



The 6th

Mission Idea Contest

For Achieving Sustainable Development Goals with Human Spaceflight



Regional Seminar in Japan 6th Mission Idea Contest (MIC6) *for Achieving Sustainable Developments with Human Spaceflights*

*May 6, 2019,
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MIC6 Overview



- The MIC6 offers aerospace engineers, scientists, college students, consultants, and anybody interested in space with opportunities to present their creative ideas on payload for ISS platform and gain attention internationally.
- MIC6 is organized in cooperation with ICE Cubes and Space BD to utilize the ISS experiment modules, Columbus of ESA and Kibo of JAXA.
- Important dates: 8/8, 9/9, 10/10
 - Abstract submission due: **August 8**, 2019
 - Notification: **September 9**, 2019
 - Full Paper submission due: **October 10**, 2019
 - Final presentation: during 7th UNISEC-Global Meeting (Dec 2, 2019) the University of Tokyo, Tokyo, Japan

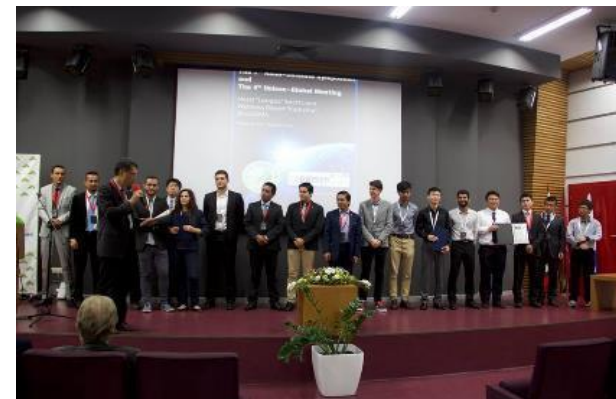
<http://www.spacemic.net>

Background (1)

- Mission Idea Contest was launched in 2010 to encourage innovative exploitation of micro/nano-satellites to provide useful capabilities, services.
- It provides aerospace engineers, college students, consultants, and anybody interested in space with opportunities to present their creative ideas and gain international attention.



MIC3 finalists and reviewers, Nov 19, 2014, Kitakyushu, Japan



MIC4 finalists and reviewers, Oct. 21, 2016, Verna, Bulgaria

Background(2)

Five MICs and 3 Pre-Workshops were successfully organized in 2011-2018

- Results

- Potential utilizations of micro/nano-satellites were provided in the large number of submitted proposals
- Four books were published as IAA book series



MIC1-3



MIC4 & DDC

Comparison of MIC1,2,3,4, 5, 6 and Pre-MIC3,4,5

	MIC1	MIC2	PreMIC3	MIC3	PreMIC4	MIC4	PreMIC5	MIC5	MIC6
Satellite mass	< 15 kg	<50 kg	<50 kg	<50 kg	<50 kg	<50 kg	<50 kg	<50 kg	ISS Platform
Number of satellites	2 or more (constellations only)	1 or more	1 or more	1 or more	1 or more	1 or more	1 or more	1 or more	N/A
Category	1 Mission idea for nano-satellite constellation	2 Mission idea & satellite design Mission idea & business model	2 User Developer	1 Mission idea and satellite design	2 Mission proposer Resource provider	1 Mission idea and satellite design	1 Mission idea and satellite design to satisfy any of SDGs	1 Mission idea and satellite design to satisfy any of SDGs	2 ICECUBES (inside) iSEEP (outside)

Requirements

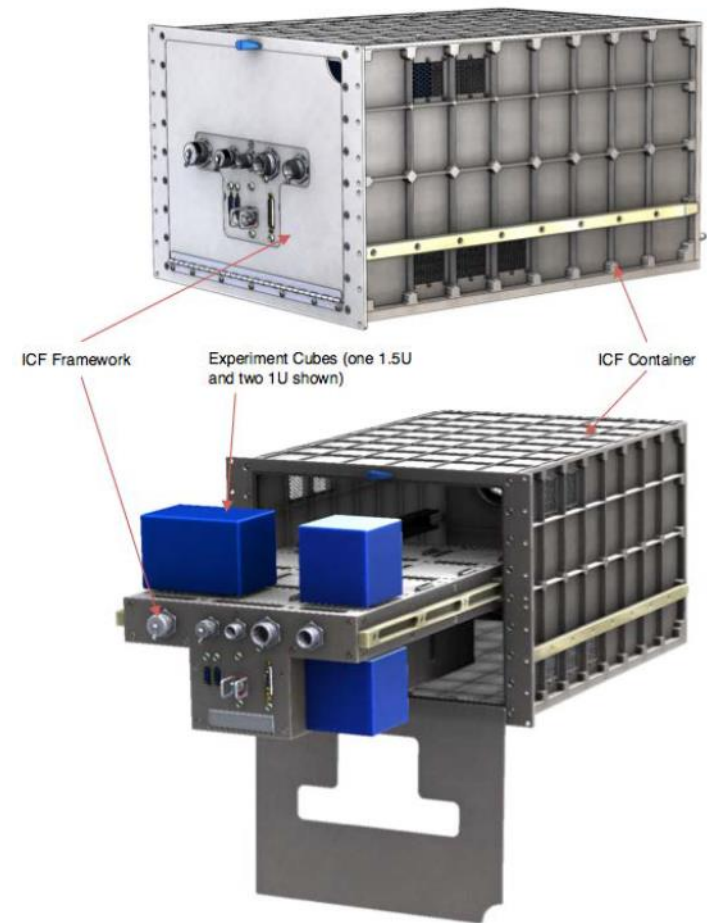
- Propose an innovative experiment idea which:
 - either contributes to earth benefits or contributes to human space exploration
 - contributes to any of the UN Sustainable Development Goals.
- Other requirements:
 - Research or technology idea for the pressurized internal of the international space station for which microgravity or radiation aspects of this space environment are mandatorily required.

Platform (A) ICECUBES Facility

Installed in ESA's
Columbus module:
Payload of dimension of
between

**1U (10*10*10cm) and
3U*4U (30*40*10cm)**

www.icecubesservice.com

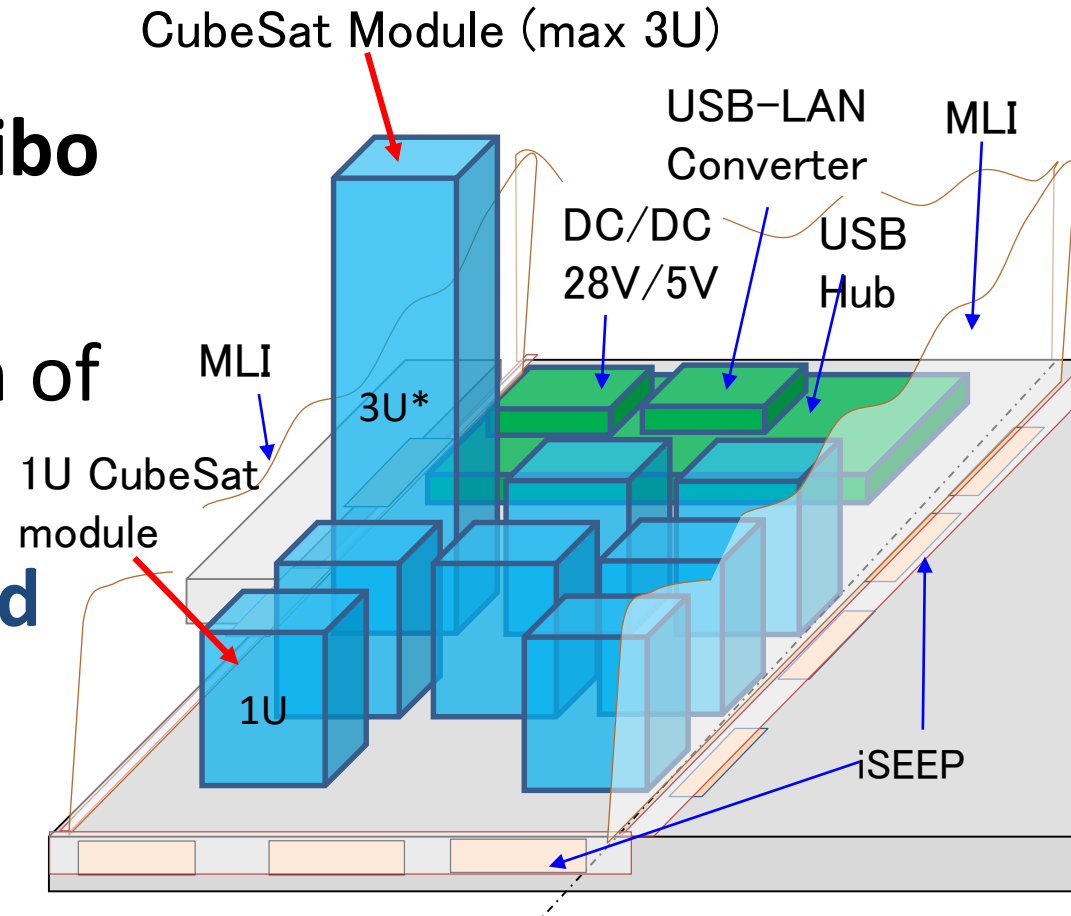


Platform (B) Space BD Facility

Use **iSEEP** in JAXA's
Exposed Facility of Kibo
module

Payload of dimension of
between

1U (10*10*10cm) and
3U (30*30*10cm)



<http://iss.jaxa.jp/en/kiboexp/ef/i-seep/>

Requirement for MIC6

Your proposal needs to satisfy any of the SDGs.



<https://sustainabledevelopment.un.org/sdgs>

Process and Timeline

8.8-> 9.9-> 10.10-> 12.2

Application Submission : Deadline August 8, 2019

Submitted abstracts will be evaluated by review team



Notification of Finalist: September 9, 2019

Title of paper and finalist(s)' name and affiliation will be published on the website.



Final Paper Submission: October 10, 2019

Submitted final paper will be distributed to review team for evaluation



Presentation in Japan on December 2, 2019

at the 7th UNISEC-Global Meeting

Evaluation Criteria

Originality (50 points)	Novel concept not yet realized or proposed, or a new implementation of an existing capability or service (25) Impact on society / Sustainable Development Goals / human spaceflight exploration (25)
Feasibility (50 points)	Technical (20) Programmatic (cost estimate, development schedule, infrastructure requirements) (15) Operational (protocol, communication and interaction during experiment) (15)

Worldwide Network of MIC Regional Coordinator



Function of MIC Coordinators



- Possible advice to potential applicants in your region and beyond
- Coordinating between potential applicants within your capacity
- Consultation with MIC Office about the most effective ways of applying for the MIC6 (e.g. organizing a regional seminar, using a space event in your region or disseminating information through existing network)
- Possible approach to policy makers and business people in your region for the realization of mission ideas with an implication of contributing to a better future of your society or country

Reasons for joining MIC

- 1) Good training opportunities as capacity building
- 2) Meaningful mission idea can be sought
- 3) MIC can function as catalyst which can make a difference in the real world because the missions using ISS platform can be affordable and technically reachable.
- 4) High visibility for your ideas and the potential for future collaboration and support
- 5) Awards

Awards (1)

- 1st place:
 - (A) ICE Cubes:
 - 25% discount on a 1U cube of 1 kg for 4 months operations for a launch within 2 years from award and
 - A visit to the ICE Cubes control centre / clean room and the European Astronaut Centre or Monetary award (500 Euro)
 - (B) iSEEP: 25% discount on a 1U-3U size payload for 6 months operations for a launch within 2 years from the award and Monetary award (50,000 Japanese yen)
- 2nd place:
 - (A) ICE Cubes:
 - 15% discount on a 1U cube of 1 kg for 4 months operations for a launch within 2 years from award and
 - A visit to the ICE Cubes control centre / clean room and the European Astronaut Centre or Monetary Award (300 Euro)
 - (B) iSEEP: 15% discount on a 1U-3U size payload for 6 months operations for a launch within 2 years from the award and Monetary award (30,000 Japanese yen)

Awards (2)

- Student Prize:
 - (A) ICE Cubes:
 - 10% discount on a 1U cube of 1 kg for 4 months operations for a launch within 2 years from award and
 - Monetary Award (250 Euro)
 - (B) iSEEP:
 - 10% discount on a 1U-3U size payload for 6 months operations for a launch within 2 years from the award
 - Monetary award (25,000 Japanese yen)
- IAA award (TBA)

How to write abstract (1)

- **Need**
 - In 2-3 sentences describe the fundamental need (humanitarian, business, scientific, etc.) your mission idea addresses.
- **Mission Objectives**
 - List and describe no more than 5 mission objectives and prioritize them. These should be quantitative in nature and serve as overall measures of effectiveness for the mission.
- **Sustainable Development Goal(s):**
 - *Please indicate which sustainable development goal(s) your mission can contribute to.*
 - <https://sustainabledevelopment.un.org/?menu=1300>
- **Brief description of the experimental concept and setup.**
 - In 2-3 sentences describe the overall concept and setup for your experiment. Description of the expected deliverables (e.g. returned samples, data amount, data rate, others). What outcome will you expect in the end?
- **Space Segment Description**
 - Describe the conceptual design for your mission system(s) for the space segment. Brief description of the type of hardware composing the experiment. List key specifications (e.g. mass, volume, peak and average power, link budget, etc.). Diagrams or simple CAD drawings are encouraged.
-

How to write abstract (2)

- **Concept of Operations**
 - List and describe key mission elements for operations and describe their primary interfaces. Use diagrams and tables as appropriate. Describe the experiment process and your mission profile (mission duration, operations start, operations end, timeline, Describe the intended interaction from the ground. Specific operational needs.
- **Key Performance Parameters**
 - List and explain the rationale for 3-5 key performance parameters that enable the successful conduct of your mission idea.
- **Implementation Plan**
 - Provide a reasonable estimate of total life cycle cost to include design, development, assembly, integration, testing, launch, operations and return (if necessary). List any facilities or other infrastructure to be used or needed. Describe the project organization. Present a top-level project schedule starting from authority to proceed.
- **Risk**
 - List and describe the top 5 project risks (technical or programmatic).
- **References**
 - List any technical references for your idea

Advice from Reviewers

- Do some literature research (using the internet) on their proposed ideas before preparing their proposal to make sure that it has not already been done.
- If you are not experienced with space technology, please read one of the introductory books to confirm the basic feasibility of your ideas.
- Seek an experienced advisor or mentor who can review your ideas at an early stage and provide guidance on the preparation of your proposal.

Call for proposals!

- Abstract

- Due: **August 8, 2019**

- Length: 5 pages max

- Template can be downloaded at:

- <http://www.spacemic.net>**

- Note: Online system for abstract submission will be set up in June.

- Important date:

- **September 9, 2019**: Notification of acceptance

- **October 10, 2019**: Final Paper (12 pages max) Due

- **December 2, 2019**: Final presentation at the University of Tokyo, Japan

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