

UNISEC-Global The 10th Virtual Meeting

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1. Presentation "Roles of a Space Agency"

Prof. Mengu Cho, Kyushu Institute of Technology

Prof. Mengu Cho received his B.S. and M.S. degrees from the University of Tokyo and his Ph.D. degree from Massachusetts Institute of Technology in 1992. After working at Kobe University and International Space University, he joined Kyushu Institute of Technology (Kyutech) in 1996. Since 2004, he has been a Professor. Currently, he is the director of Laboratory of Lean Satellite Enterprises and In-Orbit Experiments (LaSEINE). His research interests include spacecraft environmental interaction and satellite systems. He has supervised over 11 university satellite projects, among which 10 projects, 19 satellites, are already launched. In 2019, he received Frank J. Malina Astronautics Medal from International Astronautical Federation.



Pictured: Prof. Mengu Cho from Kyutech presenting about space agency's role

- Countries with mature space sector:
 - Three parts: Space Agency, Academia, Private Industries
 - Space agency implements plans given by stakeholders (government, public)
 - All three parts are interlinked and support one another
 - Academia are focused on human resource
 - Very mature: Private receive payments directly from customers and provide service
 - Very mature: Private and University collaborate together more
 - No country at this moment is in very mature stage
- Countries with non-mature, infant space sector:
 - Agency has to do everything: R&D, human resource development, HR and Business development
- Space sector is heading towards very mature space eco-system
 - Space is not special because now it's part of infrastructure
 - Long term planning is role of government
 - Maintain large infrastructure by government
 - Space agency role is to keep everyone happy (analogy: restaurant madam)

Highlights (Continued):

- Very infant space eco-system
 - Space is very special in this case
 - Government funded space agency collaborates with university to improve human resource
 - Industry promotion, decentralize work to private companies
 - Aggressive outreach activities to gain people's support
 - Should be aggressive in human resource development



Pictured: Prof. Mengu Cho shows differences on space agency's role in mature and infant stages of space eco-system in a country

2. Presentation "Space Agency's Contribution to Education: Compendium of Best Practices"

Quentin Verspieren, University of Tokyo

Mr. Quentin Verspieren is a Researcher at the Intelligent Space Systems Laboratory (ISSL) of the University of Tokyo, where he is in charge of establishing international collaboration programs for space technology development and utilization, mostly targeting developing countries in Southeast Asia and Africa. In parallel, Mr. Verspieren is pursuing a PhD on the role of the military on international regime-making for space traffic management at the Graduate School of Public Policy, University of Tokyo and holds various consultancy positions in the Japanese government and Japanese space ventures.



Pictured: Quentin Verspieren presenting about Space Agency's contribution to education

Highlights:

- Space education is multifaceted and has many actors
- Space agency is important however the role in education is very modest
- First step: recognize compendium best practices for education and awards
- This would then grab attention of space agencies
- Many forms of education: initiation, embedded systems, integrated systems, space utilization
- Actors include: Schools, Universities, Centers, Organizations, Space Agencies, Companies
- NASA/JAXA's work is visible, however, how much are they working on education?
- Space agency has staff, mandate and budget to move ahead
- JAXA's KiboCube that supports 1U deployment and guidance
- CNES (French Space Agency): PRSEUS (small launcher)
- These opportunity is known to few, make these opportunities more visible
- First step: provide compendium of available organizations, provide awards
- That way, best practices have visibility and can be copied by other organizations
- "UNISEC partner of the year" award
- UNISEC-Global partner because there's a need to make it global
- Pilot
 - June-July 2021: Call for research partner and group
 - July-Sept 2021: Develop method
 - Sept-Oct 2021: Call for volunteer space agency
 - Oct-Nov 2021: Testing method
 - Dec 2021: Announce pilot at APRSAF
 - 2022: Implement

3. Breakout Discussion and Sharing

Moderators: George MAEDA, Kyutech; Nate Taylor, UNISEC-Global.



UNISEC-Global The 10th Virtual Meeting Breakout Discussion

Time: 35 minutes

- I. Set the leader.
- II. Discuss your thoughts on a Space Agency Compendium:
 - a) How would a compendium of best-practice be *useful* for agencies and students?
 Would any universities in your region be interested in being a research partner?
 - b) What role should a space agency play in space education?
 - c) How can we *define "best-practice"* for space education initiatives?
 - How should a compendium of best-practices be *categorized*? (i.e. by discipline, region)
 - What are some examples of agency education initiatives that you are aware of or have been involved in?
 - What made these programs successful or how could they be improved?

After closure of Breakout session

III. Leader to share your ideas:

Please keep to the 1 minute timer to ensure everyone can speak!

1 minute to summarize your discussion (timer on-screen).

Pictured: The topic subject for the breakout session regarding Space Agency's role

- Discuss roles, best practices and usefulness of activities done/can be done by space agency
- Entire meeting is divided into 6 breakout rooms (about 4-5 people in each room).
- Participants discuss the above agenda for 35 minutes.
- Representatives of each room make a 1-2 min summary to the entire meeting.

Group	Speaker	Highlights		
Room 1	Melchizedek	Agency Role: Space education, developing program/curriculum, <u>Useful Practice:</u> Policy and guidelines for space education, collaborate with universities, share knowledge in space in academia/industry, <u>Best Practice:</u> Provide funding, Philippine Space Agency has no clear policy on how to fund research universities who want to start out. Another should be quality of content, target younger students.		
Room 2	Abhas	<u>Agency Role</u> : Mature – Management, future planning while universities train the next generation. Infant- Direct training, basic space science education and outreach <u>Best Practice</u> : Very good question, important to experiment with programs and receive feedback. Project Based Learning (PBL) could work. <u>Useful Practice</u> : Example of JAXA, free rides for domestic applicants. Discontinued but re-continued from this year again.		
Room 3 Vesselin		Agency Role: Three major directions 1) space outreach/education 2) organizing student related visible activities 3) support the academia, work with educators and universities <u>Useful Practice</u> : Competition which allows comparison, space activity should be part of curriculum Rei mentioned that use the power of UNISEC where space agencies recognize local professors to involve them in space agency's activities		
Room 4	Akiko	<u>Agency Role:</u> Reach students and industries, collaborate with universities, students can receive scholarships to be involve in practical space programs. <u>Best Practice:</u> International guideline for space education would be better.		
Room 5	-	-		
Room 6	Suchayaa	Agency Role: Competition related to space, involve students from high school for project based activities, provide many opportunities <u>Useful Practice</u> : provide opportunity to involve students in hands-on activities, encourage students to know more about space and provide funding <u>Best Practice</u> : Hand-on space activity, proper guidance through experienced teachers. Provide freedom for students to experiment, not give them answers beforehand.		

Comments from Prof. George Maeda

Just want to remind everyone that UNISEC organizes Mission Idea Contest (MIC) every year. Since people are talking about competition, you have the opportunity to compete through MIC.

Comments from Prof. Herman Steyn

Just to add what Prof. Maeda said, MIC is for more experienced space engineering student or group of people and not for the new comer for space. It has progressed into a competition that requires a lot of knowledge to really participate.

Other comments

From MC | Nate Taylor | UNISEC-Global to Everyone:

Discussion included 1) Opportunities 2) Funding 3) Policy 4) Management 5) Future planning and there was large emphasis on several of the groups to look on hands-on projects but also utilizing the expertise of University professors in recognizing them as well. There was one thing that we didn't talk about was <u>direct education</u> rather than using a university or some other education platform to help set the curriculum.

4. Regional Report: UNISEC-Egypt

Prof. Ayman H. Kassem, Cairo University

Prof. Ayman H. Kassem received his B.Sc. and M.Sc. in Aerospace Engineering from Cairo University in 1990 and 1993 respectively. He got his Ph.D. in 1998 from Old Dominion University, USA. He joined Aerospace Department at Cairo University in 1998 as an assistant Professor and he joined the research and training team for EgyptSat-1 satellite project (1999-2001). He got a second M.Sc. in Computer Science in 2002. From 2004 to 2011, he had joined Aerospace department at King Fahd University of Petroleum and Minerals (KFUPM), Saudi Arabia. He currently works as a Professor and Chair of Department of Aerospace Engineering at Cairo University.



Pictured: Prof. Kassem introducing the activities of UNISEC-Egypt

- UNISEC-Egypt started working 2014 and SSTlab at Cairo University became the host of all programs
- CanSat Training Program is the main program. Completed 12 trainings with 300+ trained students
- Open to all engineering students in Egypt
- Space Rover Program, where students learn how to build rovers. Initially for ARLISS.
- Rover program complements the CanSat programs
- Working on network and formation, and Simultaneous Localization and Mapping (SLAM)
- CubeSat program: 4 iterations for all subsystems
- Quadcopter/Octocopter programs used primarily for launching CanSat
- Covid-19
 - Fully online: Online CanSat Training Program and Online STEM Training Program
 - Partially online: CubeSat iteration 5 and Space Rover
- Online CanSat Training Program has over 30 videos (18hrs), 270 registered students and 70 have completed training
- Online STEM Material called Aerospace 4 Kids (YouTube channel) that teaches basics of aerospace engineering, free for all
- Most systems are ready and two more iterations before testing and launch for CubeSat. Aimed at 2024.
- Space Rover Program in third iteration with robotic arm
- Object recognition through camera
- Plan for 2022 and beyond
 - Continue CanSat and Rover
 - 6th Iteration will be the final for CubeSat
 - Cooperate with Egyptian and African Space Agency
 - Upgrade laboratory
 - Cairo-Sat aimed at 2024



Pictured: Rover designed by students involved in UNISEC-Egypt's activities

5. Regional Report: UNISEC-Mongolia

Dr. Enkhjargal Natsagdorj, National University of Mongolia

Dr. Enkhjargal Natsagdorj holds a PhD degree in Geo-informatics and Remote Sensing from Ghent University in Belgium. Prior degrees were earned at the National University of Mongolia (M.Sc.) and the Mongolian State University of Agriculture (B.Sc.) in Mongolia. She has done her exchange research at the University of Vienna, Austria. Currently, she is a researcher of the NUM-ITC-UNESCO Remote Sensing and Space Science laboratory at the National University of Mongolia.



Pictured: Quentin Verspieren presenting his report

- UNISEC Mongolia established in Feb 2011. 4 Universities, 2 Associations and 2 Laboratories
- Two associations established: Mongolian Space Technology Association (MOSTA) and Mongolian Aerospace Research and Science Association (MARSA): TV programs, podcasts, training
- UNISEC-Mongolia Timeline
 - 2011-2012: UNISEC activities begin
 - 2013: First laboratory for nano-satellite
 - 2015: BIRDS project initiation, first satellite for Mongolia (Mazaalai) and space engineering master course begins
 - 2017: First Mongolian satellite launched successfully
 - 2018-2021: Mongolian space engineering specialist and scientist preparation
 - CLTP participation since CLTP2. Participation in 2011, 2012, 2013, 2014, 2016 and 2018
- CanSat Leader Training Program in Mongolian since 2012, conducted every year
- CanSat competition organized 2013, 2015
- Two laboratories:
 - NUM-ITC-UNESCO for Space Science and Remote Sensing Laboratory
 - NUM-ITC-UNECO is led by Prof. R. Tosolmon, currently 30 students

- Highlights (continued):
 - Nanosatellite Development Laboratory
 - Belonged to NUM-ITC until 2018
 - From 2018, Ass Prof. D. Erdenebaatar is head of laboratory
 - UNISEC-Mongolia's Challenge: Capacity building for CubeSat/Microsatellite in 2015
 - Higher Engineering Education Development (M-JEED) Project from 2015-2023
 - Project objectives
 - Collaborate with Japanese Universities
 - Development of microelectronics, space engineering and application in Mongolia
 - To make Mongolian CubeSat, ground station and human resource
 - Under M-JEED total of 5 PhD students (3 completed), 1 Masters
 - 5 of them is working at National University of Mongolia (NUM)
 - M-JEED and BIRDS Project in 2016 through Prof. Mengu Cho
 - Mongolia participated in BIRDS-1 project, building the first satellite for the country
 - Information from BIRDS-1 satellites were received from Mongolian GS
 - UNISEC-Mongolia meeting will be conducted online because of pandemic
 - CLTP9 participant Baasandorj created plasma actuator (research)
 - Students participated in APSCO Student Satellite Project
 - Women in Space Science celebrated in Woman's Day (year not stated)
 - 2019: "Nanosatellite-New Possibility" business meeting, 2 years after launch of first satellite
 - Currently undergoing Temuulel Satellite Project led by Alumni from Kyutech nad APSCOs SSS project summer school/short trainings
 - Temuul PDR was conducted in 2019
 - CanSat National Competion stopped in 2015 but reactived in 2020
 - 27 teams in 2020 in competition
 - Covid-19
 - Podcasts, online lectures, online meetings
 - NUM team met the PM of Mongolia in 2021 to discuss future plan for space
 - Mongolia is now moving towards Micro-satellites, better space applications and supported by graduate students



Pictured: Timeline for Mongolia's first satellite which was part of Kyutech's BIRDS-1 project

6. New member acknowledgment, announcements and closing

Rei Kawashima, UNISEC-Global



Pictured: Kawashima-san announces new members for the UNISEC-Global Community

- No new local chapters
- 1 new university member (Khwopa Engineering College from UNISEC-Nepal)
- As of June 19, 2021, UNISEC-Global Community has 21 local chapters, 188 university members and 7 corporate members
- New Point of Contact (POC) for UNISEC-Mongolia, Dr. Enkhjargal Natsagdorj (NJ). Prof. Tsolmon Renchin will remain as co-POC
- Next Virtual Meeting: July 17, 2021 10:00PM 0:00 AM (JST)
 - Theme: Space Agency Education Rating
 - Confirmed speaker: TBC, Breakout: Space Agency Education Rating
 - Local Chapter Presentation: TBC
 - UNISEC-Global Meetings will take place on the **Third Saturday** of almost every month on 2021
- 7th Mission Idea Contest
 - Abstract due: July 7, 2021, Final: Nov 13, 2021 done hybrid in Tokyo, Japan
 - Free online lecture http://www.spacemic.net/lecture.html
 - Abstract template download http://www.spacemic.net/index.html
- Prof Didier Queloz will present at 14th UNISEC=Global Meeting on October 16, 2021



Pictured: Nobel Laureate Prof. Didier Queloz

Future Planning

- MIC7 abstract submission due: July 7, 2021
- UNCOPUOS: August 25 Sep 3, 2021
- Samara Space international summer space school : August 30-Sep10, 2021
- PiNa Workshop (Wuerzburg): Sep 22-24, 2021
- IAC2021(Dubai): October 25-29, 2021
- MIC7 final presentation (Tokyo): Nov 13, 2021,
- IAA 1st African Symposium for small satellite (South Africa) : Nov 29 – Dec1
- Asia-Pacific Regional Space Agency Forum (APRSAF) (Vietnam) : Nov 30-Dec 3

Please let us know your event information.

Pictured: Kawashima-san showing events planned for 2021

- 2021 Planned Events

- MIC7 abstract submission due by July 7, 2021
- UNCOPUOUS on August 25- Sept 3, 2021
- Samara Space International Summer Space School on August 30-Sep 10, 2021
- PiNa Workship (Wuerzburg) on Sep 22-24, 2021
- IAC2021 in Dubai on October 25-29, 2021
- MIC7 final presentation on Nov 13, 2021
- IAA 1st African Symposium for Small Satellite (South Africa) on Nov 29 Dec 1, 2021
- APRSAF 2021 on Nov 30-Dec 3, 2021 in Vietnam



Pictured: Mr. Ganapati (left) shares experience at 10th UNISEC-Global meeting Lawrence Reeves (right) deploys CanSat from helicopter during Canada's CanSat competition

- UNISEC-India's POC Mr. Ganapati's comments

- Extremely happy to be present
- Apologies for not participating earlier, will be participating fully from next time

UNISEC-Canada's POC Lawrence Reeves's update

- Completed CanSat competition last week, continue this in the future
- Deployment of CanSat was done through a helicopter
- All of the teams were excellent in the time of pandemic



7. Participant Statistics

76 registered participants from **30** countries/regions participated in the 10th Virtual UNISEC-Global Meeting.

Country/Region	Number of	Country/Region	Number of
	registrants		registrants
Afghanistan	1	Japan	18
Angola	1	Kenya	4
Argentina	2	Namibia	1
Australia	1	Nepal	4
Bangladesh	1	Pakistan	1
Bulgaria	3	Philippines	14
Cambodia	1	Republic of Korea	1
Canada	1	Russia	1
Chile	1	South Africa	1
Costa Rica	1	Thailand	2
Egypt	4	Tunisia	1
Ethiopia	1	Turkey	2
France	1	United Kingdom	1
India	3	United States	1
Italy	1	Vietnam	1

8. Participant Questionnaire



What percentage of the population do you think has access to space education? ⁷⁰ responses



Do you think space related education should be open to everybody ? 69 responses



Who should be responsible for space related education?

68 responses



Are you satisfied with the current space related education system/situation? ⁶⁶ responses



