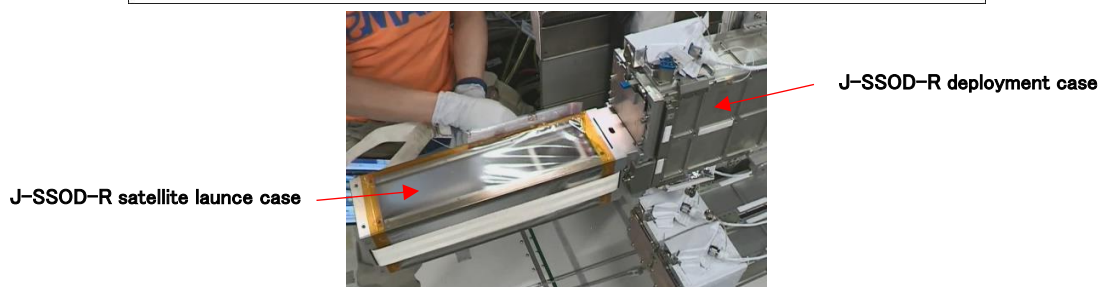
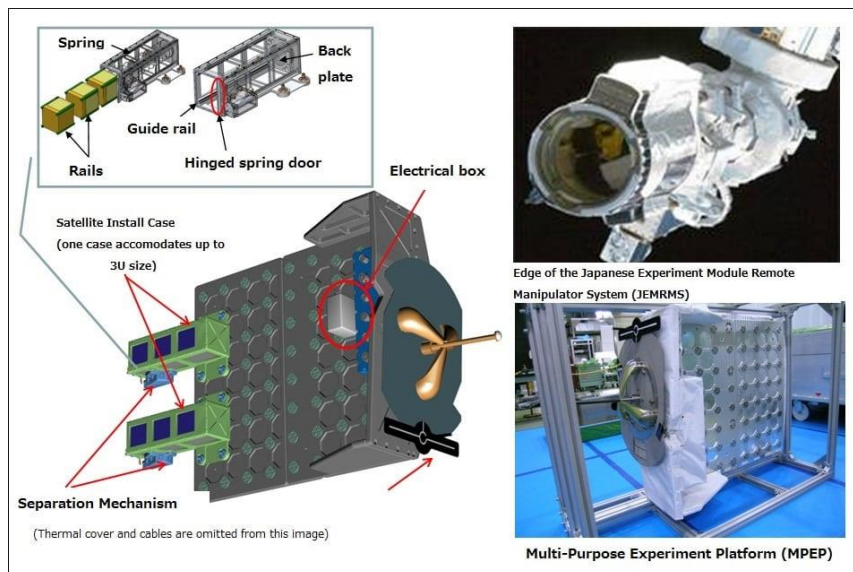
[2] Registration form

## Overview of JEM Small Satellite Orbital Deployer (J-SSOD)

### 【Overview of J-SSOD system】

The JEM Small Satellite Orbital Deployer (J-SSOD) is a mechanism for deploying small satellites from the Kibo external platform (JEM) on the International Space Station (ISS). Its design is based on CubeSat design specifications (10cm×10cm×10cm). The satellites installed on the J-SSOD are released in orbit from the Japanese Experiment Module Kibo to space. The J-SSOD is composed of satellite install cases, a separation mechanism, and an electrical box.

In response to the increased demand for CubeSat deployments, a reusable satellite orbital deployer (the JEM Small Satellite Orbital Deployer Re-usable, or J-SSOD-R) has been introduced. After the satellites are transferred to ISS by the J-SSOD-R launch case, they are mounted in the deployment case by the ISS crew. The J-SSOD-R has four deployment slots, and the maximum size that can be released from a slot has been extended from 3 U to 6 U, which accommodates up to 24 U (6 U per each slot) satellite volumes.



On-orbit satellite setting operation of J-SSOD-R deployment case in JEM/ISS

**【Specifications】**

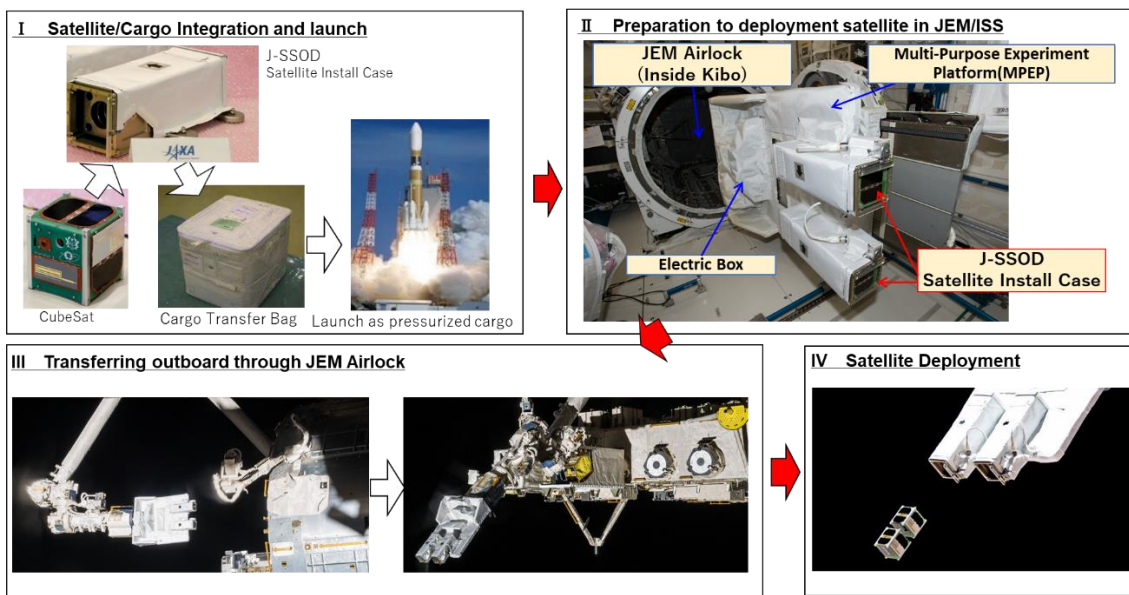
Item	Specifications
Installable satellite size	CubeSat, 1 U、2 U、3 U、4 U、5 U、6 U、W6 U*; 50 kg class satellite, 55×35×55 cm
Installable satellite mass	CubeSat, 1.33 kg or less per U, W6U satellite is 6.8 kg or less; 50 kg class satellite, less than 50 kg
Insertion orbit	Elliptical orbit with an altitude of 380km-420km (depends on ISS altitude); Inclination, 51.6°
Ballistic coefficient	CubeSat, 120 kg/m <sup>2</sup> or less; 50 kg class satellite, 100 kg/m <sup>2</sup> or less; (To prevent collisions between a satellite and the ISS, it makes satellites lose altitude faster than the ISS after deployment.)
Insertion direction	Nadir-aft 45° from the ISS nadir side, in the ISS body coordinate system
Insertion velocity	CubeSat, 0.77-1.7 m/s; 50 kg class satellite, 0.4 m/s (Depends on satellite mass)
Life expectancy in orbit	About a year, depending on the ballistic coefficient, released altitude, and solar activity

\*1-6U:10cm (W) × 10cm (D); Height – 1 U, 10 cm; 2 U, 20 cm; 3 U, 30 cm;

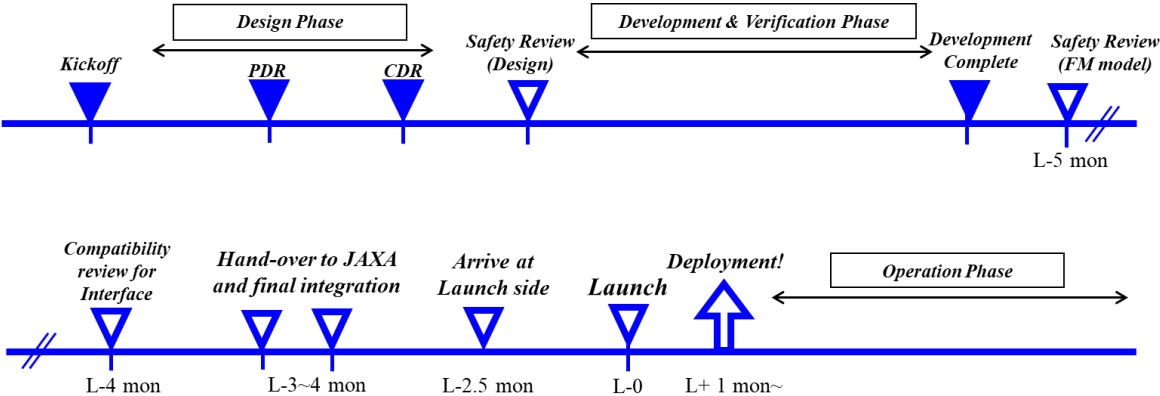
4 U, 40 cm; 5 U, 50 cm; 6 U, 60 cm. W6 U, 10 (W) × 20 (D) × 30 (H) cm

## 【Mission Procedure】

1. Satellite install cases with pre-installed CubeSats are delivered to the ISS as part of spaceship cargo.
2. On JEM, satellite install cases are installed on the MPEP. Then the MPEP is installed on the airlock slide table. Mechanism checkout and preparation are conducted.
3. The J-SSOD case attached with MPEP is transferred to the outboard. Then, JEM's robotic arm Japanese Experiment Module Remote Manipulator System (JEMRMS) grapples the MPEP and transfers it to the satellite deployment point.
4. MPEP is faced to the direction of nadir-aft  $45^\circ$ , opposite side to the ISS travel direction. Then, the satellites are deployed from the J-SSOD case by internal springs when the J-SSOD receives a command from the ground.



【Typical schedule from satellite development to deployment from JEM】





## J-CUBE Project's International Collaborative Partner-Matching System Registration form

Please fill in every section of the following forms with as much detail as you can, referring to the "J-CUBE Project's International Collaborative Partner Matching System Announcement of Registration."

- ✓ You can change the size or the position of the page break.
- ✓ There are no page limitations, but please make the text clear and concise.
- ✓ The instructions in italics must be deleted before submission.
- ✓ You can attach supporting documents to this form, but all the supporting documents have to be referred to in the form.
- ✓ Write "TBD" (to be determined) when information is not yet available on an item.

① Point of contact
Organization: Point of contact: Contact address: Address Tel: e-mail:
② Assumed satellite size
<i>Please describe your mission preference.</i>
③ Mission preference
<i>Please describe your mission preference. If you have a specific mission proposal, please explain it in detail.</i>
④ Estimated budget scale
<i>Please describe your budget scale for this mission.</i>
⑤ Schedule
<i>Please describe the assumed schedule for this project.</i> * The satellite deployment must be scheduled by the end of March 2024.

⑥ Project structure
<p><i>Please describe the project structure of this proposal.</i></p> <p><i>Details of the related organization, members, relationships, roles, number of people, satellite testing/development/integrated/operations facility, and other pertinent information.</i></p>
⑦ International student dispatch request
<p><i>Please describe the student dispatch request if needed, including the number of people and their backgrounds.</i></p>
⑧ Satellite development, operations experience
<p><i>Please describe any satellite development or operations experience that you have, such as the name of the satellite and details.</i></p>
⑨ Schedule of budget, limitation in operations (ex., payment schedule)
<p><i>Please describe the budget schedule (starting – ending date). If you have any limitations, please explain them.</i></p>
⑩ Request for partner
<p><i>Please describe any request for a partner. If you have a specific organization in mind, please write down their names in order of preference.</i></p>
⑪ Ground facility availability
<p><i>Please describe the availability of ground facilities in your country.</i></p>

End