

WELCOME TO

The 6th UNISEC-Global Meeting

in collaboration with
International Space University
November 19-21, 2018
Strasbourg, France

By the end of 2030, let's create a world where university students can participate in practical space projects in all countries.



MESSAGE FROM GENERAL CHAIR

Professor Shinichi Nakasuka



As a General Chair of the 6th UNISEC-Global Meeting, I am very pleased and honored to welcome all of you at the International Space University, Strasbourg, France.

This is the first time for UNISEC-Global to collaborate with ISU. This collaboration was discussed and initiated at the UN-COPUOS meeting in February 2018 where both organizations are permanent observers. Our Secretary General, Rei Kawashima who graduated from ISU-MSS in 1996 – the first ever ISU masters class, asked Prof Chris Welch of ISU to help organize the 6th UNISEC-Global Meeting at ISU. I hope that many ISU students will participate in UNISEC-GLOBAL meeting, and

I am really curious about what kind of fusion will occur by mixing two communities !

University Space Engineering Consortium (UNISEC) was established with the objectives to support university students' practical space engineering activities such as micro/nano/pico-satellite and hybrid rocket development in Japan. Since then, UNISEC-Japan has grown very rapidly and in 2018 we now have 74 member groups from 53 universities and colleges. UNISEC has had such tremendous success in technological development, that 56 university satellites have been launched into space. In terms of education, many young engineers and researchers graduating from UNISEC are now playing very important roles in space development and utilization, as well as in many other areas.

With the success in Japan, UNISEC-Global activities was started in 2013 with several international professors who were willing to establish their own UNISECs in their regions. Now, we have fifty Points of Contact and sixteen Local Chapters across the world. We believe that UNISEC can be an excellent model of university-level space education in many countries. In this meeting at ISU, we would like to exchange information on what kind of activities are going on and how problems have been solved in each country's UNISEC, so that participants can learn from the experiences of others, one of the important roles of a UNISEC-type organization. As to the collaboration with ISU, UNISEC focuses on space engineering education and promoting practical space projects at university level whereas ISU space education features its 3Is - International, Intercultural and Interdisciplinary.

Thus, two organizations are perfectly complimentary, and participants can learn from each other in various aspects. I believe that we could learn and apply ISU's diversity and dynamism for future UNISEC-Global activities, and I strongly hope that innovative space projects will really happen in a good shape through our collaboration.

Finally, I would like to convey our gratitude to the companies who kindly supported our activities as sponsors. Without their support, this event would never be realized.

Please enjoy the excellent presentations and informative discussions in this three-day event and the following two day HEPTA-Sat training, and don't forget to enjoy the beautiful city, food and culture of Strasbourg !



MESSAGE FROM CHAIR OF LOCAL COMMITTEE

Professor Chris Welch



On behalf of the local organisers and all of the International Space University (ISU) faculty, staff and students, I would like to extend a very warm welcome to all of the delegates to the 6th UNISEC-Global Meeting.

ISU was founded in 1987 as a not-for-profit international, interdisciplinary institution of higher learning, dedicated to the development of outer space for peaceful purposes education and research.

Its portfolio of courses includes an MSc in Space Studies (MSS) here in Strasbourg, an annual 9-week Space Studies Program (SSP) in a different location each year (SSP19 - Strasbourg, SSP20 – Shenzhen, China, SSP21 Grenada, Spain), a 5-week Southern Hemisphere Summer Space Program (SH-SSP) in Adelaide and 1-week Executive Space Course in Strasbourg and Seattle. Since its inception, ISU has graduated more than 4600 alumni from over 100 countries.

Unlike most of the schools represented at the UNISEC-Global meeting, ISU is not an engineering school, instead specialising in a «3Is» approach, providing an interdisciplinary, intercultural, and international environment for educating and training graduates and professionals. In addition, ISU is quite small compared to many university space engineering departments.

Although we have a number of resident faculty based at the Strasbourg campus, we make great use of an international network of visiting faculty and lecturers, including astronauts, space agency leaders, space engineers, space scientists, space project managers, space lawyers and experts, covering a wide range of technical and non-technical space-related fields, all of these supported by space agencies and space sector companies and organizations.

Communications between different disciplines, different cultures and different nationalities can be demanding sometimes, but the rewards for persevering with this particular form of space exploration are both immense and highly gratifying. It is in this spirit of dialogue and discovery that we welcome you to ISU and look forward to making significant progress on our shared space mission – educating the next generation of space professionals.

Ad astra,



PROGRAM COMMITTEE

(Alphabetical order)

Chair: Shinichi Nakasuka, the University of Tokyo

A Rustem Aslan, Istanbul Technical University

Mengu Cho, Kyushu Institute of Technology

Mohammed Khalil Ibrahim, Cairo University

Rei Kawashima, UNISEC-Global

Shinichi Kimura, Tokyo University of Science

Yasuyuki Miyazaki, Nihon University

Harunori Nagata, Hokkaido University

Rainer Sandau, International Academy of Astronautics (IAA)

Fabio Santoni, Sapienza – University of Rome

Klaus Schilling, University of Würzburg

Herman Steyn, Stellenbosch University

Sir Martin Sweeting, Surrey Satellite Technology Ltd (SSTL) and Surrey Space Centre (SSC)

LOCAL ORGANIZING COMMITTEE

Chair: Chris Welch, International Space University

Claire Byrski, International Space University

Taiwo Tejumola, International Space University

REVIEW COMMITTEE FOR MIC5

Chair: Herman Steyn, Stellenbosch University

Rene Laufer, Baylor University

Jordi Puig-Suari, Calpoly

Shinichi Nakasuka, University of Tokyo

Rainer Sandau, IAA

Jerry Sellers, TSTI

Sir Martin Sweeting, SSTL and Surrey Space Centre

Chris Welch, ISU

REVIEW TEAM FOR THE BEST POSTER AWARD:

Chair: A Rustem Aslan, Istanbul Technical University

Mengu Cho, Kyushu Institute of Technology

Fabio Santoni, Sapienza, University of Rome

POINT OF CONTACT

- **ALGERIA** - Messaoud Bensaada, Algerian Space Agency
- **ARGENTINA** - Marco Alvarez Reyna, National Technological University
- **ANGOLA** - Zolana João: Angolan Office for Space Affairs (GGPEN)
- **ANGORA** - Ivandro Rodrigues, Angolan Office for Space Affairs (GGPEN)
- **BANGLADESH** - Tarekul Islam, Bangladesh University of Engineering and Technology
- **BANGLADESH** - MD Khalilur Rhaman, BRAC University
- **BANGLADESH** - Raihana Shams Islam Antara, BRAC University
- **BELARUS** - Vladimir Saetchnikov, Belarusian State University
- **BRAZIL** - João Dallamuta: Universidade Tecnológica Federal do Paraná
- **BOLIVIA** - Eddy Vino: Universidad Mayor de San Andres and Universidad Privada Boliviana
- **BULGARIA** - Plamen I. Dankov: Sofia University "St. Kliment Ohridski"
- **BULGARIA** - Nikolay Tomov Cluster Aero-Space Technologies, Research & Applications (CASTRA)
- **CANADA** - Larry Reeves: Canadian Satellite Design Challenge Management Society
- **CHILE** - Cristian F. Chavez Tapia: Pontificia Universidad Catolica de Chile
- **COSTA RICA** - Adolfo Chaves Jiménez, Costa Rica Institute of Technology
- **EGYPT** - Ayman Kassem; Cairo University - Mohammed Khalil Ibrahim: Cairo University
- **EL SALVADOR** - Luis Salaverria, El Salvador Aerospace Institute
- **GHANA** - Manfred Quarshie: Space Science Systems Research Institute
- **GHANA** - Sharon Emelia Dornukie Sappor: All Nations University College
- **GUATEMALA** - Willy Ricardo Cabañas Villagrán: University Rafael Landivar
- **GERMANY** - Klaus Schilling: University of Würzburg
- **INDIA** - G.P.Ganapathy, Vellore Institute of Technology (VIT)
- **INDIA** - K. Gopalkrishnan, New Horizon College of Engineering
- **INDONESIA** - Thombi Layukallo: Yayasan Bina Bangsa Agung Podomoro
- **INDONESIA** - Robertus Heru Triharjanto Satellite Technology Center, LAPAN
- **ITALY** - Fabio Santoni: Sapienza – University of Rome
- **JAPAN** - Mengu Cho: Kyushu Institute of Technology
- **KENYA** - Faith Karanja: University of Nairobi
- **LEBANON** - Amin Haj-Ali, Lebanese International University
- **LITHUANIA** - Vidmantas Tomkus: Lithuanian Aerospace Association
- **LUXEMBURG** - Edder Rabadan Santana, University of Luxemburg
- **MEXICO** - Blanca Rebollar: The Mexican Space Agency
- **MEXICO** - Barbara Bermudez Reyes: Universidad Autonoma de Nuevo Leon
- **MALAYSIA** - Norilmi Amilia Ismail: Universiti Sains Malaysia (USM),
- **MONGOLIA** - Tsolmon Renchin: The National University of Mongolia
- **MOROCCO** - Naoufal Raissouni: University of Abdelmalek Essaadi,
- **NAMIBIA** - Smita Francis: Namibia University of Science and Technology
- **NEPAL** - Anup Thapa: Kathmandu University
- **NIGERIA** - Nnadih S Ogechukwu: African Regional Centre for Space Science and Technology Education in English
- **NEW ZEALAND** - Jim Hefkey: University of Auckland
- **OMAN** - Al-Shidhani, Sultan Qaboos University
- **PERU** - Hector Bedon: The National University of Engineering (UNI)
- **PHILIPPINES** - Rogel Mari Sese: Regulus SpaceTech
- **PHILIPPINES** - Rosario Ang: The University of the Philippines Diliman (UPD)

- **RUSSIA (SAMARA)** - Igor V Belokonov: Samara National Research University
- **SAUDI ARABIA** - Sultan Hasan AlSultan: The Environmental Remote Sensing Consultant
- **SERBIA** - Dušan Radosavljević: University of Novi Sad
- **SINGAPORE** - Kay Soon Low: National University of Singapore
- **SLOVENIA** - Saso Blazic: University of Ljubljana
- **SOUTH AFRICA** - Arno Barnard: University of Stellenbosch
- **SOUTH AFRICA** - Robert van Zyl, The Cape Peninsula University of Technology
- **SOUTH KOREA** - In-Seuck Jeung: Seoul National University
- **SOUTH KOREA** - Hyochoong Bang: The Korea Advanced Institute of Science and Technology (KAIST)
- **SPAIN** - Fernando Aguado-Agelet, University of Vigo, CINAЕ (Galician Aerospace Centre)
- **TAIWAN** - Jyh-Ching Juang: National Cheng Kung University
- **THAILAND** - Sawat Tantiphawadi: SpaceThai
- **THAILAND** - Phongsatorn Saisutjarit: King Mongkut's University of Technology
- **TUNISIA** - Kamel Besbes: University of Monastir/ DG Centre for Research on Microelectronics and Nanotechnology, Technopark Sousse
- **TURKEY** - Alim Rustem Aslan: Istanbul Technical University
- **UKRAINE** - Oleksii V. Kulyk: National Aerospace Educational Center of Youth
- **USA** - Jordi Puig-Suari: California Polytechnic State University (Cal Poly)
- **USA** - Amal Chandran: University of Colorado
- **USA** - Amelia Greig: California Polytechnic State University (Cal Poly)
- **VIETNAM** - Nguyen Huu Diep: Vietnam National Satellite Center (VNSC)



PROGRAM

DAY 1 **MONDAY NOVEMBER 19 2018**

8:00 - 9:00 REGISTRATION AND WELCOME REFRESHMENT

9:00 - 9:40 OPENING CEREMONY

MC: Chris Welch - International Space University (ISU)

Welcome message, Juan de Dalmau – President of ISU

Video Message from Simonetta Di Pippo, United Nations Office for Outer Space Affairs

Nicolas Matt, Vice-President of the Eurometropole de Strasbourg

Opening Message, Rei Kawashima, UNISEC-Global

9:40 - 10:40 KEYNOTE SPEECH

09:40 - 10:10 Shinichi Nakasuka, University of Tokyo

CanSat and CubeSat History in Japan - How they started and contributed to education and technologies

10:10 - 10:40 Mengu Cho, Kyushu Institute of Technology

My evolution from ISU 3I to BIRDS Program, a Cross-Border Inter-University Collaboration on Space Research and Education

10:40 - 11:00 COFFEE & TEA BREAK - EXHIBITION HALL

11:00 - 12:00 SPONSORS / EXHIBITORS PRESENTATION

Moderator: Nobuyuki Kaya, WaveArrays, Inc.

11:00 - 11:15 Canon Electronics Inc. - Satch Hattori

11:15 - 11:30 Space BD Inc. - Makoto Kanazawa

11:30 - 11:40 ICE CUBES - Hilde Stenuit

11:40 - 11:50 UNISEC - Japan - Kento Maeda

11:50 - 11:55 TSTI - Jerry Sellers [Video]

11:55 - 12:00 ISU - Chris Welch

12:00 - 13:00 LUNCH - EXHIBITION HALL

13:00 - 15:10 THE 5TH MISSION IDEA CONTEST FOR MICRO/NANO SATELLITE UTILIZATION

Moderator: Tadadjeu Sokeng Ifriky, The University Space Centre of Montpellier

13:00 - 13:10

Overview of MIC5 - Herman Steyn, Stellenbosch University

13:10 - 13:30

Smallsat Ionosphere Exploration at Several Times and Altitudes (SIESTA)

Duann Yi, National Central University, Kandi Anand Kaustubh, ISRO

13:30 - 13:50

Development of Microsatellite in Monitoring Initial Harmful Algae Bloom (HAB)

Aik Kwan Tan, University Sains Malaysia (USM)

13:50 - 14:10

HERON - An Open Source Microbiology Experiment Platform in Low Earth Orbit

Ali Haydaroglu, Xi Lan, Kimberly Ren, University of Toronto

14:10 - 14:30

HEMERA-Constellation of passive SAR-based micro-satellites for a Master/Slave configuration

Andrea Bellome, Giulia Broggi, Luca Collettoni, Davide Di Lenno, Edoardo Fornari, University of Rome - La Sapienza

14:30 - 14:50

Mining Surveillance Application Using a CubeSat Constellation

Luke Hans van der Stokker, Francois Nicolaas Lombard, Stellenbosch University

14:50 - 15:10

Arid and Semi-Arid Lands Satellite (ASAL-SAT): A LoRa ground sensor network for easing life in Sub-Saharan Africa ASAL areas [Video]

Kiruki Cosmas, Kyushu Institute of Technology

15:10 - 15:30 COFFEE & TEA BREAK - EXHIBITION HALL

15:30-16:30 MIC5 POSTER PRESENTATION - EXHIBITION HALL

15:30 - 15:45 In-Situ Measurement of Material Degradation in Space

James Xie, Queen's Space Engineering Team

15:45 - 16:00

In-Orbit Assembly of Cube Satellites with Novel Docking Techniques

Samuel Low and Parekh Shalv Amit, Singapore Space and Technology Association

16:00 - 16:15

Satellite laser tracking system for aquatic organisms

Yuki Kakushi, Kindai University

16:20 - 17:40 LOCAL CHAPTER AND REGIONAL REPORT

Moderator: Taiwo Tejumola, ISU

16:20 - 16:30 UNISEC - Bulgaria, *Stoil Ivanov, Sofia University*

16:30 - 16:40 UNISEC - India, *Nikhil Riyaz, New Horizon College of Engineering*

16:40 - 16:45 UNISEC - Bangladesh, *Raihana Shams Islam Antara, BRAC University [Video]*

16:45 - 16:50 UNISEC - Egypt, *Ayman Kassem, Cairo University [Video]*

16:50 - 17:00 Malaysia, *Norilmi Amilia ismail, Universiti Sains Malaysia*

17:00 - 17:10 Lebanon, *Amin Haj-Ali, Lebanese International University*

17:10 - 17:20 Luxemburg, *Edder Jose Rabadan Santana, The University of Luxemburg*

17:20 - 17:30 Singapore, *Jonathan Hung, Singapore Space and Technology Association*

17:30 - 18:00 MIC5 AWARD CEREMONY AND PHOTO SESSION

MC: Shinichi Nakasuka, University of Tokyo

18:30 - 20:30 RECEPTION AT EXHIBITION HALL OF ISU

MC: Mengu Cho, Kyushu Institute of Technology



Day 2 - **TUESDAY NOVEMBER 20 2018**

8:00 - 9:00 REGISTRATION AND WELCOME REFRESHMENTS

9:00 - 10:00 Local Chapter Report

Moderator: Edder Jose Rabadan Santana, The University of Luxemburg

- 9:00 - 9:15** **UNISEC-Turkey**, Alim Rustem Aslan, Istanbul Technical University
9:15 - 9:30 **UNISEC-SAR**, *Herman Steyn, University of Stellenbosch*
9:30 - 9:45 **UNISEC-Japan**, Mengu Cho, Kyushu Institute of Technology
9:45 - 10:00 **UNISEC-Italy** - Fabio Santoni, Sapienza University of Rome

10:00 - 10:30 COFFEE/TEA BREAK AND GROUP PHOTO - EXHIBITION HALL

10:30 - 17:30 GROUP DISCUSSION SESSION

Moderator: Norilmi Smilia Ismil, University Saints Malaysia

10:30 - 11:30 MODERATOR PRESENTATION

10:30 - 10:40 Overview: Rei Kawashima, UNISEC-Global

10:40 - 10:45

Group 1: Commercialization of ISS - How to open up the ISS utilization to the private sectors

Ryuichi Sato, Space BD, Inc. & Hilde Stenuit, Space Applications Services

10:45 - 10:50

Group 2: Open Source Virtual Satellite

Satoshi Ikari, The University of Tokyo

10:50-10:55

Group 3: Follow up for BIRDS project

Mengu Cho, Kyushu Institute of Technology

10:55-11:00

Group 4: Global Antenna Sharing Project

Rustem Aslan, Istanbul Technical University

11:00-11:05

Group 5: Commercialization of the Small Satellite Imagery

Alice Pellegrino, Sapienza University of Rome

11:05-11:10

Group 6: Global University Space Debris Observation Network (GUSDON)

Fabio Santoni, Sapienza University of Rome

11:10-11:15

Group 7: Standardization of Electrical interface for Pico/Nano Satellites

Oliver Ruf, Wurzburg University

11:15 - 11:20

Group 8: Eco-system Development of HEPTA-Sat

Stoil Ivanov, Sofia University & Masahiko Yamazaki, Nihon University

11:20 - 11:25

Group 9: Design and Implementation of a Space Mission Concept Database

Tadadjeu Sokeng Ifriky, the University Space Centre of Montpellier

11:25 - 11:30

Group 10: Balancing Reliability and Cost; Towards Fostering Greater Mission Assurance for University CubeSats Projects

Taiwo Tejumola, International Space University

11:30 - 12:30 GROUP LUNCH

(Please follow assistants of each group)

12:30 - 16:00 GROUP DISCUSSION

16:00 - 16:20 COFFEE/TEA BREAK - EXHIBITION HALL

16:20 - 17:20 GROUP DISCUSSION FINAL PRESENTATIONS

17:20 - 17:30 - Group Discussion Remarks

17:30-17:50 - Acknowledgment of New Local Chapter MC:

MC: Alim Rustem Aslan, Istanbul Technical University

17:50 - 18:50 ISU FACILITY TOUR

19:00 - 21:00 GALA DINNER AT EXHIBITION HALL OF ISU

MC: CHRIS WELCH, ISU

DAY 3 **WEDNESDAY NOVEMBER 21 2018**

8:00 - 9:00 REGISTRATION AND WELCOME REFRESHMENTS

9:00 - 10:00 INVITED PRESENTATION

Moderator: Masahiro Nohmi, Shizuoka University

9:00 - 9:30 Small Satellite debris mitigation guidelines - a community effort, Rene Laufer, Baylor University

9:30 - 10:00 ISU Hydra Space Station Payloads, Chris Welch, ISU

10:00 - 10:20 COFFEE/TEA BREAK - EXHIBITION HALL

10:20 - 11:50 STUDENT REPRESENTATIVE PRESENTATIONS

Moderator: Stoil Ivanov, Sofia University

10:20 - 10:30 UNISEC-Bulgaria - *Ivan Mihov*

10:30 - 10:40 UNISEC-India - *Nikhil Riyaz*

10:40 - 10:50 UNISEC-Italy - *Alice Pellegrino*

11:00 - 11:10 UNISEC-Japan - *Nobuhiro Funabiki*

11:10 - 11:20 UNISEC-SAR - *Francois Nicolaas Lombard & Luke Hans van der Stokker*

11:20 - 11:30 Canada - *Ali Haydaroglu and James Xie*

11:30 - 11:40 ISU - *James Hurrell*

11:40 - 11:50 UNISEC-Egypt - *[Video] Shady Ammar Ahmed*

11:40 - 11:50 Argentina *[Video]* - *Talia Bossone, UTN-FRC*

11:50 - 12:50 LUNCH AT EXHIBITION HALL OF ISU

12:50 - 14:05 STUDENT SESSION - (ALL PARTICIPANTS ARE WELCOMED)

Theme: "Gender Equality in the Space Field"

Moderator: Alice Pellegrino

Introduction (15 min), Guest Speech (30 min), Break-out Session (30 min)

14:05 - 14:25 COFFEE/TEA BREAK

14:25 - 15:20 STUDENT SESSION - PANEL DISCUSSION

15:20 - 15:40 CLOSING CEREMONY

MC: Rainer Sandau, IAA

SIGHTSEEING (OPTIONAL)

NOTE

- Welcome Refreshments, Coffee/Tea, Lunch, and Reception during the Meeting are included in the registration fee.
- Information in this document is subject to change without notice.
- All presentation materials will be uploaded to UNISEC Global website.
- Photos and videos taken during the meetings may be uploaded to UNISEC Global website/ facebook and used for other publications.

ASSOCIATED EVENT: HEPTA-SAT TRAINING

DATE:

November 22-23

9:00 am - 6:00 pm

VENUE:

International Space University



HEPTA-Sat Training

Hands-on Education Program for Technical Advancement

Associate event for 6th UNISEC-Global Meeting

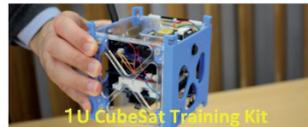
Date: Nov 22-23, 2018 (9:00am- 6:00pm)

Venue: International Space University, Strasbourg, France

HEPTA-Sat Training

In this hands-on training, you will experience "assembly, integration and test" of a satellite development process using HEPTA-Sat. Through the hands-on training, you will learn the roles, architecture and integration way of each subsystem.

Target participants of the training course are all those who are interested in space. Non-engineers are also welcomed. Please enjoy HEPTA-Sat training as "an opportunity to know space engineering" or "a tool to learn small satellite engineering." JOIN US!



Participant's Voice

The HEPTA-Sat training program was informative for me from the viewpoint of educational process. In this program, each chapter consists of a hands-on working of satellite assembling and programming, and learning of theory and design methodology. Owing to this composition, I could effectively experience the satellite system development and acquire the background knowledge. In addition, I thought that the balance of hands-on working and learning could be arranged for each participant according to one's level and interests, so that a variety of people could enjoy the training. This teaching method will be a good reference for me to design my lectures

Tuition: €350 (till Oct 31)
€400(from Nov 1)

Contact: hepta@unisec.jp
<http://www.unisec-global.org/>
UNISEC Office
2-3-2, Yayoi, Bunkyo,
Tokyo 113-0032, Japan



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EXHIBITORS

PERSON IN CHARGE



Makoto Kanazawa - Ryuichi Sato
 m.kanazawa@space-bd.com
 r.sato@space-bd.com



Hilde Stenuit
 hilde.stenuit@spaceapplications.com



Jerry Sellers
 jerry.sellers@mac.com



Keiko Ishizuri
 Ishizuri.Keiko@da.mitsubishielectric.co.jp



Michio Ozawa
 ozawa@unisec.jp
 hepta@unisec.jp



Nassim Bovet
 nassim.bovet@isunet.edu

UNISEC - Global

ISU - Host Organization

Central Yayoi 2F, 2-3-2 Yayoi,
 Bunkyo-ku, Tokyo,
 113-0032 - JAPAN
 www.unisec-global.org

1 rue Jean Dominique Cassini
 Parc D'Innovation
 67400 Illkirch Graffenstaden - France
 www.isunet.edu

Ms. Rei Kawashima
 Phone: +81-3-5800-6645
 Email: rei@unisec.jp

Mr. Chris Welch
 Phone: +33 (0)3 88 65 54 30
 Email: chris.welch@isunet.edu

Mr. Michio Ozawa
 Phone: +81-3-6231-4404
 Email: ozawa@unisec.jp

Ms. Claire byrski
 Phone: +33 (0)3 88 65 54 30
 Email: claire.byrski@isunet.edu

Let's create a world where university students can participate in practical space projects in all countries !

