



# Results and Future Perspectives of the Mission Idea Contest

December 13, 2011

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(Héctor Bedón Monzón) and other MIC Regional coordinators**

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# Contents

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- Purpose of the paper
  - To examine the effects and difficulties of the MIC from viewpoint of capacity building
- Report of the 1st Mission Idea Contest
- Feedbacks from Regional Coordinators
  - Turkey, Egypt, Mexico, Peru and others
- Discussion
  - Positive effects and Lessons learnt
- Call for Ideas on MIC 2

# Report of 1<sup>st</sup> MIC: Process and Results

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**Objectives:** Encourage innovative exploitation of nano-satellites (less than 15kg) in **constellations** to provide useful and sustainable capabilities, services or data

## **1st round: extended abstract evaluation step**

- 62 applications from 24 countries
- 10 finalists and 5 semi-finalists were selected on Jan 20, 2011.

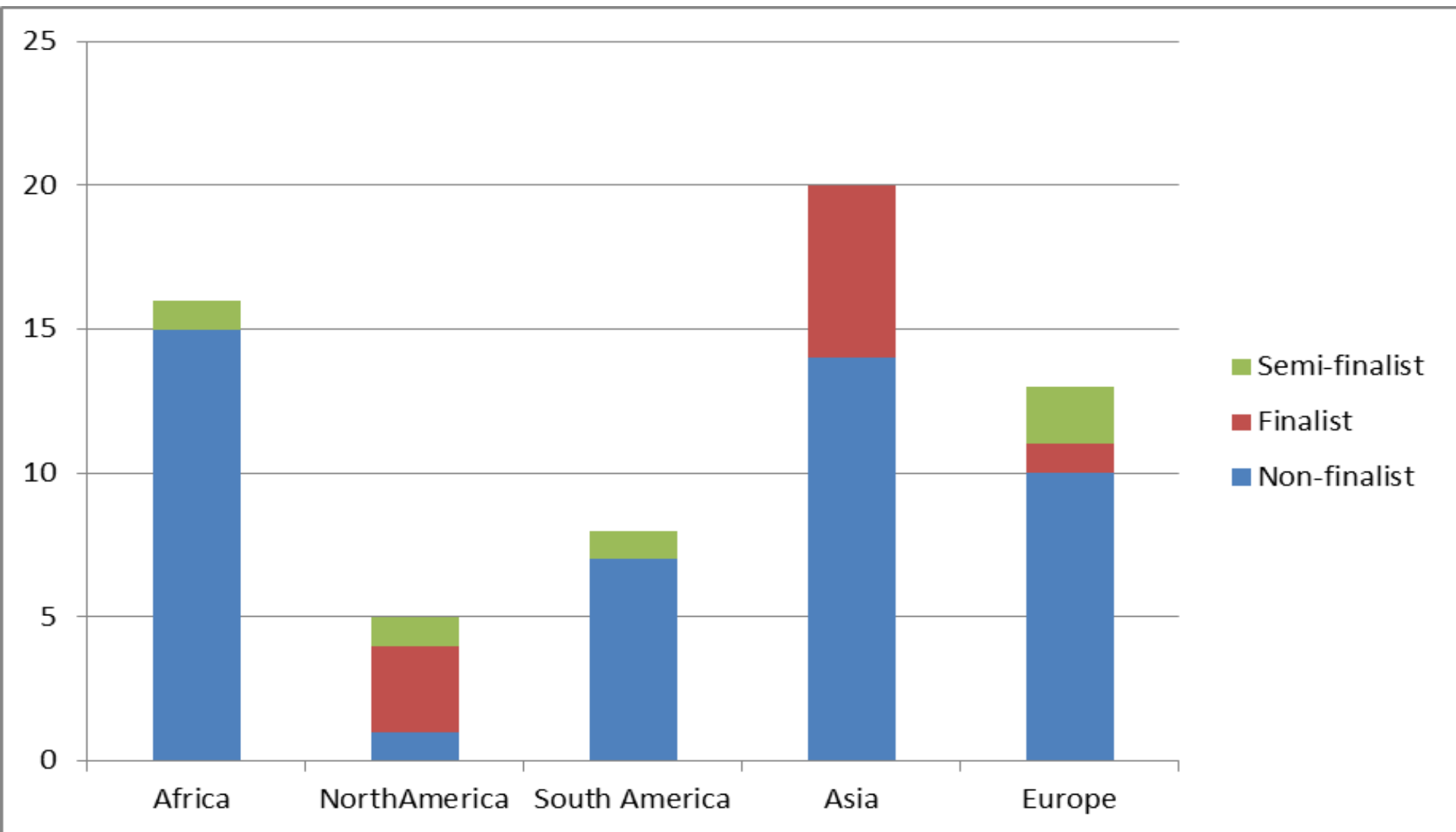
Finalists: Japan2, Canada2, Vietnam2, UK1, Turkey1, Korea 1, USA 1

Semi-finalists: Spain1, South Africa1, Peru1, Ukraine1, USA1

## **2nd round: paper and presentation step**

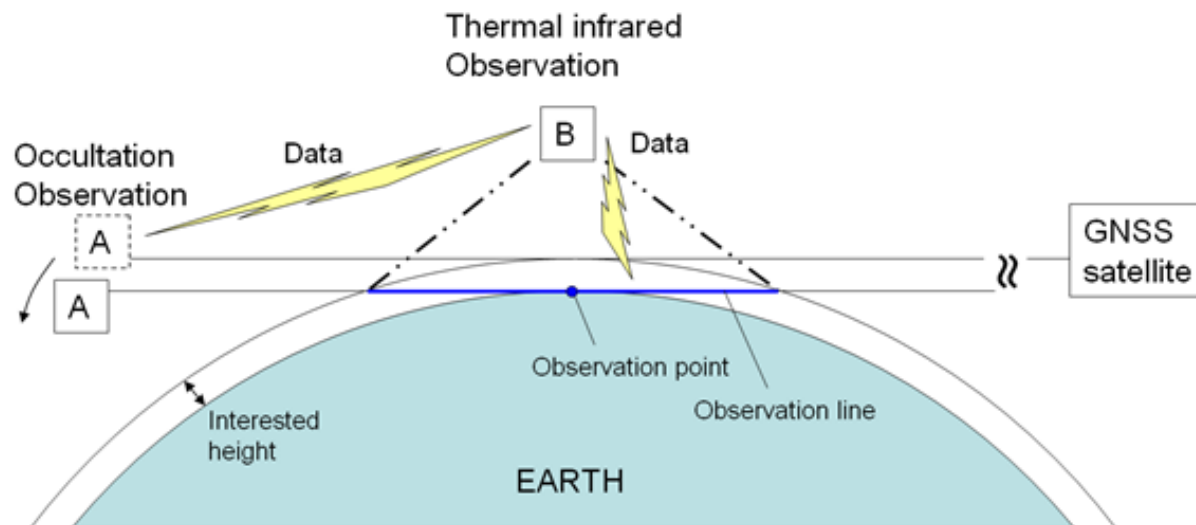
- 10 finalists made presentation on March 14.

# Area Distribution of Applicants



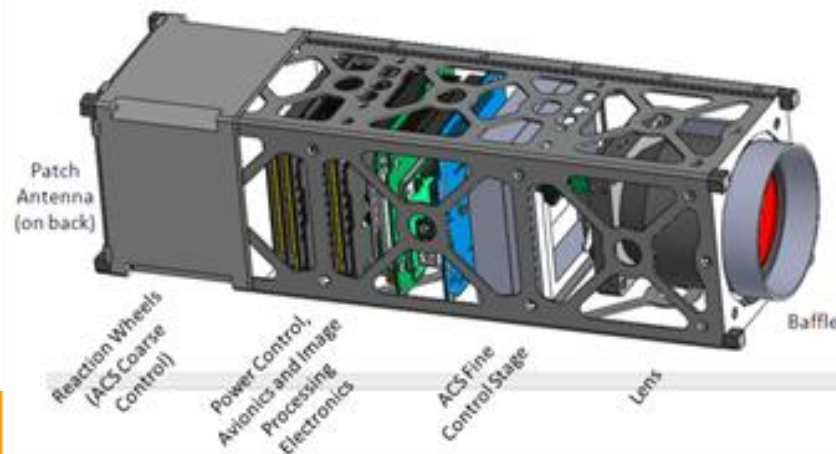
# 1st place: Integrated Meteorological / Precise Positioning Mission Utilizing Nano-Satellite Constellation (MELCO)

- This mission focuses on two needs; **meteorological mission (more accurate rainfall prediction)** and **precise positioning mission** are integrated utilizing nano-satellite constellation. The fundamental components of this mission are two nano-satellites, nano-satellite A that observes GNSS (Global Navigation Satellite Systems) **radio occultation (RO) from edge-on**, and nano-satellite B that acquires **thermal infrared (TIR) images** from the zenith.



## 2nd place: ExoplanetSat Constellation(MIT)

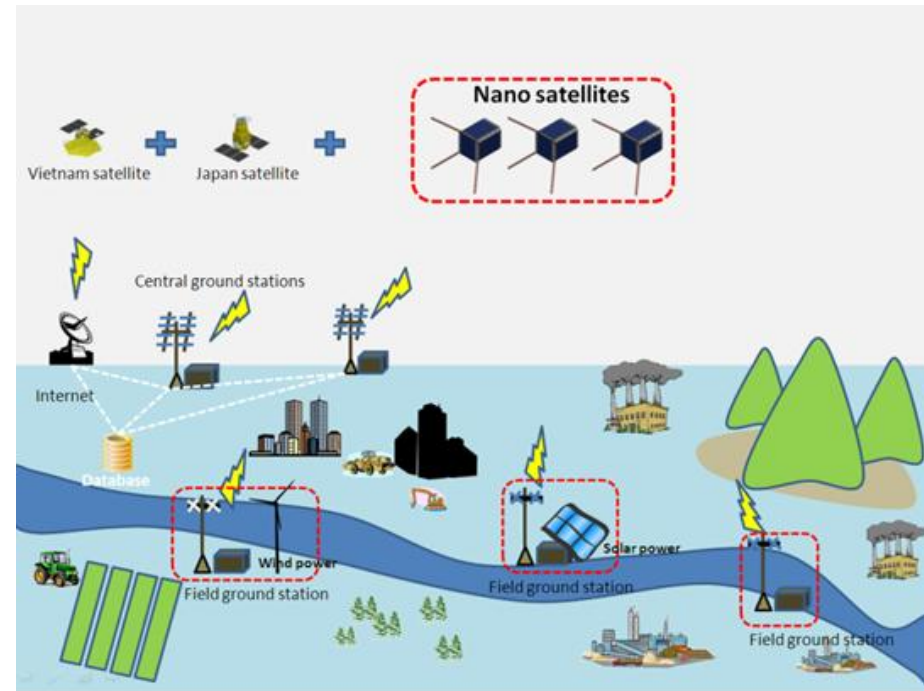
- Constellation of **3U CubeSat** form factor to search for transiting **Earth-sized planets in front of Sun-like stars** in an attempt to locate a habitable planet. The ExoplanetSat Constellation shall use precision photometry to cooperatively monitor chosen Sun-like stars with a maximum measurement noise of 10 parts per million.



# Unique Proposals (Peru and Vietnam)

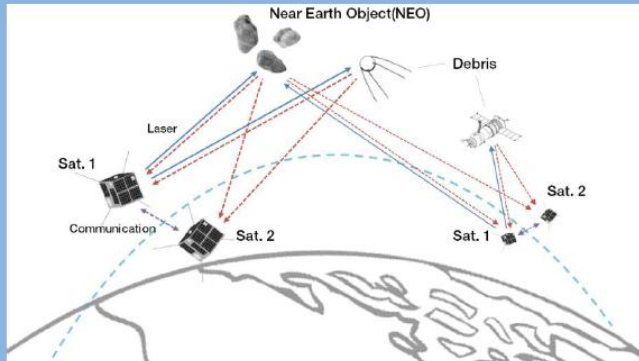
## - Water pollution observation -

Vietnam team and Peru team proposed to distribute many ground sensors which can continually monitor quality of water (ground water, sea, river, etc), and satellites constellation collect data from ground sensors.



**“Information Collecting  
by Multi-Satellites”**

R. Sandau, S. Nakasuka, R. Kawashima, J. Sellers (eds)



Novel Ideas for Nanosatellite  
Constellation Missions

IAA book series  
Small Satellites – Programs, Missions, Technologies and Applications



# Publication

Full papers of  
finalist and  
semi-finalist will  
be published as  
one of IAA book  
series.

## Thanks to IAA!



# Regional Seminars in 2010



Cairo University, Egypt  
August 2, 2010



Instituto de Ingeniería,  
UNAM, Mexico  
September 10, 2010



NanYang Technological  
University, Singapore  
September 15, 2010

## Held in 15 regions

Use University facility (convenient and less expensive),  
Involve diverse background people (diverse knowledge),  
Hear from local people who have real needs (local contact),  
Make students think ideas with help of professionals (big team)

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# MIC Regional Report TURKIYE

Prof.Dr. Alim Rüstem ASLAN  
Istanbul Technical University

# MIC1 Preparations

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- Informed of MIC1 by Miss Rei Kawashima during a visit to University of Tokyo at October 2010.
- Just one MIC seminar was given by Dr. Seiko Shirasaka of Japan, in Istanbul at 26 Nov 2010.
- Submission Deadline: December 20, 2010
- 7 Turkish Proposals (3 by ITU, 2 by TAMSAT, 2 by AFA)
- 1 Finalist
- Having already a CubeSat, ITUpSAT1, in orbit and being working on the development of another nano-satellite was very helpful in preparing abstracts in a short time.

# MIC Turkiye Seminar



Seventy (70) participants from different institutions and disciplines attended the seminar. The seminar was widely announced through email and FAA web site. The Audience are encouraged for participation to MIC.



# PROPOSALS

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- **Space Advertiser (S-VERTISE) (FINALIST)**
- A Nanosatellite Constellation for Earth Fields Measurement (NICEARTH)
- Satellite Network and Data Carrier
- The Tiny EARS (Ears Above for Radiation Searching)
- Dynamic Orbital System for Versatile Missions – DOSVM
- Nano SOS (Space Object Surveillance)

# Effects

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- MIC in itself gives the opportunity to aerospace engineers to prepare a complete space project proposal, considering all its aspects, from planning to in orbit operations.
- Considering the heavy time schedules and large budget requirements of typical space projects, the topics considered in MIC will certainly serve to increase the space awareness among public.
- The interdisciplinary proposals to find innovative solutions to today's difficult problems.

# MIC2

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- Wider public will be reached,
- Many more proposals are expected, also from non engineering background
- UNISEC-TR activities are expected to be of great help



Nano-satellite Constellation  
**Mission Idea Contest**



# Mission Idea Contest Regional Coordinator Report

Mohammed Khalil Ibrahim, Ph.D.

Cairo University - Egypt



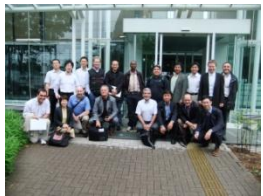
# Timeline

Announcement  
about MIC within Egypt

Announcement about MIC  
to potential Institute in MENA  
region



June 11, 2010  
Launching of MIC



June 21, 2010  
First regional Seminar  
@ Aerospace Eng. Dept.



August 2, 2010  
Second regional Seminar  
@ Cairo University



December 20, 2010  
Submission deadline

January 20, 2011  
Announcement  
of finalists

March 14, 2010  
Final submission and  
Presentation



# Basic Coordinators Activities

## Regional Seminar



June 21, 2010



August 2, 2010

# Seminar Feedback

- Limited available time
- IPR related issues



# Expansion to MENA region



Algeria, Saudi Arabia, and UAE



# MIC-1 Outcomes

- Increase awareness of Nano-sats (7 Ideas)
- Practical Space Engineering Education (CLTP)
- CBG for space laboratories (Establishment of Space laboratory at Cairo University)





## MEXICO REPORT ON MIC-1



- ❖ MIC1 Seminar: September 10<sup>th</sup>, 2010, at Instituto de Ingeniería, UNAM.
- ❖ **Seminar in Face mode as well as by Videoconference.**
- ❖ Participants from: Baja California, Puebla, Querétaro and México City.
- ❖ The Mexican initiative of the Space Agency was floating in the environment.
- ❖ **MIC1 highlighted the Satellite Field in the National Environment.**



- ❖ Participants had not enough time to submit a proposal.
- ❖ **2 proposals submitted for MIC-1: UNAM (Querétaro and México City)**
  - a) **Early detection of Earthquakes**
  - b) **Detection of Oil-Spills in Oceans**

❖ No one of them were semifinalists, **however Reinforced the Feeling to Compete Again**





# The 2nd Mission Idea Contest for Micro/Nano-satellite Utilization

**FIRST MEXICAN SEMINAR GIVEN IN: IEEE Workshop on Aerospace, ITESM Guadalajara (Mexican Silicon Valley) , Jalisco, México, November 28, 2011.**

**Participants from CINVESTAV, ITESM, ITSZapopan and Jalisco Government.**

**Good participation of students**







## MIC2 SCHEDULE IN MEXICO FOR 2011

- 1) 2nd National Seminar : February 2012 at UNAM with videoconference facilities.  
**Participation of Mexican Space Agency, highlighting:**
  - a) Examples of CLTP1 winning ideas
  - b) Discussion of the 2 Mexican proposals generated in MIC1
  - c) Brain storm of ideas taken in the seminar
- 2) March-April – May 1st Follow on of proposals by Email and by phone
  - MIC2 to encourage participation of young Students .
  - All Mexican universities with Aeronautical and Space programs or activities will be invited (at least 15 universities ).

# Regional Seminar PERU

Centro de Tecnologías de Información y Comunicaciones Universidad Nacional de Ingeniería.

November 04, 2011



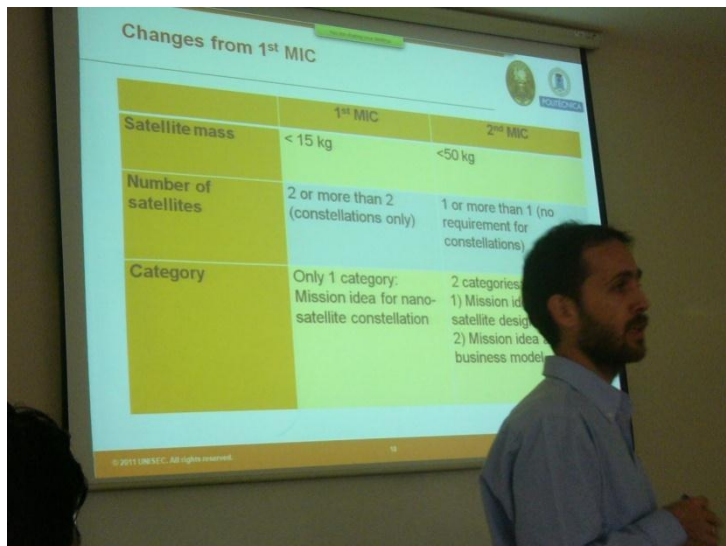
Mr. Shinya Fujiwara, Second secretary of Japanese Embassy in Peru participated in the 1<sup>st</sup> MIC

# MIC2 Seminar – International Collaboration

CTIC-UNI Auditorium. Universidad Nacional de Ingenieria (UNI).

Time: Nov 9, 2011, 1st Iberoamerican Workshop on Nanosatellites

Presented by two regional coordinators: Prof. Hector Bedon (PERU) and Prof. Ramon Martinez (SPAIN)



# 1<sup>st</sup> MIC: Positive Effects

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- Catalyst and Accelerator of “Change”
- Contribution to Space Engineering Education at Universities
- Contribution to awareness-raising of government

# Lessons Learnt and Countermeasure (1)

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## Difference of level in space engineering knowledge

Countermeasure:

### **Possible educational supports including;**

- Basic knowledge on space technology
- How to create mission idea and satellite design
- How to constitute an appealing proposal
  
- Making Textbook
- Showing example ideas and designs.
- Already planned to be provided by IAA book

# Lessons Learnt and Countermeasure (2)

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## Insufficient Support to Regional Coordinators

Countermeasures:

- to provide a guidebook
- to organize a special seminar for Regional Coordinators
- to make interactive lecture opportunities using internet

# Lessons Learnt and Countermeasure (3)

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## Insufficient care for motivating non-finalists for the next time

Countermeasures:

- To provide a certificate of participation
- To provide mailing list (for example) to exchange ideas between participants



The 2nd

**Mission Idea Contest**

for Micro/Nano-satellite Utilization

**Call for Paper**  
**The 2<sup>nd</sup> Mission Idea Contest**  
**for**  
**Micro/Nano Satellites utilization**



# Changes from 1<sup>st</sup> MIC

	1 <sup>st</sup> MIC	2 <sup>nd</sup> MIC
<b>Satellite mass</b>	< 15 kg	<50 kg
<b>Number of satellites</b>	2 or more than 2 (constellations only)	1 or more than 1 (no requirement for constellations)
<b>Category</b>	Only 1 category: Mission idea for nano-satellite constellation	2 categories: 1) Mission idea and satellite design 2) Mission idea and business model <b>(new category!)</b>

# Schedule for 2<sup>nd</sup> Mission Idea Contest

- August 2011 Call for Paper
- August 2011- April 2012 Regional Seminar/Dissemination of info

## 1st round: extended abstract evaluation

- **May 1, 2012 Abstract Deadline**
- July 1, 2012 Selection of Finalist

## 2nd round: paper and presentation step

- Sep 1, 2012 Final Paper Deadline
- **Oct 10, 2012 Final Presentation** at the 4<sup>th</sup> Nano-satellite Symposium (in Nagoya)

**Free Ticket to Japan!**

<http://www.spacemic.net>



# Finalists will be invited to UN Workshop/Nano-Satellite Symposium



THE UNIVERSITY OF TOKYO

Oct. 10-13, 2012

NAGOYA, Japan

Co-organized by United Nations  
Conjunction with JA2012 exhibition



**MIC2 Final Presentation on Oct 10!!**



# Awards

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## Contest Award

- 1<sup>st</sup> and 2<sup>nd</sup> place in Category 1 and 2

## IAA Award for environmental issues

- the most imaginative application of micro/nano satellite technologies to environmental issues for the benefit of humankind

## Student Prize (for category 1 only)

- the best proposal in Category 1 (Mission Idea and Satellite Design) submitted by a student, a student group or a University with involvement of a significant number of students

# Reviewers



Dr. Jerry Sellers (Chair)  
Teaching Science &  
Technology, Inc.



Dr. Rainer Sandau  
DLR



Dr. Masaya Yamamoto  
Weathernews Inc.



Prof. Shinichi Nakasuka,  
Univ. of Tokyo



Dr. Masami Takai  
INVENIO Co. Ltd.



Prof. Sir Martin Sweeting  
SSTL  
SSC



Prof. Herman Steyn  
Stellenbosch Univ.



Prof. Hiroshi Kawahara  
Cyber Univ.



Prof. Mitsuru Osaki  
Hokkaido University



Mr. Takeshi Motohashi  
NTT, Tokyo Univ. of Science,  
MIT Enterprise Forum of Japan



Dr. Yasushi Horikawa  
Tokai University  
Japan Aerospace Exploration Agency (JAXA)

# Regional Coordinators (as of Dec, 2011)



Fernando Stancato  
University of São Paulo, Brazil



Esaú Vicente Vivas  
Instituto de Ingeniería, UNAM, Mexico



Jordi Puig-Suari,  
Cal Poly, USA



Mohammed Khalil Ibrahim  
Cairo University, Egypt



John Mugwe  
Afrosoft, Kenya



Low Kay Soon  
Nanyang Technological University, Singapore



Pham Anh Tuan, VAST, Vietnam



Fernando Agelet  
University of Vigo, Spain



Regina Lee,  
York Univ, Canada



Hyo choong Bang  
KAIST, Korea



Marco Schmit  
Würzburg University, Germany



Robert van Zdy  
Capetown Peninsula univ South Africa



Andrés J. Arenas  
Unefa, Venezuela



Seiko Shirasaka,  
Keio Univ, Japan



Vidmantas Tomkus,  
Lithuania



Hector Bedon, UNI, Peru



Rustem Aslan, ITU, Turkey



Tsolmon Renchin,  
National Univ of Mongolia



Jyh-Ching Juang,  
Cheng Kung Univ



Jose Edgardo Aban,  
Universiti Brunei Darussalam, Brunnei



Kamel Besbes  
Faculty of Sciences of Monastir, Tunisia



Willy Cabañas  
Central American Association for Aeronautics and Space, Chapter Guatemala



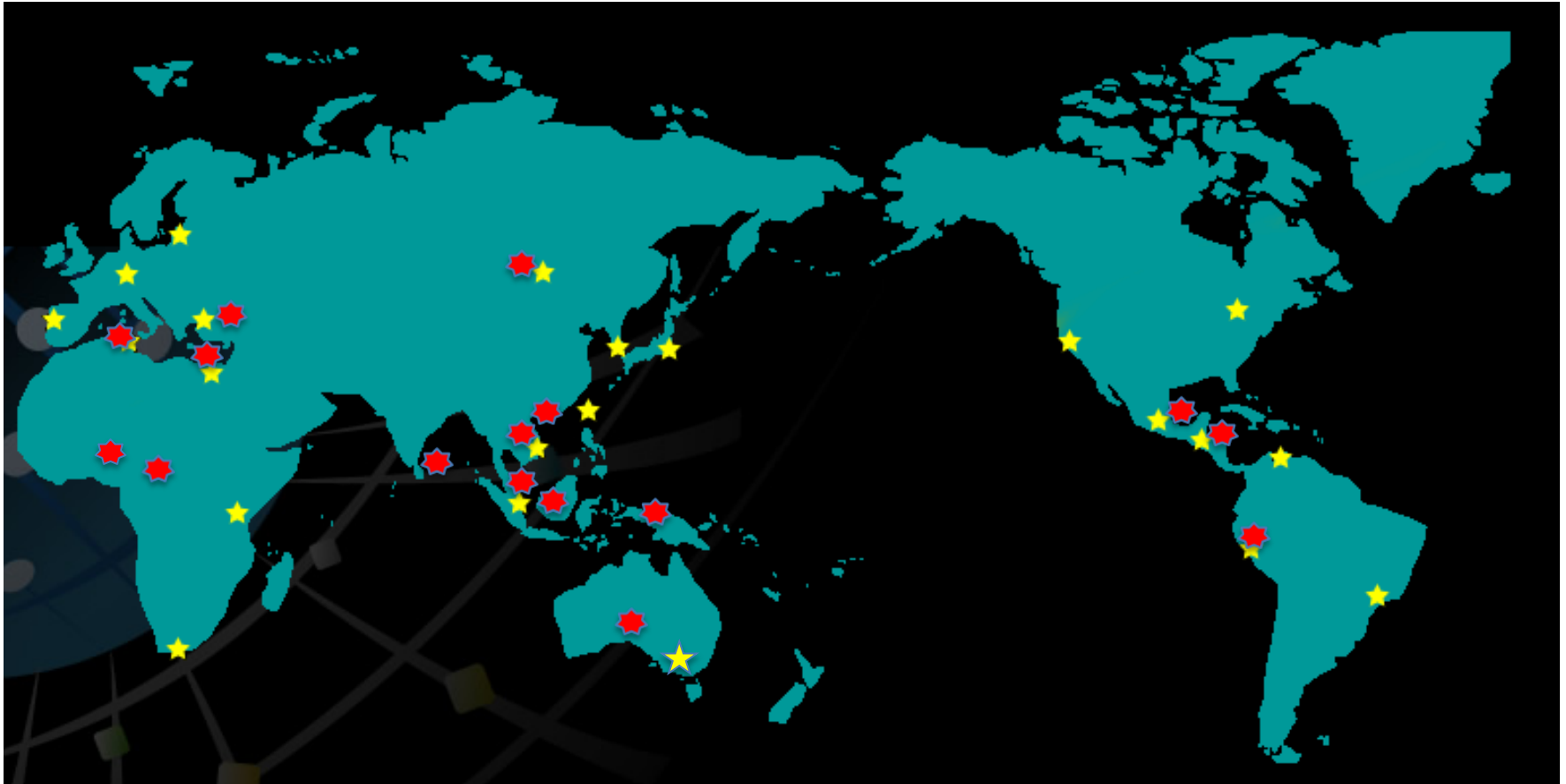
The Victorian (VSSEC), Australia



VON KARMAN INSTITUTE FOR FLUID DYNAMICS  
UNISEC  
University Space Engineering Consortium



# Global network through MIC and CLTP (MIC:24 countries, CLTP:16 countries)



★: CLTP participant    ★: MIC coordinator

# JOIN US!



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