The 9th Mission Idea Contest: to the Moon

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Introduction to the 9th Mission Idea Contest : to the Moon (MIC9)

Lunar Mission

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https://www.spacemic.net/

UNISEC GLOBAL University Space Engineering Consortium

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MIC9 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: **April 15, 2025**

Notification: **June 12, 2025**

Full paper submission(Finalists): **August 25, 2025**

Final presentation: **November 1, 2025** in Japan

(Selected finalists will make a presentation at MIC9.)

25 abstracts were submitted from 14 countries.

10 finalists and 4 semi-finalists were selected.

UNISEC GLOBAL
University Space Engineering Consortium

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.

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

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

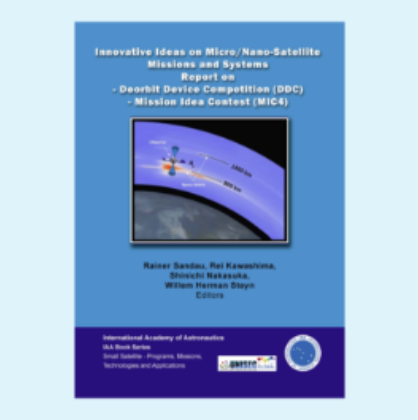
PreMIC9 finalists and reviewers, Nov. 27, 2024, Stellenbosch, South Africa

Background(2)

8 MICs and 5 Pre-Workshops were successfully organized in 2011-2024.

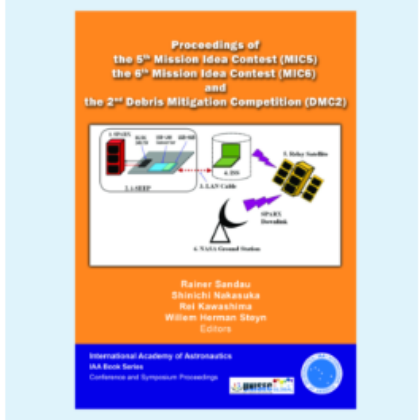
- Results
  - Potential utilization of micro/nano-satellites were provided in the large number of submitted proposals
  - Four books and three e–books were published as IAA book series

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

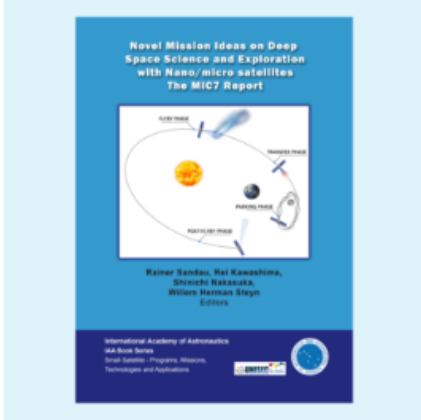


Innovative Ideas on Micro Nano-Satellite

Inventive Ideas for Micro/Nano-Satellite
The MIC3 Report



Proceedings of the MIC5 / MIC6 / DMC2



The MIC7 Report

The MIC8 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)
MIC 6 (2019, Tokyo) (ISS-iSEEP)	Spectrum Monitoring from Space with i-SEEP (SMoSiS)	Philippines (professional)
MIC 7 (2022, Tokyo)	PARS: Precursor Asteroid Remote Survey	Turkey (student)
MIC 8 (2023, Tokyo)	MOTHS: Moon Observation Through Hyperspectral Satellites	Italy (student)

MIC1-9 & Pre-MIC3-9 Comparison

	MIC1	MIC2	PreMIC3	MIC3	PreMIC 4	MIC4	PreMIC5	MIC5	MIC6	MIC7	PreMIC 8	MIC8	PreMIC9	MIC9
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	<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	1 or more
Rover mass													<10 kg (Maximum Convoy Mass)	<10 kg (Maximum Convoy Mass)
Number of Rover													1 or more	1 or more
	1	2	2	1	2	1	1	1	2	2	1	1	2	2
Category	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	Lunar Orbit CubeSat Mission
		Mission idea & business model	Developer		Resource provider				(inside) iSEEP (outside)	cis-lunar orbit or deep space trajectory orbit			Lunar Surface Rover Mission	Lunar Surface Rover Mission

Requirements

Theme: ***“Lunar Mission “***

Category:

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

Details of Requirements：
https://www.spacemic.net/pdf/mic9/MIC9_Mission_Requirements.pdf

Please download and use the abstract template on the website.

https://www.spacemic.net/

Process and Timeline

Application Submission: Deadline April 15, 2025

Submitted abstracts will be evaluated by review team

Notification of Finalist: June 12, 2025

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

Final Paper Submission: August 25, 2025

Submitted final paper will be distributed to review team for evaluation

Presentation in Japan: November 1, 2025

at the 11th UNISEC-Global Meeting (in-person)

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).

Awards/Prize

- 1st Place　300,000JPY(about 2,000USD)
- 2nd Place　100,000JPY(about　667USD)
- Student Prize　50,000JPY(about　333USD)
- IAA Award

※1USD=150JPY

Finalist Presentation (1/2)

Title	Presenter
Exploring Lunar Ionosphere Characterization through Multi-CubeSat Occultation with Ranging Technology and Radiation Environment Analysis	**YiYu Chang**, **Yuhsiu Tien**, and **Chieh Lung**, National Central University, Taiwan
SELENE (Spectral Evaluator and Lunar Energetic-radiation Notification Experiment): A Lunar CubeSat constellation for evolving characterization of Lunar regolith and exosphere, with an experimental radiation forecasting system.	**Izaak Cerneaz, Charles Ward, Sam Magarey, Quenton Yeo**, The University of Sydney, Australia **Will Vallis**, Spiral Blue and The University of Sydney, Australia
Rover for In-Situ Umzi eNyangeni – No 1 (RISUN-1)	**Dirk Slabber**, isiLimela Space Systems, South Africa
Sat-GPT: Investigating Adaptive AI Performance in a Radiation-Intense Lunar Environment	**Grace Bruce, Mark Buddee, Alec Cook, Rishi Deshpande, Ashley Hanna , Cameron Mitchell, Isabella Tooher** and **Sophia Wood**, The University of Sydney, Australia
Taiwan-India Lunar Dust Analysis (TILDA) Mission	**Ying Liao**, National Taipei University of Technology, Taiwan

Finalist Presentation (2/2)

Title	Presenter
SLINQI – Stellenbosch Lunar Interferometric Network for Quasi-static Imaging	**Jandré Frey, Russouw Grobbelaar** and **Nortier Geyer**, Stellenbosch University (SLINQI), South Africa
LUNar ATmospheric Investigations with Cube-Sats (LUNATICS)	**Kelly Chen, Ellie Deveson, Joshua Dickford, James Hocking, Jasmine Khuu,** and **Aum Mehta**, The University of Sydney, Australia
Lunar Multi-Rover Lava Tube Exploration (LuMEX)	**Yunus Emre ÖZDEMİR** and **Elif Irmak KAYNAR**, Middle East Technical University, Turkiye
CubeSat Mission Concept for TREED (The REceiver Exploring Darkages)	**Takato Hatae** and **Yojiro Yamashiro**, The University of Tokyo, Japan
VISTA-PIPR Virtual Immersive Sensing and Terrain Analysis for Polar Ice Prospecting Rover Mission	**Abdulla Hil Kafi, Yuzuki Fukata, Taichi Nakamura** and **Kosuke Iwatsu** , Kyushu Institute of Technology, Japan

Submissions

- 25 Abstracts from 14 countries
- 10 Finalists and 2 Semi-finalists from 7 countries
- Constellations or single satellites of 2U to 12U CubeSats in Lunar 100 km polar orbit
- Swarm of 2.5 kg or single 10 kg Lunar Rovers
- Payloads of Hyperspectral imagers, Multispectral imagers, LiDAR, Dosimeters, Dust particle detectors, Mass Spectrometers, Phase Array antennas, etc.
- Missions to Lunar surface or Lunar orbit

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