MIC3

Introduction to 3rd Mission Idea Contest (MIC3)

for micro/nano satellite utilization

April 2, 2014

MIC office

University Space Engineering Consortium

(UNISEC)

UNISEC
University Space Engineering Consortium

Contents

- MIC3 Overview
- Background
- Comparison with previous MICs
- Process and Timeline
- Evaluation Criteria
- Regional Coordinator and Seminar
- Reasons for joining MIC
- How to write abstract
- Review team and advice
- Call for proposal

MIC3 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): nano/micro satellite(s) weighing less than 50 kg

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

Background(2)

Two MICs and 1 Pre-Workshop were successfully organized in Japan in 2011, 2012 and 2013.

- Results
  - Potential utilizations of micro/nano-satellites were provided in the large number of submitted proposals

  (regarding the resolution of local and global problems.)
    - MIC1: 62 applications from 24 countries
    - MIC2 : 72 applications from 31 countries
    - Pre MIC3: 22 applications from 15 countries
      - User: 12 from 10 countries,
      - Developer: 10 from 9 countries

Comparison of MIC1,2,3 and Pre-MIC3

	MIC1	MIC2	PreMIC3	MIC3
Satellite mass	< 15 kg	<50 kg	<50 kg	<50 kg
Number of satellites	2 or more than 2 (constellations only)	1 or more than 1 (no requirement for constellations)	Same as MIC2	Same as MIC2
Category	Only 1 category: Mission idea for nano-satellite constellation	2 categories: 1) Mission idea and satellite design 2) Mission idea and business model	1)Users 2)Developers	Only 1 category: Mission idea and satellite design

Process and Timeline

Application Submission : Deadline June 27, 2014

Submitted abstracts will be evaluated by review team

Notification of Finalist: September 1, 2014

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

Final Paper Submission: October 15, 2014

Submitted final paper will be distributed to review team for evaluation

Presentation in Kitakyushu on November 19, 2014

at the 2nd UNISEC-Global Meeting

Evaluation Criteria

Originality (50 points)	-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)	-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)

Regional Coordinators and Seminar

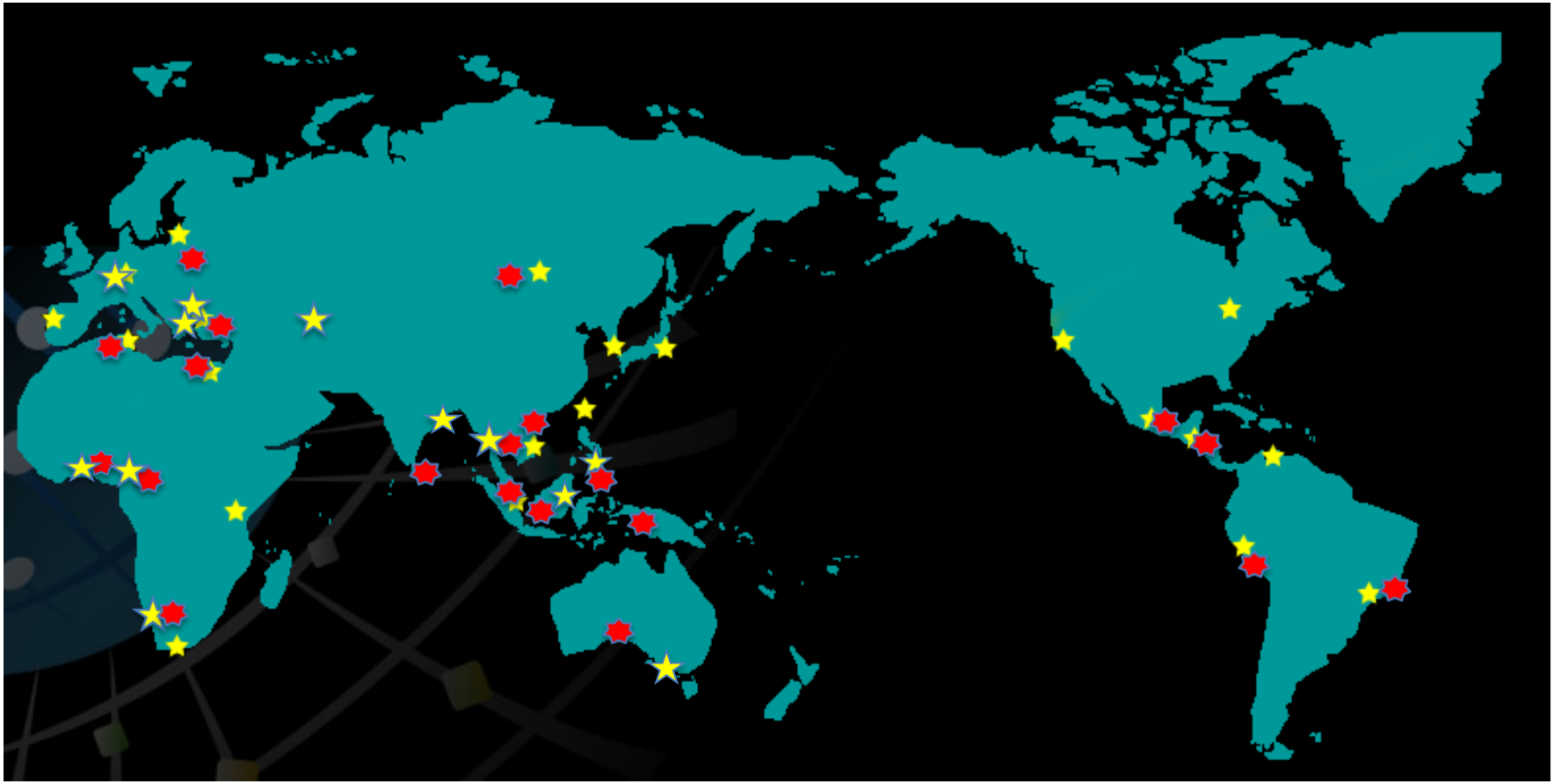
Regional seminars and MIC2 introductory presentations had been organized in 24 countries, namely Peru, Brazil, Lithuania, Taiwan, Saudi Arabia, Japan, Kenya, Turkey, Singapore, Belgium, Egypt, México, Bulgaria, Nigeria, Korea, Spain, Guatemala, Ghana, Namibia, Tunisia, Germany, Philippines, Venezuela and South Africa.

Approximately 60% of the applicants heard about the contest through the Regional Coordinators and Regional Seminars organized by them.

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 MIC3 (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

MIC Global Network of Regional Coordinator (38 regions)



: CLTP participant : MIC coordinator

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.

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 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. 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

Reviewers

Dr. Jerry Sellers
Teaching Science & Technology, Inc.

Dr. Rainer Sandau
IAA

Dr. Masaya Yamamoto
Weathernews Inc.

Prof. Shinichi Nakasuka,
Univ. of Tokyo

Prof. Sir Martin Sweeting
SSTL
SSC

Prof. Herman Steyn
Stellenbosch Univ.

Prof. Jordi Puig-Suari, Calpoly, USA

Prof. Hiroshi Kawahara
Cyber Univ.

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.
- 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 proposal!

- Abstract
  - Due: June 27, 2014
  - Length: 5 pages max
  - Template can be downloaded at:

    http://www.spacemic.net

  Note: Online system for abstract submission will be set up later.
- Important date:
  - Sep 1, 2014: Notification of acceptance
  - Oct 15, 2014: Final Paper (12 pages max) Due
  - Nov 19, 2014: Final presentation

Contact

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