

The 5th UNISEC-Global Meeting Program

2-4 December 2017, Rome, Italy

Organized by
UNISEC-Global
in cooperation with
Sapienza – University of Rome



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HYPERION TECHNOLOGIES



1. Background

Since the establishment of UNISEC-Global (UNIGLO) in November 2013, UNISEC-Global Meeting has been focusing on researchers and university students around the world in the field of pico/nano/micro satellite, and providing them with an opportunity to present their research products for review. In addition, it has been offering free discussions about the pre-arranged themes different from each meeting. In other words, it is an annual gathering to be held in a different city, as well as a forum for young people who will be expected to play a key role in the future space sector.

As of November 2017, UNIGLO has 15 local chapters and 44 points of contact (POC) across the world. In June 2017, UNIGLO applied for an observer status with the UN Committee on the Peaceful Uses of Outer Space (COPUOC) and was approved by the Committee. In one way or another, UNIGLO will keep close contact with the Committee.

Commemorating the 5th year anniversary of its establishment and thanks to our Italian colleagues, the 5th UNIGLO Meeting is to be held at Sapienza - University of Rome, Italy on December 2-4, 2017, following Varna, Bulgaria in October 2016.

2. Purpose

Based upon the establishment of UNISEC-Global and other decisions at the first UNISEC-Global Meeting in November 2013 at the University of Tokyo in Japan,

- To follow up the successful outcomes made at the 4th UNISEC-Global Meeting at Varna, Bulgaria on October 20-23, 2016,
- To review the on-going activities of the new local chapters (15 countries/regions and one association of local chapters), which were acknowledged at the 4th UNISEC-Global Meeting and to share information for further advancement,
- To acknowledge new applications for the UNISEC-local chapters,
- To provide a forum for the UNISON-Global (student organization) to exchange their opinions about research activities and issues they face for closer cooperation at a student level around the world,
- To continue to organize the Mission Idea Contest (MIC) and to invite the winners of the pre-MIC5 which has been initiated by several local chapters in the past year under the theme of how to



- satisfy any of the UN Sustainable Development Goals,
- To continue to discuss debris mitigation matters under the rename of the Debris Mitigation Competition (DMC) from the Deorbit Device Competition (DDC), especially focusing on post-mission disposal (PMD) and active debris removal (ADR).

3. Venue:

Engineering Faculty of Sapienza – University of Rome,
Via Eudossiana 18, 00184, Rome (Italy)

4. Language: The language used at the Meeting is English.

5. Organization for the 5th UNISEC-Global Meeting

✧ **General Chairperson**

Prof. Shinichi Nakasuka, University of Tokyo

✧ **Honorary advisors**

- Prof. Sir Martin Sweeting, Surrey Satellite Technology Ltd (SSTL); and Surrey Space Centre (SSC), UK
- Prof. Rainer Sandau, International Academy of Astronautics (IAA)

✧ **Programme Committee**

- Prof. A Rustem Aslan, Istanbul Technical University
- Dr. Werner Balogh, United Nations
- Prof. Mengu Cho, Kyushu Institute of Technology
- Prof. Mohammed Khalil Ibrahim, Cairo University
- Prof. Toshiya Hanada, Kyushu University
- Prof. Yasuyuki Miyazaki, Nihon University
- Prof. Harunori Nagata, Hokkaido University
- Prof. Shinichi Nakasuka, the University of Tokyo
- Prof. Jordi Puig-Suari, Calpoly
- Prof. Klaus Schilling, University of Würzburg
- Prof. Herman Steyn, Stellenbosch University
- Prof. Fabio Santoni, Sapienza – University of Rome

✧ **Local Organizing Committee**

- **Chair:** Prof. Fabio Santoni, Sapienza – University of Rome
- Prof. Fabrizio Piergentili, Sapienza – University of Rome
- Alice Pellegrino, Sapienza – University of Rome
- Niccolò Bellini, NPC Space Mind
- Davide Rastelli, NPC Space Mind

Student Committee

- **Chair:** Alice Pellegrino, Sapienza – University of Rome
- Lorenzo Mariani, Sapienza – University of Rome
- Marco Acernese, Sapienza – University of Rome
- Giulia De Santis, Sapienza – University of Rome
- Giammarco Cialone, Sapienza – University of Rome
- Federica Angeletti, Sapienza – University of Rome
- Federico Bernardi, Sapienza – University of Rome
- Giuseppe Pilato, Sapienza – University of Rome
- Shariar Hadji Hossein, Sapienza – University of Rome

✧ **Points of Contact for the 5th UNISEC-Global Meeting**

Country	POC for LC/Planned LC
Angola	Zolana João: Angolan Office for Space Affairs (GGPEN)
	Ivandro Rodrigues: Angolan Office for Space Affairs (GGPEN)
Australia	Sean Tuttle, University of New South Wales
Bangladesh	Tarekul Islam: Bangladesh University of Engineering and Technology
	Md Khalilur Rhaman: 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"
	Nikolay Tomov: Cluster Aero-Space Technologies, Research & Applications (CASTRA)
Canada	Larry Reeves: Canadian Satellite Design Challenge Management Society

Chile	Cristian F. Chavez Tapia: Pontifical Catholic University of Chile
Costa Rica	Mario Gómez Jenkins: Costa Rican 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
	Sharon Emelia Dornukie Sappor: All Nations University College
Guatemala:	Willy Ricardo Cabañas Villagrán: University Rafael Landivar
Germany	Klaus Schilling: University of Würzburg
Indonesia	Thombi Layukallo: Yayasan Bina Bangsa Agung Podomoro
	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
Lithuania	Vidmantas Tomkus: Lithuanian Aerospace Association
México	Blanca Rebollar: The Mexican Space Agency
	Barbara Bermudez Reyes: Universidad Autonoma de Nuevo Leon
Malaysia	Norlimi 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
Peru	Hector Bedon: The National University of Engineering (UNI)
Philippines	Rogel Mari Sese: Regulus SpaceTech
	Rosario Ang: The University of the Philippines Diliman (UPD)
Samara	Igor V Belokonov: Samara National Research University
Saudi Arabia	Sultan Hasan AlSultan: The Environmental Remote Sensing Center
Singapore	Kay Soon Low: National University of Singapore

Slovenia	Saso Blazic: University of Ljubljana
South Africa	Arno Barnard: University of Stellenbosch
South Korea	In-Seuck Jeung: Seoul National University
	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 Tantiphanwadi: SpaceThai
	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)
	Amal Chandran: University of Colorado
	Amelia Greig: California Polytechnic State University (Cal Poly)
Vietnam	Nguyen Huu Diep: Vietnam National Satellite Center (VNSC)

❖ The Preliminary Workshop for the 5th Mission Idea Contest (PreMIC5)

❖ Review Committee

- Rainer Sandau, IAA
- Shinichi Nakasuka, the University of Tokyo
- Herman Steyn, Stellenbosch University
- Alim Rustem Aslan, Istanbul Technical University

❖ Local Competition Regional Coordinator

Region	Coordinator
Japan	George Maeda, Kyushu Institute of Technology
USA	Amal Chandran: University of Colorado
Germany	Alexander Kleinschrodt and Andreas Freimann, Julius-Maximilians, Universität Würzburg, Marco Schmidt, Bochum University
Mexico	Mario Alberto García-Ramírez, Universidad de Guadalajara
Italy	Fabio Santoni, Sapienza – University of Rome

❖ The 2nd Debris Mitigation Competition (DMC)



❖ Review Committee

- **Chair:** Herman Steyn, Stellenbosch University
- Rustem Aslan, Istanbul Technical University
- Mengu Cho, Kyushu Institute of Technology
- Toshiya Hanada, Kyushu University
- Yasuyuki Miyazaki, Nihon University
- Shinichi Nakasuka, University of Tokyo
- Rainer Sandau, IAA
- Fabio Santoni, Sapienza – University of Rome
- Sir Martin Sweeting, SSTL
- Craig Underwood, University of Surrey

Contact Point

UNISEC-Global
<p>c/o UNISEC, Central Yayoi 2F, 2-3-2 Yayoi, Bunkyo-ku, Tokyo, 113-0032, Japan E-mail: secretariat@unisec-global.org</p>
<p>Ms. Rei Kawashima Phone: +81-3-5800-6645 E-mail: rei@unisec.jp</p>
<p>Mr. Michio Ozawa Phone: +81-3-6231-4404 E-mail: ozawa@unisec.jp</p>

Host Organization
<p>Sapienza – University of Rome</p>
<p>DIAEE - Dipartimento di Ingegneria Astronautica, Elettrica ed Energetica Sapienza – University of Rome Via Eudossiana, 18 00184 Rome, Italy</p>
<p>Prof. Fabio Santoni Email: fabio.santoni@uniroma1.it</p>
<p>Ms. Alice Pellegrino Student Representative of UNISON-Italy Email: ali.pellegrino.92@gmail.com</p>

6. Event venue and pictures

Engineering Faculty of Sapienza – University of Rome

Via Eudossiana 18, 00184, Rome (Italy)

- Pictures:



Note 1: Engineering Faculty of Sapienza – University of Rome (A: Faculty “Chiostro” – B: Faculty main entrance).



Note 2: Location of the Engineering Faculty.

7. Sponsors and Partners

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This activity is supported by the Coordination Funds for Promoting Aerospace Utilization, MEXT Japan.

Supported by: International Academy of Astronautics (IAA)





8. Exhibitors

Exhibitor	Country	Person in charge	e-mail
GomSpace ApS	Denmark	Dennis Elgaard,	del@gomspace.com
Hyperion Technologies N.L.	Netherlands	Bert Monna	b.monna@hyperiontechnologies.nl
Infostellar	Japan	Naomi Kurahara, Hazel Naylor	naomi@istellar.jp hazel@istellar.jp
NPC Space Mind	Italy	Niccolò Bellini and Davide Rastelli	n.bellini@npcitaly.com d.rastelli@npcitaly.com
CubeSpace	South Africa	Herman Steyn	whsteyn@sun.ac.za
WaveArrays, Inc.	Japan	Nobuyuki Kaya	n.kaya@wavearrays.com
WIA Europe Rome Local Chapter	Italy	Annamaria Nassisi	annamaria.nassisi@gmail.com
UNISEC-Japan	Japan	Michio Ozawa, Haruka Yuyama	ozawa@unisec.jp info@unisec.jp

9. Official Program

Day 1 - Saturday, 2 December, 2017 (Aula 1)	
8:00 -9:00	Registration of participants
9:00-9:25	Opening Ceremony MC: Fabio Santoni, Sapienza – University of Rome Opening Speech <ul style="list-style-type: none"> - Welcome message, Maria Sabrina Sarto, Sapienza – University of Rome - Video Message from Simonetta Di Pippo, UNOOSA - Opening Message, Rei Kawashima, UNISEC-Global
9:30-9:35	Overview and schedule of the 5th UNI-GLO Meeting Alice Pellegrino, UNISEC Italy
9:35-10:30	Local Chapter Report Moderator: Jim Hefkey, the University of Auckland
9:35-9:42	Turkey Alim Rustem Aslan, Istanbul Technical University
9:42-9:49	South Africa Herman Steyn, Stellenbosch University
9:49-9:56	Lithuania Vidmantas Tomkus, Lithuanian Aerospace Association
9:56-10:03	Japan Toshiya Hanada, Kyushu University
10:03-10:10	Italy Fabio Santoni, Sapienza – University of Rome
10:10-10:17	Egypt Ayman Kassem, Cairo University
10:17-10:24	Bulgaria Vesselin Vassilev, CASTRA
10:30-10:50	Coffee/Tea Break, Exhibition
10:50-12:00	Sponsors/Exhibitors presentations Moderator: Mehmet Şevket Uludağ, TU-Delft
10:50-10:57	GomSpace ApS Dennis Elgaard
10:57-11:04	Hyperion Technologies N.L. Bert Monna

11:04-11:11	NPC Space Mind	Niccolò Bellini and Davide Rastelli
11:11-11:17	CubeSpace	Herman Steyn
11:17-11:24	WaveArrays, Inc.	Nobuyuki Kaya
11:24-11:31	Infostellar	Naomi Kurahara
11:31-11:38	UNISEC-Japan	Kiichiro Ichinose and Haruka Yuyama
11:38-11:45	WIA Europe	Annamaria Nassisi
11:45-11:55	Canon Electronics	Yusuke Yaguchi and Kohei Tanaka
12:00-13:00	Lunch at the Faculty “Chiostro” (Catering buffet)	
13:00-15:05	Preliminary Workshop for the 5th Mission Idea Contest (PreMIC5) Moderator: Toshihiro Obata, University of Tokyo	
13:00-13:10	Overview of PreMIC5	Rainer Sandau, IAA
13:10-13:35	“Satellite Tracking Ocean Currents for Marine Searching and Rescue”	Phongsakorn Meemak, Kyushu Institute of Technology, Japan
13:35-13:50	“Smallsat Ionosphere Exploration at Several Times and Altitudes (SIESTA)”	William Evonosky, Univ of Colorado, USA, Yi Duann, National Central University, Taiwan, and Kaustubh Anand Kandi, Indian Institute of Space Science and Technology, India (from USA Local Competition)
13:50-14:15	“SWEET - The Open-source Satellite Mission for Worldwide Water-quality Assessment”	Kelly Antonini and Florian Schummer, Technical University of Munich, Germany
14:15-14:40	“Small satellite to monitor the Red Tide blooming on Central American coast using a High Definition Camera and two Multispectral Cameras”	Olman Quiros-Jimenez and Gustavo Fonseca-Naranjo, University of Costa Rica, Costa Rica (from Mexico Local Competition)
14:40-15:05	“Growth of tomato plants MICRO-TOM in space environment”	Luca Guglielmetti and Paolo Marzioli, Sapienza – University of Rome, ENEA, Italy
15:05-15:25	Coffee/Tea Break, Exhibition	

15:25-15:57	Reports from Local Point of Contacts Moderator: Vidmantas Tomkus, Lithuanian Aerospace Association	
15:25-15:33	USA	Ryan Nugent, CalPoly
15:33-15:41	Taiwan	Hsin-chian Albert Lin, National Space Organization
15:41-15:49	New Zealand	Jim Hefkey, the University of Auckland
15:49-15:57	Nepal	Rakesh Chandra Prajapati, Orion Space
16:00-16:10	Award Ceremony of PreMIC5 Moderator: Toshihiro Obata, University of Tokyo	
16:10-17:20	Special Lecture Moderator: Florian Schummer, Technical Univ. of Munich	
16:10-17:00	Special Lecture : <i>“What is Important in Developing Micro/nano/pico-satellites? -From Engineering and Project Management Perspectives”</i> Shinichi Nakasuka, University of Tokyo	
17:00-17:20	Special Lecture (through internet) Luisa Innocenti, Head of ESA Clean Space Department	
19:00-23:00	Reception at “Oppio Caffè” Via delle Terme di Tito, 72, 00184 Rome (Italy)	

Day 2 – Sunday 3 December 2017 (Sala del Chiostro)		
8:30 -9:00	Registration of participants	
9:00-10:30	Student Presentations Moderator: Niccolò Bellini, NPC Space Mind	
9:00-9:08	USA	William Ray Evonosky, University of Colorado Boulder
9:08-9:16	Turkey	Sibel Turkoglu, Istanbul Technical University
9:16-9:24	Thailand	Phongsakorn Meemak, Kyushu Institute of Technology
9:24-9:32	South Africa	Luke Thirkell Hibbert and Dylan Els, Stellenbosch University
9:32-9:40	Japan	Kyohei Yashima, Tokyo Institute of Technology and Nobuhiro Funabiki, University of Tokyo
9:40-9:48	Italy	Alice Pellegrino, Sapienza – University of Rome
9:48-9:56	Egypt	Akram Abdelaziz Mohamed Eltrabyly and Mohamed Mahmoud Donia, Cairo University
9:56-10:04	Costa Rica	Olman Quiros-Jimenez, University of Costa Rica
10:04-10:12	Bulgaria	Bogdan Konstantinov, Teodora Nedyalkova and Zdravko Dimitrov, Sofia University
10:12-10:30	POC presentation UNISEC-Europe UNISEC-Germany	Klaus Schilling, Wurzburg University
10:30-11:00	Group Photo, Coffee/Tea Break, Exhibition	
11:00-16:00	Group Discussion Session (break-out session) Moderator: Alice Pellegrino, Sapienza – University of Rome	
11:00-11:10	Introduction to Group Discussion Session	Alice Pellegrino, Sapienza – University of Rome

11:10-11:15	Group 1: Requirements for Guidance, Navigation and Control of Deep Space CubeSats	Sibel Türkoğlu, Istanbul Technical University, Turkey
11:15-11:20	Group 2: Water Quality Management with Micro/ Nano Satellites	Shinichi Nakasuka and Toshihiro Obata, Univ of Tokyo, Japan
11:20-11:25	Group3: CubeSat/SmallSat development lessons learned	Ryan P. Nugent, CalPoly, USA
11:25-11:30	Group 4: Discussion of frequency and legal regulations surrounding a ground station network	Naomi Kurahara, Infostellar, Japan
11:30-11:35	Group 5: PocketQube: A New Opportunity and It's Challenges	Rakesh Chandra Prajapati, Orion Space, Nepal & Marco Truglio, GAUSS S.r.l, Italy
11:35-11:40	Group 6: Using Deep Learning to Manage Space	Martin Coleman, MC-IRG, UK
11:40-11:45	Group 7: Small satellites launch systems and services: needs, availability, development trends, and how to get on-board	Vesselin Vassilev, CASTRA, Bulgaria
11:45-11:50	Group 8: Manual for Starting a University Pico-Satellite Project	Mehmet Şevket Uludağ, Delft University of Technology, the Netherlands
11:50-16:00	Lunch, Break-out Session (Please follow assistants of each group)	
16:00-16:20	Coffee/Tea Break, Exhibition	
16:20-17:20	Group Discussion Final Presentations	
17:30-18:30	Short tour of Rome	
19:30-23:00	Gala Dinner at the “Royal Art Café” Restaurant Piazza del Colosseo, 1, 00184 Rome (Italy)	

Day 3 - Monday, 4 December 2017 (Sala del Chiostro)	
8:30 -9:00	Registration of participants
9:00-9:30	<p>Special Speech Moderator: Davide Rastelli, NPC Space Mind</p> <p>“UNOOSA and Space for Sustainable Development” Jorge Del Rio Vera, UNOOSA</p>
	<p>2nd Debris Mitigation Competition Moderator: Ryan Nugent, CalPoly and Kiichiro Ichinose, UNISEC-Japan</p>
9:30-9:40	<p>DMC Overview</p> <p>Herman Steyn, Stellenbosch University</p>
9:40-10:00	Coffee/Tea Break, Exhibition
10:00-12:05	DMC Presentations
10:00-10:25	<p>“Water Deorbiting Device”</p> <p>Gleb Rukhovich, Moscow State University, Russia</p>
10:25-10:50	<p>“Space-Based Laser Constellation for Active Debris Removal”</p> <p>Luke T. Hibbert and Dylan Els, Stellenbosch University, South Africa</p>
10:50-11:15	<p>Space Fan2: A Mechanical De-Orbiting Device System for Satellites”</p> <p>Boğaç Karabulut and Muzaffer Duysal, Istanbul Technical University, Turkey</p>
11:15-11:40	<p>“Sail deployment deorbit system by solenoids for microsattellites”</p> <p>Luis Javier Vazquez and Germán Ontivero, National Technological University - Córdoba Regional Faculty, Argentina</p>
11:40-12:05	<p>“Membrane Deployment De-orbit Device Composed of Self-Deployable Truss Structure”</p> <p>Daiki Kousaka, Nihon University, Japan</p>
12:05-13:05	Lunch at the Faculty “Chiostro” (Catering buffet)
13:05-14:35	<p>Student Session (All participants are welcomed) “Overview of International Hands-on Educational Activities for Students in the Space Field”</p> <p>(DMC reviewer meeting is held separately.)</p>
14:35-14:50	DMC Award Ceremony
14:50-15:00	Closing Ceremony

Note

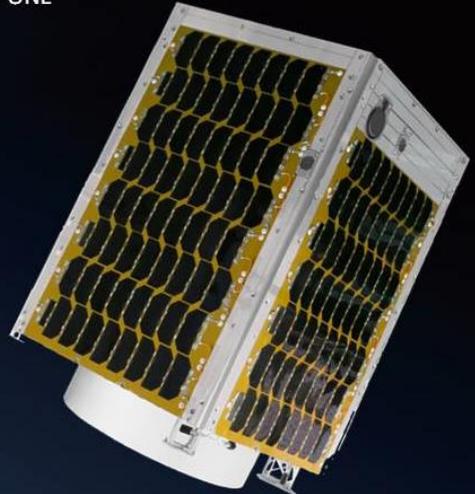
- *Coffee/Tea and Lunch during the Meeting are included in the registration fee.*
- *Information in this document is subject to change without notice.*
- *All presentations and materials will be uploaded to the website.*
- *Photos and videos taken during the meetings may be uploaded to the website and used for other publications*

The Meeting will be posted for record on the following YouTube link:
<<https://www.youtube.com/user/UNISECmovie/videos>>

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