Opening Message
The 6th UNISEC-Global Meeting

Rei KAWASHIMA,
UNISEC-Global

International University, Strasbourg, France, Nov 19, 2018.
Quick (rough) statistics on UNIGLO6 Participants

• 123 registers from 35 countries
  (including cancelled participants due to visa, finance, schedule etc)
• 51 ISU students and staff
• 87 students and 36 professionals
## Schedule

<table>
<thead>
<tr>
<th>Date</th>
<th>Event Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nov 19 (Mon)</td>
<td>Keynote speech. Sponsors/exhibitors presentation, <strong>Mission Idea Contest</strong>, Local Chapter and Regional report, MIC 5 award ceremony. Reception</td>
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<tr>
<td>Nov 20 (Tue)</td>
<td>Local Chapter Report, <strong>Group Discussion</strong>, Acknowledgement of new local chapter, ISU Facility Tour, Gala Dinner</td>
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<tr>
<td>Nov 21 (Wed)</td>
<td>Invited Presentation, Student Representative Presentation, <strong>Student session (Gender Equality in the Space Field)</strong></td>
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What is UNISEC-Global?

• **UNISEC-Global** is an international nonprofit, nongovernmental organization, consisting of local-chapters across the world.
• Since its **establishment in November 2013**, it has provided an annual forum, training programs, competitions.
• In 2017, it was accepted as **permanent observer by UNCOPUOS**.
• Its **primary objective** is to help create a world where space science and technology is used by individuals and institutions in every country, rich or poor for peaceful purposes and for the benefit of humankind.

UNISEC stands for University Space Engineering Consortium
Vision

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

• 2030-ALL (revised)
  – “By the end of 2030, let’s create a world where university students can participate in practical space projects in all countries.”

Key principle of the 2030 Agenda for Sustainable Development: No one will be left behind.
UNISEC-Global Network

50 Points of contact
16 Local Chapter in 2018
UNISEC-Global’s Approach

Training Program
- HEPTA-Sat Training
- CanSat Leader Training Program

Forum, Conferences
- UNISEC-Global Meeting
- Nano-satellite Symposium

Vision 2030-ALL

Debris Awareness and Solutions
- Debris Mitigation Competition
- IAA Study Group: Post Mission Disposal for Micro and Smaller Satellites – Concept and Trade Studies

Global Project
- Mission Idea Contest for Micro/Nano Satellite Utilization
- UNISEC—Global Project
**CanSat Leader Training Program (CLTP)**

**Objective:** CLTP is a training program for professors/instructors to learn how to conduct CanSat training by experience. Participants are expected to teach their students after training. It has contributed to capacity building in basic space engineering and technology.

**Launched:** October 2010

**Offered:** Annually

**Graduated:** 81 participants from 37 countries

CLTP10 will be held in August at Nihon University, Japan
UNISEC-Global Meeting

• **Objective:** The UNISEC-Global Meeting is an annual gathering to get together to exchange knowledge, information, experiences on practical space projects and activities. The meeting includes Local Chapter activities report, Group discussion, Student Session, Competitions and Acknowledgement of new local chapter.

• **Launched:** November 2013

• **Conducted:** Annually
Mission Idea Contest (MIC) for Micro/Nano Satellite Utilization

Objective: The Mission Idea Contest (MIC) is encouraging aerospace engineers, college students, consultants, and anybody interested in space to share their ideas on how to use micro/nano/pico satellites, and provides opportunities to present their ideas and gain attention internationally.

Launched: June 2010

Conducted: Annually as PreMIC or MIC
- Regional coordinators from 41 countries
- Four books were published as a part of the IAA book series.
Debris Mitigation Competition (DMC)

• **Objective:** To facilitate the sharing of innovative solutions for debris mitigation and developing effective deorbit devices that can be demonstrated and validated with Micro/Nano-Satellites. It is also expected to increase awareness of debris problems among satellite developers and university students.

• **Launched:** November 2015

• **Conducted:** Annually
Training Programs: Educational Kits

HEPTA-Sat
(CLTP8-, HEPTA-Sat Training Workshops)
*Developed by: UNISEC-Japan*

i-CanSat
(CLTP3-7, CTP)
UNISEC-Global Projects

A. Global Antenna Sharing Project (Kyushu Institute of Technology and Istanbul Technical University)
B. Standardization of electrical interface Project (Wurzburg University)
C. Store & Forward Constellation (University of Tokyo)
D. Global University Space Debris Observation Network (GUSDON) (Sapienza University of Rome)
E. BIRDS project (Kyushu Institute of Technology)

See the Group Discussion topics!
Global Antenna Sharing Project

Objectives: Efficient use of *Micro/Nano Satellites*

- Sharing resources
- Helping less developed institutions to reach higher levels
- Increased usage time of expensive systems (ground stations)
- Better use of systems

• Use a cloud-based software platform that connects satellite operators with antenna owners, solving both the problem of insufficient satellite access time and unused antenna idle time.
Standardization of electrical interface

Objective: support international university cooperation by a standard electrical interface suitable for pico-satellites

Advantages: modular and flexible satellite system design, no harness

Electrical Interface Standard Allows to Combine Components from Different Partners
Free documentation: http://unisec-europe.eu/standards/bus
Store & Forward Constellation

- Ground or buy sensors to measure, satellites to collect data that downlinked to ground stations at low bit rate
- **Proposal is to build a constellation of CubeSats for the mission.** Each country/university can contribute with their own satellite and get frequent access of sensor data through the constellation
- What to measure
  - Water quality, water level, soil, environment (CO2, gas), car velocity (traffic jam), ship route (oceanic current), ground movement (earthquake)
  - Competitive where no mobile infrastructure, dangerous areas, etc.
Global University Space Debris Observation Network (GUSDON)

- Space debris observation is very important to improve the knowledge of the environment and prevent collisions in orbit with active spacecraft.
- Orbit determination of space debris is extremely sensitive to the number and geographical distribution of measurements.
- Basic, but still useful measurements can be obtained using affordable equipment, within typical university research budgets.
- Sapienza University of Rome developed an extensive experience in optical space debris observation and already established collaboration with other Universities in this field.
- A Global University Space Debris Observation Network could be established among Universities within UNISEC.
- The main objective of the network is to foster student awareness of the global space debris problem, in a global international collaboration.
# The BIRDS project

**Working with UNISEC-Global and the UN to implement Space Engineering Capacity Building**

<table>
<thead>
<tr>
<th>BIRDS-1</th>
<th>Launch</th>
<th>Deployment</th>
<th>Status</th>
<th>Participating countries</th>
</tr>
</thead>
<tbody>
<tr>
<td>(5 sats)</td>
<td>summer of 2017</td>
<td>summer of 2017</td>
<td>All in orbit</td>
<td>Japan, Ghana, Mongolia, Nigeria, Bangladesh</td>
</tr>
<tr>
<td></td>
<td>(3 June 2017)</td>
<td>(7 July 2017)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BIRDS-2</td>
<td>summer of 2018</td>
<td>summer of 2018</td>
<td>Awaiting launch</td>
<td>Bhutan, Malaysia, Philippines</td>
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<tr>
<td>(3 sats)</td>
<td>(28 June 2018)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BIRDS-3</td>
<td>2019</td>
<td>2019</td>
<td>Under development</td>
<td>Japan, Sri Lanka, Nepal</td>
</tr>
<tr>
<td>(3 sats)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BIRDS-4</td>
<td>2020</td>
<td>2020</td>
<td>Being organized</td>
<td></td>
</tr>
<tr>
<td>(? sats)</td>
<td></td>
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**BIRDS Mission Statement**

Make the first step toward creating an indigenous space program by designing, building, testing, launching, and operating, the first satellite for participating nations.

*As we grow the number of BIRDS partners, the ground station network expands in scope*

*Photo above: ISS deployment of BIRDS-1, CubeSats of Nigeria and Bangladesh, on 7 July 2017.*

*Archive of the "BIRDS Project Newsletter"*

http://birds1.birds-project.com/newsletter.html

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Collaboration between ISU and UNISEC-Global

<table>
<thead>
<tr>
<th>ISU</th>
<th>UNISEC-Global</th>
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<tbody>
<tr>
<td>• 3I (International, Intercultural, Interdisciplinary)</td>
<td>• Practical space project</td>
</tr>
<tr>
<td>• University</td>
<td>• Space engineering education (hands-on)</td>
</tr>
<tr>
<td>• 40% female students</td>
<td>• Consortium of universities</td>
</tr>
<tr>
<td>• Diversity</td>
<td>• 20% female Points of Contact</td>
</tr>
<tr>
<td>• Space enthusiasts</td>
<td>• Satellite developers</td>
</tr>
</tbody>
</table>

Inter-dependent?
If you want to go faster, go alone.

If you want to go further, go together.
Backup slides
IAA-Study Group (IAA-SG 4.23)

- **Title of Study**: Post Mission Disposal for Micro and Smaller Satellites – Concept and Trade Studies
- **Members**:
  - **Chairs**: Darren McKnight (USA), Toshiya Hanada (Japan), Alex da Silva Curie (UK), and Peter Martinez (South Africa)
  - **Secretary**: Rei Kawashima (Japan)
  - **Experts**: IAA members and non IAA members
- **Overall Goal**: Provide framework for a practical implementation to assure compliance with Space Debris Mitigation guidelines for micro and smaller satellites.
- **Target Communities**: Universities, micro/nano/pico-satellite manufacturers, and new spacefaring entities
  - UNISEC-Global will help disseminate the information and recommendation.
Recent Activities’ Timeline

CLTP-8

HEPTA-Sat Training in Bulgaria

5th UNISEC-Global Meeting
Pre Fifth MIC
2nd DMC

First IAA-SG 4.23 Meeting

iCanSat Training in Namibia

Jun 17
Jul 17
Sep 17
Oct 17
Nov 17
Dec 17
Jan 18
Feb 18
Mar 18
Apr 18
May 18
Jun 18

UNISEC-Global application
To UNCOPUOS

HEPTA-Sat Training in Nepal

HEPTA-Sat Training During UN Workshop

UNISEC-Global presentation at UNCOPUOS

UNISEC Presentation at Fifty-Fifth session of STS-UNCOPUOS

HEPTA-Sat Training in UAE