



The Pre-5th

Mission Idea Contest Workshop

Micro/Nano Satellites for Global Sustainable Development



Local Competition in USA for Pre 5th Mission Idea Contest Workshop (PreMIC5) for micro/nano satellite utilization

July 31st, 2017

Amal Chandran,

LASP, University of Colorado

Contents

- PreMIC5 Workshop Overview
- Background
- Comparison with previous MICs
- Process and Timeline
- Evaluation Criteria
- Regional Coordinator and Seminar
- New requirement for PreMIC5
- How to write abstract
- Advice from Reviewers
- Call for proposal

PreMIC5 Overview

- Objective: encourage innovative exploitation of micro/nano satellites to provide useful capabilities, services or data
- Eligibility: Any individual, group or company with suitable space systems expertise and an enthusiasm for nano-satellites
- One Category : Mission Idea and Satellite Design
- Target satellite(s): satellite(s) weighing less than 55 kg.
6U (12 kg, 12x24x36 cm), 12U (24 kg, 23x24x36cm), 27U (54kg, 34x35x36 cm) or custom form factor
- Local Competition Host: **Laboratory for Atmospheric and Space Physics, University of Colorado at Boulder**
- Important dates:
 - May 28, 2017 : Abstract (5 pages max) Due
 - June 19, 2017 : Notification of acceptance
 - July 31, 2017 : Final presentation in Boulder, Colorado
 - Dec 3, 2017 : Winners will make presentation at PreMIC5 Workshop in UNISEC-Global Meeting, Rome, Italy

<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.



MIC2 final presentation, Oct. 10, 2012, Nagoya, Japan



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

Background(2)

Four MICs and 2 Pre-Workshops were successfully organized in Japan in 2011-2016

•Results

- Potential utilizations of micro/nano-satellites were provided in the large number of submitted proposals
- Three books were published as IAA book series and one book will be printed soon.



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

	MIC1	MIC2	PreMIC 3	MIC3	PreMIC4	MIC4	PreMIC 5
Satellite mass	< 15 kg	<50 kg	<50 kg	<50 kg	<50 kg	<50 kg	<50 kg
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
Category	1 Mission idea for nano-satellite constellation	2 Mission idea and satellite design Mission idea and 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

Process and Timeline

Application Submission : Deadline May 28, 2017

Submitted abstracts will be evaluated by review team



Notification of Finalist: June 19, 2017

The result will be notified by Email



Presentation : July 31, 2017

Select the 1st place and 2nd place



**Winner's Presentation in Rome on December 3, 2017
at the 5th UNISEC-Global Meeting**

Evaluation Criteria

Originality (50 points)	<ul style="list-style-type: none"> -Novel mission concept not yet realized or proposed, or a new implementation of an existing capability or service (25) -Impact on society (25)
Feasibility (50 points)	<ul style="list-style-type: none"> -Technical (20) -Programmatic (cost estimate, development schedule, infrastructure requirements) (15) -Operational (description of ground segment and communications architecture, e.g., planned use of existing infrastructure) (15)

Worldwide Network of MIC Regional Coordinator



★ : CLTP participant ★ : MIC 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 MIC4 (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 satellite 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 micro/nano satellites can be affordable and technically reachable.
- 4) High visibility for your ideas and the potential for future collaboration and support

With the MIC, many people including students start to think what they need and what they can do to achieve the goal using micro/nano satellites. Through participation in the MIC, needs/wants and solutions are considered in deeper level.

New Requirement for PreMIC5

Your proposal needs to satisfy any of the frameworks.



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

How to write abstract (1)

- **Need**
 - In 2-3 sentences describe the fundamental need (humanitarian, business, scientific, etc.) your mission idea addresses. For example "Some countries need timely tsunami warnings," and why this need is not being fully addressed by current or conventional large space systems.
- **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.
- **Concept of Operations**
 - List and describe key mission elements (ground segments, space segments, launch, etc.) and describe their primary interfaces. Use diagrams and tables as appropriate.
- **Key Performance Parameters**
 - List and explain the technical rationale for 3-5 key performance parameters that enable the successful conduct of your mission idea. For example, tsunami detection may depend on better than 20 m spatial resolution in the visible spectrum.

How to write abstract (2)

- **Space Segment Description**
 - Describe the conceptual design for your satellite system or systems. List key specifications (e.g. mass, volume, peak and average power, link budget, delta-V, etc.). Diagrams or simple CAD drawings are encouraged.
- **Orbit/Constellation Description**
 - Describe the orbital elements for the desired mission and explain the technical rationale for its selection. Presentation of analytical results ground coverage (for Earth observation mission) or user access computations or simulations is encouraged.
- **Implementation Plan**
 - Describe who would be possible players for implementation and how they could implement your idea. Provide a reasonable estimate of total life cycle cost to include design, development, assembly, integration, testing, launch, operations and disposal (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. 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.
- Check the ideas submitted by previous finalists in the MIC website and MIC books.
- If you are not experienced with satellite and space technology, please read one of the introductory books to confirm the basic feasibility of your ideas. (“Understanding Space,” etc.)
- 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: May 28, 2017
 - Length: 5 pages max
 - Template can be downloaded at:
<http://www.spacemic.net>
- Important date:
 - May 28, 2017 : Abstract (5 pages max) Due
 - June 19, 2017 : Notification of acceptance
 - July 31, 2017 : Final presentation in Boulder, Colorado
 - Dec 3, 2017 : Winners can make presentation at PreMIC5 Workshop in UNISEC-Global Meeting, Rome, Italy

Contact

Amal Chandran
Program Manager, INSPIRE
Laboratory for Atmospheric and Space Physics
University of Colorado at Boulder
1234 Innovation Dr.
Boulder, CO 80303
Tel: 303 735-6860
Email : amal.chandran@lasp.colroado.edu

MIC Office info@spacemic.net

c/o UNISEC Office

2-3-2 Yayoi, Bunkyo-ku, Tokyo, 113-0032, Japan

Tel: +81-3-5800-6645

<http://www.spacemic.net>