UNISEC-Global The 11th Virtual Meeting

July 17, 2021 22:00-00:00
(Standard Japan time GMT +9)

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July 17, 2021.
Japan

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1. Opening Remarks

Prof. Martin Sweeting, Surrey Satellite Technology Ltd. and Surrey Space Center

Prof. Martin Sweeting was educated at University of Surrey where he completed BSc in 1974 and PhD in 1979 on shortwave antennas. Prof. Sweeting is the founder and executive chairman of Surrey Satellite Technology Ltd (SSTL). SSTL is a corporate spin-off from the University of Surrey, where Prof. Sweeting is a Distinguished Professor who founded and chairs the Surrey Space Centre. In recognition of his pioneering work on cost-effective spacecraft engineering, Prof. Sweeting was knighted in 2002.

Pictured: Prof. Martin Sweeting's message is not to rely on government all the time

Highlights:

- Space agencies not just for education but stimulating what's called "New Space"
- Resurgence of space by participation of universities, countries, small companies
- SSC and SSTL has been working together for space activities
- Hands-on activities important: "learning by doing"
- For Surrey, 95% of its activities has come from commercial sectors, 5% from government
- Government support came at very critical times
- Government support important for pre-market development of space
- Government support in university course development/funding and political support to transfer knowledge to developing and emerging space nations
- While government support is critical, it's important not to be "addicted" to government support
- Makes things "lazy" and "dulls" the initiative
- Important to stay hungry
- Key message: While government funding is critical at critical times, having a business model that supports your organization to grow is essential

2. Presentation "Space Agencies and Space Education"

Juan De Dalmau, International Space University

Juan De Dalmau has a background in mechanical engineering, business administration, space studies, and languages. He has over 35 years of international management experience in engineering, operations, technology development, education and communications. He has worked in the private sector, in university and for the French (CNES) and European (ESA) Space Agencies. Mr. Dalmau is a graduate of International Space University's (ISU) SSP Program in 1989. He is ISU's 6th President.

Pictured: Juan De Dalmau presenting about Space Agencies and Space Education

Full Transcript:

Greetings from Strasbourg France as small teams of students at the International Space University (ISU) are in the middle of a hands-on exercise for the Space Studies Program (SSP). Composed of interdisciplinary professionals from over 30 nationalities, teams at the SSP have overcome engineering and design challenges to successfully launch their team rockets. The SSP has also overcome the challenges of COVID this year by adapting to provide the first triple stream activity for ISU in a hybrid split between participants located at ISU headquarters in France, our partners at the University of Granada in Spain, and in an online environment. It is a pleasure to be invited to the UNISEC-Global Meeting and to have opening remarks made by Sir Martin Sweeting. In a way we can say this is then a week of "Sirs" with Sir Richard Branson showing how private initiatives can make an impactful difference in the space industry.

Our topic today is space agencies and space education. Sir Martin made comments about organizations being hungry, but not starving. This ethos is particularly relevant and important in the modern space industry. This position of "hungry, but not starving" is where ISU resides and has resided for years. ISU has been operating for 30 years as a small organization with less than 30 employees. ISU is independent of any government, which was a critical part of the ISU founders vision, keeping ISU hungry as we rely on

convincing space industry stakeholders of the benefits of investing in ISU students. Very often professors ask students “If you could choose two things to carry to space, what would they be”? A pertinent and simple answer may be to reply “water and bread” for these are simple essentials. Many convicts in the past have been kept alive (or hungry, but not starving) this way.

So the question is, how to not starve? One way is through working with space agencies around the world. The role of governments is largely strategic wherein they provide input at the right place and time such as with scholarship funding to enable future industry leaders, or seed funding used to trigger an expansion in domestic commercial initiatives. Past UNISEC-Global meetings have proposed an academic exercise to examine how agencies conduct space education. A critical component in this endeavor is investigating government policy. An example can be seen where the UK Government pursues commercial growth of the space industry with several key performance indicators (KPIs) and milestones. Despite many changes occurring in the UK Government and UK political parties, space policy has been largely maintained. This continuity of direction and policy is key in strengthening the relationships and capability formed between agencies and universities, evidenced by this year's SSP, where a large delegation of UK participants are in attendance thanks to dual partial-funding from the UK Government and the European Space Agency (ESA).

Many governments around the world are now emphasizing the importance of entrepreneurship and New-Space phenomenon. This was observed with several buzzwords during the annual European Union space meeting last January that reflected a consensus on interests and intentions such as “workforce development”; “education”; “training”; and “entrepreneurship”. If UNISEC examines the existing policies at a regional and government level, this will reveal how agencies transform policy into plans. One insightful question to ask is “who are the target audiences of space agencies in their space education effort”? The answer will reveal the agency’s approach. Most agencies are investing in teachers as this has a wider impact and extended payback. Teachers who understand how space inspires pupils become some of the agency’s greatest assets as exemplary space ambassadors, promoting and inspiring students into STEM careers for years. At the university level, the target audience is smaller with direct investment in students themselves, however, the approach by agencies to prepare students to enter the space industry is varied.

An example is seen by examining the approach of the Luxembourg Government which is driven by a commercial focus. The Luxembourg Space Agency is less than 3 years old and was established to position Luxembourg with a long-term plan for the space industry. An ESA lab has been established in Luxembourg which is utilized for space resources and planetary exploration, attracting entrepreneurs and expanding the workforce, and even to attract international investment. Another strategy by the Luxembourg Space Agency has seen the inception of a multidisciplinary space master's program in collaboration with the University of Luxembourg. As such, regardless of the age of a space agency, there is always an educational component to develop a workforce; critical to growing the local space industry.

Other examples of a space agency’s approach to education can be found in the partnerships that ISU has formed and how they change over time. A promising case is found in the Canadian Space Agency. Changes in the priorities of the agency has resulted in the budget for education being reduced dramatically in recent years. This presents a challenge for ISU to work closely with the Canadian Space Agency to resume the good practice of training professionals. Consider the United Arab Emirates (UAE) who share similarities with Luxemburg in their approach. The UAE is economy focused with consideration for financial aspects of the space industry, such as insurance. The Government wants to diversify the economy from a traditional oil-based system, and see the space industry as a substantial and dynamic component in their long-term plan. The UAE has made great progress in training UAE citizens such that brilliant scientists and managers have been emerging to contribute to space science missions including mars exploration planning that is directed by the human spaceflight research institute in Dubai. In this way, the UAE is training its own people

through the agency directly.

Consider now the case of Israel. Israel has both the Israel Space Agency as well as a dynamic and successful non-government education organization in the Ramon foundation who require the acquisition of public and private funds including those of investors and donors. The Ramon Foundation was named after the first Israeli astronaut, Ian Ramon. The Ramon Foundation manages all the activities surrounding the upcoming RAKIA mission of Israel's second astronaut, Eytan Stibbe, who will crew on-board the International Space Station in 2022 and they aim to achieve the transformation of a private citizen into a space traveler in less than 6 months. The Ramon Foundation is using this mission objective as a nationwide outreach activity displaying to younger generations the greatness that they too can achieve through study, perseverance, and conviction. Beyond this incredible achievement, the Roman Foundation organizes competitions for Secondary (High School) students involving hundreds of students who design experiments for flight on the ISS.

Considering the vast and varied approaches of space agencies, UNISEC-Global should be congratulated on work that is being done to convey some of these agency-driven best-practices to professionals all around the world. Space agencies can follow these examples by looking outward rather than only inward towards their own citizens. In 2018, ISU partnered with the Government of the Netherlands as a local host organization to provide a financial guarantee for the SSP. Decision makers at universities and the Dutch Government saw that they were investing in more than simply a two-month space program. They identified that they would be bringing in worldwide space professionals and temporarily becoming the world's space capital. This idea could be capitalized on more than the once-off effort required to facilitate the program by integrating this education priority into a long-term goal. The Stichting Space Professional Foundation (SSPF) was thus formed to collect donations from governments, companies and private citizens for candidates wishing to attend ISU programs. One of the most unique and inspirational aspects of this fund is that Dutch citizenship is not a requirement for eligibility. Candidates simply need to have a connection with the Netherlands to be considered in the fund. This positions the Netherlands to attract talent from around the world, further strengthening their space industry by not limiting investment only to its own citizens. This international and intercultural approach is something that we can all benefit from as global citizens, and something that both UNISEC-Global and the International Space University promote and embody.

<u>Highlights:</u>

- More than 100 students from over 30 nationalities for micro-rocket launching course
- 1/3rd is conducting the course online, 1/3rd at ISU and 1/3rd at partner universities due to Covid-19
- Week of "Sirs"
  - Prof. Martin Sweeting was knighted because of his incredible work for small satellites
  - Sir Richard Branson who has shown that private space initiative can make a difference
- Prof. Martin's quote "Organizations need to be hungry but not starving"
- ISU is a small organization, established 30 years ago with 30 employees. Independent of the government.
- Fact of being hungry is very important
  - If you could only carry one thing in space, what would it be?
  - I would carry water and bread
  - Many prisons in the past were kept alive by water and bread
- How do we not starve?
  - Personal example: As a young engineer met colleagues of Prof. Sweeting who came to launch the first satellite for surrey
  - Late 80s CNES and ESA scholarship for ISU

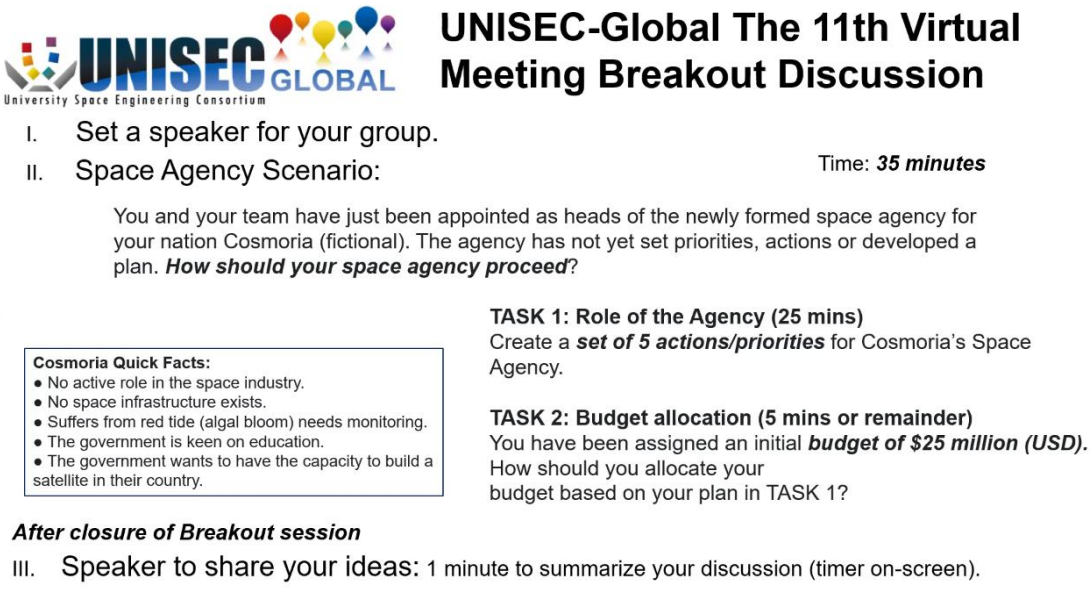
    - Government agencies supported that initiative
    - Role of the government is to be at the right time at the right place
    - University of Tokyo and UNISEC: Researchers look into government policies
    - UK: Commercial growth is key policy in space
    - Despite the change of the government, space policy has been maintained
    - Well invested public money by UK to make their delegations members of space community
- Entrepreneurship and phenomenon
    - Is becoming government policy
    - Loudest buzzword: Workforce development, education and entrepreneurship for space
- For "Role of Space Agency" study
    - Look into the policy
    - who are the target audiences in space agencies? different in middle/high and university
    - How to they target is important
    - Best way for education would be to target teachers and invest in them for middle school
    - For universities, target can be directly students because the group is smaller
    - **Luxemburg example:**
        - Government driven but commercial driven
        - Space industry in the economy of the country for long term
        - Attract space entrepreneurs, most of them come from other countries
        - Education: Special collaboration with University of Luxemburg for multi-disciplinary space education
        - Government need the workforce to get the space industry growing
    - Other examples of space agencies whom we work and their education strategy
        - Promising case: **Canadian Space Agency**
        - Changes in priorities, need to resume good practice of before
        - **UAE,** similarities with Luxemburg. Government looking to diversify
        - Investment in space, long term
        - Brilliant scientists and managers by previous training and investing in space
        - Training done by the space agency
        - Israel has a space agency, has a dynamic and successful NGO called the **Ramon Foundation**
        - Ramon Foundation "hungry but not starving" getting funds from private entities who believe in space education
        - Ramon Foundation is managing all the upcoming missions for Israel's second astronaut
        - Ramon Foundation is to inspire the next generation by launching astronaut. If they want, they can
        - Ramon Foundation actively involved with secondary schools, making space-based experiments
- Congratulations to UNISEC for the work you have done
- Good friends in Netherlands: Financial guarantee if required for education
- 150 people from all over the world for a 2-month program by the Dutch government
- Training by ISU is beneficial for own workforce, foundation that collect money from gov and private so that every year they can provide scholarship for ISU's program
- Requirement by Dutch foundation [Stichting Space Professionals Foundation (SSPF)] is that you need to have connection with Netherlands. No need to be citizen.
- Not limit scholarship to our own citizens (ISU's collaboration with Tohuku University)
- JAXA investing in education projects

Q&A:
Rei Kawashima: *Is ISU satisfied with JAXA's contribution to ISU*
Jaun De Dalmau: *Yes. ISU is run by our general assembly and JAXA is part of that. The general assembly decides on who sits on the board of ISU and we have the great honor of having Norimitsu Kamimori from JAXA as a member of our board. He is very proactive and supportive person. He is helping the ISU to inform JAXA management of our programs. For example, some of our students have been hosted by JAXA for their compulsory masters internship despite COVID-19. JAXA has adapted by remotely taking the students and has invested in time, video calls so that the interns can meet people. We are thankful for this innovative approach by JAXA. We are also looking for new initiatives by my successor. Prof. Pascale Ehrenfreund will take the presidency, she's currently the chancellor of ISU. She will come to Strasbourg and she has very strong ideas of collaboration internationally, that includes Japan.*

Chatroom Question:
Kuang-Han Ke: *This is a wonderful talk! Juan. Why would some Space Agency reduce the education funding? What would be the possible thought and reasoning process?*
Jaun De Dalmau: *One reason could be that the government wants all educational activities to be run by the relevant ministry, which might be different from the ministry overseeing the space agency.*

3. Breakout Discussion and Sharing

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



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

Highlights:
- Set 5 actions/priorities for Csomoria (imaginary country) and allocate $25 million initial budget
- Use Cosmoria's quick facts that will guide on
- Entire meeting is divided into 4 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	**Charleston**	Priority Areas: 1) Capacity building and building human resource to run space agency 2) International collaboration (common now where developed help developing country) 3) Space education, even elementary students to have an idea on how satellites are made and their uses. Change opinion that space is not a waste of money 4) Engage with the public, inform them of the activities and make them more accessible 5) What can we study from Algae bloom? How are satellites useful?
Room 2	**Irem**	First project can be a satellite with a camera to observe the problem. The Algae bloom can cause poisonous sea food which is important for the public to know about it. Experts can be brought to the country to solve the issue and for transfer of knowledge. Training can be done to develop CubeSats. This information has to be open and available for everyone. One of the education areas is satellite imagery as well. ***Nate:*** *Why international experts?* ***Arno:*** *No space infrastructure, so makes sense to bring experts*
Room 3	**Erika**	Priority Areas: 1) Education is most important and build educational satellite 2) International collaboration to build international relationship Focus areas has been on building satellites through international collaboration. Budget breakdown (US$ 25 MIL) US$ 3 MIL Satellite US$ 4 MIL Education US$ 4 MIL Data Analysis US$ 2 MIL International Collaboration US$ 7 MIL HR US$ 5 MIL Building/Facility
Room 4	**Rajasekhar**	Priority Areas: 1) Satellite data application [training and applications, software packages for agriculture, disaster and climate change] 2) Making satellites [Understand satellites, tracking and reception of data, building satellites, use commercial arm to build bigger ones] 3) Satellite Kit, Capacity building [engage with institutions like ISU] 4) Recruit international expertise for initial development, buying software and manpower ***Nate****: Use existing data that's not available in the country?* ***Rajasekhar****: Yes*

4. Regional Report: UNISEC-Nepal

Devraj Pant, Antarikchya [Pratisthan Nepal]

Devraj Pant did his undergraduate studies at Kathmandu University in 2020 and is currently engaged in a Non-profit Organization (NPO) Antarikchya [Pratisthan Nepal] where he works as a Antarikchya Satellite Fellow. His work is primarily focus on Electrical Power System (EPS) for next generation NepaliSat-2 project. He is presenting the report on behalf of Dr. Abhas Maskey for UNISEC-Nepal.

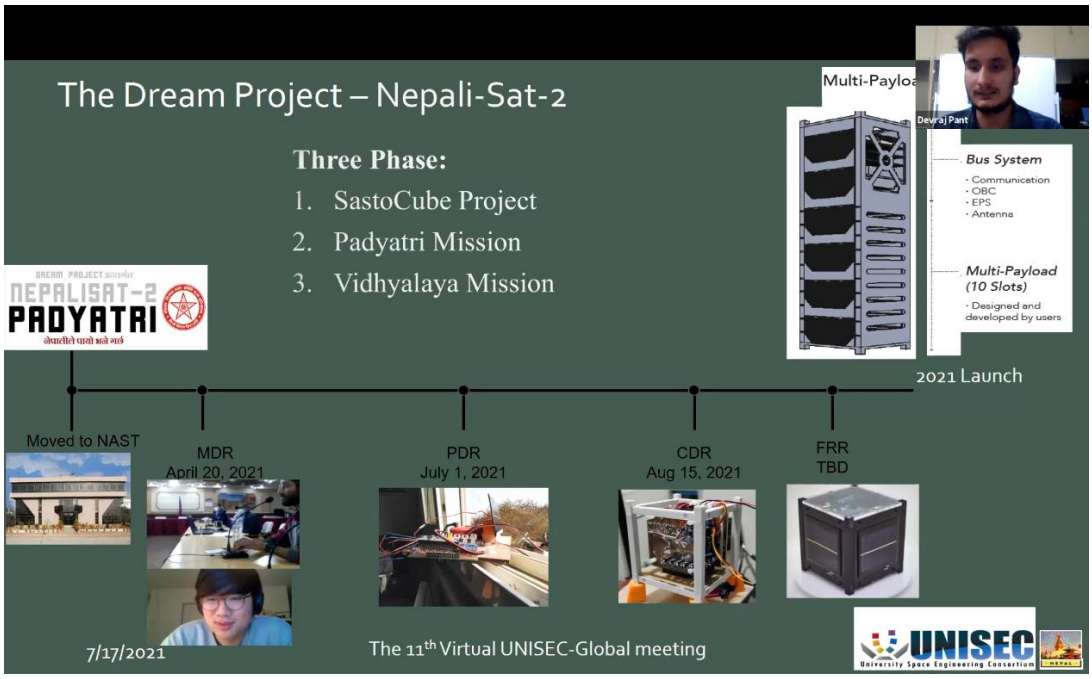
Pictured: Devraj Pant's presentation for UNISEC-Nepal

Highlights:

- Six engineering colleges under three universities are members of UNISEC-Nepal
- 2016 SastoSat Grassroots (CanSat) program from Kathmandu University
- 2016 was the first interaction with UNISEC-Global
- 2017-2018 SastoSat CanSat training to high school and school students, Hepta-Sat training
- 2019-2020 NepaliSat-1 ground station establishment and First CanSat competition in Nepal at Kathmandu University
- 2021: NepaliSat-2 all Nepali team formed and SastoCube Educational Satellite deployed in rural Nepal
- SastoSat grassroots program began from 2016 after CLTP-7 training. First training at Kathmandu University in 2016 and has continued every year since then reaching younger audience
- CanSat workshop and Competition in 2019 at Kathmandu University
- Drone used for deployment, 9 teams from nepal
- Three-day competition with three rounds: Rover involved as well
- SastoCube Educational satellite developed at National Innovation Center. Manpower by Antarikchya Pratisthan Nepal
- SastoCube project launched on January 1, 2021. Targeted students to 7 and above
- SastoCube is 1U CubeSat standard

Highlights:

- SastoCube workshop at rural Khotang district in Nepal from 5-11 July 2021.
- 50 students from 4 schools were involved
- 9-10 organizations are now involved in space
- Orion Space developed SanoSat-1 picosatellite which is awaiting launch in 2021
- SEDS-Nepal developed Garuda rocketry project for 2021 Spaceport America Cup
- WoAA Nepal empowers women that are involved in space sector. Conducted talk series
- Dream Project: NepaliSat-2, initiated in 2020. NepaliSat-1 developers instigated the local project
- Build world's first high-school satellite constellation with INSTED from Thailand
- Targets public school students
- Dream Project is in three phases: SastoCube Project, Padyatri Mission and Vidhyala Mission for NepaliSat-2
- MDR on April 20, 2021. PDR completed on July 1, 2021. CDR planned for August 15, 2021 at Nepal Academy of Science and Technology
- Vision 2050: Aim to launch Nepal's first astronaut to space



Pictured: NepaliSat-2 timeline

Q&A:

Rei Kawashima: *Why does the high school kids need to build CubeSat? They have CanSat and small rockets. CubeSat cost a lot and its quite huge, why are you helping high school kids to launch a real CubeSat?*

Devraj Pant: *Basically, the concept came from the project which we are collaborating with Thailand. The team who trains to build NepaliSat-2 Padyatri will supervise the NepaliSat-2 Vidhyala (high school). NepaliSat-2 Padyatri trainers are university graduate students who will then look after high school students. This is done to accelerate the learning process.*

5. New member acknowledgment, announcements and closing

Rei Kawashima, UNISEC-Global

Pictured: Kawashima-san making announcements for the UNISEC-Global Community

Highlights:

- No new local chapters
- As of July 17, 2021, UNISEC-Global Community has 21 local chapters, 188 university members and 7 corporate members
- **Next Virtual Meeting: August 21, 2021 10:00PM – 0:00 AM (JST)**
    - Theme: TBC
    - Confirmed speaker: TBC
    - Local Chapter Presentation: UNISEC-Peru
    - UNISEC-Global Meetings will take place on the **Third Saturday** of almost every month on 2021
- 7th Mission Idea Contest
    - Extended Abstract due: July 21, 2021, Final: Nov 13, 2021
    - Venue: X-Nihonbashi, Tokyo, done hybrid
    - Free online lecture http://www.spacemic.net/lecture.html
    - Abstract template download http://www.spacemic.net/index.html
- Kyushu Institute of Technology (Kyutech) is calling for applications for Assistant/Associate Professor
    - Recruiting prospective foreign students to SEIC
    - Build collaborative relationships with related institutions
    - Strong interest in capacity building in developing countries in the area of satellite technology
    - No doctoral degree required
    - Details: https://jrecin.jst.go.jp/seek/SeekJorDetail?fn=4&ln=1&id=D121071205&ln_jor=1

Pictured: Nobel Laureate Prof. Didier Queloz will be presenting on Oct 16, 2021

- Prof. Didier Queloz will be presenting on October 16, 2021 at UNISEC-Global Virtual Meeting
  - Lost dark sky is going to be an issue because of many satellites in space
  - 2019 Nobel Prize winner in Physics

Pictured: Kawashima-san showing events planned for 2021

- **2021 Planned Events**
    - MIC7 abstract submission due by July 21, 2021 (extended)
    - 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

- Announcement from Prof. George Maeda from Kyutech
    - UNOOSA and JAXA have launched 7th round of KiboCube
    - Free launch of 1U CubeSat
    - Application from July 15, 2021 – Dec 31, 2021
    - Details: https://www.unoosa.org/oosa/en/ourwork/access2space4all/KiboCUBE/KiboCUBERounds.html

- Announcement from Kuang-Han Ke
    - International Conference on Astronautics and Space Exploration (iCASE)
    - Taiwan on Nov 16-18, 2021
    - Abstract submission: Sep 16, 2021
    - Details: https://www.nspo.narl.org.tw/activity/iCASE/2021/

- Announcement from Juan de Dalmau
    - Joint scholarship program from UNOOSA and ISU to attend Master's or Space Studies program in Adelaide/Strasbourg. Announcement coming soon.
        - These are coming from alumni (seed idea)
    - **ISU Alumni Conference 2021**
        - It's open to everyone, it's online and it's for free

      Details: https://www.eventbrite.com/e/isu-alumni-conference-2021-tickets-156269599579

Question on Chatroom

Christian F. Chavez*: Dear Rei, I have a question about the deadline for MIC7: Is July 21, 23:59 Japan time?*

Rei: *That is correct but we can arrange the deadline according to your time. So don't worry. We can wait, we can wait almost 24 hours difference.*

Q&A

Willy Cabanas: *We are preparing for MIC7 and the deadline is at 12. Is it Japan or our time?*

Rei: *It can be adjusted to your time since Japan time is difficult for you.*

Pictured: Mr. Ganapati (left) shares experience at 10th UNISEC-Global meeting

Lawrence Reeves (right) deploys CanSat from helicopter during Canada's CanSat competition

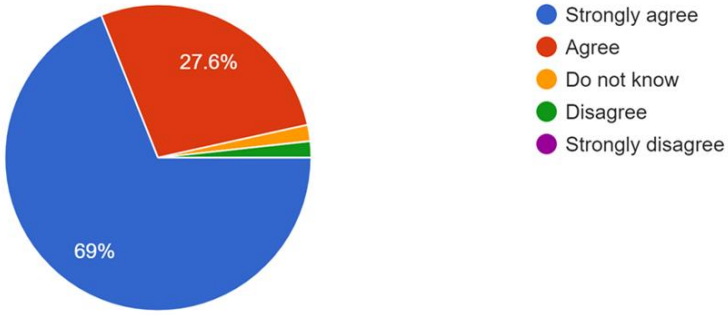
6. Participant Statistics

58 registered participants from **29** countries/regions participated in the 10th Virtual UNISEC-Global Meeting.

Country/Region	Number of registrants	Country/Region	Number of registrants
Afghanistan	1	Mexico	1
Australia	1	Nepal	3
Bulgaria	1	Nigeria	1
Canada	1	Oman	1
Chile	1	Pakistan	1
Egypt	6	Peru	5
El Salvador	1	Philippines	5
France	2	Singapore	1
Germany	1	South Africa	1
Ghana	1	Taiwan	1
Guatemala	1	Tunisia	1
India	2	Turkey	1
Istanbul	1	United Kingdom	1
Japan	7	United States	1
Kenya	1		

7. Participant Questionnaire

Do you think that space agencies should contribute to (space) education?
58 responses



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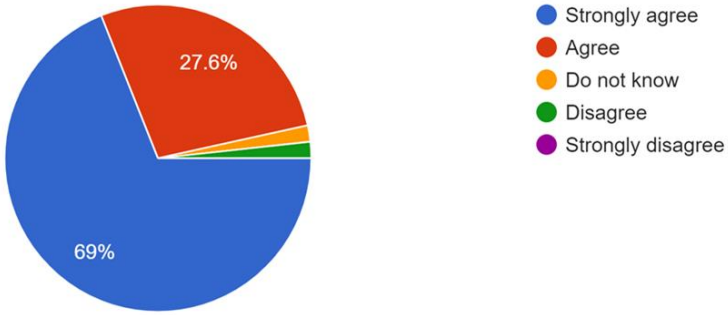
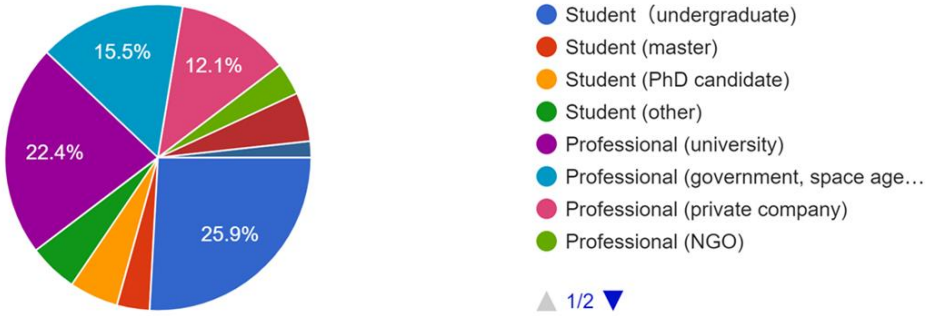
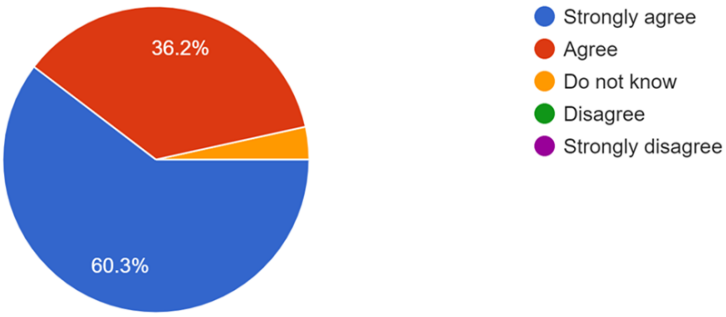


Student or professional?
58 responses



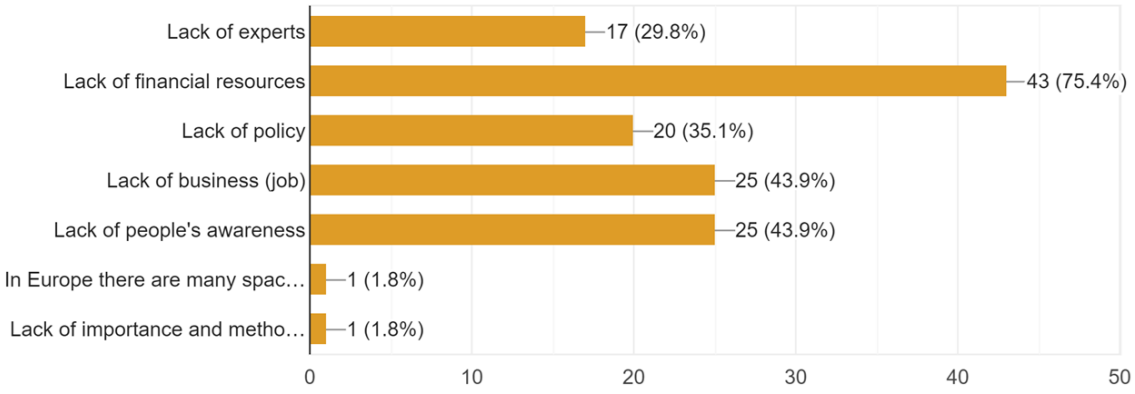
Do you think space agencies in advance countries should help space education in emerging countries?

58 responses



What's the problem in education in the space field in your region?

57 responses



Thank you