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

Nov 19 (Mon)	Keynote speech. Sponsors/exhibitors presentation, Mission Idea Contest, Local Chapter and Regional report , MIC 5 award ceremony. Reception
Nov 20 (Tue)	Local Chapter Report, Group Discussion, Acknowledgement of new local chapter, ISU Facility Tour, Gala Dinner
Nov 21 (Wed)	Invited Presentation, Student Representative Presentation, Student session (Gender Equality in the Space Field)

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

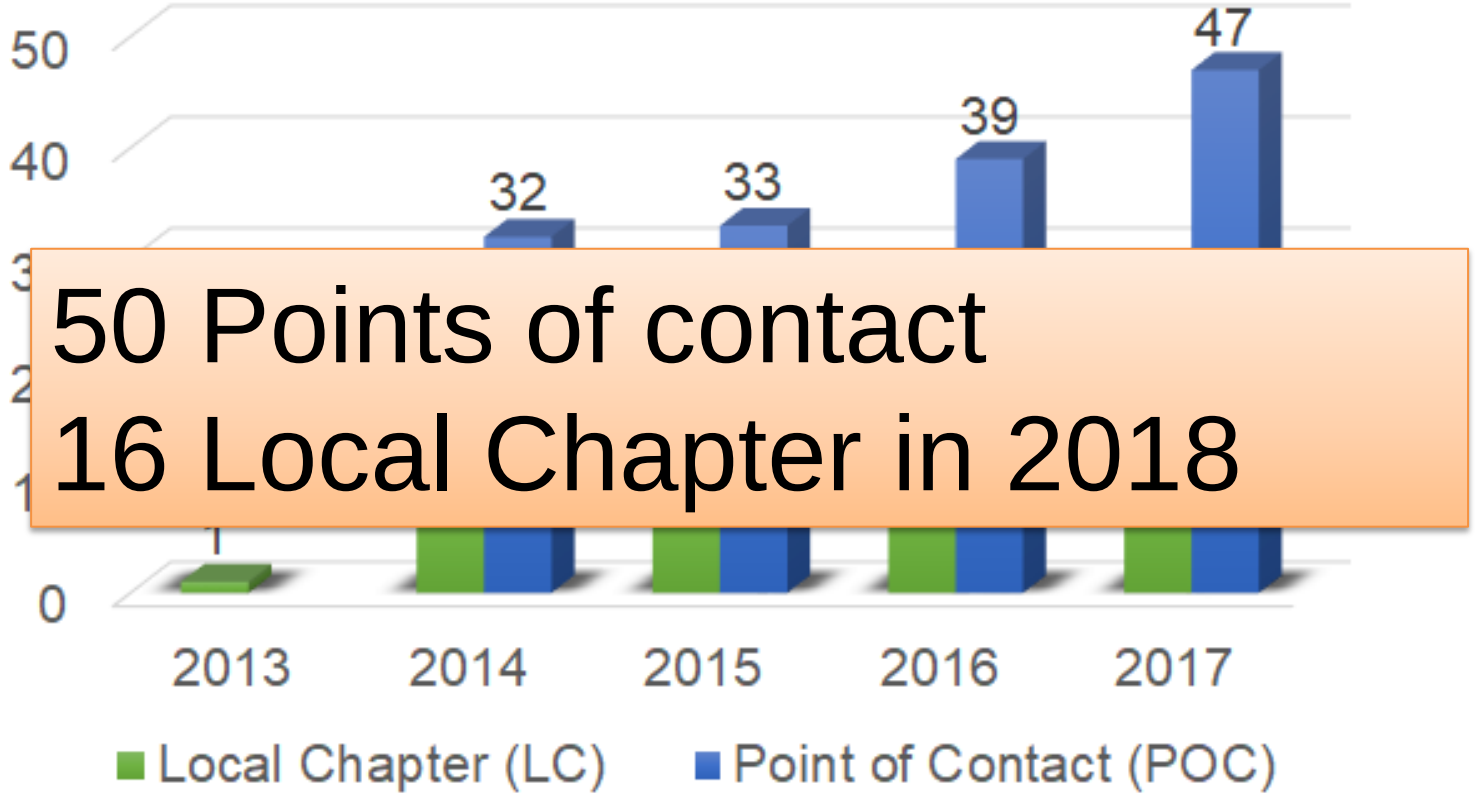
Vision

- 2020-**100** (initial)
  - *"By the end of 20**20**, let's create a world where university students can participate in practical space projects in more than **100** countries."*

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

- 2030-**ALL** (revised)
  - *"By the end of 20**30**, let's create a world where university students can participate in practical space projects in **all** countries."*

UNISEC-Global Network



50 Points of contact

16 Local Chapter in 2018

UNISEC-Global's Approach

CanSat Leader Training Program (CLTP)

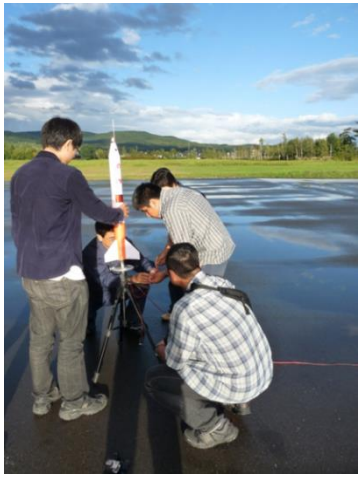
Objective: CLTP is a training program for professors/instructors to learn how to conduct CanSat training by experience. Participants are expected to teach their students after training. It has contributed to capacity building in basic space engineering and technology.

Launched: October 2010

Offered: Annually

Graduated: 81 participants from 37 countries

CLTP10 will be held in August at Nihon University, Japan



Launch Experiment

CanSat Manufacturing

Testing

Paper Craft Rocket

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

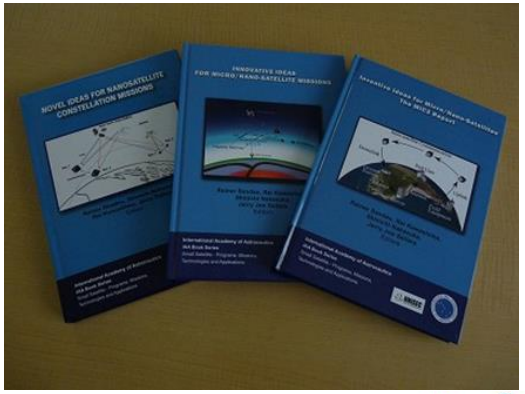
Nano-satellite Constellation Mission Idea Contest

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.

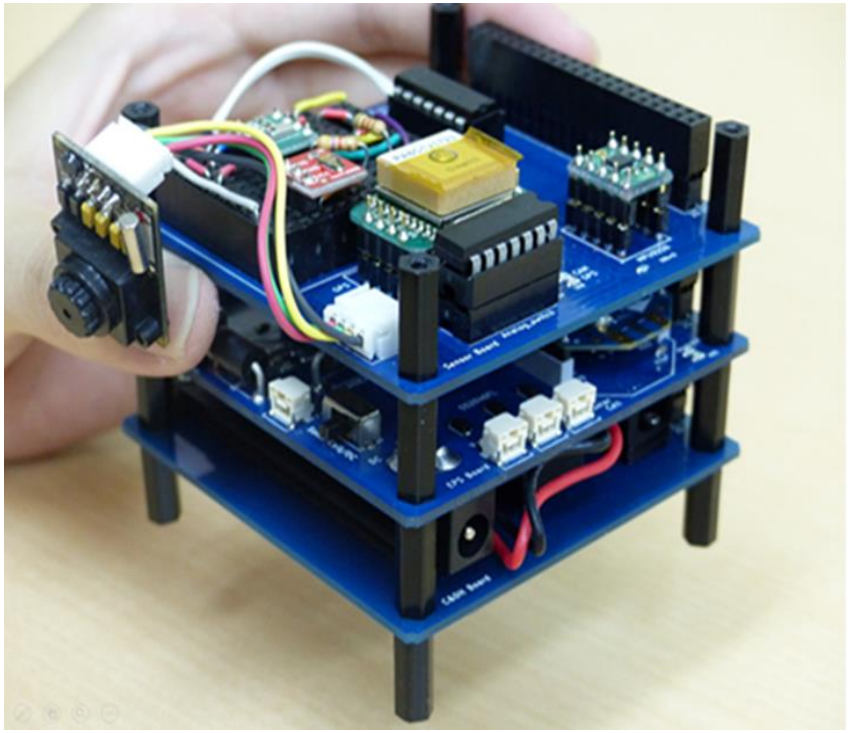


UNISEC GLOBAL
University Space Engineering Consortium

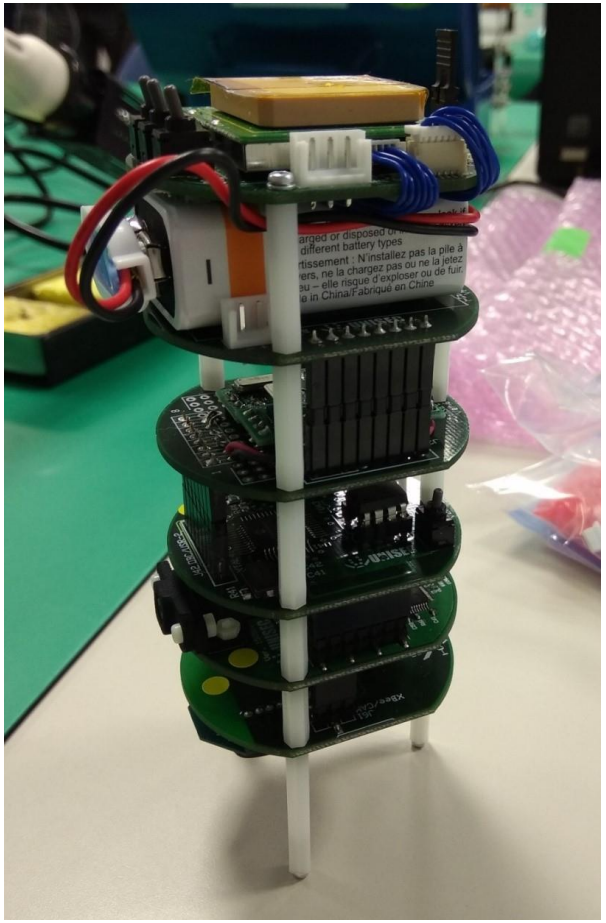
Debris Mitigation Competition(DMC)

- **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

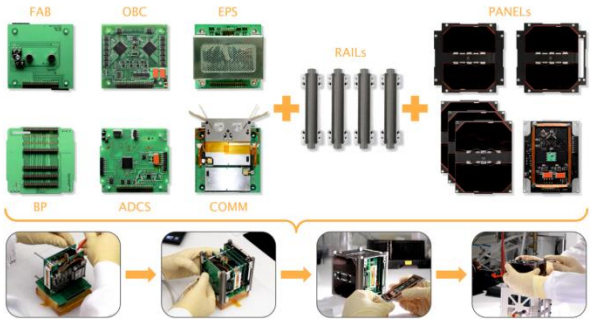
Julius-Maximilians-
UNIVERSITÄT
WÜRZBURG

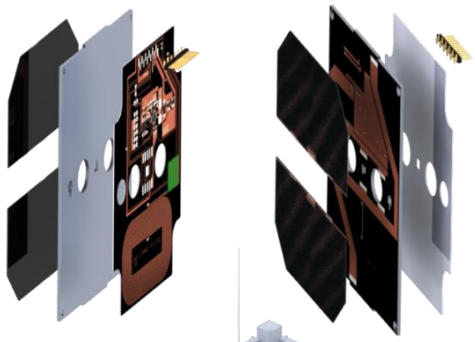
UNISEC EUROPE
University Space Engineering Consortium

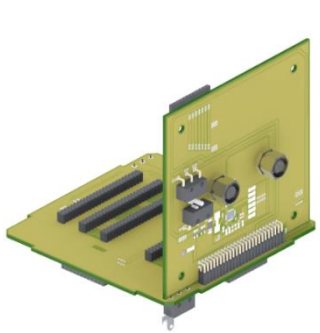
Prof. Dr. Klaus Schilling, Computer Science VII: Robotics & Telematics.

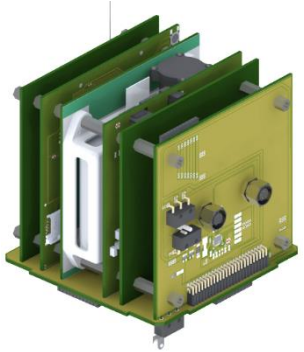
Objective: support international university cooperation by a standard electrical interface suitable for pico-satellites

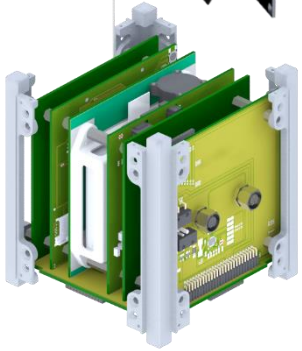
Advantages: modular and flexible satellite system design, no harness

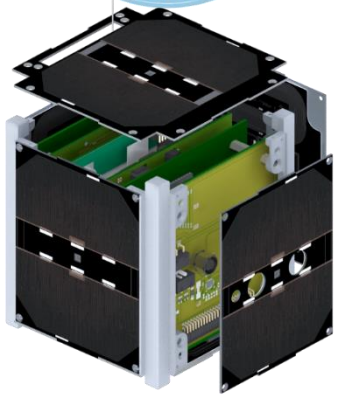








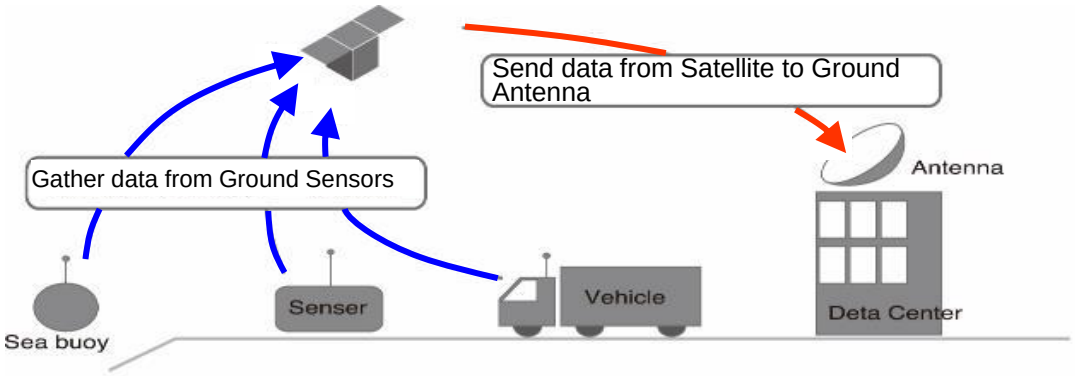


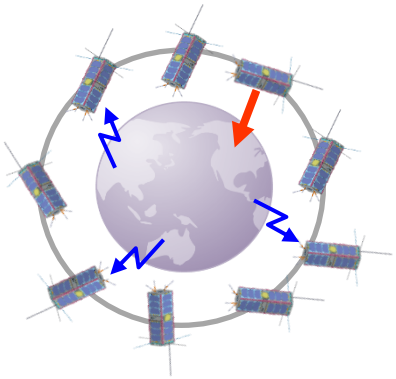


Electrical Interface Standard Allows to Combine Components from Different Partners
Free documentation: **http://unisec-europe.eu/standards/bus**

Store & Forward Constellation

Prof. Dr. Shinchi Nakasuka





- 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)

Prof. Dr. Fabio Santoni

- 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

Prof. Dr. Mengu Cho

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

BIRDS-1 BIRDS-2 BIRDS-3

	Launch	Deployment	Status	Participating countries
BIRDS-1 (5 sats)	summer of 2017 (3 June 2017)	summer of 2017 (7 July 2017)	All in orbit	Japan, Ghana, Mongolia, Nigeria, Bangladesh
BIRDS-2 (3 sats)	summer of 2018 (28 June 2018)	summer of 2018	Awaiting launch	Bhutan, Malaysia, Philippines
BIRDS-3 (3 sats)	2019	2019	Under development	Japan, Sri Lanka, Nepal
BIRDS-4 (? sats)	2020	2020	Being organized	

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.

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

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

The BIRDS Ground Station Network

← all BIRDS members (on 4-Oct-2017)

Archive of the "BIRDS Project Newsletter"
http://birds1.birds-project.com/newsletter.html

Collaboration between ISU and UNISEC-Global

ISU

- 3I (International, Intercultural, Interdisciplinary)
- University
- 40% female students
- Diversity
- Space enthusiasts

UNISEC-Global

- Practical space project
- Space engineering education (hands-on)
- Consortium of universities
- 20% female Points of Contact
- Satellite developers

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

iCanSat Training in Namibia

First IAA-SG 4.23 Meeting

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 Presentation at Fifty-Fifth session of STS-UNCOPUOS)

HEPTA-Sat Training in UAE

UNISEC-Global presentation at UNCOPUOS

UNISEC GLOBAL
University Space Engineering Consortium