



# Introduction to the 8<sup>th</sup> Mission Idea Contest (MIC8) *for Multiple Nano-satellites*

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# Contents

- MIC8 Requirements
- Background
- Previous MIC winners
- Process and Timeline
- Evaluation Criteria
- Submissions

# MIC8 Requirements

- The mission shall be carried out by multiple satellites made of **6U CubeSat** or smaller each.
- The number of satellites can be anything as long as there are **at least two** satellites in the mission; and
- The mission has **clear benefits of having multiple satellites** in orbit simultaneously.
  - **Constellation** missions (with no inter-satellite link) or
  - **Formation Flying** missions (with inter-satellite link)

# 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, Varna, Bulgaria

## Background(2)

7 MICs and 4 Pre-Workshops were successfully organized between 2011-2022.

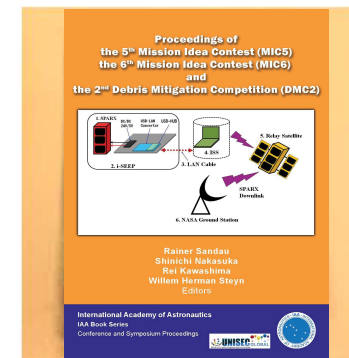
- Results
  - Potential utilizations of micro/nano-satellites were provided in the large number of submitted proposals
  - Four books were published as IAA book series



MIC1-3



MIC4 & Deorbit Device Competition



MIC5-6 & DCM2

# MIC Winners' Mission Ideas

	Proposed idea	Country	Status
MIC 1 (constellation)	Integrated Meteorological / Precise Positioning Mission Utilizing Nano-Satellite Constellation	Japan	professional
MIC 2 (Satellite Design)	SOLARA/SARA: Solar Observing Low-frequency Array for Radio Astronomy/ Separated Antennas Reconfigurable Array	USA	student
MIC 2 (Business model)	Underground and surface water detection and monitoring using a microsatellite	South Africa	student
MIC 3	Clouds Height Mission	Germany, Italy, Slovenia	professional
MIC 4	Cubesat constellation for monitoring and detection of bushfires in Australia	Australia	student
MIC 5	Smallsat Ionosphere Exploration at Several Times and Altitudes,	Taiwan, USA, India	student
MIC 6 (ISS-IceCube)	MUSA: An ISS Experiment for research of a dual culture for Panama Disease	Costa Rica	student
MIC6 (ISS-iSEEP)	Spectrum Monitoring from Space with i-SEEP (SMoSiS)	Philippines	professional
MIC7 (Deep space)	PARS: Precursor Asteroid Remote Survey	Turkyie	student

# Process and Timeline

**Application Submission : Deadline June 30, 2023**

Submitted abstracts will be evaluated by review team

**Notification of Finalists: August 8, 2023**

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

**Final Paper Submission: October 3, 2023**

Submitted final paper will be distributed to review team for evaluation

**Presentation in Japan in November or December, 2023  
at the 9th UNISEC-Global Meeting (in-person)**

# Evaluation Criteria

<b>Originality</b>	Novel concept not yet realized or proposed, or a new implementation of an existing capability or service (25).
<b>Impact</b>	Impact on society / Potential to expand scientific knowledge / Strengthen deep space mission motivation (25).
<b>Engineering</b>	Technical description and solutions (20). Operational (protocol, communication and interaction during experiment) (15).
<b>Feasibility</b>	Programmatic (realistic- cost, development schedule, infrastructure requirements, risks and opportunities) (15).



# Submissions

- 23 Abstracts from 16 countries
- 10 Finalists and 2 Semi-finalists from 10 countries
- Constellations of 1.5U to 6U CubeSats
- Constellations from 2 to 220 satellites
- Payloads of Hyperspectral imagers, Multispectral imagers, GNSS, Lidar, SAR, Dosimeters, Mass Spectrometers, Phase Array antennas, etc.
- Missions to Europa (Jupiter moon), Earth's Moon and LEO