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 30 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 a 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:

- Experience 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.

• 32 Applications have been submitted.
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...
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 27, 2015 for Resource Providers
Call for Resource Providers

• 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.

• In the MIC4, applicants are required to make concrete proposals including satellite design and cost estimation.
Process and Timeline


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

Application Submission for Resource Providers: Deadline April 27, 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/
Sustainability of nano/micro satellite projects?

• Recent trend
  – micro/nano/pico satellites are not good for “long term sustainability of space activities” due to debris problem.

  “Nano-satellite? Oh...you are making debris!”

  – Guidelines might be made to restrict free activities of nano-satellite developers....?

• “Scientifically correct” truth should be sought.

• Success rate of satellite projects should be increased.
Conclusion

- UNISEC is a consortium which functions as a platform that provides opportunities and a forum to university students, researchers, professors and supporters.
- UNISEC-Global is a consortium of local chapters of UNISEC, and can be described as a large network.
- As far as universities/professors/students want to continue their satellite projects, they need to aware of importance of “long-term sustainability of space activities” as a part of players of space exploration and development.
- UNISEC-Global may be able to contribute to solution.
- We want to be a part of solution, not a part of problems.
Contact

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