

What we can do for Capacity Building in Space Science and Technology in Africa



University Space Engineering Consortium
(UNISEC)

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Introduction

Who are we? UNISEC



<http://www.unisec.jp>

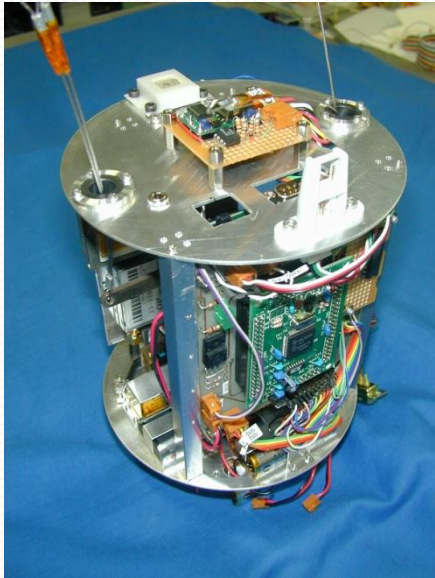
UNISEC: University Space Engineering Consortium



- UNISEC is a non-profitable organization to facilitate and promote practical space development activities, such as designing, developing, manufacturing, and launching small satellites and hybrid rockets at university level.
- Established in 2002
- 55 laboratories/groups from 35 universities
- 470 student members and 220 supporters
- 3 pillars: Human resource development, Technological development, Outreach

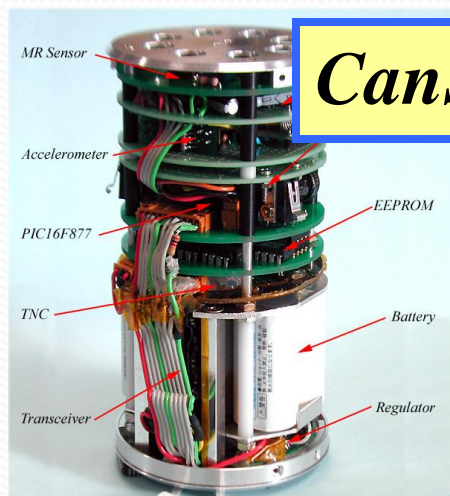
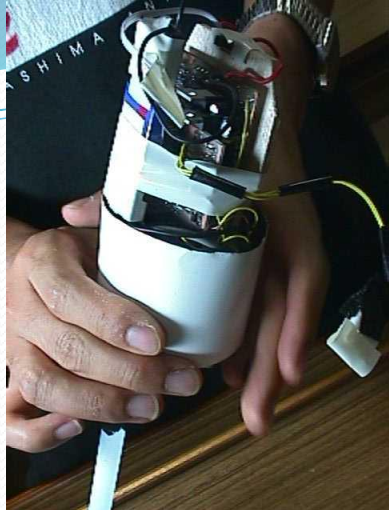
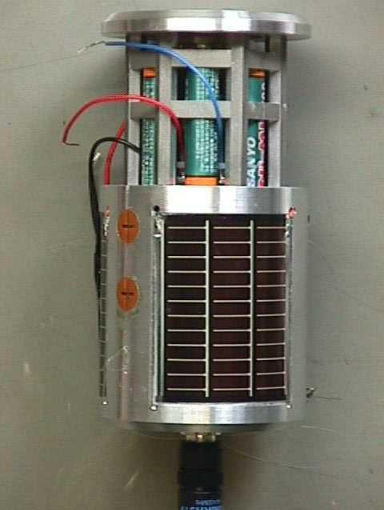


Background (1) CanSat 1998~

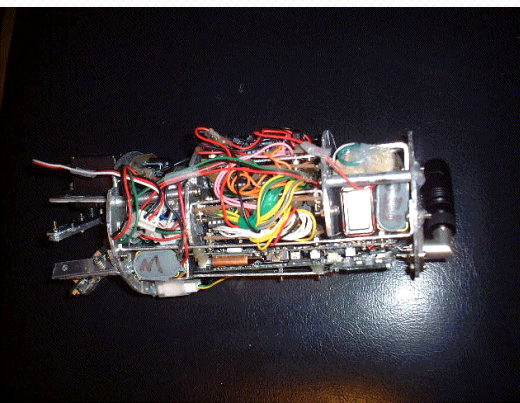


Thanks to
Prof. Bob Twigg!



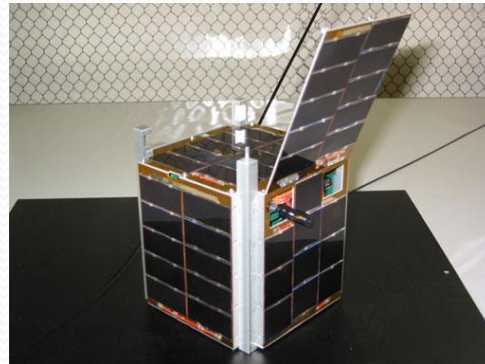
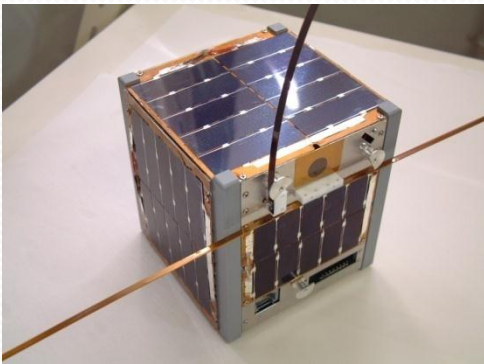


CanSats 1999-



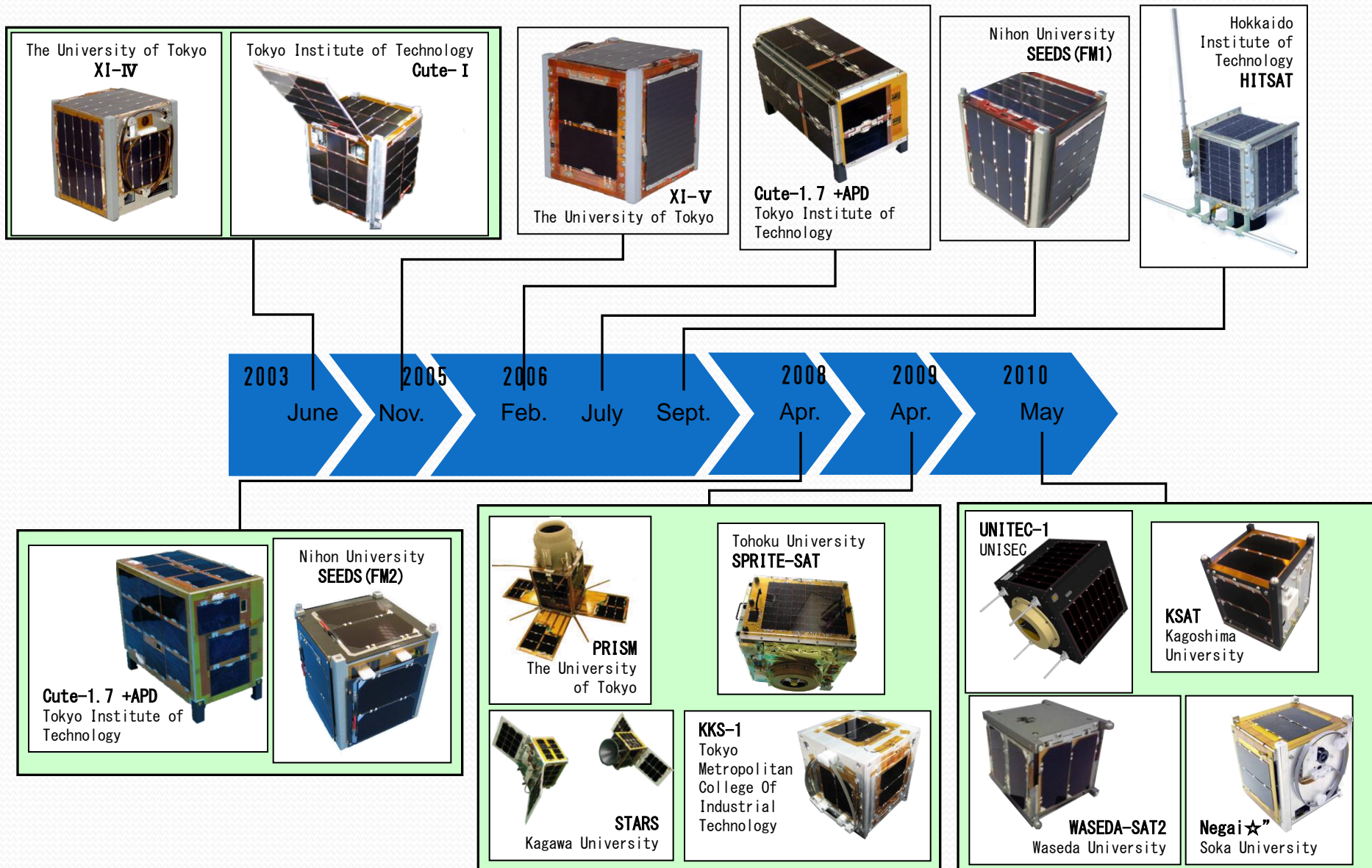
Background (2) CubeSat 1999~

- First CubeSat launch (June 2003)
 - Two Japanese CubeSats (one by Univ. of Tokyo, and the other by Tokyo Inst. of Tech.) worked well.
 - Both satellites are still very healthy in orbit (more than 8 years)
- A total of 15 Japanese university nano satellites were launched up to now.



First CubeSat
Left: XI-IV by Univ. of Tokyo
Right: CUTE-I by Tokyo Inst. of Tech.

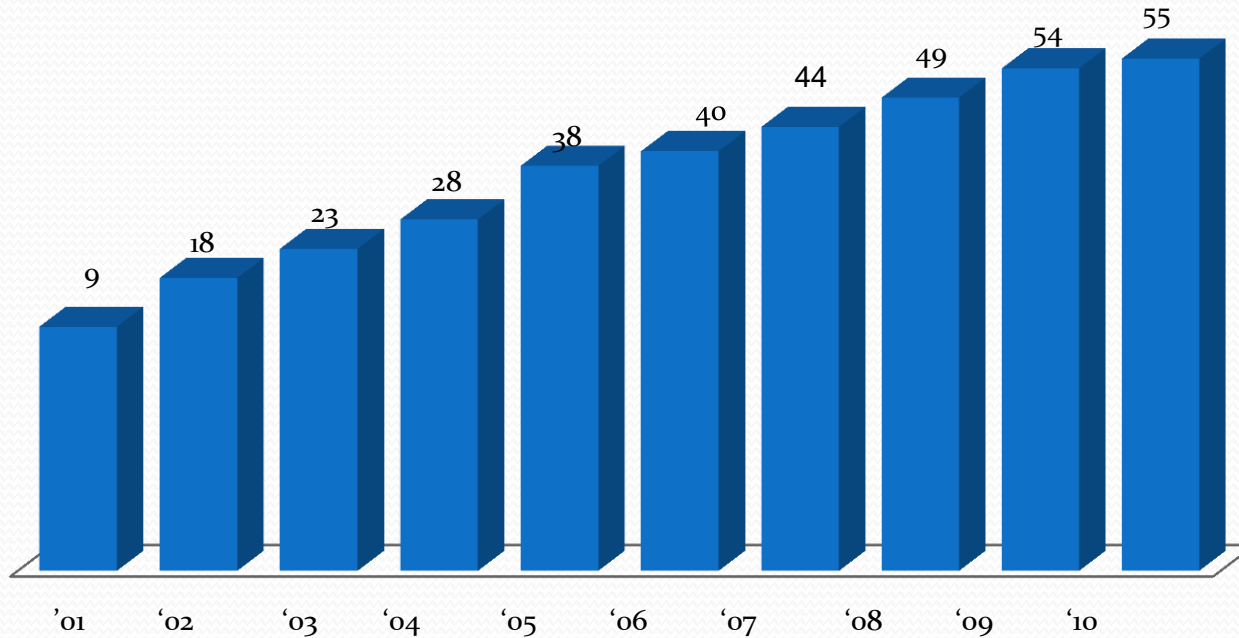
UNISEC Satellites Development



UNISEC Development



Number of Member Laboratories



What we offer for Capacity building

- 1) Nano-satellite Mission Idea Contest (MIC)
- 2) Cansat Leader Training Program (CLTP)
- 3) Nano-satellite Symposium
- 4) UN/Japan Doctrine Program (Scholarship)

1) Mission Idea Contest

- Objective
 - Encourage innovative exploitation to provide useful and sustainable capabilities, services or data.
- Eligibility
 - Any individual, group or company with suitable space systems expertise and an enthusiasm for nano-satellites
- Award for Finalists
 - Free tickets to Japan
 - Presentation in the Nano-satellite Symposium
 - High visibility (example: IAA publication)

Results of 1st Mission Idea Contest

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

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

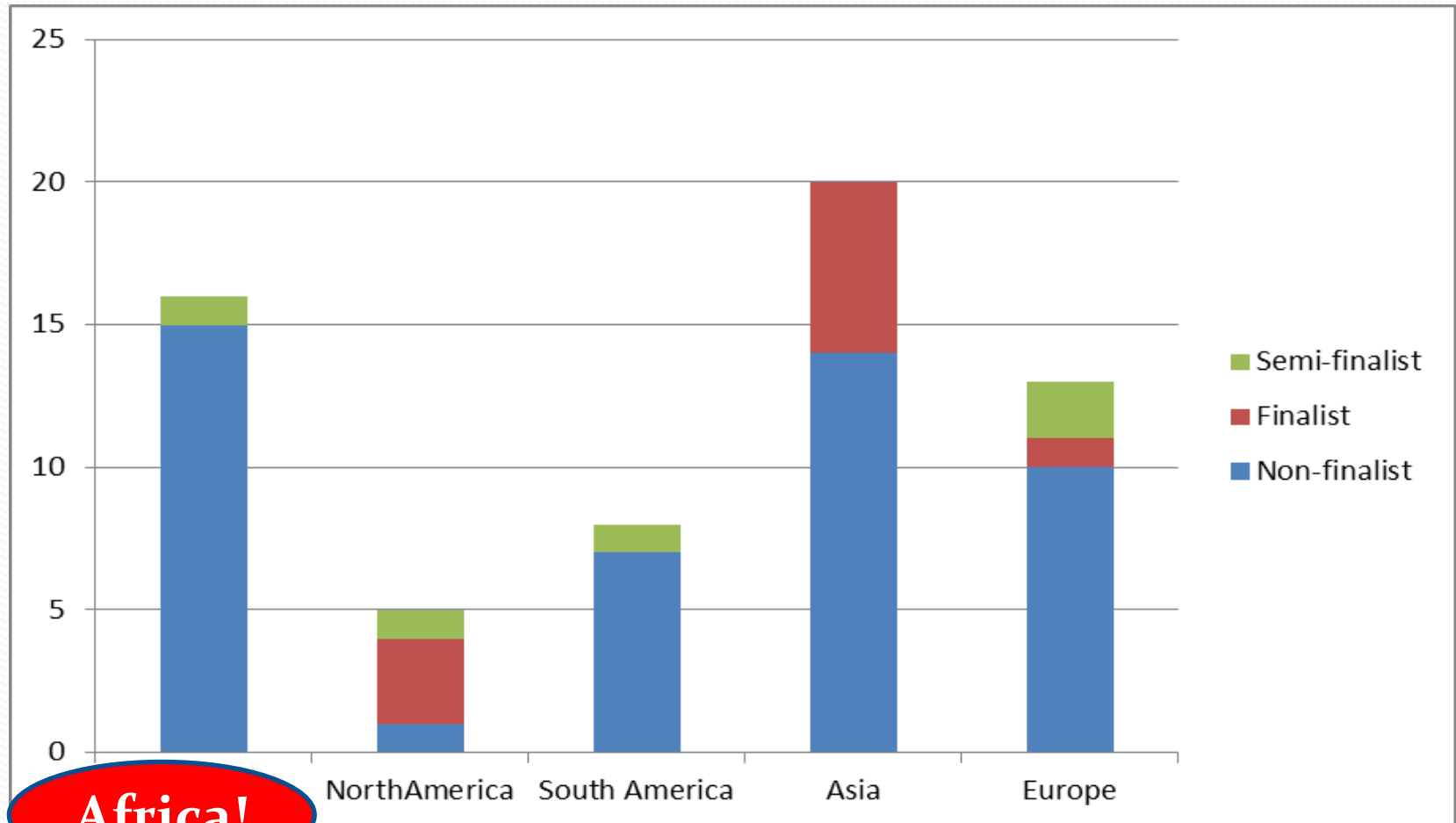
Finalists: Japan 2, Canada 2, Vietnam 2, UK 1, Turkey 1,
Korea 1, USA 1

Semi-finalists: Spain 1, South Africa 1, Peru 1, Ukraine 1,
USA 1

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

- 10 finalists made presentation on March 14. (right after the earthquake in Japan)

Area Distribution of Applicants



Reviewers



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



Prof.
Herman
Steyn
Stellenbosch
Univ.



Prof. Shinichi
Nakasuka,
Univ. of
Tokyo



Prof. Sir Martin
Sweeting
SSTL
SSC



Dr. Masaya
Yamamoto
Weathernews
Inc.



Dr. Rainer
Sandau
DLR



Prof. Hiroshi
Kawahara
Cyber Univ.

More reviewers will be
announced

Regional Seminars in 2010



Cairo University, Egypt
August 2, 2010



Nairobi University, Kenya
October 27, 2010



French South African
Institute of Technology
October 28, 2010

Held in 16 regions in 2010

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

Regional Coordinators



Fernando Stancato
University of São Paulo, Brazil



Esaú Vicente Vivas
Instituto de Ingeniería, UNAM, Mexico



Jordi Puig-Suari,
Cal Poly, USA



Mohammed Khalil Ibrahim
University, Egypt



John Mugwe
Afrosoft, Kenya



Faith Karanja
University of Nairobi, 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

Tunisia, Guatemala joined, and more..

World wide network (Currently 22 regions)



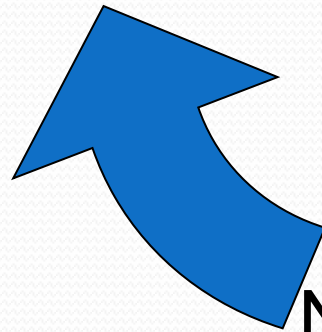
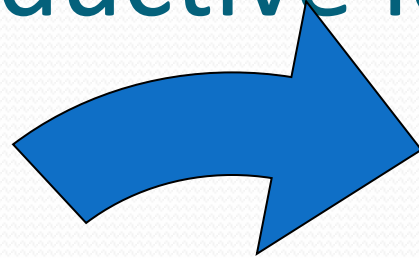
Merits of the contest for capacity building

- No need for budget – Capacity building from Grass Roots
 - All needed is **only time and brain**.
 - Anybody, even students, can take initiative to form a team.
 - Can start with one person – one person can make a big difference.
- New way of space development
 - Transform from technology seeds driven development to needs driven development.
 - Developing countries can take initiative in mission design.
- Reason to think new missions with local community

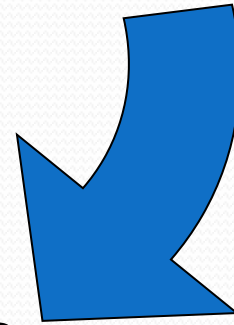
Is Lack of Budget a reason of unproductive loop?

No budget

No project



No progress



Get out from Unproductive Loop by starting something!



The 2nd Mission Idea Contest

- Objective
 - Encourage innovative exploitation of micro/nano-satellites to provide useful capabilities, services or data.
- 2 Categories:
 - 1) Mission Idea and Satellite Design
 - 2) Mission Idea and Business Model
- Target satellite(s): weighing **less than 50 kg**,
(both constellation mission and non-constellation mission are welcome)

<http://www.spacemic.net>

Schedule for 2nd Mission Idea Contest

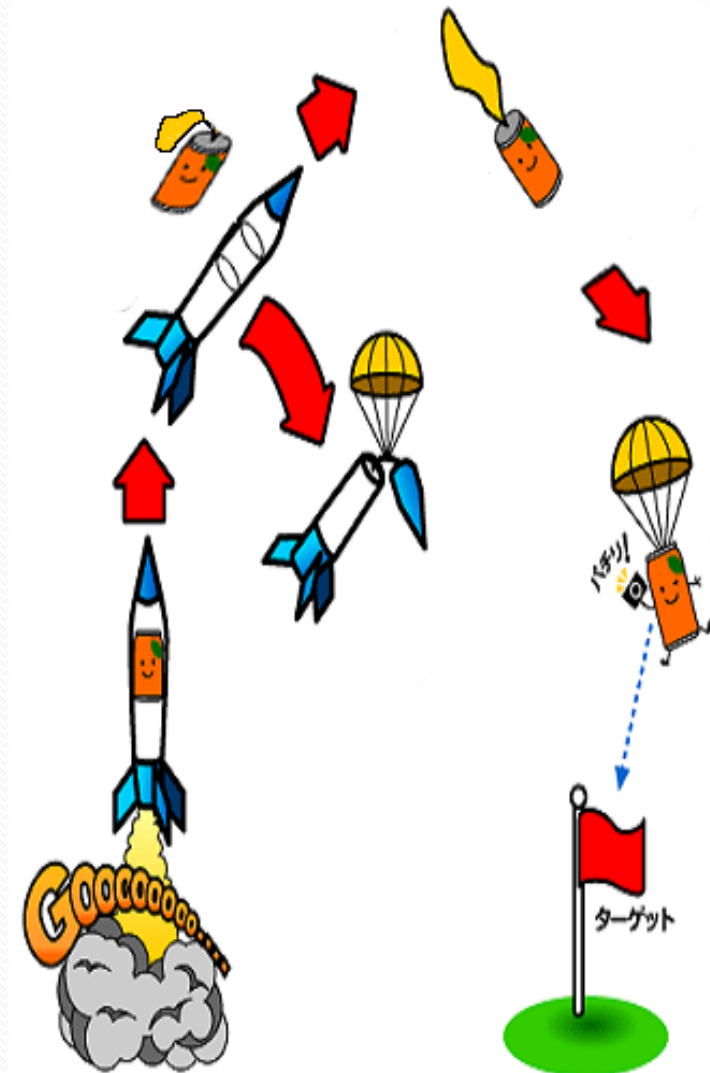
- September 2011 Call for Paper
- September 2011- April 2012 Regional Seminar
- **May 1, 2012 Abstract Deadline**
- June 15, 2012 Evaluation Deadline
- July 1, 2012 Announcement of Finalist
- Sep 1, 2012 Final Paper Deadline
- **Oct 10, 2012 Final Presentation** at the 4th Nano-satellite Symposium (in Nagoya)

2) CanSat Leader Training Program (CLTP)

CLTP was established in 2011 to contribute to capacity building in space technology and to improve teaching methods-based space engineering education.

- One month course gives training through whole cycle of Can Sat development until sub-orbital launch experiments
- Textbook in each language will be made as one outcome
- Participants are expected to teach and promote CanSat experiments in their countries
- Aiming for international CanSat education network

“Give a man a fish and you feed him for a day. Teach him how to fish and you feed him for a lifetime.”



CLTP 1 and CLTP2 and...



<http://www.unisec.jp/cltp/en/2nd.html>
<http://www.cltp.net>

CLTP1

held in Wakayama Univ. in Japan in Feb-March 2011, with 12 participants from 10 countries, namely **Algeria**, Australia, **Egypt**, Guatemala, Mexico, **Nigeria**, Peru, Sri Lanka, Turkey, Vietnam.

CLTP2

will be held in Nihon Univ. in Nov-Dec 2011 with 10 participants from 10 countries, namely Indonesia, Malaysia, **Nigeria**, Vietnam, **Ghana**, Peru, Singapore, Mongolia, Thailand, Turkey.

CLTP 3 will be announced soon. (Oct-Nov 2012?)



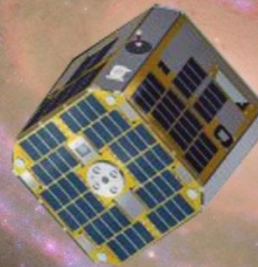
3) The 3rd Nano-Satellite Symposium

December 12 – 13, 2011

Kitakyushu,
Japan



Prof. Shinichi NAKASUKA, Chairperson



NanoJasmin



The sessions include:

- International Collaboration in Micro/NanoSatellite Utilization
- International Capacity Building Program
- Micro/Nano Satellite & Debris Issues
- Standardization of Micro/Nano Satellite Technologies





UN Workshop and The 4th Nano-Satellite Symposium

Oct. 10-13, 2012



NAGOYA, Japan



Co-organized by United Nations

The Symposium is held in conjunction with JA2012



MIC2 Final Presentation on Oct 10!!



Nano-JASMINE
Japan Astrometry Satellite Mission for Infrared Exploration
Intelligent Space Systems Laboratory / National Astronomical Observatory of Japan
<http://www.space.tu-braunschweig.de/~nanosat/nanojasm.htm>

4) UN/Japan Fellowship Program (Kyushu Institute of Technology)

- The United Nations/Japan Long-term Fellowship Programme on Nano-Satellite Technologies (Doctorate in Nano-Satellite Technologies (DNST))" starts on October 1st, 2011. (Egypt and Mongolia)
- Application fo the next programme will be accepted until April 30th, 2012.
- Fellowship Programme details and application forms are available from:
<http://www.unoosa.org/oosa/en/SAP/bsti/fellowship.html>.

Conclusion: Let's join Nano-sat activities!

- Lack of Budget?
 - Participate in the Mission Idea Contest and explore nano-satellite potential. If you are lucky, you can get free ticket to Japan.
- Lack of Knowledge?
 - Participate in the training course and build your own training course in your country.
- Lack of Experiences?
 - Just do it! Then you will have experiences.
- Lack of Motivation?
 - Participate in the Symposium, and listen to what other participants are doing. You will be energized and motivated.
- Lack of Confidence?
 - You are absolutely normal. Don't worry. Confidence will come after you have done it.

Future Vision 2020-100

By the end of 2020, we will see the world where university students can participate in practical space engineering projects in more than 100 countries



**Plan for UNISEC-International
Support for establishing UNISEC-(your country)**

Contact



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