



UNITED NATIONS
Office for Outer Space Affairs

United Nations Expert Meeting on Human Space Technology - Providing Access to Space

Organized and hosted by the United Nations Office for Outer Space Affairs

With the support of the
China Manned Space Agency (CMSA) and the Japan Aerospace Exploration Agency (JAXA)

4-6 December 2018, Vienna International Centre (VIC), Vienna, Austria

Meeting Venue: Room C4, 7th floor, Building C, VIC

Programme Booklet

(Ver 11.0 – FINAL-Revision)

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Vienna International Centre (VIC) area, Vienna, Austria

1. General information

Background:

In 2010, the United Nations Office for Outer Space Affairs (UNOOSA) launched the Human Space Technology Initiative (HSTI) to promote international cooperation on human space flight and space exploration-related activities, create awareness among countries on the benefits of utilizing human space technology and its applications, and build capacity in microgravity education and research. Under this initiative, various events and activities have been carried out.

Since the inception of HSTI, the United Nations outreach seminars, expert meetings, and workshops on human space technology were successfully conducted under this initiative with strong support from host countries/organizations. These events acknowledged that human space exploration can be regarded as a common goal of humanity to unite the world and that all countries and particularly emerging countries are encouraged to get involved in human space exploration related activities and benefit from its outcomes. They also demonstrated that HSTI has been a meaningful mechanism to raise awareness of the benefits of, to build capacity in, and to promote international cooperation in human space exploration related activities, space technology and its applications¹.

Under HSTI, UNOOSA is carrying out substantial activities in cooperation with space-faring nations, including ZGIP, DropTES, KiboCube, Dream Chaser utilization, and the China Space Station utilization² and continues to prepare new partnerships. These activities have been providing Member States of the United Nations, in particular developing countries, physical access to space through a wide range of opportunities in space experiments, space flights, and small satellites, thus contributing to bridging the space divide between nations that have developed space-related capabilities and technologies and those that have limited or no access to such capabilities.

Objectives:

Reaffirming the achievements made under HSTI, UNOOSA is organizing this Expert Meeting on human space technology towards the following objectives:

- Exchanging information on the latest developments and future plans of human space flight, space exploration and their commercial applications;
- Exchanging information on the progresses, achievements, and potential improvements and lessons learnt on the past and ongoing cooperation projects under HSTI;
- Increasing awareness of the benefits of human space technology and its multiple applications, including their important role towards attaining the Sustainable Development Goals (SDGs);
- Promoting capacity in scientific research, experiments, payloads development and space education as well as small satellites utilizing space and ground facilities, space environment and microgravity conditions;

¹ <http://www.unoosa.org/oosa/en/ourwork/psa/hsti/events.html>

² <http://www.unoosa.org/oosa/en/ourwork/psa/hsti/index.html>

- Identifying new and potential opportunities for new space-faring and emerging countries as well as for industry and the private sector to participate in activities under HSTI;
- Discussing and soliciting recommendations on how to further HSTI and its activities, as well as the way forward in international cooperation on potential activities of flying foreign astronauts/payload engineers to promote further utilization of space vehicles and space stations, including with the Office and among participating entities.

Focal points:

Mr. Aimin Niu

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Ms. Ayami Kojima

Expert, UNOOSA
Tel: (+43-1)-26060-5767
Email: ayami.kojima@un.org

2. Programme overview

Time	Tuesday 4 December 2018	Wednesday 5 December 2018	Thursday 6 December 2018
Morning			
09:00-10:00	Registration	Plenary Session 2 (cont'd): Space-/ground-based facilities and their utilization	Keynote speech: Access to space for all
10:00-10:05	Welcome address		Announcement on call for interest in utilizing "Bartolomeo"
10:05-11:00	Plenary Session 1: National and international space activities	Plenary Session 4 (cont'd): Human space and other capacity building activities	
11:00-11:40	Group photo		
11:40-13:00	Plenary Session 1 (cont'd): National and international space activities	Plenary Session 3: Small satellite related capacity building activities	
Afternoon			
14:30-16:30	Plenary Session 2: Space-/ground-based facilities and their utilization	Breakout Session 1: HSTI-Lessons learnt, benefits and improvements Breakout Session 2: Current and future needs on access to space	Breakout Session 1 (cont'd): Outcomes finalization Breakout Session 2 (cont'd): Outcomes finalization
16:30-17:00		Plenary Session 4: Human space and other capacity building activities	Plenary Session 5: Presenting Breakout Sessions outcomes
17:00-17:10			Closing Remarks
17:10-18:00			

Meeting venue:

Plenary sessions: Room C4, 7th floor, Building C, VIC
Breakout session 1: Room C4, 7th floor, Building C, VIC
Breakout session 2: Room C0739, 7th floor, Building C, VIC

3. Detailed programme

Tuesday, 4 December 2018

Time	Activity
	Master of ceremony: Mr. Aimin Niu
0900-1000	Registration of participants
	Welcome address
1000-1005	Mr. Luc St-Pierre Chief, Space Applications Section, United Nations Office for Outer Space Affairs
	Plenary session 1: National and international space activities Moderator: Mr. Luc St-Pierre, Rapporteur: Mr. Jorge Del Rio Vera
1005-1025	1. UNOOSA: Human Space Technology Initiative Mr. Luc St-Pierre, United Nations Office for Outer Space Affairs
1025-1040	2. Fly with China Space Station for human's common benefits Mr. Yuanzhen Wang, China Manned Space Agency (CMSA)
1040-1055	3. International contribution through the utilization of Japanese Experimental Module on ISS Mr. Shigeaki Kamigaichi, Japan Aerospace Exploration Agency (JAXA)
1055-1140	Group photo (15') & Coffee break (30')
1140-1155	4. The impacts Colombia will face with the upraise of their first astronaut Ms. Natally Mendez, Asociación Astronáutica Colombiana
1155-1210	5. UNICEF innovation's approach to involve youth and start-ups from developing countries in space technology development Mr. Do-Hyung KIM, United Nations Children's Fund (UNICEF)
1210-1240	Plenary session 1 discussion (30')
	Lunch
	Plenary session 2: Space-/ground-based facilities and their utilization Moderator: Mr. Takao Doi, Mr. Jack Van Loon Rapporteur: Mr. Aimin Niu, Mr. Hui Du
1430-1445	1. Utilization resources and cooperation opportunities for China Space Station Mr. Yang Yang,

	Chinese Academy of Sciences (CAS)
1445-1500	2. Internationalization and win-win development plan of space medical platform facilities Mr. Ji Xu, Space Institute of Southern China
1500-1515	3. Space mission opportunities on the Airbus Bartolomeo platform Mr. Per Christian Steimle, Airbus Defence and Space GmbH
1515-1530	4. Research activities at ZARM Mr. Claus Kurt O. Laemmerzahl, ZARM, University of Bremen
1530-1545	5. The use of centrifuges in space related research Mr. Jack Van Loon VU Medical Center Amsterdam & ESA-ESTEC
1545-1600	6. United Nations/Sierra Nevada Corporation on the Utilization of Dream Chaser Mr. Jorge Del Rio Vera, United Nations Office for Outer Space Affairs
1600-1630	Coffee break & Poster session (30')
1630-1645	7. Ground-based microgravity simulators in gravitational biology: potential and limitations Mr. Ralf Anken, Institute of Aerospace Medicine, German Aerospace Center (DLR)
1645-1700	8. Mexican participation in the first Latin American suborbital mission ESAA-01 carrying out on-board experiments that help in the cure of cancer and mellitus diabetes in the Latin population Mr. Jose Alberto Ramirez Aguilar, High Technology Unit (UAT) - Faculty of Engineering, Universidad Nacional Autónoma de México (UNAM)
1700-1715	9. Synergistic effects on gene expression changes in microgravity: bioinformatics analysis for the model organism <i>Oryzias latipes</i> and propagation toward astrobiological, simulated microgravity experiments. Ms. Jonna Kim Amato-Ocampo University of South Florida, Morsani College of Medicine
1715-1730	10. UNOOSA ZGIP experience in Spain: from the primary school to the research centre level Mr. Raul Herranz, Centro de Investigaciones Biologicas (CSIC)
1730-1745	11. Enhancing space education and research in microgravity among school children in Africa: ARCSSTEE 's UN-ZGIP experience, lessons learnt and potential improvements Mr. Ganiyu Ishola Agbaje,

	African Regional Centre for Space Science and Technology Education, Affiliated to the United Nations - English (ARCSSTEE)
	End of day 1

Wednesday, 5 December 2018

Time	Activity
	Session 2: Space-/ground-based facilities and their utilization (cont'd) Moderator: Mr. Jack Van Loon, Mr. Takao Doi Rapporteur: Mr. Hui Du, Mr. Aimin Niu
0900-0915	12. Innovation Initiative at the American University of Madaba Mr. Nabil Yousef Habib Ayoub, American University of Madaba
0915-0930	13. ASTRILIS remote asteroid acquisition mission, the most efficient sourcing of materials from space for mankind Mr. Giulio Manzoni, Microspace Rapid Pte Ltd, a Member of Astrilis Working Group
0930-0945	14. Autonomous intelligent space robotic manipulator design and simulation for CSS Mr. Xiaofeng Wu, University of Sydney
0945-1000	15. Understanding socio-technical issues affecting the future microgravity research marketplace Ms. Christine Joseph, Massachusetts Institute of Technology
1000-1030	Plenary session 2 discussion (30')
1030-1100	Coffee break & Poster session (30')
	Plenary session 3: Small satellite related capacity building activities Moderator: Mr. Per Christian Steimle, Rapporteur: Ms. Ayami Kojima
1100-1115	1. 1KUNS-PF: 1st Kenyan university satellite development, launch deployment and operation Mr. Mwangi Mbuthia, University of Nairobi
1115-1130	2. Development of the first Mauritian infrared cube-satellite Mr. Arjoon Suddhoo, Mauritius Research Council
1130-1145	3. PROJECT IRAZU: the first central America satellite, benefits and challenges of Costa Rica having entered the space race Mr. Luis Diego Monge Solano, Central America Society for Aeronautics and Space ACAE

1145-1200	4. Myanmar Earth observation micro-satellite programme Mr. Win Aung, Ministry of Transport and Communications, Myanmar
1200-1215	5. Development of satellite communication labs using low cost embedded devices for the improvement of education standard of satellite communication concepts in Pakistani universities Mr. Muhammad Tahir Mushtaq Hassan Bin Ahmad, University of Management and Technology (UMT), Pakistan
1215-1230	6. The Lego-Star low-earth orbit backbone satellite system for wideband access of the cube-sats Mr. Sergii Vladimirovich Kapshtyk The National Space Facilities Control and Test Center, Ukraine
1230-1245	7. Introducing space technology and aerospace engineering in Guatemala Mr. Victor Hugo Ayerdi Bardales, Universidad del Valle de Guatemala
1245-1300	Plenary session 3 discussion (15')
	Lunch
1430-1630	Breakout session 1: HSTI-Lessons learnt, benefits and improvements Moderator: Mr. Aimin Niu, Rapporteur: Ms. Ayami Kojima This breakout session will have an interactive discussion among the current and past participants on HSTI activities. The objective is to gather lessons learnt that could help other participants and the Office, benefits that the HSTI programmes generated, and suggestions and new proposals for improvements both at participant and Office level.
1430-1630	Breakout session 2: Current and future needs on access to space Moderator: Mr. Jorge Del Rio Vera, Rapporteur: Mr. Hui Du The objective of this breakout session is to brainstorm on the needs on access to space from the perspective of current and future applicants, related to HSTI activities. This is linked to institutional or country priorities that could be supported by these types of activities. Participants will also be asked the question about which (HSTI-related) capabilities should be developed and how.
1630-1700	Coffee Break (30')
	Plenary session 4: Human space and other capacity building activities Moderator: Mr. William Carey, Rapporteur: Ms. Maruska Strah
1700-1715	1. Europe's experience in the utilisation of the ISS and China's space programme in support of global progress Mr. William Carey, Five Owls Technology Limited
1715-1730	2. Science education programme on human space activities

	Mr. Takao Doi, Kyoto University, Unit of Synergetic Studies for Space, Japan
1730-1745	3. Framework for multi-level education & training-curriculum development and methodology Ms. Anjana Narendra Vyas, CEPT University, India
1745-1800	4. Prospects and ways of commercial cooperation based on low earth orbit space station Mr. Shaohua Wang, China Aerospace Science & Technology Consulting Co., Ltd.
	End of Day 2

Thursday, 6 December 2018

Time	Activity
	Keynote speech
0900-0915	UNOOSA: Access to space for all Mr. Ian Freeman, United Nations Office for Outer Space Affairs
	Plenary session 4: Human space and other capacity building activities (cont'd) Moderator: Mr. William Carey, Rapporteur: Ms. Maruska Strah
0915-0930	5. Analysis of the psychosocial situation of people living in space habitats using electroencephalographic signals Mr. Avid Roman-Gonzalez, Universidad de Ciencias y Humanidades (UCH), Peru
0930-0945	6. Space nutrition: The key role of nutrition in human space flight Mr. Enrico Catalano, University of Oslo
0945-1000	7. Online STEM education and aerospace micro-lesson in Nigeria: A panacea to African development Mr. Abiodun Ogunbiyi, Aerospace Palace International
1000-1015	8. A novel spacecraft with an innovative payload for radiation measurements between Venus and Mars orbits Mr. Premkumar Babu Saganti Prairie View A & M University
1015-1030	9. Preparing human exploration on Moon and Mars: towards a functional base Ms. Christiane Heinicke ZARM, University of Bremen

1030-1045	10. Human mars mission concept design with global collaboration Mr. Ozan Kara, KOC University - Space Generation Advisory Council
1045-1115	Coffee Break (30')
	Announcement on call for interest
1115-1130	Call for interest in utilizing “Bartolomeo” on ISS Speakers: 1) Mr. Luc St-Pierre Chief, Space Applications Section United Nations Office for Outer Space Affairs 2) Mr. Akos Hegyi Head of ISS Services Airbus Defence and Space Bremen
1130-1145	11. Is the present rescue and return regime sufficient to govern private spacecrafts and persons? Ms. Upasana Dasgupta, Institute of Air and Space Law and Faculty of Law, McGill University
1145-1200	12. Multi-planetary human rights protection Ms. Barikatul Hikmah Albar Salim, The Human Catalysts
1200-1215	13. How to take advantage of biodiversity for human spaceflight: The Costa Rica case Mr. Adolfo Chaves Jimenez, Space Systems Engineering Laboratory (SETEC Lab), Costa Rica Institute of Technology
1215-1245	Plenary session 4 discussion (30')
	Lunch
1430-1600	Breakout session 1 (cont'd): Finalizing outcomes Moderator: Mr. Aimin Niu, Rapporteur: Ms. Ayami Kojima
1430-1600	Breakout session 2 (cont'd): Finalizing outcomes Moderator: Mr. Jorge Del Rio Vera, Rapporteur: Mr. Hui Du
1600-1630	Coffee break (30')
1630-1700	Plenary session 5: Presenting outcomes from Breakout Sessions Moderator: Mr. Luc St-Pierre, Presenters: Ms. Ayami Kojima (for Breakout session 1) Mr. Hui Du (for Breakout session 2)

1700-1710	Closing remark Mr. Luc St-Pierre Chief Space Applications Section, United Nations Office for Outer Space Affairs
	End of the Expert Meeting

Posters

Poster title	Author / Presenter
1. Thermal modelling and analysis of planetary landers for lunar exploration missions.	Ms. Hannah Rana, University of Oxford/ ESA/ SGAC
2. Galvanic vestibular stimulation as an aid for space adaptation through vagal response activation	Ms. Adriana Cristina Pliego Carrillo, Universidad Autonoma del Estado de Mexico (UAEM)
3. Neural differentiation of stem cells in simulated microgravity environment	Ms. Zahra Hajebrahimi, Aerospace Research Institute, Ministry of Science Research and Technology, Iran
4. Qualification of standing instability caused by Zero-G environments.	Mr. Lars Heiko Mehnen, University of Applied Sciences FH-Technikum Wien, Austria
5. Bartolomeo & Earth observation	Ms. Simone Valeska Sasse, Airbus Defence and Space GmbH
6. UNOOSA ZGIP experience in Spain: from the primary school to the research centre level	Mr. Raul Herranz, Centro de Investigaciones Biologicas (CSIC)
7. Myanmar Earth observation micro-satellite programme	Mr. Win Aung, Ministry of Transport and Communications, Myanmar

4. Preliminary list of participants (in order of country of organization)

No.	Name	Organization	Country of Organization
1	Mr. Xiaofeng Wu	University of Sydney	Australia
2	Mr. Hannes Mayer	Competence Centre for Space Law at Karl-Franzens-University Graz	Austria
3	Mr. Lars Heiko Mehnen	University of Applied Sciences FH-Technikum Wien	Austria
4	Mr. Daniel Garcia Yarnoz	International Space University	Austria
5	Ms. Jennifer Djongow	University of Vienna, Postgraduate Center	Austria
6	Ms. Zoi Lendway	International Space University University of Vienna	Austria
7	Mr. Viktor Vaylov Danchev	EnduroSat	Bulgaria
8	Mr. Raycho Ruslanov Raychev	EnduroSat	Bulgaria
9	Mr. Giuseppe Sisinni	EnduroSat	Bulgaria
10	Ms. Upasana Dasgupta	Institute of Air and Space Law and Faculty of Law, McGill University	Canada
11	Mr. Yuanzhen Wang	China Manned Space Agency (CMSA)	China
12	Mr. Yaofeng Lu	China Manned Space Agency (CMSA)	China
13	Mr. Ji Xu	Space Institute of Southern China (SISC)	China
14	Mr. Zongpeng Zhu	The Develop and Test Center of Space Technology, China Academy of Space Technology (CAST)	China
15	Mr. Yang Yang	Technology and Engineering Center for Space Utilization, Chinese Academy of Sciences(CSU-CAS)	China
16	Mr. Shaohua Wang	China Aerospace Science & Technology Consulting Co., Ltd.	China
17	Mr. Suquan Ding	Beijing Space Quest Co., Ltd.	China
18	Mr. Sun Peng	Tiance Technology Co., Ltd	China
19	Ms. Nataly Mendez	Asociacion Astronautica Colombiana	Colombia
20	Mr. Adolfo Chaves Jimenez	Space Systems Engineering Laboratory (SETEC Lab), Costa Rica Institute of Technology	Costa Rica
21	Mr. Luis Diego Monge Solano	Central America Society for Aeronautics and Space ACAE	Costa Rica
22	Mr. Jiri Sperka	Czech Metrology Institute	Czech
23	Mr. Claus Kurt O. Laemmerzahl	ZARM, University of Bremen	Germany
24	Ms. Christiane Heinicke	ZARM, University of Bremen	Germany
25	Mr. Ralf Anken	Institute of Aerospace Medicine, German Aerospace Center (DLR)	Germany

No.	Name	Organization	Country of Organization
26	Mr. Akos Hegyi	Airbus Defence and Space GmbH	Germany
27	Mr. Per Christian Steimle	Airbus Defence and Space GmbH	Germany
28	Ms. Simone Valeska Sasse	Airbus Defence and Space GmbH	Germany
29	Ms. Maruska Strah	World Space Week Association	Germany
30	Ms. Jacqueline Myrrhe	Journalist	Germany
31	Mr. Victor Hugo Ayerdi Bardales	Universidad del Valle de Guatemala	Guatemala
32	Ms. Anjana Narendra Vyas	CEPT University	India
33	Ms. Zahra Hajebrahimi	Aerospace Research Institute, Ministry of Science Research and Technology	Iran
34	Mr. Takao Doi	Kyoto University, Unit of Synergetic Studies for Space	Japan
35	Mr. Shigeki Kamigaichi	Japan Aerospace Exploration Agency (JAXA)	Japan
36	Ms. Fuki Taniguchi	Paris Office, Japan Aerospace Exploration Agency (JAXA)	Japan
37	Mr. Nabil Yousef Habib Ayoub	American University of Madaba	Jordan
38	Mr. Mwangi Mbuthia	University of Nairobi	Kenya
39	Mr. Arjoon Suddhoo	Mauritius Research Council	Mauritius
40	Mr. Jose Alberto Ramirez Aguilar	High Technology Unit (UAT) - Faculty of Engineering, Universidad Nacional Autónoma de México (UNAM)	Mexico
41	Ms. Adriana Cristina Pliego Carrillo	Universidad Autonoma del Estado de Mexico (UAEM)	Mexico
42	Mr. Win Aung	Ministry of Transport and Communications	Myanmar
43	Mr. William Carey	GoTaikonauts!/European Space Agency (ESA)/Five Owls Technology Limited	Netherlands
44	Mr. Jack Van Loon	VU Medical Center Amsterdam & ESA-ESTEC	Netherlands
45	Mr. Benjamin Gbenro Ayantunji	National Space Research and Development Agency (NASRDA)	Nigeria
46	Mr. Ganiyu Ishola Agbaje	African Regional Centre for Space Science and Technology Education, Affiliated to the United Nations - English (ARCSSTEE)	Nigeria
47	Mr. Abiodun Ogunbiyi	Aerospace Palace International	Nigeria
48	Mr. Olutoyin Justus Oloniteru	Spindlar Cyberlaw Centre	Nigeria
49	Mr. Enrico Catalano	University of Oslo	Norway
50	Mr. Muhammad Tahir — Mushaq Hassan Bin Ahmad	University of Management and Technology (UMT), Lahore	Pakistan

No.	Name	Organization	Country of Organization
51	Mr. Avid Roman-Gonzalez	Universidad de Ciencias y Humanidades (UCH)	Peru
52	Mr. Giulio Manzoni	Microspace Rapid Pte Ltd, a Member of Astrilis Working Group	Singapore
53	Mr. Raul Herranz	Centro de Investigaciones Biologicas (CSIC)	Spain
54	Mr. Ozan Kara	KOC University - Space Generation Advisory Council	Turkey
55	Mr. Sergii Vladimirovich Kapshtyk	The National Space Facilities Control and Test Center	Ukraine
56	Ms. Hannah Rana	University of Oxford/ ESA/ SGAC	UK
57	Ms. Barikatul Hikmah Albar Salim	The Human Catalysts	UK
58	Ms. Christine Joseph	Massachusetts Institute of Technology	USA
59	Ms. Jonna Kim Amato-Ocampo	University of South Florida, Morsani College of Medicine/USA	USA
60	Mr. Premkumar Babu Saganti	Prairie View A & M University	USA
61	Mr. Do-Hyung KIM	United Nations Children's Fund (UNICEF)	
UNOOSA Participants (in alphabetical order of last name)			
62	Mr. Lorant Czarán	United Nations Office for Outer Space Affairs	
63	Mr. Jorge Del Rio Vera	United Nations Office for Outer Space Affairs	
64	Ms. Simonetta Di Pippo	United Nations Office for Outer Space Affairs	
65	Mr. Hui Du	United Nations Office for Outer Space Affairs	
66	Mr. Ian Freeman	United Nations Office for Outer Space Affairs	
67	Mr. Patrick Gindler	United Nations Office for Outer Space Affairs	
68	Ms. Ayami Kojima	United Nations Office for Outer Space Affairs	
69	Mr. Kurian Maniyanipurathu	United Nations Office for Outer Space Affairs	
70	Mr. Aimin Niu	United Nations Office for Outer Space Affairs	
71	Mr. Martin Stasko	United Nations Office for Outer Space Affairs	
72	Mr. Luc St-Pierre	United Nations Office for Outer Space Affairs	
73	Mr. Markus Woltran	United Nations Office for Outer Space Affairs	
Participants from Permanent Missions (in random order)			
74	Mr. Armin Schuller	Permanent Mission	Canada
75	Ms. Wenting Zhao	Permanent Mission	China
76	Mr. Thomas Mützelburg	Permanent Mission	Germany
77	Mr. Peter R. Barte	Permanent Mission	USA
78	Mr. Travis I. Williams	Permanent Mission	USA
79	(more will come...)		