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Committee on the Peaceful Uses of Outer Space
Scientific and Technical Subcommittee
Fifty-eighth session
Vienna, 19–30 April 2021

Draft report

I. Introduction

C. General statements

1. Statements were made by representatives of the following member States during the general exchange of views: Algeria, Argentina, Australia, Austria, Belgium, Brazil, Canada, Chile, China, Colombia, Cuba, Czechia, Egypt, Finland, France, Germany, Greece, Hungary, India, Indonesia, Iran (Islamic Republic of), Israel, Italy, Japan, Kenya, Luxembourg, Malaysia, Mexico, Netherlands, New Zealand, Pakistan, Paraguay, Peru, Philippines, Republic of Korea, Romania, Russian Federation, Saudi Arabia, Singapore, Slovakia, South Africa, Spain, Switzerland, Thailand, Ukraine, United Kingdom, United States and Venezuela (Bolivarian Republic of). A statement was also made by the representative of Costa Rica on behalf of the Group of 77 and China. The observer for the European Union made a statement. Additional statements were made by the observers for APSCO, CRTEAN, For All Moonkind, IAF, ISU, the Moon Village Association, SGAC, SWF, UNISEC-Global and WSWA.

2. The Subcommittee heard the following scientific and technical presentations:

(a) “Chilean development facility and space mission programme”, by the representative of Chile;

(b) “China’s Chang’e-5 mission and first Mars mission”, by the representative of China;

(c) “Data analysis as basic input for good governance in space environment management”, by the representative of Austria;

(d) “Indian space programme: 2020 updates and priorities”, by the representative of India;

(e) “Technical presentation on recommendations from the Dark and Quiet Skies for Science and Society workshop”, by the observer for IAU;

(f) “World Space Week 2021: women in space”, by the observer for WSWA;

(g) “On-orbit servicing, assembly and manufacturing (OSAM-1) contributions to the Artemis programme”, by the representative of the United States;

(h) “Smart space communications using 3D beam-steering plasma antennas”, by the representative of the Islamic Republic of Iran;

(i) “Fostering scalable, resilient utility infrastructure for cislunar space”, by the observer for NSS;

(j) “Radio signal interference detection from space”, by the representative of Austria;

(k) “The vision of a space safety institute”, by the observer for IAASS;

(l) “Moon Village Association contribution to sustainable lunar exploration and utilization”, by the observer for the Moon Village Association;

(m) “PSIPW ninth awards ceremony and conference”, by the observer for PSIPW;

(n) “All-sky X-ray map: orbital observatory Spectrum-Roentgen-Gamma (SRG) with X-ray telescopes ART (Russian Federation) and eROSITA (Germany)”, by the representative of the Russian Federation;

(o) “60 years since Yuri Gagarin’s flight – the founders of former Union of Soviet Socialist Republics (USSR) practical cosmonautics: S.P. Korolev and M.V. Keldysh”, by the representative of the Russian Federation;

(p) “NASA’s view of climate change from space”, by the representative of the United States;

(q) “Findings and recommendations from recent space traffic management webinars co-organized by IAASS and the Aerospace Corporation”, by the observer for IAASS;

(r) “India’s international cooperation in space”, by the representative of India;

(s) “Mission idea contest for deep space science and exploration with micro- and nanosatellites”, by the observer for UNISEC Global;

(t) “Open architecture data repository”, by the representative of the United States;

(u) “European Space Resources Innovation Centre”, by the representative of Luxembourg;

(v) “Eurasian regional centre for space science and technology education, affiliated to the United Nations”, by the representative of the Russian Federation;

(w) “NASA and Office for Outer Space Affairs memorandum of understanding to enhance its longstanding partnership”, by the representative of the United States.

3. At the 935th meeting, on 19 April, the Chair of the Subcommittee made a statement outlining the work of the Subcommittee at its fifty-eighth session. She noted that the emergence of new technologies and new actors at an unprecedented rate could encourage further development and appreciation of space applications among a wider group of people and should encourage the Subcommittee in its efforts to promote international cooperation and the enhanced use of space technologies for socioeconomic development and to address global challenges. She also noted that, despite the impact of the pandemic, which had caused disruptions of a magnitude unprecedented in contemporary history to many sectors, space activities were continuing to develop steadily. Furthermore, the contribution that outer space activities were making to the attainment of the 2030 Agenda for Sustainable Development continued to be immense, not least considering the impact of the COVID-19 pandemic on society, and thus it would be important to continue supporting the peaceful pursuit of common goals in space that have illustrated the very best of what humankind can achieve together.

4. At the same meeting, the Director of the Office for Outer Space Affairs made a statement in which she reviewed the work done by the Office since the

fifty-seventh session of the Subcommittee, including the Office's contribution to the United Nations system-wide response to COVID-19, the quantitative and qualitative expansion of the Office's services rendered to Member States and the success in the work towards the strategic and structural implementation of the enhanced role of the Office and its Director within the United Nations system, following the issuance in 2020 of the Secretary-General's bulletin on the organization of the Office for Outer Space Affairs (ST/SGB/2020/1). She introduced the current and planned strategic priorities in the work of the Office, which continued to advance its role as the gateway to space in the United Nations, including in its fundamental capacity as substantive secretariat to the Committee and its Subcommittees. In addition, she stressed that the global participation in the Committee demonstrated its unique nature as the platform within the United Nations for collaboration on space affairs with established, emerging and non-spacefaring nations, and also manifested the continued, and even reinforced, interest of space stakeholders in international cooperation and multilateralism through the United Nations, as the key path to the future we want.

5. The Subcommittee recalled that 12 April 2021 had marked the sixtieth anniversary since the Soviet cosmonaut Yuri Gagarin had carried out the first-ever human space flight, opening the way for space exploration for the benefit of all humanity. In that connection, the Subcommittee also recalled that the General Assembly, in its resolution 65/271 of 7 April 2011, had declared 12 April as the International Day of Human Space Flight to celebrate the beginning of the space era for humankind, thereby reaffirming the important contribution of space science and technology in achieving sustainable development goals and increasing the well-being of States and peoples, as well as ensuring the realization of their aspiration to maintain outer space for peaceful purposes.

6. The Subcommittee noted with regret the passing of Luboš Perek of Czechia, a renowned astronomer at the international level, former Chief of the Outer Space Affairs Division, United Nations Secretariat (1975–1980), and an active contributor for many years to the work of the Subcommittee and of the Committee as a whole.

7. The Subcommittee agreed that it, together with the Committee and the Legal Subcommittee, with the support of the Office for Outer Space Affairs, remained a unique international forum tasked with promoting international cooperation in the exploration and peaceful uses of outer space and offering an appropriate environment to discuss matters that had a great impact on the development of States for the betterment of humankind.

8. The Subcommittee reiterated its commitment to taking a cooperative approach to advancing the exploration and use of outer space, and stressed that only through cooperation would it be possible to fully reap the benefits of space science and technology while ensuring that space activities continued to be conducted for peaceful purposes. In that connection, the Subcommittee agreed that international cooperation and dialogue would be essential for effectively addressing the demands and challenges of space, and for promoting space as a driver of sustainable development to achieve global, regional and national goals.

9. The Subcommittee noted that the work relating to the "Space2030" agenda and its implementation plan would contribute to enhancing and raising awareness of the benefits of space activities and tools for the implementation of the 2030 Agenda for Sustainable Development and the Sustainable Development Goals and targets contained therein.

10. The Subcommittee agreed that space technology continued to be a valuable tool for the benefit of humankind and the achievement of the Sustainable Development Goals, and that it had become an indispensable element of public infrastructure. Therefore, States members of the Committee must combine their efforts to increase the benefits of space and preserve it for future generations.

11. The Subcommittee noted that space activities had intensified significantly in recent years, with more and more actors entering the space arena and more space

objects being placed in outer space. In that connection, the Committee agreed that ongoing international collaboration and coordination to develop common practices and standards would be particularly essential and would also contribute to transparency and the building of trust between the various actors in space, thereby reducing the risk of accidents and potential conflicts.

12. Some delegations expressed the view that it was very important to foster international cooperation and to establish principles guiding responsible behaviour in, and the sustainability of, space activities. In that connection, there was a need to strengthen commitments to avoiding potentially harmful interference with the peaceful exploration and use of outer space, facilitating equitable access to outer space and developing initiatives that would alleviate tensions and increase confidence and mutual trust among all space actors.

13. The view was expressed that the growing diversity and rapidly growing economic impact of activities in outer space were creating tensions between different users and stakeholders, and that that situation increasingly required the different interests of those users and stakeholders to be balanced. In that connection, it would be necessary to explore how the Committee and its Subcommittees could contribute to global governance and coordination of space traffic management and what role the Office for Outer Space Affairs could play in that regard.

14. Some delegations expressed the view that the work of the Subcommittee should support measures to enhance international cooperation in space activities to ensure that such activities benefit all the peoples of the world. In that regard, it was important to continue to respect the established principles guiding outer space activities, including the principle of the exploration and use of outer space on the basis of equality, the principle of the non-appropriation of outer space, including the Moon and other celestial bodies, and the peaceful use of outer space.

15. Some delegations expressed the view that, in order for it to achieve its main objectives, it was important for the Subcommittee to concentrate its work in areas such as the building and promotion of technological capacities, the transfer of technology favourable to developing countries, the prevention and mitigation of natural disasters, and scientific and technological research in developing countries, within the framework of international cooperation. The delegations expressing that view were also of the view that the only way to ensure the sustainability of outer space activities was to continue to deliver benefits derived from it to humanity as a whole through enhanced cooperation and collaboration.

16. Some delegations expressed the view that the Subcommittee should remain the main forum for the enhancement of cooperation on the peaceful uses of outer space and that, in that connection, the Office for Outer Space Affairs and Member States should provide greater support to enhance both North-South and South-South cooperation aimed at facilitating the transfer of technology among nations, as well as to make more opportunities available for enhanced academic linkages, long-term fellowships and further collaboration among national and regional laboratories, United Nations research centres and other national and international institutions, including in developing countries, on space matters.

17. The Subcommittee expressed its gratitude to the organizers of the following events, held on the margins of the fifty-eighth session of the Subcommittee:

(a) Side event entitled “From the shadow of exoplanets and lost dark skies: enlightenment by Michel Mayor and Didier Queloz, laureates of the Nobel Prize in Physics 2019”, organized by the delegation of Switzerland;

(b) Side event entitled “International Lunar Research Station”, co-organized by the delegations of China and the Russian Federation;

(c) Question-and-answer webinar entitled “KiboCUBE: sixth round”, organized by the delegation of Japan.

II. United Nations Programme on Space Applications

18. In accordance with General Assembly resolution 75/92, the Subcommittee considered agenda item 4, entitled “United Nations Programme on Space Applications”.

19. The representatives of China, Indonesia, India, Israel, Japan, Peru and the Russian Federation made statements under agenda item 4. During the general exchange of views, statements relating to the item were made by representatives of other member States. The Subcommittee heard the following scientific and technical presentations:

(a) “The fifth anniversary of the Regional Centre for Space Science and Technology Education in Asia and the Pacific in the days of fighting COVID-19”, by the representative of China;

(b) “ISONscope cooperative programme of the Office for Outer Space Affairs and the Keldysh Institute of Applied Mathematics, under the Access to Space for All initiative”, by the representative of the Russian Federation.

A. Activities of the United Nations Programme on Space Applications

20. The Subcommittee recalled that the General Assembly, in its resolution 74/82, had recognized the capacity-building activities under the United Nations Programme on Space Applications, which provided unique benefits for Member States, in particular developing countries, participating in those activities.

21. The Subcommittee recalled with appreciation that 2021 marked the fiftieth anniversary since the beginning of work of the United Nations Programme on Space Applications and, in that connection, recognized the unique and continuous contribution made by the Programme in promoting and supporting the capacity-building activities of Member States, in particular emerging spacefaring nations. In that regard, the Subcommittee acknowledged the instrumental role played by the Office for Outer Space Affairs in implementing the Programme.

22. At the 935th meeting, on 19 April, the Director of the Office for Outer Space Affairs apprised the Subcommittee of the status of the Office’s activities under the United Nations Programme on Space Applications.

23. The Subcommittee noted with appreciation that, since its previous session, in-cash and in-kind contributions, including the provision of staff on a non-reimbursable loan basis, had been offered for the activities of the Office by the following donors: Airbus Defence and Space; Federal Ministry for Transport, Innovation and Technology and Federal Ministry for European and International Affairs of Austria; Avio S.p.A; Brazilian Air Force; Centre for Applied Space Technology and Microgravity; CMSA; China National Space Administration; City of Graz, Austria; ESA; Graz University of Technology, Austria; Instituto de Astrofísica de Canarias, Spain; IAU; JAXA; Joanneum Research, Austria; Keldysh Institute of Applied Mathematics of the Russian Academy of Sciences; Kyushu Institute of Technology, Japan; PSIPW; and Sierra Nevada Corporation.

24. The Subcommittee noted that, since its last session, in 2020, the Office had concluded memorandums of understanding, funding agreements and framework agreements in relation to its capacity-building activities, which had included the implementation of the United Nations Programme on Space Applications. The Office had also extended agreements with the Centre for Applied Space Technology and Microgravity; ESA; the Government of Mongolia; JAXA; the Keldysh Institute of Applied Mathematics; the Ministry of Science, Technology and Innovation of Brazil; and PSIPW.

25. The Subcommittee noted that the Office for Outer Space Affairs continued to collaborate with the Government of Japan, through the Kyushu Institute of

Technology, in order to arrange for the future provision of long-term fellowship programme opportunities for students from developing countries under the United Nations/Japan Long-term Fellowship Programme on Nanosatellite Technologies. The Office also continued to collaborate with the Politecnico di Torino, Italy, evaluating the possibility of overhauling and reorganizing its master's programme and long-term fellowship programme opportunities by broadening the subject areas covered and adding new elements pertinent to Galileo and other global navigation satellite systems and their applications.

26. The Subcommittee noted the Drop Tower Experiment Series, which was a fellowship programme of the Office for Outer Space Affairs, undertaken in collaboration with the Centre for Applied Space Technology and Microgravity and the German Aerospace Center (DLR), in which students could study microgravity by performing experiments in a drop tower. In the seventh cycle of the fellowship programme, a team from Universidad Católica Boliviana, Plurinational State of Bolivia, had been awarded the fellowship through a competitive selection process. The announcement of opportunity for the eighth cycle of the Drop Tower Experiment Series had been issued in February 2021, with the deadline for the submission of applications set for 30 June 2021.

27. The Subcommittee noted the continued collaboration between the Office for Outer Space Affairs and the Government of Japan, in collaboration with JAXA, in implementing the United Nations/Japan Cooperation Programme on CubeSat Deployment from the International Space Station Japanese Experiment Module (Kibo), known as "KiboCUBE". The second winner under the Programme, a team from Guatemala, had launched its first CubeSat, Quetzal-1, in April 2020. CubeSats developed by teams from Mauritius, Indonesia and the Republic of Moldova, which had been selected for the third and fourth rounds of the Programme, would be launched after the first two rounds. The final selection for the fifth round had been announced on 10 December 2020, with the Central American Integration System (SICA) selected as the winner. The objective of the cooperation programme was to promote international cooperation and capacity-building in space technology and its applications under the Human Space Technology Initiative by providing opportunities for educational and research institutions in developing countries to deploy CubeSats from Kibo.

28. The Subcommittee noted the continued cooperation between the Office for Outer Space Affairs and the Government of China, through CMSA, in implementing the United Nations/China cooperation on the utilization of the China space station initiative, as part of the Access to Space for All initiative. That innovative and forward-looking cooperation was aimed at providing scientists around the world with an opportunity to conduct their own experiments on board the China space station, thus opening space exploration activities to all countries and creating a new paradigm for building capabilities in space science and technology. The first opportunity to conduct scientific experiments on board the China space station had been open to all Member States, in particular developing countries. As an outcome of the application and selection process, nine projects had been selected for implementation on board the China space station in the first cycle. The nine projects involved 23 institutions from 17 Member States in the Asia-Pacific region, Europe, Africa, North America and South America.

29. The Subcommittee noted the Hypergravity Experiment Series (HyperGES), which was a fellowship programme of the Office for Outer Space Affairs undertaken in collaboration with ESA. Under the programme, students could better understand and describe the influence of gravity on systems by performing experiments in the Large Diameter Centrifuge facility located at the European Space Research and Technology Centre of ESA in Noordwijk, the Netherlands. The winner of the first fellowship under HyperGES was announced in June 2020 and a team from Mahidol University, Thailand, was selected on the basis of its proposal to study the effects of hypergravity on watermeal, an aquatic plant. The team was currently developing its experiment.

30. The Subcommittee noted the joint United Nations-Airbus Defence and Space technical assistance programme on the Bartolomeo external platform on board the International Space Station. The programme offered Member States, through a competitive selection process, the opportunity to have small- and medium-sized payloads hosted on the Bartolomeo platform, and the selected winner would receive a comprehensive range of mission services provided by Airbus Defence and Space. The first announcement of opportunity had been issued in October 2019, and the winners were to be announced in the second quarter of 2021.

31. The Subcommittee noted the cooperation programme on the utilization of the Vega-C launcher, implemented in collaboration with Avio S.p.A. The programme was aimed at providing educational and research institutions in developing countries that had developed a CubeSat of 3U size or smaller with the opportunity, through a competitive process, to put their CubeSat into orbit. The first announcement of opportunity had been issued in October 2020 and had been closed on 4 April 2021.

32. The Subcommittee noted the "ISONscope" telescope provision cooperation programme, carried out by the Office for Outer Space Affairs in collaboration with the Keldysh Institute of Applied Mathematics. The programme was aimed at offering academic and research institutions the opportunity to receive, through a competitive selection process, small telescopes and associated capacity-building on astronomy. The first announcement of opportunity had been issued in January 2021, with the deadline for the submission of applications set for 1 May 2021.

33. The Subcommittee continued to express its concern about the still-limited financial resources available for carrying out the capacity-building activities of the Office, including the United Nations Programme on Space Applications, and appealed to Member States to provide support through voluntary contributions.

34. The Subcommittee noted that the Programme continued to implement the Access to Space for All initiative, which was focused on developing the capacity of Member States to access the benefits of space and which offered to its partners research opportunities to develop the technologies needed to send hardware into space, access to unique ground and orbital facilities for experiments in microgravity and access to space data and training on their use, including on astronomical data.

35. The Subcommittee also noted that the Programme was aimed at promoting, through international cooperation, the use of space technologies and space-related data for sustainable economic and social development in developing countries by establishing or strengthening the capacity in those countries to use space technology; raising the awareness of decision makers about the cost-effectiveness and additional benefits to be obtained from such technologies and data; and strengthening outreach activities to increase awareness of those benefits.

36. The Subcommittee further noted the following activities under the United Nations Programme on Space Applications, conducted by the Office in 2020, together with Member States and international organizations:

(a) United Nations/Austria symposium on the theme "Space applications for Sustainable Development Goal 13: climate action", held in Graz, Austria, from 1 to 3 September 2020 (A/AC.105/1231);

(b) United Nations/IAU/Spain Dark and Quiet Skies for Science and Society online workshop, held from 5 to 9 October 2020. Recommendations emanating from the workshop regarding satellite constellations, artificial light at night and radio signals were gathered in a conference room paper submitted by Chile, Ethiopia, Jordan, Slovakia, Spain and IAU (A/AC.105/C.1/2021/CRP.17).

37. The Subcommittee was informed that the Office for Outer Space Affairs had organized, or continued to organize, capacity-building events, including within the United Nations Programme on Space Applications, with the Governments of Austria, Brazil, Ghana, Mongolia, Spain and the United Arab Emirates, as well as with IAF. The events planned to be held in the near future were to cover the following topics:

space-based solutions for astronomy and the protection of astronomical observation facilities; water resources management; global navigation satellite systems; space weather; and capacity-building in space technology and applications. The Subcommittee noted that the Office would present reports and further information on the events at its fifty-ninth session, in 2022.

38. The Subcommittee noted that, in addition to the United Nations conferences, training courses, workshops, seminars and symposiums conducted in 2020 and planned for 2021, the Office for Outer Space Affairs had conducted or was planning to conduct other activities under the Programme, with emphasis on:

(a) Providing support for capacity-building efforts in developing countries through the regional centres for space science and technology education, affiliated to the United Nations;

(b) Strengthening its long-term fellowship programme, to include support for the implementation of pilot projects;

(c) Ensuring the mainstreaming of a gender perspective into all of its activities;

(d) Promoting the participation of young people in space activities;

(e) Promoting access to space for people with disabilities;

(f) Supporting or initiating pilot projects as a follow-up to activities of the Programme in areas of priority interest to Member States;

(g) Providing technical advice, upon request, to Member States, bodies and specialized agencies of the United Nations system and relevant national and international organizations;

(h) Enhancing access to space-related data and other information;

(i) Applying an integrated and cross-sectoral approach to activities, as appropriate.

39. The Subcommittee also noted the highlights of the activities of the regional centres for space science and technology education, affiliated to the United Nations, namely, the African Regional Centre for Space Science and Technology Education – in English Language; the African Regional Centre for Space Science and Technology – in French Language; the Centre for Space Science and Technology Education in Asia and the Pacific; the Regional Centre for Space Science and Technology Education for Latin America and the Caribbean; the Regional Centre for Space Science and Technology Education for Western Asia; and the Regional Centre for Space Science and Technology Education in Asia and the Pacific (China).

40. The Subcommittee took note of the information provided by the Russian Federation explaining that the country was conducting consultations within a network of educational institutions to propose the establishment of a regional centre for space science and technology education, affiliated with the United Nations, and indicating its willingness to collaborate with other such regional centres in offering a high-quality educational degree in space science and technology.

B. Regional and interregional cooperation

41. The Subcommittee recalled that the General Assembly, in its resolution 74/82, had emphasized that regional and interregional cooperation in the field of space activities was essential to strengthen the peaceful uses of outer space, assist Member States in the development of their space capabilities and contribute to the implementation of the 2030 Agenda for Sustainable Development. To that end, the Assembly had requested relevant regional organizations and their groups of experts to offer any assistance necessary so that countries could carry out the

recommendations of regional conferences. In that regard, the Assembly had noted the importance of the equal participation of women in all fields of science and technology.

42. The Subcommittee noted that the eighth African Leadership Conference on Space Science and Technology for Sustainable Development, on the theme “Prospects and challenges of African space development”, had been hosted at the Economic Commission for Africa, in Addis Ababa, from 2 to 4 December 2019. The Congress would in future be held on a biennial basis; the South African National Space Agency would host the next congress in Durban, South Africa, by the end of October 2021.

43. The Subcommittee also noted that the international conference entitled “Space and Sustainable Development 2020” (CEDS 2020) had been postponed as a result of the COVID-19 global pandemic and would be held at the Faculty of Physical Sciences and Mathematics of the University of Chile in July 2021. The objective of the conference would be to contribute to the examination and discussion of four topics: opportunities and challenges presented by space activity; the development of space science and technology; innovation and industrial development; and the use of space as a global challenge and its contribution to sustainable development.

44. The Subcommittee further noted that the twenty-sixth session of the Asia-Pacific Regional Space Agency Forum (APRSAF), on the theme “Advancing diverse links towards a new space era”, had been held in Nagoya, Japan, from 26 to 29 November 2019. The twenty-seventh session of the Forum, which had been planned to be held in the third quarter of 2020, had been postponed and would be held in Viet Nam in the third quarter of 2021. In addition, the Subcommittee noted that APRSAF had held an event in November 2020 entitled “APRSAF Online 2020”, on the theme “Sharing space visions beyond distance”.

45. The Subcommittee noted that, at the fourteenth meeting of the Council of APSCO, in December 2020, the Council had approved the Development Plan of Cooperative Activities of APSCO for 2021–2030. The strategic objectives of the Plan were focused on enhancing the capabilities of APSCO member States, as well as countries in the Asia-Pacific region, in the peaceful uses of outer space, including in the domains of space science, and space technology and its applications.