

Introduction to UNISEC-Global



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Outline

- Background – UNISEC activities in Japan
- Examples of UNISEC International Programs
 - CanSat Leader Training Program
 - Micro/Nano Satellite Mission Idea Contest
- UNISEC-Global
 - Vision and mission
 - Status quo
- Conclusion

Background - UNISEC (Japan)

- UNISEC: “University Space Engineering Consortium”
 - UNISON: UNISEC Student Organization
 - UNISAS: UNISEC Alumni Organization
- NPO/NGO to facilitate/promote university level students’ practical space development activities, such as designing, manufacturing and launching small satellites and hybrid rockets.
- Established in 2002
- 67 laboratories/groups from 47 universities
- 811 student members and 267 individual supporters 23 corporate supporters
- 3 pillars: Human resource development, Technological development, Outreach



Achievements

More than 34 university satellites launched in 12 years



From CanSat to CubeSat, Nano-Satellite
From Educational purpose to Practical application

Achievements

(human resource development)

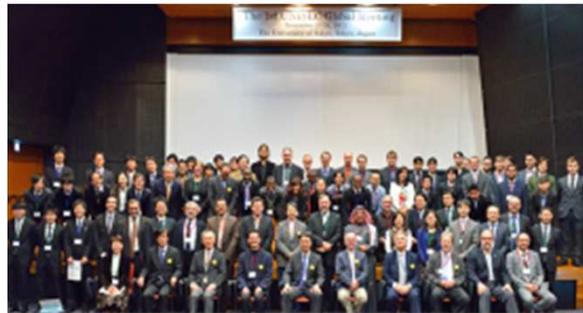
- Provide many engineers/researchers who have
 - Project management skills
 - Proficient knowledge of satellite/rocket and their subsystem design and manufacturing
 - Systems engineering and integration
 - “Guts” to tackle challenging problems
- In Japan’s space development field in Japan as well as **many other technological areas** such as automotive, aircraft plants, electronics, construction, etc.

What enabled the Achievements of UNISEC?

- UNISEC provided university students with Platform - **opportunities to observe and exchange;**
What other universities achieved and how, leading to
 - strong motivation (we can do something similar!!)
 - hints of achieving something (rocket, satellite, CanSat,--)
 - competitive feeling (if they can do it, we can do it better !!)
- Highly motivated leading persons (such as professors) continually have had to consider what they can achieve even without enough resources.

Vision 2020-100

- *“By the end of 2020, let’s create a world where university students can participate in practical space projects in more than 100 countries.”*



This ambitious goal cannot be achieved without the supports and participation of many countries

Capacity building program

1) CanSat Leader Training Program (CLTP)



CLTP was established in 2011 to contribute to capacity building in basic space technology. CLTP will enable participants to do the following:

- Experiences the whole cycle of CanSat development including sub-orbital launch experiments through hands-on training.
- Conduct CanSat program in their countries for senior-high school and undergraduate university students.
- Join “international CanSat education network”



CanSat
Manufacturing



Vibration Test



Paper craft Rocket



Launch Experiment

CLTP History & Participants



CLTP1 (Wakayama Univ. in Feb-March, 2011)

12 participants from 10 countries, namely Algeria, Australia, Egypt, Guatemala, Mexico, Nigeria, Peru, Sri Lanka, Turkey (3), Vietnam.

CLTP2 (Nihon Univ. in Nov-Dec, 2011)

10 participants from 10 countries, namely Indonesia, Malaysia, Nigeria, Vietnam, Ghana, Peru, Singapore, Mongolia, Thailand, Turkey.

CLTP3 (Tokyo Metropolitan Univ. in July-August, 2012)

10 participants from 9 countries, namely Egypt (2), Nigeria, Namibia, Turkey, Lithuania, Mongolia, Israel, Philippines, Brazil.

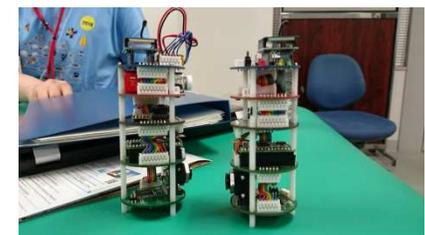
CLTP4 (Keio Univ. in July-August, 2013)

9 participants from 6 countries, namely Mexico(4), Angola, Mongolia, Philippines, Bangladesh, Japan.

CLTP5 (Hokkaido Univ. in Sept 8-19, 2014)

7 participants from 5 countries, namely Korea (2), Peru, Mongolia Mexico (2), Egypt.

48 participants from 25 countries



Overview of CLTP6



- Date:
 - Online-lecture: July- August, 2015 (TBA)
 - Hands-on training: August 24- Sept 4, 2015
- Venue:
 - Hokkaido University (Sapporo) and Uematsu Electric Co., Ltd (Akabira)
- Eligibility
 - Academic researchers, instructors, and graduate students who belong to universities or research institutes . A Ph.D. degree holder is preferable.
 - Company employees who wants to use CLTP as an education and training program.
- Application Due: Feb 28, 2015

Who should attend?



- You should apply if you:
 - Want to learn basic space technology.
 - Want to learn teaching methodology in space engineering
 - Are in the position to teach entry level courses in space engineering.
 - Want to expand your international network in space engineering education.
 - Want to experience studying in Japan
 - Need to improve your knowledge and skills in space engineering education
 - Want to interact with competent international participants from all over the world.
 - Understand how enjoyable and meaningful teaching and learning with CanSat can be.

Post- CLTP Activities



- CLTP (teaching professors) in Turkey and Mexico
- CTP (teaching students) at universities in Egypt, Ghana, Peru, Mexico, Mongolia, Nigeria and the Philippines, etc.
- National CanSat Competitions in Lithuania, Mongolia, Turkey, Peru, etc...
- Participation in the international CanSat Competition from Egypt, Peru, Mongolia, Turkey, Guatemala, etc...

The 5th CanSat Training Program (CTP5)
Organized by
Space Systems Technology Laboratory (SSTLAB), Aerospace Engineering Department,
Faculty of Engineering, Cairo University
In Cooperation with
University Space Engineering Consortium – Egypt (UNISEC-Egypt)

What is CTP?
The CanSat Training Program (CTP) was launched in 2011 at the Space System Technology Laboratory (SSTLAB) to contribute to capacity building in space technology and improve teaching methods based on space engineering education. In the next 5 years, education using CanSat will be expected in about 100 nations in the world.

History
CTP1: July 20 – August 1, 2011
CTP2: January – February, 2012
CTP3: January – February, 2013
CTP4: February – March, 2014

What is CanSat?
The CanSat provides an affordable way to acquire the students with the basic knowledge to many challenges in building a satellite. Students will be able to design and build a small electronic payload that can fit inside a coke can. The CanSat is launched and ejected from a rocket or a balloon. By the use of a parachute, the CanSat slowly descends back to earth performing its mission while transmitting telemetry. Post launch and recovery data acquisition will allow the students to analyze the cause of success and/or failure.

What is SSTLAB?
Founded and operated by students, The Space Systems Technology Laboratory (SSTLAB) is a student based running laboratory, started in August 2011. The SSTLAB mission is to promote space science and engineering education at Cairo University.

What is UNISEC-Egypt?
UNISEC-Egypt is a non-profitable organization (NPO) to support practical space development activities in universities and colleges, such as small satellite and hybrid rockets. It was founded in Japan in April 2002. In November 2013, UNISEC Global was acknowledged and in November 2014 UNISEC-Egypt was acknowledged as the local chapter of UNISEC Global in Egypt.

The following technical topics will be covered in CTP5

- Programming with Arduino microcontroller board.
- Using different types of sensors: mems IMUs, temperature, pressure and others.
- Design and implementation of ground stations.
- Design and fabrication of structure and recovery systems.
- Design and fabrication of PCB electronics.

Date and Time
CTP5 will be held from January 27 – February 9, 2015, From 9:00 AM until 7:00 PM.

Venue
Space System Technology Laboratory,
Department of Aerospace Engineering Building
40000, 3F, Faculty of Engineering, Giza, Egypt.

For further information
Email : info@sstlab-eg.org
Facebook: <https://www.facebook.com/SSTLAB>

UNISEC EGYPT
University Space Engineering Consortium

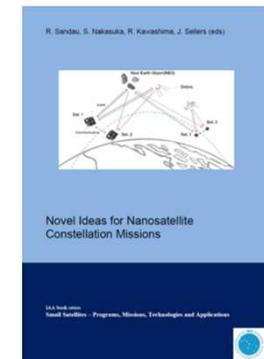
The 5th CanSat Training Program in Egypt

Capacity building program



2) Mission Idea Contest for Micro/nano satellite utilization

- Objective: Encourage innovative exploitation of micro/nano-satellites
- Regional coordinators: 33 regions
- History
 - MIC1 in Tokyo, March 14, 2011
 - MIC2 in Nagoya, Oct. 10, 2012
 - PreMIC3 Workshop in Tokyo, Nov. 23, 2013
 - MIC3 in Kitakyushu, Nov 19, 2014



<http://www.spacemic.net>

Pre-MIC4 Workshop Overview



- Date: July 3, 2015 (during the 3rd UNISEC Global Meeting scheduled in July 3-5, 2015)
- Venue: University of Tokyo, Tokyo, Japan
- Two Categories:
 - Mission Proposers
 - Anybody who has mission ideas using micro/nano satellite(s)
 - Resource providers
 - who can present resources that can be provided to applicants
 - can be companies, space agencies or other government sectors as well as individuals.
- Application Submission due:
 - March 3, 2015 for Mission Proposers
 - April 10, 2015 for Resource Providers

Objectives for Pre-MIC4



- To create a favorable environment to facilitate domestic/international cooperation among industry, university and government for the use of micro/nano-satellite.
- To increase the probability of realization of the mission by inviting resource providers, which is expected to move their mission ideas forward to realization. The resource provider can be companies, space agencies or other government sectors as well as individual experts.

By inviting the resource providers, the Pre-MIC4 workshop will provide a forum for MIC participants, in terms of seeking possible international cooperation or partnership arrangements.

Process and Timeline



Application Submission for Mission Proposers : Deadline March 3, 2015

Notification of Acceptance for Mission Proposers on March 31, short abstract will be presented on the website.



Application Submission for Resource Providers : Deadline April 10, 2015

Notification of Acceptance for Resource Providers on April 30, 2015



Selected Proposers and Providers will be given information on each other.

Contact each other to seek support or to exchange information/opinions



Presentation in Tokyo at Pre-MIC4 workshop on July 3



What is UNISEC-Global?
Vision and Mission
Condition of Local Chapter
Status-quo of UNISEC-Global

What is UNISEC-Global?

- UNISEC-Global is a consortium of UNISEC Local Chapters
- A UNISEC Local Chapter is a consortium of university members which consist of professor and students in each country/region.



Vision

- The Global University Space Engineering Consortium (UNISEC-Global) envisions a world where space science and technology are used by individuals and institutions in every country, rich or poor, and offers opportunities across the whole structure of society – whether academic, industrial or educational – for peaceful purposes and for the benefit of humankind.

Mission

UNISEC-Global will create an environment that will promote the free exchange of ideas, information and capabilities relating to space engineering and its applications, especially for young people, including those in developing countries and emerging economies.

Status Quo

POCs in 33 regions/countries, namely, **South Africa**, **Angola**, **Namibia**, **Egypt**, Ghana, Kenya, **Nigeria**, **Tunisia**, **Bangladesh**, Korea, Mongolia, the Philippines, Singapore, Taiwan, Thailand, **Turkey**, Australia, Indonesia, Saudi Arabia, Canada, USA, Guatemala, **Mexico**, Peru, Brazil, Bulgaria, Italy, **Samara (Russia)**, Switzerland, **Germany**, Slovenia, **Lithuania** and **Japan**.



11 Local Chapters and 1 Association of Local Chapters have been acknowledged.

Local Chapter Member's responsibility:

- Members have to engage in space related activities aligned with UNISEC-Global vision.
- Timely submission of annual report (template will be provided)
- Attendance of UNISEC-Global Meetings (UNISEC local chapter should be represented at least in one of every two successive meetings).
- All legal and financial issues are local chapter's responsibility.

Financial support to local chapter in each country/region would be necessary in the beginning.

1st UNISEC Global Meeting

Establishment of the UNISEC-Global has been announced.



Nov 23-24, 2013,
University of Tokyo
112 participants
from 31 countries

2nd UNISEC-Global Meeting

Acknowledged 11 Local Chapters

Bangladesh, Egypt, Germany, Japan, Lithuania, Nigeria,
North Mexico, Samara, Southern Africa Region, Tunisia, and Turkey

And 1 Association of Local Chapters

UNISEC-Europe (Germany, Lithuania, Samara, Turkey)



Nov 18-20, 2014,
Kyushu Institute of
Technology
144 participants
from 43 countries

3rd UNISEC-Global Meeting

- Date: July 3-5, 2015
- Venue: University of Tokyo, Tokyo, Japan
- Program:
 - Pre-MIC4 workshop
 - Activity Report
 - Group Discussion
 - Student Session (UNISON-Global)
 - Acknowledgement of new local chapters
- Applications Due: March and April, 2015

<http://www.unisec-global.org/>

Conclusion

- UNISEC is a consortium which functions as a platform that provides opportunities and a forum to students, researchers and supporters.
- UNISEC-Global is a consortium of local chapters of UNISEC, and can be described as a large network.
- **A node serves as the local chapter** of UNISEC in each region/country and **the networks** that manage the communication between the nodes and addition of new nodes to achieve the designated activities **is the UNISEC-Global.**
- PreMIC4, 3rd UNISEC-Global Meeting and CLTP6 will be organized in 2015.

Contact

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