



The 9th

Mission Idea Contest: to the Moon

Preliminary Workshop

**Introduction to
the 9th Mission Idea Contest : to the Moon
Preliminary Workshop
(PreMIC9)
*Lunar Mission***

MIC Office

Contents

- PreMIC9 Overview
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PreMIC9 Overview

The lunar missions consider the use of one or more CubeSats placed into lunar orbit or one or more rovers deployed on the lunar surface. Designs are encouraged to demonstrate originality, impact, engineering elegance, and feasibility.

Category:

- Lunar Orbit CubeSat Mission (LOCM)
- Lunar Surface Rover Mission (LSRM)

Important dates:

Abstract submission due: **July 24, 2024**

Notification: **September 10, 2024**

Final presentation: **November 27, 2024**, in Stellenbosch, South Africa
(Selected finalists will a make presentation at PreMIC9.)

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



MIC8 finalists and reviewers, Nov. 29, 2023, Tokyo, Japan

Background(2)

8 MICs and 4 Pre-Workshops were successfully organized in 2011-2023.

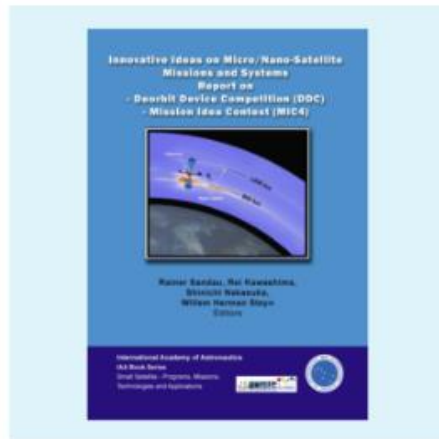
- Results

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

<https://iaaspace.org/product-category/pub/bookseries/>



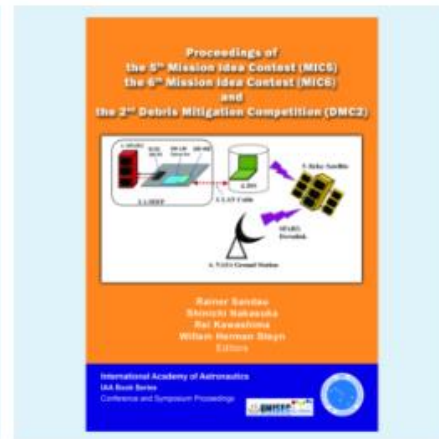
Small Satellite



Innovative Ideas on Micro Nano-Satellite



Inventive Ideas for Micro/Nano-Satellite The MIC3 Report



Proceedings of the MIC5 / MIC6 / DMC2



The MIC7 Report

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, Slovenia (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)
MIC8 (2023, Tokyo)	MOTHS: Moon Observation Through Hyperspectral Satellites	Italy (student)

MIC1-8 & Pre-MIC3-9 Comparison

	MIC1	MIC2	PreMIC3	MIC3	PreMIC4	MIC4	PreMIC5	MIC5	MIC6	MIC7	PreMIC8	MIC8	PreMIC9
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	<12'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	1 or more
Rover mass													<10 kg (Maximum Convoy Mass)
Number of Rover													1 or more
Category	1	2	2	1	2	1	1	1	2	2	1	1	2
	Mission idea for nano-satellite constellation	Mission idea & satellite design	User	Mission idea and satellite design	Mission proposer	Mission idea and satellite design	Mission idea and satellite design to satisfy any of SDGs	Mission idea and satellite design to satisfy any of SDGs	ICECUBES	Mission idea for Deep Space Science and Exploration with Nano/Micro Satellite	Multiple satellites mission (constellation and Formation flying)	Multiple Satellites Mission (constellation and Formation flying)	Lunar Orbit CubeSat Mission
		Mission idea & business model	Developer		Resource provider				(inside)	cis-lunar orbit or deep space trajectory orbit			Lunar Surface Rover Mission
								iSEEP (outside)					

Process and Timeline

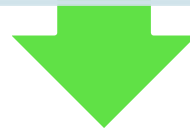
Application Submission : Deadline July 24, 2024

Submitted abstracts will be evaluated by review team



Notification of Finalist: September 10, 2024

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



**Presentation and Workshop in South Africa on November 27, 2024
(Selected finalists will make a final presentation.)**

Requirements

Theme: ***“Lunar Mission “***

Category:

- Lunar Orbit CubeSat Mission (LOCM)
- Lunar Surface Rover Mission (LSRM)

Details of Requirements :

https://www.spacemic.net/pdf/premic9/PreMIC9_Requirements.pdf

Please download and use the abstract template on the website.

<http://www.spacemic.net>

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).
Feasibility	Programmatic (realistic- cost, development schedule, infrastructure requirements) (15).

Finalist Presentation

Rafli Rizaldi Alief Nurvian (Indonesia)	Investigating the Effects of Cosmic Radiation on Human Cells in Lunar Orbit
YiYu Chang Yuhsiu Tien (Taiwan)	Lunar Ionosphere Characterization and GNSS Evaluation through Multi-Satellite Occultation (LIGEMO)
Victoria Zlateva (Bulgaria)	Lunar Surface Penetrating Radar Mission (Lunar SPR)
Onwuama Ihunanya (Nigeria)	LUCAD (Lunar Cavity Detection)