The 8th Mission Idea Contest for Multiple Nano-satellites

Introduction to the 8th Mission Idea Contest (MIC8)

for Multiple Nano-satellites

MIC Office

UNISEC GLOBAL
University Space Engineering Consortium

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MIC8 Overview

- Theme: “Missions by multiple nano-satellites”

  The mission is carried out by multiple satellites made of 6U CubeSat or smaller each.
  The number of satellites can be anything as long as it is bigger than one, 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)

- Important dates:

  Abstract submission due: **June 30, 2023**

  Notification: August 8, 2023

  Full Paper submission due: October 3, 2023

  Final presentation: TBD (Nov or Dec, 2023, in Japan)

Note: Final presentation may be pre-recorded or live dependent on COVID19 travel restrictions.

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.

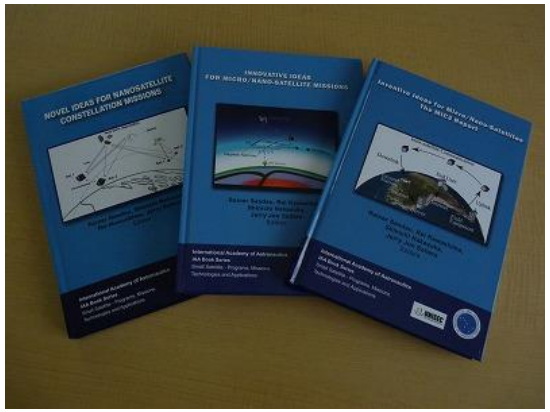
MIC3 finalists and reviewers, Nov 19, 2014, Kitakyushu, Japan


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

Background(2)

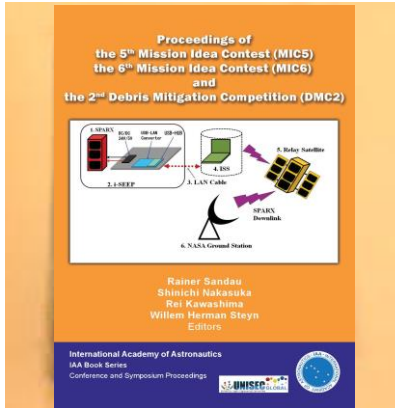
7 MICs and 4 Pre-Workshops were successfully organized in 2011-2022.

- 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
MIC 1 (2011,Tokyo) (constellation)	Integrated Meteorological / Precise Positioning Mission Utilizing Nano-Satellite Constellation	Japan (professional)
MIC 2 (2012,Nagoya) (Satellite Design)	SOLARA/SARA:Solar Observing Low-frequency Array for Radio Astronomy/ Separated Antennas Reconfigurable Array	USA (student)
MIC 2 (2012,Nagoya) (Business model)	Underground and surface water detection and monitoring using a microsatellite	South Africa (student)
MIC 3 (2014, Tokyo)	Clouds Height Mission	Germany, Italy, Sloveni (professional)
MIC 4 (2016, Bulgaria)	CubeSat constellation for monitoring and detection of bushfires in Australia	Australia(student)
MIC 5 (2018, France)	Smallsat Ionosphere Exploration at Several Times and Altitudes,	Taiwan, USA, India (student)
MIC 6 (2019, Tokyo) (ISS-IceCube)	MUSA: An ISS Experiment for research of a dual culture for Panama Disease	Costa Rica(student)
MIC6 (2019, Tokyo) (ISS-iSEEP)	Spectrum Monitoring from Space with i-SEEP (SMoSiS)	Philippines (professional)
MIC7 (2022, Tokyo)	PARS: Precursor Asteroid Remote Surve	Turkey (student)

MIC1-7 & Pre-MIC3-8 Comparison

	MIC1	MIC2	PreMIC3	MIC3	PreMIC4	MIC4	PreMIC5	MIC5	MIC6	MIC7	PreMIC8	MIC8
Satellite mass	< 15 kg	<50 kg	<50 kg	<50 kg	<50 kg	<50 kg	<50 kg	<50 kg	ISS Platform	Deep Space	<6'U	<6'U
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	N/A	2 or more	2 or more
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)	2 Mission idea for Deep Space Science and Exploration with Nano/Micro Satellite cis-lunar orbit or deep space trajectory orbit	1 Multiple satellites mission (constellation and Formation flying)	1 Multiple satellites mission (constellation and Formation flying)

Requirements

- The mission is carried out by multiple satellites made of 6U CubeSat or smaller each.
- The number of satellites can be anything as long as it is bigger than one, 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)

Please download and use the abstract template on the website.

http://www.spacemic.net

Process and Timeline

Application Submission : Deadline June 30, 2023

Submitted abstracts will be evaluated by review team

Notification of Finalist: 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)

Example of National/regional competition for MIC8
Please encourage potential applicants to join.

Application Submission : Deadline March-April, 2023

Submitted abstracts will be evaluated by regional review team

Presentation (online and/or in-person): sometime in April-May

Winner teams are selected by regional review team

Abstract Submission to MIC8: June 30, 2023

Winner teams submit polished abstracts to MIC8

Notification: August 8, 2023

Selected Finalists submit full paper by Oct 3 and make a final presentation in Nov or Dec in Tokyo, Japan

Evaluation Criteria

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

Function of MIC Coordinators

- **Mentor**: Offer advice and expertise, as well as facilitate the coordination of potential applicants, within your region and beyond.

- **Coordinate**: Liaise with the MIC Office to develop effective ways for participants to engage and apply for the MIC7 (e.g. organizing a regional seminar, using a space event in your region or disseminating information through existing network).

- **Network**: Develop methods to help link students, researchers, 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/region.

Reasons for joining MIC

1) Capacity building via training opportunities.
2) Seek meaningful mission ideas.
3) Attend free lectures on deep space exploration.
4) Make a difference in the real-world. MIC can function as catalyst and result in projects which are innovative, affordable and technically reachable.
5) Receive exposure for your ideas. Develop your career profile and find potential future collaborators among a worldwide network.
6) Recognition of excellence; awards/prizes (TBA).

JOIN US!!

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