Introduction of J-Cube

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Introducing

J-CUBE

Your Future CubeSats

JAXA

UNISEC
University Space Engineering Consortium

A new collaboration between JAXA and UNISEC to help emerging space nations get their ~~first~~ CubeSats deployed into Low-Earth Orbit via the ISS.

J-CUBE is not to be confused with KiboCUBE

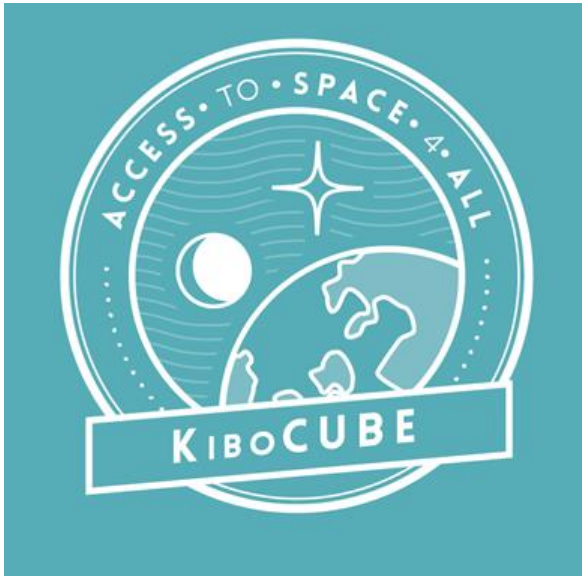
JAXA+UNISEC, low-cost opportunities

The program has two categories:
① one is construction of international collaborative relationships,
② another is for domestic capacity building.
Both categories require Japanese partners (UNISEC-Japan's universities, institutes, and technical colleges) for small sat development.

J-CUBE winners secure a low-cost launch opportunity 12U/per year (or 6 satellites/per year). The satellite size is assumed to be 1~3U.

J-CUBE:
http://unisec.jp/serviceen/j-cube

JAXA+UNOOSA, zero-cost opportunities



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

J-CUBE vs KiboCUBE

	J-CUBE	KiboCUBE
Launch price	Not free, but much lower than the market price	Free
Size	Up to 3U	1U
Selection	Application is reviewed by the selection committee	Very competitive
Requirement	**Team up with a Japanese university** Capacity building purpose	Capacity building purpose

Both will use ISS Kibo module

Typical flow

1. **Contact to UNISEC**
2. Introduction of a Japanese partner
3. First contact
4. Meeting (remote/in-person)
5. Many remote meetings and many exchange of e-mails
6. Statement of Work (SoW)
   - What to do in the collaboration
   - Responsibilities of each party
7. Contract signed
8. Money transfer
   - Usually from foreign partners to Japanese universities
9. Actual works
   - Students may come to Japan as full-time graduate students or research visiting students
10. Satellite launch and operation
11. Discussion on the next collaborative project

Important points

- In-person meetings are important to know each other
  - Utilize conferences such as UNISEC-Global, IAC, etc.
- Clear definition of responsibilities in SoW
- Be careful about money transfer
  - Anticipate many dramas
- Continue the collaboration even after the project

What Japanese universities want

- Universities are not launch brokers
  - Not doing for money
  - Expect return in other ways
    - Students, papers, etc.
- Leverage the international collaboration to promote globalization of university research/education and campus
- Japanese university may simply want to lower the launch cost by sharing with the foreign partners
- Anyway, note that you are not dealing with launch brokers

Suggested schemes

- Good collaboration scheme
  - Joint development of CubeSat
    - Student exchange through the project
    - Students (both Japanese and non-Japanese) learn how to work with people from different cultural background
- Other good schemes
  - Satellite is built outside Japan, but students come to Japan for study
    - Learn satellite development/testing/operation via hands-on
    - Serve as a liaison with the home country
  - Satellite is built in Japan by students coming from abroad
    - Learn satellite development/testing/operation via hands-on

Student exchange make the collaboration better and more fruitful

Student exchange

- Suggest long-term (> 1 year) stay
- Full-time graduate student is a good option
  - Japanese university tuition is much lower than other developed countries
- To enroll a graduate school in Japan, everybody needs to pass the exam.
- Be careful about the time-line
  - For October admission, the exam application period is May*
  - To send students to Japan, the preparation must start in advance

*Kyutech application period for October admission is May 18-24.
The application period differs depending on universities

Things to be noted

- As the money transfer occurs in J-CUBE, the contract between the foreign entity and the Japanese university is necessary
- The contract is legally-binding. Need assistance from the legal section of your organization
- The points in the contract
  - Non-military use
  - UN registration
  - Export control
  - Payment due
  - Payment currency (it is in Yen!)

Conclusion

If you want a low-cost launch opportunity and work with a Japanese university, think about J-Cube.

Use your smartphone to access more info.

http://unisec.jp/serviceen/j-cube

Google “J-Cube UNISEC”

UNISEC-Japan
Regional Report 2022

Mengu Cho, Kyushu Institute of Technology

Board member of UNISEC-Japan

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Overview of UNISEC-Japan

- UNISEC: “University Space Engineering Consortium”
  - UNISON: UNISEC Student Organization
  - UNISAS: UNISEC Alumni Organization
- Established in 2002
- NPO/NGO to facilitate/promote university level students’ practical space development activities, such as designing, manufacturing and launching small satellites and hybrid rockets.
- 54 laboratories/groups from 39 universities
- 803 student members, 240 individual supporters, and 24 corporate supporters
- 3 pillars: Human resource development, Technological development, Outreach

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Activities in 2021

- July 1: Takumi Conference
- July 31: General assembly
- Nov.3-7: Noshiro space event (CanSat, Rocket)
- Nov.20, 21: Asagiri CanSat experiments
- Nov.27, 28: UNISEC SPACE Job Fair
- December 4, 5: Annual Workshop
- December 9,10: Space Engineering Conference
- August-January (14 times): UNISEC Academy
- Mission assurance handbook
- J-Cube

Done Online

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Student activities

Rocket

Credit:湘南工科大学

CANSAT

https://www.facebook.com/photo?fbid=3052934538284154&set=pcb.3052934601617481

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University satellites launched in 2021

Credit: JAXA

ARICA (Aoyama Gakuin U.)

ASTERISC (Chiba Tech)

KOSEN-1 (Kochi Polytech)

TeikyoSat-4 (Teiky U.)

Hibari (Tokyo Tech)

Credit: JAXA

BIRDS-4 x 3 (Kyutech)

OPUSAT-2 (Osaka Pref. Univ.)

STARS-EC C (Shizuoka Univ.)

G-Satellite 2 (Univ. Tokyo)

11 satellites (6x1U, 1x2U, 2x3U, 2x50kg) went to orbit this year

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Conclusion

- Since 2002, UNISEC has been successful to provide valuable engineering talents to Japanese society
- Supported by individual, corporations, government, agency
  - But most of all, students
- UNISEC Japan continues working hard to promote the university space activities despite the pandemic.

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