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## **Report of the Scientific and Technical Subcommittee on its sixtieth session, held in Vienna from 6 to 17 February 2023**

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## I. Introduction

1. The Scientific and Technical Subcommittee of the Committee on the Peaceful Uses of Outer Space held its sixtieth session at the United Nations Office at Vienna from 6 to 17 February 2023, in a hybrid format (in person and online), with Juan Francisco Facetti (Paraguay) as Chair.
2. The Subcommittee held 20 meetings.

### A. Attendance

3. Representatives of the following 84 States members of the Committee attended the session: Algeria, Angola, Argentina, Armenia, Australia, Austria, Azerbaijan, Belarus, Belgium, Brazil, Bulgaria, Canada, Chile, China, Colombia, Costa Rica, Cuba, Cyprus, Czechia, Denmark, Dominican Republic, Ecuador, Egypt, El Salvador, Finland, France, Germany, Ghana, Greece, Guatemala, Hungary, India, Indonesia, Iran (Islamic Republic of), Iraq, Israel, Italy, Japan, Jordan, Kazakhstan, Kenya, Kuwait, Luxembourg, Malaysia, Mexico, Mongolia, Morocco, Netherlands (Kingdom of the), New Zealand, Nicaragua, Nigeria, Norway, Oman, Pakistan, Panama, Paraguay, Peru, Philippines, Poland, Portugal, Qatar, Republic of Korea, Romania, Russian Federation, Rwanda, Saudi Arabia, Singapore, Slovakia, Slovenia, South Africa, Spain, Sri Lanka, Sweden, Switzerland, Syrian Arab Republic, Thailand, Tunisia, Türkiye, Ukraine, United Arab Emirates, United Kingdom of Great Britain and Northern Ireland, United States of America, Uruguay and Venezuela (Bolivarian Republic of).
4. At its 975th, 977th and 989th meetings, on 6, 7 and 15 February, the Subcommittee decided to invite the observers for Côte d'Ivoire, Croatia and Honduras, at their request, to attend the session and to address it, as appropriate, on the understanding that it would be without prejudice to further requests of that nature and that doing so would not involve any decision of the Committee concerning status.
5. Also at its 975th meeting, the Subcommittee decided to invite the observer for the Sovereign Order of Malta, at its request, to attend the session and to address it, as appropriate, on the understanding that it would be without prejudice to further requests of that nature and that doing so would not involve any decision of the Committee concerning status.
6. Observers for the Office for Disarmament Affairs of the Secretariat, the Food and Agriculture Organization of the United Nations, the International Atomic Energy Agency (IAEA), the International Civil Aviation Organization (ICAO), the International Telecommunication Union (ITU), the United Nations Environment Programme and the World Meteorological Organization (WMO) attended the session.
7. The session was attended by representatives of the European Union, in its capacity as permanent observer of the Committee and in accordance with General Assembly resolutions [65/276](#) and [73/91](#).
8. The session was attended by observers for the following intergovernmental organizations having permanent observer status with the Committee: Asia-Pacific Space Cooperation Organization (APSCO), European Organization for Astronomical Research in the Southern Hemisphere (ESO), European Space Agency (ESA), European Telecommunications Satellite Organization, International Organization of Space Communications, Regional Centre for Remote Sensing of the North African States and the Square Kilometre Array Observatory.
9. The session was attended by observers for the International Asteroid Warning Network (IAWN) and the Space Mission Planning Advisory Group (SMPAG), in accordance with the agreement of the Subcommittee at its fifty-third session ([A/AC.105/1109](#), para. 182).

10. The session was attended by the Coordinator of the Space and Global Health Network in accordance with the agreement of the Subcommittee at its fifty-ninth session ([A/AC.105/1258](#), annex IV, para 7 (d)).

11. The session was attended by observers for the following non-governmental organizations having permanent observer status with the Committee: CANEUS International, Committee on Earth Observation Satellites (CEOS), Committee on Space Research (COSPAR), European Space Policy Institute, For All Moonkind, the Hague Institute for Global Justice, Ibero-American Institute of Aeronautic and Space Law and Commercial Aviation, International Academy of Astronautics (IAA), International Association for the Advancement of Space Safety, International Astronautical Federation (IAF), International Astronomical Union (IAU), International Organization for Standardization (ISO), International Society for Photogrammetry and Remote Sensing (ISPRS), International Space University (ISU), Moon Village Association, National Space Society, Open Lunar Foundation, Prince Sultan bin Abdulaziz International Prize for Water (PSIPW), Secure World Foundation (SWF), Scientific Committee on Solar-Terrestrial Physics (SCOSTEP), Space Generation Advisory Council (SGAC), University Space Engineering Consortium-Global (UNISEC-Global) and World Space Week Association.

12. At its 975th and 977th meetings, the Subcommittee decided to invite observers for ASTM International, the International Genetically Engineered Machine Foundation (iGEM) and the International Space Environment Service (ISES) at their request, to attend the session and to address it, as appropriate, on the understanding that it would be without prejudice to further requests of that nature and that doing so would not involve any decision of the Committee concerning status.

13. A list of the representatives of States, United Nations entities and other international organizations attending the session is contained in document [A/AC.105/C.1/2023/INF/50](#).

## **B. Adoption of the agenda**

14. At its 975th meeting, on 6 February, the Subcommittee adopted the following agenda:

1. Adoption of the agenda.
2. Statement by the Chair.
3. General exchange of views and introduction of reports submitted on national activities.
4. United Nations Programme on Space Applications.
5. Space technology for sustainable socioeconomic development.
6. Matters relating to remote sensing of the Earth by satellite, including applications for developing countries and monitoring of the Earth's environment.
7. Space debris.
8. Space-system-based disaster management support.
9. Recent developments in global navigation satellite systems.
10. Space weather.
11. Near-Earth objects.
12. Long-term sustainability of outer space activities.
13. Future role and method of work of the Committee.
14. Space and global health.

15. Use of nuclear power sources in outer space.
16. Examination of the physical nature and technical attributes of the geostationary orbit and its utilization and applications, including in the field of space communications, as well as other questions relating to developments in space communications, taking particular account of the needs and interests of developing countries, without prejudice to the role of the International Telecommunication Union.
17. General exchange of views on dark and quiet skies for science and society.
18. Draft provisional agenda for the sixty-first session of the Scientific and Technical Subcommittee.
19. Report to the Committee on the Peaceful Uses of Outer Space.

### C. General statements

15. Statements were made by representatives of the following member States during the general exchange of views: Algeria, Argentina, Australia, Austria, Belarus, Brazil, Canada, Chile, China, Colombia, Costa Rica, Czechia, Dominican Republic, Ecuador, Egypt, Finland, France, Germany, Guatemala, India, Indonesia, Iran (Islamic Republic of), Israel, Italy, Japan, Kazakhstan, Kenya, Luxembourg, Malaysia, Mexico, New Zealand, Nigeria, Pakistan, Paraguay, Peru, Philippines, Poland, Portugal, Qatar, Republic of Korea, Romania, Russian Federation, Rwanda, Saudi Arabia, Singapore, Slovenia, South Africa, Spain, Sweden, Switzerland, Thailand, Türkiye, United Arab Emirates, United Kingdom, United States and Venezuela (Bolivarian Republic of). A statement was made by the representative of Ghana on behalf of the Group of African States and by the representative of Pakistan on behalf of the Group of 77 and China. The representative of the European Union, in its capacity as permanent observer, made a statement on behalf of the European Union and its member States. Additional statements were made by the observers for APSCO, ESA, ESO, For All Moonkind, the Hague Institute for Global Justice, IAA, IAF, ISU, Moon Village Association, National Space Society, Regional Centre for Remote Sensing of the North African States, the Square Kilometre Array Observatory, SGAC, SWF, UNISEC-Global and World Space Week Association.

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

(a) “Beyond gravity: the Passive Reflectometry and Dosimetry (PRETTY) nanosatellite mission: fighting the impacts of climate change”, by the representative of Austria;

(b) “Progress in international cooperation of China’s lunar and deep space exploration”, by the representative of China;

(c) “Novel research and development efforts by Indian emerging space entities”, by the representative of India;

(d) “Deep space exploration/Türkiye’s Moon research programme”, by the representative of Türkiye;

(e) “Climate research and science integration across NASA”, by the representative of the United States;

(f) “The first International Moon Day results and outlook for 2023”, by the observer for the Moon Village Association.

17. At the 975th meeting, on 6 February, the Chair of the Subcommittee made a statement in which he outlined the work of the Subcommittee at its sixtieth session and highlighted the achievements of the Subcommittee in its 60 years of work. He underscored that furthering international coordination and cooperation among all space actors, including partnerships among States, international intergovernmental and non-governmental organizations, industry and private sector entities, would be

key in promoting space activities for sustained economic growth and sustainable development in all countries. He also expressed his desire to explore during the session whether the Subcommittee could develop a contribution for the forthcoming Sustainable Development Goals Summit, to be held in New York in September 2023.

18. At the same meeting, the Acting Director of the Office for Outer Space Affairs made a statement in which he reviewed the work undertaken by the Office since the fifty-ninth session of the Subcommittee, highlighting developments in space policy, science and technology, as well as in international cooperation. He stressed the importance of the collaboration by the Office with an ever-increasing number of partners, from governmental authorities and space agencies to international organizations, academia, industry and the private space sector. He also referred to growing engagement in the work of the Committee and its subcommittees and noted the importance of international cooperation, in the context of which the Office could assist in a broad range of capacity-building efforts for the benefit of developing countries.

19. The Subcommittee expressed solidarity with the people of the Syrian Arab Republic and Türkiye who had been affected by the recent devastating earthquakes, as well as its regret and condolences for the lives lost. In that connection, the Subcommittee noted the importance of space data in supporting the rescue and recovery efforts that were under way.

20. The Subcommittee noted that the delegation of Türkiye had expressed its gratitude for the solidarity shown by the Subcommittee in relation to the devastating earthquakes in Türkiye and the Syrian Arab Republic and that Türkiye had also thanked the international community for the bilateral and multilateral efforts and the immediate activation of emergency assistance mechanisms.

21. The Subcommittee noted the landmark achievements of space programmes in areas such as space exploration, human space flight, planetary defence, astronomy and astrophysics since it had held its fifty-ninth session, in February 2022.

22. The Subcommittee agreed that international cooperation, mutual assistance and dialogue were essential for preserving outer space for peaceful purposes, effectively addressing the demands and challenges of space and promoting space as a driver of sustainable development.

23. The Subcommittee also agreed that it, together with the Committee and the Legal Subcommittee, and 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.

24. Some delegations expressed the view that the Scientific and Technical Subcommittee and the Legal Subcommittee should work more closely with each other, in particular on overlapping and interrelated topics.

25. Some delegations expressed the view that the Committee should continue to support space science and technology education and regional initiatives to promote intraregional cooperation, as well as to foster greater regional excellency and the increased participation of women and young people in the space field.

26. Some delegations reiterated their opposition to the establishment of a new regional centre for space science and technology education in the Eurasian region, affiliated to the United Nations, hosted by the Roscosmos Corporate Academy, as proposed by the Government of the Russian Federation. Those delegations were also of the view that although the General Assembly, in its resolution 76/76, had noted with satisfaction the progress in the establishment of the regional centre, in the light of recent developments, they were not in a position to accept any affiliation of that regional centre to the United Nations.

27. The view was expressed that the Committee, at its sixty-fourth session, had noted that the evaluation mission on the proposed establishment of the regional centre for space science and technology education had resulted in the recommendation to accept the offer of the Russian Federation to establish the regional centre and that the Committee had welcomed the progress on the establishment of the regional centre, and thus no additional agreement was required by the Committee. The delegation expressing that view also informed the Committee that the centre was already operational and providing services. Over 100 applicants from various countries in the region had been successfully accepted by the Centre as students.

28. Some delegations expressed the view that all delegations should abide by the rules of procedure of the General Assembly and speak to issues within the consensus agenda of the Subcommittee.

29. Some delegations expressed the view that it was crucial that developing countries did not get left behind and were not left unfairly disadvantaged by space exploration efforts, that space technology applications must produce concrete benefits for developing countries and that, in order to achieve that goal, the transfer of technology on favourable terms for developing countries, as well as associated capacity-building, were of vital importance. The delegations expressing that view encouraged States to strengthen international, multilateral, regional and bilateral cooperation in the exploration and use of outer space for peaceful purposes.

30. Some delegations expressed the view that States should refrain from promulgating, adopting and applying any unilateral economic, financial and trade measures or actions not in accordance with international law and the Charter of the United Nations that could hamper or impede access to space and space activities, in particular in developing countries.

31. Some delegations expressed the view that the deployment of megaconstellations, if not carried out sustainably and equitably, could pose a risk of congestion of the low Earth orbit, which would be a significant disadvantage in the use and exploration of space by developing countries. Therefore, the principle of equitable access to outer space, in particular the low Earth orbit, needed to be observed more than ever.

32. Some delegations highlighted the need for developing countries to have access to technologies and methodologies for the measurement, monitoring and characterization of space debris and other space objects.

33. The view was expressed that the activities of satellite constellations conducted in the territory of any State must respect local landing rights as well as the sovereignty of States. In accordance with article 2, paragraph 7, of the Charter of the United Nations, such activities not respecting local landing rights were in violation of international law. The delegation expressing that view was also of the view that States that had private megaconstellations under their jurisdiction or control were held responsible under international space law.

34. The view was expressed that low Earth orbits were a limited natural resource and activities conducted using that orbit, including the deployment of thousands of satellites in megaconstellations in those orbits, would saturate low Earth orbits and pose a threat to the sustainability of space activities. The development of megaconstellations should limit neither the allocation to developing countries of orbital slots in low Earth orbits nor equitable access to those orbits.

35. The view was expressed that large constellations offered opportunities for international cooperation and that relevant issues concerning those constellations, such as those issues involving space radio communication services, should be discussed by the relevant technical experts in the appropriate forum.

36. Some delegations expressed the view that the increasing use of outer space for security purposes was of grave concern and that an arms race in outer space ran counter to the principle of the peaceful uses of outer space.

37. Some delegations expressed the view that issues concerning the use of outer space for security purposes were more appropriately discussed in forums whose mandates focused on those issues.

38. Some delegations expressed the view that transparency and confidence-building measures related to outer space activities were of utmost importance, as was the need to ensure responsible behaviour in outer space, through the United Nations, for the benefit and in the interest of all countries.

39. The Subcommittee noted the invitation extended by the Chair and the Vice-Chair of the Working Group on Legal Aspects of Space Resource Activities of the Legal Subcommittee to delegations at the sixtieth session of the Scientific and Technical Subcommittee to contribute to the work of the Working Group (A/AC.105/C.1/2023/CRP.16), which was in line with the means of coordination with the Scientific and Technical Subcommittee, as expressed in the methods of work of the Working Group.

40. The Subcommittee was informed of the conference room paper submitted by Germany and Luxembourg on dedicated tools and practices for enhanced information-sharing (A/AC.105/C.1/2023/CRP.30) and the conference room paper submitted by the Moon Village Association containing a report on the Global Expert Group on Sustainable Lunar Activities (A/AC.105/C.1/2023/CRP.20).

41. The Subcommittee expressed its gratitude to the organizers of the following events, held on the margins of the sixtieth session of the Subcommittee:

(a) “Bridging the gender gap: women and girls in space tech”, co-organized by the Permanent Mission of Israel and the Office for Outer Space Affairs;

(b) “Dark and quiet skies: the way ahead”, organized by the European Space Policy Institute with the support of the European Organization for Astronomical Research in the Southern Hemisphere, IAU and the Square Kilometre Array Observatory;

(c) “The recommended framework and key elements for peaceful and sustainable lunar activities”, organized by the Moon Village Association;

(d) “WSWA space and sustainability reception”, organized by the World Space Week Association;

(e) “Vega C announcement of awardee”, co-organized by the Office for Outer Space Affairs and Avio S.p.A.;

(f) “UNOOSA activities on climate action”, organized by the Office for Outer Space Affairs;

(g) “What is UNOOSA? And why is it relevant for you?”, organized by the Office for Outer Space Affairs.

## **D. National reports**

42. The Subcommittee took note with appreciation of the reports by Member States (see [A/AC.105/1271](#), [A/AC.105/1271/Add.1](#) and [A/AC.105/1271/Add.2](#)) and the conference room paper (A/AC.105/C.1/2023/CRP.5) submitted for its consideration under agenda item 3, entitled “General exchange of views and introduction of reports submitted on national activities”. The Subcommittee recommended that the Secretariat continue to invite Member States to submit annual reports on their space activities.

## **E. Symposium**

43. Pursuant to the agreement reached by the Subcommittee at its forty-fourth session, in 2007 ([A/AC.105/890](#), annex I, para. 24), and by the Committee on the Peaceful Uses



of Outer Space at its sixty-fifth session (see [A/77/20](#), para. 192), a symposium organized by COSPAR covering different space applications supporting climate action and related data-driven decision-making was held on 14 February 2023.

44. The symposium, entitled “Space observation contributions supporting climate action”, was moderated by Pascale Ehrenfreund, President of COSPAR. The speakers were Ralph Kahn of COSPAR, Katherine Calvin of the National Aeronautics and Space Administration (NASA) of the United States, Edward Blanchard Wrigglesworth of the University of Washington (Seattle, United States), Anny Cazenave of the Laboratory of Space Geophysical and Oceanographic Studies (French National Centre for Scientific Research (CNRS)/CNES/French National Research Institute for Sustainable Development (IRD)/University Toulouse III – Paul Sabatier), Angelica Tarpanelli of the National Research Council of Italy, C.K. Shum of Ohio State University, Nancy French of Michigan Technological University and Aneesh Subramaian of the University of Colorado Boulder.

45. The Subcommittee noted with satisfaction that the symposium had contributed to the work of the Subcommittee and to raising awareness of issues concerning space activities supporting climate action.

## **F. Adoption of the report of the Scientific and Technical Subcommittee**

46. After considering the items before it, the Subcommittee, at its 994th meeting, on 17 February, adopted its report to the Committee on the Peaceful Uses of Outer Space, containing its views and recommendations, as set out in the paragraphs below.

## **II. United Nations Programme on Space Applications**

47. In accordance with General Assembly resolution [77/121](#), the Subcommittee considered agenda item 4, entitled “United Nations Programme on Space Applications”.

48. The representatives of Austria, China, Germany, India, Indonesia, Japan, Mexico, Nigeria and Pakistan 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.

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

(a) “A report on three batches of the Indian Space Research Organization (UNNATI) training programme on satellite-building”, by the representative of India;

(b) “ISONscope cooperation programme of UNOOSA and the Keldysh Institute under the Access to Space for All initiative”, by the representative of the Russian Federation;

(c) “Highlights of Space4Water activities in 2022”, by the representative of the Office for Outer Space Affairs.

50. The Subcommittee had before it the following:

(a) Report on the United Nations/Ghana/Prince Sultan bin Abdulaziz International Prize for Water Fifth International Conference on the Use of Space Technology for Water Management, held in Accra from 10 to 13 May 2022 ([A/AC.105/1268](#));

(b) Report on the United Nations/Austria Symposium on Space for Climate Action, held in Graz, Austria, from 13 to 15 September 2022 ([A/AC.105/1269](#));

(c) Report on the United Nations/France/International Astronautical Federation Workshop on Space Technology for Socioeconomic Benefits, on the theme “Access to

Space for All: bridging the space divide”, held in Paris on 16 and 17 September 2022 (A/AC.105/1280);

(d) Report on the first Space4Water stakeholder meeting, held in Vienna on 27 and 28 October 2022 (A/AC.105/1272).

## A. Activities of the United Nations Programme on Space Applications

51. The Subcommittee recalled that the General Assembly, in its resolution 77/121, 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.

52. The Subcommittee noted with appreciation that, since its previous session, 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 Climate Action, Environment, Energy, Mobility, Innovation and Technology and Federal Ministry for European and International Affairs of Austria; Avio S.p.A.; Brazilian Air Force; Center of Applied Space Technology and Microgravity; China Manned Space Agency; China National Space Administration; ESA; Government of France; City of Graz, Austria; Graz University of Technology, Austria; IAU; Japan Aerospace Exploration Agency (JAXA); Joanneum Research; Keldysh Institute of Applied Mathematics of the Russian Academy of Sciences; Kyushu Institute of Technology, Japan; PSIPW; Sierra Nevada Corporation; Government of the United States; and University of Energy and Natural Resources, Ghana.

53. The Subcommittee noted that the United Nations Programme on Space Applications had enabled national programmes on space applications to disseminate information and knowledge to a wider audience and achieve greater development.

54. The Subcommittee noted with appreciation the efforts made by the Office to continue to pursue awareness-raising and capacity-building activities to support countries in the implementation of the “Space2030” Agenda and welcomed the preparation of the report of the European Union Agency for the Space Programme and the European Earth Observation Programme entitled “Supporting an eight billion world – building blocks for the ‘Space2030’ Agenda and the global agendas”.

55. The Subcommittee noted that the United Nations Programme on Space Applications 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 under which the Subcommittee noted the following programmes and activities:

(a) Drop Tower Experiment Series, carried out in collaboration with the Center of Applied Space Technology and Microgravity and the German Aerospace Center (DLR);

(b) Hypergravity Experiment Series, carried out in collaboration with ESA;

(c) United Nations/Japan Cooperation Programme on CubeSat Deployment from the International Space Station Japanese Experiment Module, known as “KiboCUBE”, and “KiboCUBE Academy” online lectures conducted in partnership with JAXA;

(d) United Nations/China cooperation on the utilization of the China Space Station, in cooperation with the China Manned Space Agency;

(e) United Nations/Airbus Defence and Space cooperation on accessing space with the Bartolomeo platform;

(f) Cooperation programme on the utilization of the Vega-C launcher, implemented in collaboration with Avio S.p.A.;

(g) “ISONscope” telescope provision cooperation programme, implemented in collaboration with the Keldysh Institute of Applied Mathematics of the Russian Academy of Sciences;

(h) The Payload Hosting Initiative, implemented in collaboration with the Mohammed Bin Rashid Space Centre of the United Arab Emirates.

56. The Subcommittee noted that under the Basic Space Technology Initiative, and in cooperation with the Office for Outer Space Affairs, the Kyushu Institute of Technology continued to offer students from developing countries opportunities to participate in the “Post-Graduate Study on Nanosatellite Technology” fellowship programme.

57. The Subcommittee also noted the following activities under the United Nations Programme on Space Applications conducted by the Office for Outer Space Affairs in 2022, together with Member States and international organizations:

(a) United Nations/Ghana/Prince Sultan bin Abdulaziz International Prize for Water Fifth International Conference on the Use of Space Technology for Water Management, held in Accra and online from 10 to 13 May 2022 ([A/AC.105/1268](#));

(b) United Nations/Austria Symposium on Space for Climate Action, held in Graz (online) from 13 to 15 September 2022 ([A/AC.105/1269](#));

(c) United Nations/France/IAF Workshop on Space Technology for Socioeconomic Benefits on the theme “Access to space for all: bridging the space divide”, held in Paris on 16 and 17 September 2022 ([A/AC.105/1280](#));

(d) United Nations/China Second Global Partnership Workshop on Space Exploration and Innovation, held, in hybrid format, in Haikou, China, from 21 to 24 November 2022.

58. The Subcommittee noted that, in addition to the aforementioned activities, the Office had conducted or was planning to conduct other activities under the United Nations Programme on Space Applications, with an 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.

59. The Subcommittee also noted the highlights of the activities of the regional centres for space science and technology education, affiliated to the United Nations, and the request made to the Office for Outer Space Affairs to assist with the outreach efforts of the regional centres in relation to recovery from the COVID-19 pandemic.

## B. Regional and interregional cooperation

60. The Subcommittee recalled that the General Assembly, in its resolution [77/121](#), 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.

61. The Subcommittee noted that the fourth Ministerial Conference on Space Applications for Sustainable Development in Asia and the Pacific had been held on 26 October 2022. The Conference had adopted the Jakarta Ministerial Declaration on Space Applications for Sustainable Development in Asia and the Pacific.

62. Some delegations expressed the view that space technology had practical benefits that could be leveraged to accelerate progress in various areas of the 2030 Agenda and Agenda 2063 of the African Union, including economic development, disaster management, health and climate change mitigation.

63. Some delegations expressed the view that in order for the Subcommittee to achieve its main objectives, it was important for it to concentrate on areas such as the building and promotion of technological capacities, the transfer of technology favourable for developing countries, the prevention and mitigation of natural disasters and the conduct of scientific and technological research in developing countries in the context of international cooperation.

64. Some delegations expressed the view that capacity-building was required in order to ensure that the required technical expertise was available to Member States, in particular developing countries, to support their implementation of the “Space2030” Agenda.

## III. Space technology for sustainable socioeconomic development

65. In accordance with General Assembly resolution [77/121](#), the Subcommittee considered agenda item 5, entitled “Space technology for sustainable socioeconomic development”.

66. The representatives of Australia, Austria, Brazil, Canada, China, Colombia, Egypt, France, India, Indonesia, Italy, Japan, Luxembourg, Mexico, Pakistan, the Philippines, the Russian Federation, South Africa, the United Kingdom, the United States and Venezuela (Bolivarian Republic of) made statements under agenda item 5. Statements were also made by the observers for CANEUS International, CEOS and World Space Week Association. During the general exchange of views, statements relating to the item were made by representatives of other member States.

67. The Subcommittee had before it the following:

(a) Report on the United Nations/Republic of Korea Space for Women expert meeting: access and participation of women and girls in the space sector, held in Daejeon, Republic of Korea, from 16 to 19 August 2022 ([A/AC.105/1273](#));

(b) Conference room paper containing the report on the United Nations/Austria World Space Forum 2022: “Sustainability in space for sustainability on Earth” ([A/AC.105/C.1/2023/CRP.25](#));

(c) Conference room paper containing the contribution to the Sustainable Development Goals Summit, submitted by the Chair of the Scientific and Technical Subcommittee ([A/AC.105/C.1/2022/CRP.32](#)).

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

(a) “2023 Space4Women expert meeting”, by the representatives of Canada;

(b) “Space technology in Egypt”, by the representative of Egypt;

(c) “Africa-Japan CubeSat Cooperation Workshop and future collaboration in Africa”, by the representative of Japan;

(d) “Space development of Paraguay”, by the representative of Paraguay;

(e) “Millimetron Observatory: the future of millimetre astronomy”, by the representative of the Russian Federation;

(f) “Caucasian Mountain Observatory: a new scientific educational centre of the Lomonosov Moscow State University”, by the representative of the Russian Federation;

(g) “The Lunar Commerce Portfolio report: main results”, by observers for the Moon Village Association;

(h) “What cyber protection for space technologies? A technical study on safety norms”, by the observer for SGAC;

(i) “World Space Week 2022: space and sustainability—outreach activities for the promotion of space sustainability”, by the observer for the World Space Week Association.

69. The Subcommittee noted the value of space technology and applications, as well as of space-derived data and information, for sustainable development, including in terms of improving the formulation and subsequent implementation of policies and programmes of action relating to environmental protection, land and water management, the development of degraded land and wastelands, urban and rural development, marine and coastal ecosystems, health care, climate change, disaster risk reduction and emergency response, energy, infrastructure, navigation, transport and logistics, rural connectivity, seismic monitoring, natural resources management, snow and glaciers, biodiversity, agriculture and food security.

70. The Subcommittee also noted in that context the information provided by States on their use of space-based platforms and satellite systems in support of sustainable socioeconomic development, as well as actions and programmes aimed at increasing society’s awareness and understanding of the applications of space science and technology for meeting development needs, and on cooperation activities aimed at building capacity through education and training on the use of space science and technology applications for sustainable development.

71. The Subcommittee agreed that the Chair of the Subcommittee should provide a contribution, highlighting the contribution of space science, technology and applications to sustainable socioeconomic development, to the high-level political forum on sustainable development to be convened under the auspices of the General Assembly in 2023.

72. The Subcommittee agreed on the following text and noted that Paraguay, in its capacity as holder of the Chair of the Subcommittee, would seek its inclusion in the political declaration to be adopted at the Sustainable Development Goals Summit to be held in September 2023:

“We express our firm conviction that space exploration, science and technology and their applications, such as satellite communications, Earth observation systems and satellite navigation technologies, provide indispensable tools for viable long-term solutions for sustainable development and can contribute more effectively to efforts to promote the development of all countries and regions of the world, to improve people’s lives, to conserve natural resources in a world with a growing population that places an increasing strain on all ecosystems, and to enhance the preparedness for the consequences of disasters and the adverse effects of climate change.

“We strongly believe that space technology and applications should be used to reach the ultimate goal of peaceful exploration and uses of outer space, as well as to attain the Sustainable Development Goals, in accordance with international law, including the Charter of the United Nations, in the interest of maintaining

international peace and security and promoting international cooperation and understanding.

“Space technology and applications have become ubiquitous and improve the daily lives of people worldwide through their contributions to environmental monitoring, the management of natural resources, meteorological forecasting, climate modelling, satellite navigation, communications and early warning systems. Promoting inclusiveness, gender equality and capacity-building in space activities is paramount. We therefore support emerging avenues that support the acceleration of the 2030 Agenda for Sustainable Development, such as the ‘Space2030’ Agenda: space as a driver of sustainable development and its implementation plan, adopted by the General Assembly in its resolution 76/3, as a forward-looking strategy for reaffirming and strengthening the contribution of space activities and space tools for the achievement of the Sustainable Development Goals. To achieve the 2030 Agenda for Sustainable Development, it is crucial to provide access to space and its benefits to everyone everywhere. Space activities are essential to realize the attainment of the Sustainable Development Goals for future generations.”

73. Some delegations expressed the view that it was essential that planning for a high-level track on space at the Summit of the Future fully took into account the unique role of the Committee and its subcommittees, as reaffirmed in General Assembly resolution 76/3.

74. The view was expressed that neither the Committee nor its subcommittees had a consensus-based mandate to contribute to the Summit of the Future.

75. The view was expressed that it was necessary to increase the sharing and transfer of knowledge and space technology related to socioeconomic development in order to enhance space-related benefits for all humankind, as well as the awareness of youth and the private sector, as a form of inclusiveness.

76. The Subcommittee noted that the Committee and its subcommittees, with the support of the Office for Outer Space Affairs, had a fundamental role to play in promoting international cooperation and capacity-building in support of socioeconomic development.

77. The Subcommittee noted that initiatives that encourage women and girls to pursue education in science, technology, engineering and mathematics (“STEM subjects”) and raise awareness with regard to career opportunities and the importance of gender equality and the empowerment of women in the space sector were important and in direct support of the Sustainable Development Goals.

78. In accordance with paragraph 10 of General Assembly resolution 77/121, the Working Group of the Whole was reconvened, with Prakash Chauhan (India) as Chair.

79. At its 989th meeting, on 15 February, the Subcommittee endorsed the report of the Working Group of the Whole, which is contained in annex I to the present report.

#### **IV. Matters relating to remote sensing of the Earth by satellite, including applications for developing countries and monitoring of the Earth’s environment**

80. In accordance with General Assembly resolution 77/121, the Subcommittee considered agenda item 6, entitled “Matters relating to remote sensing of the Earth by satellite, including applications for developing countries and monitoring of the Earth’s environment”.

81. The representatives of Canada, Chile, China, India, Indonesia, Iran (Islamic Republic of), Israel, Italy, Japan, Mexico, Pakistan, Paraguay, the Philippines, the Republic of Korea, the Russian Federation, the United Arab Emirates and the United States made statements under agenda item 6. During the general exchange of views,

statements relating to the item were also made by representatives of other member States.

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

(a) “BRICS remote sensing satellite constellation: China’s progress and prospects”, by the representative of China;

(b) “International cooperation in India’s EOS-6 data utilization”, by the representative of India;

(c) “Hyperspectral data exploitation: the ASI PRISMA SCIENZA programme”, by the representative of Italy;

(d) “The operation status and utilization of the Korean national land satellite”, by the representative of the Republic of Korea;

(e) “Russian forests: view from space”, by the representative of the Russian Federation;

(f) “Indigenous knowledge research infrastructure and remote sensing for sustainability applications”, by the observer for CANEUS International;

(g) “News from the International Society for Photogrammetry and Remote Sensing”, by the observer for the International Society for Photogrammetry and Remote Sensing;

(h) “PSIPW 10th award ceremony at the United Nations Office at Vienna”, by the observer for PSIPW.

83. In the course of the discussions, delegations reviewed national, bilateral, regional and international programmes on remote sensing, in particular in the following areas: monitoring the broader impacts of climate change; land use and land cover monitoring; natural resource management; monitoring of forests and wildfires; detection of illegal fishing; monitoring of oil pipelines and illegal extraction; monitoring of protected marine areas and marine species; environmental monitoring; monitoring of the atmosphere, greenhouse gases and air pollution; urban planning; disaster management support; telehealth and epidemiology; watershed monitoring and development planning; irrigation infrastructure assessment; agriculture, horticulture and crop production forecasting; monitoring of desertification; snow and glacier monitoring; and monitoring of oceans, glacial lakes and other water bodies.

84. Some delegations expressed the view that remote sensing of the Earth was important for advancing the Sustainable Development Goals and could assist in the identification of solutions to common problems that could benefit humankind. The integration of Earth observation data with statistical data systems and geospatial data could serve as a tool for monitoring progress on many indicators of the Sustainable Development Goals, and in that context, collaboration within dedicated international expert bodies such as CEOS and the Group on Earth Observations continued to be useful.

85. Some delegations expressed the view that providing open and cost-free access to satellite data and images, as well as providing direct satellite downlinks to international partners, should be encouraged and that the use of remote sensing technology applications to support societal and commercial development should also be promoted.

86. Some delegations expressed the view that improving, expanding and facilitating access to information and data obtained from remote sensing was important and therefore stressed the importance of the involvement of the Office for Outer Space Affairs in capacity-building in that area.

87. Some delegations expressed the view that the policies covering remote sensing data-sharing and the expansion of international cooperation for the non-discriminatory use of satellite data by all countries were important factors to be taken into consideration

in order to bring benefits to society. In that connection, the importance of the Principles Relating to Remote Sensing of the Earth from Outer Space was highlighted.

88. Some delegations expressed the view that, while remote sensing served as a key tool for achieving sustainable development, national sovereignty and the interests of individual countries should not be threatened, in particular with regard to their natural resources and the wealth contained therein.

## V. Space debris

89. In accordance with General Assembly resolution [77/121](#), the Subcommittee considered agenda item 7, entitled “Space debris”.

90. The representatives of Belarus, Canada, Chile, China, France, Germany, India, Indonesia, Japan, Luxembourg, Mexico, Netherlands (Kingdom of the), New Zealand, Pakistan, the Republic of Korea, Romania, the Russian Federation, Slovakia, Spain, Thailand, the United Kingdom, the United States and Venezuela (Bolivarian Republic of) made statements under agenda item 7. During the general exchange of views, statements relating to the item were also made by representatives of other member States.

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

- (a) “CanX-7 re-entry”, by the representative of Canada;
- (b) “The threat of space debris to the safety of spacecraft in orbit and countermeasures”, by the representative of China;
- (c) “2022 space debris in France”, by the representative of France;
- (d) “Space situational awareness activities of the Republic of Korea”, by the representative of the Republic of Korea;
- (e) “United States space debris environment and activity updates”, by the representative of the United States;
- (f) “IADC annual report 2022”, by the observer for ESA;
- (g) “SGAC review of the COPUOS compendium of space debris mitigation standards: what’s next?”, by the observer for SGAC.

92. The Subcommittee had before it information on research on space debris, the safety of space objects with nuclear power sources on board and problems relating to the collision of such objects with space debris, contained in replies received from Member States and international organizations ([A/AC.105/C.1/123](#), [A/AC.105/C.1/2023/CRP.14](#) and [A/AC.105/C.1/2023/CRP.23](#)).

93. The Subcommittee noted with satisfaction that the endorsement by the General Assembly, in its resolution [62/217](#), of the Space Debris Mitigation Guidelines of the Committee on the Peaceful Uses of Outer Space had proved vital in controlling the space debris problem for the safety of future space missions.

94. The Subcommittee also noted with satisfaction that many States and international intergovernmental organizations were implementing space debris mitigation measures consistent with the Space Debris Mitigation Guidelines and the Guidelines for the Long-term Sustainability of Outer Space Activities of the Committee ([A/74/20](#), annex II) and/or the Space Debris Mitigation Guidelines of the Inter-Agency Space Debris Coordination Committee (IADC), and that a number of States had harmonized their national space debris mitigation standards with those guidelines.

95. The Subcommittee noted that some States were using the Space Debris Mitigation Guidelines and the Guidelines for the Long-term Sustainability of Outer Space Activities of the Committee, the Space Debris Mitigation Guidelines of IADC



and ISO standards as reference points in their regulatory frameworks for national space activities.

96. The Subcommittee also noted that, in the area of space debris, some States were cooperating under the space surveillance and tracking support framework funded by the European Union, integrating data, on-ground sensors and services in order to monitor space debris.

97. The Subcommittee expressed concern at the increasing amount of space debris and encouraged States, agencies, industries and academic institutions that had not yet done so to consider voluntarily implementing the Space Debris Mitigation Guidelines and the Guidelines for the Long-term Sustainability of Outer Space Activities of the Committee and to work to preserve the space environment.

98. The Subcommittee noted that the compendium of space debris mitigation standards adopted by States and international organizations was being continuously updated. The Subcommittee further noted that the compendium, initiated by Canada, Czechia and Germany, could be consulted on the website of the Office for Outer Space Affairs, and encouraged Member States to continue to provide contributions and updates to it.

99. The Subcommittee agreed that Member States and international organizations having permanent observer status with the Committee should continue to be invited to provide reports on research on space debris, the safety of space objects with nuclear power sources on board, problems relating to the collision of such space objects with space debris and the ways in which debris mitigation guidelines were being implemented.

100. The Subcommittee noted that IADC, whose initial work had served as the basis for the Space Debris Mitigation Guidelines of the Committee, had updated its own Space Debris Mitigation Guidelines in 2021 and published a document that supported the IADC Guidelines and a statement on large constellations of satellites in low Earth orbit in order to reflect the evolving understanding of the situation regarding space debris.

101. The Subcommittee noted with appreciation that States had undertaken a number of actions to mitigate space debris, such as improving the design of launch vehicles, engines and spacecraft, developing special software, passivation, life extension, end-of-life operations and disposal. The Subcommittee noted the evolving technologies related to the in-orbit robotic servicing of satellites, the extension of satellite lifespans and active space debris removal.

102. The Subcommittee noted the development and application of new technologies and ongoing research related to space debris mitigation; protecting space systems from space debris; limiting the creation of additional space debris; re-entry and collision avoidance techniques; measuring, characterizing, continuous monitoring and modelling of space debris; prediction, early warning and notification of space debris re-entry and collision; and space debris orbit evolution and fragmentation.

103. Some delegations expressed the view that work was necessary to ensure that sufficient normative frameworks, including space debris remediation measures, were identified and developed at the international level for those purposes.

104. Some delegations expressed the view that the increase in space debris posed a serious risk to the safety, security and sustainability of space activities, and that international and national activities were necessary.

105. Some delegations expressed the view that destructively testing direct-ascent anti-satellite missiles generated a large amount of space debris in low Earth orbit.

106. Some delegations expressed the view that international cooperation was necessary to reduce the barriers and risks relating to feasible orbital debris removal missions, and that greater international agreement on the appropriate internationally accepted framework for such missions would be essential for ensuring that States

could make positive, transparent contributions to the sustainability of the space environment.

107. Some delegations expressed the view that the global challenge of space traffic management needed to be addressed through the development of capabilities, regulatory aspects and partnerships. In that regard, multilateral discussions in the context of the United Nations would be necessary.

108. Some delegations expressed the view that there was a need for developing countries to have access to technologies and methodologies for the measurement, monitoring and characterization of space debris and other space objects.

109. Some delegations expressed the view that it was necessary to strengthen international cooperation in the exchange and transfer of knowledge, data and technology for effective monitoring and mitigation of the space debris environment.

110. The view was expressed that although active debris removal was of great importance for addressing current risks in the space environment, international efforts in the area of active debris removal should not detract from efforts to advance international cooperation on space debris mitigation.

111. The view was expressed that the ability to predict and warn satellite operators of potential collisions in real time through space surveillance and tracking was key to reducing the risk posed by debris to satellites during their operational missions.

112. The view was expressed that the increase in dangerous passages and collision avoidance manoeuvres during the past year was a matter of concern. The impact of solid particles on spacecraft had led to emergency situations.

113. The view was expressed that addressing the issue of space debris was a complex matter, and that the increase in the number of missions as a result of the creation of megaconstellations would likely worsen the situation.

114. The view was expressed that, in particular in the areas of space debris and space traffic management, common solutions to the space-related problems for which countries had common but differentiated responsibilities should be found in the context of the Committee, in cooperation with other relevant United Nations bodies, and in that regard, the role and responsibility of the Subcommittee in finding common ground in those areas was stressed.

## **VI. Space-system-based disaster management support**

115. In accordance with General Assembly resolution [77/121](#), the Subcommittee considered agenda item 8, entitled “Space-system-based disaster management support”.

116. The representatives of Algeria, Argentina, Austria, Canada, China, France, Germany, India, Indonesia, Iran (Islamic Republic of), Japan, Mexico, Nigeria, Pakistan, Paraguay, the Republic of Korea, the Russian Federation, the United Kingdom, the United States and Venezuela (Bolivarian Republic of) made statements under agenda item 8. During the general exchange of views, statements relating to the item were also made by representatives of other member States.

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

(a) “Space data usage and applications for disaster risk reduction and management in the Philippines”, by the representative of the Philippines;

(b) “Earth observation for responsive disaster management”, by the representative of the Republic of Korea;

(c) “APSCO data sharing for regional sustainability and member States emergency response”, by the observer for APSCO;

(d) “Supplementing Earth observation with social media data for disaster risk management”, by the observer for SGAC.

118. The Subcommittee had before it the report on activities carried out in 2022 in the framework of the United Nations Platform for Space-based Information for Disaster Management and Emergency Response (UN-SPIDER) ([A/AC.105/1270](#)).

119. The Subcommittee welcomed with appreciation the achievements of and the activities carried out by UN-SPIDER in 2022 and noted that space-based support for disaster risk reduction and emergency response was vital for addressing and mitigating the impact of natural disasters.

120. The Subcommittee noted that, with the continued support of its network of partners, including the regional support offices, UN-SPIDER had carried out the following activities during 2022:

- (a) Technical advisory mission to Armenia, from 27 June to 1 July;
- (b) Technical advisory mission to the Philippines, from 26 to 30 September;
- (c) Technical advisory mission to Paraguay, from 21 to 25 November;
- (d) Institutional strengthening mission to Ghana, from 9 to 12 May;
- (e) Institutional strengthening mission to Nigeria, from 12 to 16 September;
- (f) Virtual support to the Dominican Republic, on 26 and 27 July;
- (g) Technical advisory support to Sri Lanka, in January;

(h) Technical advisory support to Mongolia, in January and February and from September to December.

121. As part of those activities, specific requirements had been addressed and follow-up support had been provided to countries in which UN-SPIDER technical advisory missions had been carried out in previous years.

122. The Subcommittee noted with satisfaction that UN-SPIDER had delivered tailored space-based information and resources that had helped to strengthen the capacity of States to effectively respond to disasters triggered by natural hazards.

123. The Subcommittee noted the continued outreach activities, including webinars and virtual expert meetings, carried out by the Office for Outer Space Affairs through UN-SPIDER, and the Office’s partnerships with United Nations entities, international organizations and Member States aimed at continuing to promote the use of space-based tools and information to support disaster management and disaster risk reduction.

124. Some delegations expressed the view that, while they had developed their own disaster management and emergency response procedures that utilized the expertise and resources of their national actors and space agencies to provide early warning and response services, national responses were facilitated and strengthened by the provision of space-based imagery and data sourced both through their own space activities and through ongoing cooperation mechanisms such as the Charter on Cooperation to Achieve the Coordinated Use of Space Facilities in the Event of Natural or Technological Disasters (International Charter on Space and Major Disasters), the Copernicus Emergency Management Service, the Sentinel Asia project and UN-SPIDER. The delegations expressing that view also expressed the view that such cooperation was particularly relevant and important in providing rapid access to satellite imagery and derived information during devastating disasters affecting large areas, such as the recent earthquake that had severely affected the Syrian Arab Republic and Türkiye.

125. Some delegations expressed the view that disasters triggered by natural hazards, especially those connected to hydrometeorological events and forest fires, had become more frequent and severe and had resulted in increased loss of life, property damage and economic disruption in 2022, and that national authorities would

increasingly need access to satellite imagery and data services in order to continue to provide essential services to affected populations. The delegations expressing that view also expressed the view that a multilateral approach and international collaboration were crucial for responding to those challenges, which were seen as resulting from continued climate change.

126. Some delegations expressed the view that it was important to contribute to international coordination mechanisms to support disaster recovery, noting that the provision of Earth observation imagery and data and the activities of the network of regional support offices of UN-SPIDER, were useful examples of such cooperative efforts.

127. The view was expressed that, through the Recovery Observatory, a pilot project of CEOS, satellite imagery acquisition and the subsequent analysis of such imagery were being coordinated with the aim of contributing to reconstruction and recovery efforts.

128. The Subcommittee noted the financial and staff resources that had been contributed by China, France and Germany to UN-SPIDER and the in-kind contributions, including the provision of experts, made by some States members of the Committee and by the regional support offices in 2022 in support of the activities conducted by the Office for Outer Space Affairs through UN-SPIDER, as well as their efforts to share experiences with other interested countries.

## VII. Recent developments in global navigation satellite systems

129. In accordance with General Assembly resolution [77/121](#), the Subcommittee considered agenda item 9, entitled “Recent developments in global navigation satellite systems”, and reviewed matters related to the International Committee on Global Navigation Satellite Systems (ICG), the latest developments in the field of global navigation satellite systems (GNSS) and new GNSS applications.

130. The representatives of Algeria, China, France, India, Indonesia, Italy, Japan, Pakistan, the Republic of Korea, the Russian Federation, the United Arab Emirates and the United States made statements under agenda item 9. During the general exchange of views, statements relating to the item were made by representatives of other member States.

131. The Subcommittee heard the following technical presentations:

(a) “BeiDou Navigation Satellite System: featured services and applications”, by the representative of China;

(b) “GNSS space service volume and lunar GNSS activities”, by the Co-Chair of the space use subgroup of the ICG working group on enhancement of GNSS performance.

132. The Subcommittee had before it the following:

(a) Note by the Secretariat on the sixteenth meeting of the International Committee on Global Navigation Satellite Systems ([A/AC.105/1276](#));

(b) Report of the Secretariat on activities carried out in 2022 in the framework of the workplan of the International Committee on Global Navigation Satellite Systems ([A/AC.105/1278](#));

(c) Report on the United Nations International Meeting on the Applications of Global Navigation Satellite Systems ([A/AC.105/1290](#)).

133. The Subcommittee noted that satellite-based navigation was a key enabling technology and innovation driver for the modern economy, and that ICG was an important platform for communication and cooperation in the field of GNSS, especially in the areas of compatibility and interoperability among the different systems and GNSS spectrum protection and interference detection. It also noted that

a technical booklet on the importance of GNSS spectrum protection and interference detection and mitigation was currently being developed by the executive secretariat of ICG.

134. The Subcommittee noted with satisfaction that the sixteenth meeting of ICG and the twenty-sixth meeting of the Providers' Forum, organized by the United Arab Emirates Space Agency on behalf of the Government of the United Arab Emirates, had been held in Abu Dhabi from 9 to 14 October 2022. It also noted that an expert seminar on low Earth orbit positioning, navigation and timing had been held in conjunction with the meeting and that the participants in the expert seminar had discussed how positioning, navigation and timing services could be offered through low Earth orbit satellite constellations. The Subcommittee also noted that the seventeenth meeting of ICG would be organized by the European Union and held in Madrid from 15 to 20 October 2023.

135. The Subcommittee expressed its appreciation to the Office for Outer Space Affairs for serving as the executive secretariat of ICG and its Providers' Forum and expressed its satisfaction with the efforts of the Office in promoting the use of GNSS, particularly in developing countries. The Subcommittee noted that, with education and capacity-building forming the core of the ICG programme on GNSS applications, and pursuant to the ICG workplan, the Office for Outer Space Affairs had organized a series of training courses and technical seminars and had supported follow-up projects in various fields of science and industry, including in the field of ionospheric research using GNSS technologies.

136. The Subcommittee noted that the Global Positioning System (GPS) of the United States remained a reliable pillar throughout the world and that the United States had continued to upgrade the capability of and service provided by GPS through the integration of the newest generation of satellites, GPS Block III, which were broadcasting the third civil signal, L1C. The Subcommittee also noted that the sixth GPS Block III satellite vehicle had been launched on 18 January 2023, bringing the total number of GPS Block III satellites in orbit to six. In addition, new capabilities and enhancements to the GPS Block IIF satellites were being designed. Those satellites would also host, as part of the United States contribution to the International Satellite System for Search and Rescue (COSPAS–SARSAT), a laser retroreflector array to enable the precise optical laser ranging of GPS satellites and a search-and-rescue repeater to relay distress signals to rescuers.

137. The Subcommittee further noted that, in 2022, the United States Coast Guard Navigation Center had secured the public release of the antenna patterns for GPS Block III, which would further improve the ability of space mission planners to conduct accurate analyses of the extent to which GPS could support their space missions.

138. The Subcommittee noted that the service provided by the Global Navigation Satellite System (GLONASS) of the Russian Federation operated on the basis of open access navigation signals in the L1 and L2 radio frequency bands. In 2022, three satellites had been launched, two of which were part of the third generation of the GLONASS constellation, namely, the GLONASS-K satellite. Those satellites, which were equipped with on-board radio systems for intersatellite communication and ranging, improved positioning accuracy, thereby providing services to a broader range of users. Additionally, five GLONASS-K services integrated into COSPAS–SARSAT system facilitated the registration of emergency signals and thus improved the efficiency of search and rescue operations.

139. The Subcommittee also noted that 10 GLONASS satellites had been broadcasting the third open access signal in the L3 radio frequency band. Further gradual rejuvenation of the GLONASS constellation would ensure that the high-precision navigation services provided continued to be improved and that a decimetre-level accuracy of real-time positioning could be achieved by the integrated use of GLONASS with other GNSS.

140. The Subcommittee noted that, in 2022, the BeiDou Navigation Satellite System (BDS) constellation of China had been further improved and that its applications had expanded to offer a broader range of higher-quality public services. BeiDou-3, also referred to as the “BeiDou system”, had been completed and provided global, all-weather, all-round, high-precision positioning, navigation and timing services. Regarding the BeiDou satellite-based augmentation service platform, the Subcommittee also noted that the Civil Aviation Administration of China had begun the process for the certification of its single-frequency service and that, at the trial operation stage, positioning accuracy, alarm time, integrity risk and other indicators had met the requirements. Meanwhile, in terms of the ground-based augmentation system, real-time centimetre-level and post-event millimetre-level high-precision services had been provided within China for industry and public sector users.

141. The Subcommittee further noted that the BeiDou system had been adopted as the third operator to provide tracking systems for ships after having been given a certificate by the International Maritime Organization. The BeiDou message service system would offer an additional means of communicating shipping distress and safety messages. The Subcommittee noted that the BeiDou system would become increasingly integrated with emerging technologies such as 5G, artificial intelligence and big data, which would enable it to make an even greater contribution to the development of human society.

142. The Subcommittee noted that India was pursuing two paths as part of its satellite navigation programme. The GPS-aided Geostationary Augmented Navigation System (GAGAN), a satellite-based augmentation system, had been established to provide more accurate positioning information for use in civil applications. The Indian Regional Navigation Satellite System, also known as “Navigation with Indian Constellation” (NavIC), had been implemented as an independent regional navigation system, and the NavIC signal-in-space interface control document had been made available to the public to enable the production of user receivers. Currently, more than 35 mobile telephone models released in India had NavIC capability; that number would increase with the introduction of 5G-enabled telephones.

143. The Subcommittee also noted that, in 2022, India had worked on developing the International Electrotechnical Commission standard for NavIC-based shipborne receiver equipment. It further noted that the NavIC-based safety-of-life alert dissemination system had been in operation for fishers to issue alerts about impending disasters. Additionally, an initiative had been launched to issue alerts in respect of terrestrial disasters such as landslides, earthquakes, floods, heavy rains and avalanches through the NavIC system; and appropriate updates to the NavIC message system were being carried out.

144. The Subcommittee noted that the Quasi-Zenith Satellite System (QZSS) of Japan, also known as “Michibiki”, had been operating as a four-satellite constellation, of which the QZS-1R satellite had become fully operational in March 2022. QZSS was currently providing three types of services: a service complementing GPS that transmitted ranging signals from satellites; a high-accuracy service that augmented GNSS by providing error corrections through QZSS; and a short messaging service to contribute to disaster risk reduction. The Subcommittee also noted that the QZSS constellation would be expanded to a total of seven satellites sequentially from 2024.

145. The Subcommittee further noted that Japan had begun a GNSS augmentation trial service for high-accuracy applications based on a precise point positioning (PPP) technique known as the Multi-GNSS Advanced Demonstration Tool for Orbit and Clock Analysis (MADOCA-PPP) and an early warning service for the Asia and Oceania regions. The two services would start operating in 2024 and 2025, respectively. Japan had also been supporting Multi-GNSS Asia to encourage GNSS service providers and user communities to develop new applications and businesses.

146. The Subcommittee noted that Italy had been involved in the development and operation of the European Satellite Navigation System (Galileo) and was pursuing technical developments for future systems. The Subcommittee also noted that Galileo

was currently demonstrating state-of-the-art performance and offering high-accuracy services. In the framework of ESA and European Union navigation programmes, Italy was participating in the GPS Environmental and Earth Science Information System (GENESIS), which would enhance the accuracy of the Earth space reference system and improve the precise orbit determination of Galileo and other satellites. Italy was also pursuing the extension of satellite navigation technologies to the field of planetary exploration, starting with the Moon.

147. The Subcommittee noted that France had participated in the development and operation of Galileo and was pursuing the technical development of future systems. It was also noted that France had underlined the role of its space agency and industries in the design and operation of the Galileo programme. France also presented the positive contributions of the European Geostationary Navigation Overlay Service (EGNOS) and indicated its participation in the development of a satellite-based augmentation system programme dedicated to civil aviation together with States members of the Agency for the Safety of Air Navigation in Africa and Madagascar.

148. The Subcommittee noted that Algeria was taking short-, medium- and long-term measures to make the AL-SBAS satellite-based augmentation system compliant with the ICAO standards and recommended practices contained in annex 10 to the Convention on International Civil Aviation, as well as the corresponding minimum operational performance specifications of the Radio Technical Commission for Aeronautics and the European Organisation for Civil Aviation Equipment. This would make it interoperable with other satellite-based augmentation systems, ensuring a seamless transition for aircraft travelling to and from other satellite-based augmentation system service areas.

149. The Subcommittee noted that Pakistan, through the Space and Upper Atmosphere Research Commission (SUPARCO), had promoted the development of a complete ecosystem to provide users with the GNSS infrastructure, as well as the technology and end-to-end solutions support for using the infrastructure. SUPARCO had also been enabling precise positioning through a ground-based augmentation system, utilizing real-time kinematic network technology, to meet the precise positioning requirements of the civil sector. Assistance was also being provided to the civil aviation sector through the implementation of GNSS technology for safe, secure and efficient airport operations.

150. The Subcommittee noted with appreciation that Indonesia had reported on its research projects and activities focused on the application of GNSS technology, including the development of an ionospheric tsunami power index to detect tsunamis and a regional ionospheric total electron content map.

151. The Subcommittee noted that, in 2022, the Korean Positioning System development programme, a regional satellite system of the Republic of Korea, had been officially initiated. The first satellite was to be launched in 2027, and the satellite constellation was planned to be completed by 2035. The Subcommittee also noted that the Republic of Korea was currently developing a satellite-based augmentation system named the Korea Augmentation Satellite System. The first geostationary satellite of the System had been launched in June 2022, and the safety-of-life services would be provided starting at the end of 2023.

## VIII. Space weather

152. In accordance with General Assembly resolution [77/121](#), the Scientific and Technical Subcommittee considered agenda item 10, entitled “Space weather”.

153. The representatives of Algeria, Argentina, Australia, Belgium, Brazil, China, France, India, Indonesia, Iran (Islamic Republic of), Italy, Japan, Kazakhstan, Kenya, Mexico, Nigeria, Pakistan, the Republic of Korea, the Russian Federation, South Africa, Thailand, the United Kingdom and the United States made statements under agenda item 10. The observer for COSPAR also made a statement under the item.

During the general exchange of views, statements relating to the item were made by representatives of other member States.

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

(a) “Study and monitoring of the Earth magnetic field using FASat Charlie’s magnetometer”, by the representative of Chile;

(b) “Progress of the space weather operations of the China Meteorological Administration”, by the representative of China;

(c) “Japanese contribution to space weather research and operations”, by the representative of Japan;

(d) “On the current situation in developing national space situational awareness at Omarov Assy-Turgen Observatory”, by the representative of Kazakhstan;

(e) “Norwegian space weather activities in the Arctic”, by the representative of Norway;

(f) “Operating experience of the Russian segment of the China-Russian Federation consortium of the global space weather centre in support of international air navigation”, by the representative of the Russian Federation;

(g) “Space weather—a risk to economic vitality and national security: South Africa’s solution”, by the representative of South Africa;

(h) “Report on progress following the lead efforts of Committee on Peaceful Uses of Outer Space Activities, COSPAR, WMO and ISES to improve global coordination of space weather activities”, by the observer for COSPAR;

(i) “An update on the recent activities of SCOSTEP”, by the observer for SCOSTEP;

(j) “Emerging frontiers in heliophysics/space weather enabled by artificial intelligence and public-private partnerships”, by the observer for SCOSTEP.

155. The Subcommittee had before it the following:

(a) Report on the United Nations/Azerbaijan workshop on the International Space Weather Initiative: the Sun, Space Weather and Geosphere, held in Baku from 31 October to 4 November 2022 ([A/AC.105/1275](#));

(b) Final report of the Expert Group on Space Weather: towards improved international coordination for space weather services ([A/AC.105/C.1/122](#)).

156. The Subcommittee noted that space weather, affected by solar variability, was an international concern, owing to its potential threat to space systems, human space flight, ground- and space-based infrastructure and aviation activity upon which society increasingly relied. As such, it needed to be addressed in a global manner, through international cooperation and coordination, in order to be able to predict potentially severe space weather events and mitigate their impact to guarantee safety and sustainability of outer space activities.

157. The Subcommittee noted a number of national and international activities undertaken in the space weather research, training and education to improve scientific and technical understanding of adverse space weather effects, with the aim of strengthening space weather resilience.

158. The Subcommittee also noted the importance of the work of WMO, including the development of its technical and regulatory framework for space weather and the opportunities offered by its Integrated Global Observing System and related systems, as well as the importance of the engagement of Member States with COSPAR in developing international space weather action teams for scientific research in support of transitional efforts related to research for operations, and their engagement in the space weather-related work of ITU and ISES.



159. The Subcommittee noted that activities related to space weather could have an impact on aviation and, in particular, could potentially interrupt high-frequency communications and satellite navigation. In that regard, the Subcommittee noted the importance of the four ICAO global space weather information centres, which were tasked with providing the civil aviation sector with information about space weather that could potentially affect communications, navigation and the health of passengers and crew.

160. Some delegations expressed views on the importance of the implementation of the Guidelines for the Long-term Sustainability of Outer Space Activities of the Committee ([A/74/20](#), annex II), in particular guidelines B.6 and B.7, which concerned the safety of space operations.

161. The view was expressed that in order to improve research and the predictability of space weather, further information-gathering would be beneficial. In that connection, the private sector could contribute to the monitoring of the upper atmosphere and the near-Earth space environment.

162. The Subcommittee expressed its appreciation to the Expert Group on Space Weather for its work and for its final report ([A/AC.105/C.1/122](#)) and the recommendations contained therein.

163. The Subcommittee took note of the collaboration between COSPAR, WMO and ISES on space weather coordination efforts, and it noted that the collaboration represented action taken in response to the recommendations contained in the final report of the Expert Group.

164. The Subcommittee noted that the information gathered from member States through a survey led by the Expert Group, which served as the basis of the Expert Group's final report, would be transferred to WMO to improve international coordination of space weather activities.

## **IX. Near-Earth objects**

165. In accordance with General Assembly resolution [77/121](#), the Scientific and Technical Subcommittee considered agenda item 11, entitled "Near-Earth objects".

166. The representatives of Austria, Canada, China, France, Iran (Islamic Republic of), Italy, Japan, the Republic of Korea, the Russian Federation and the United States made statements under agenda item 11. Statements were also made by the observers for IAWN and SMPAG. During the general exchange of views, statements relating to the item were made by representatives of other member States.

167. The Subcommittee heard a scientific and technical presentation by the representative of Italy on the Light Italian CubeSat for Imaging of Asteroids (LICIACube): the Italian small satellite for the close-up observation of the impact of the Double Asteroid Redirection Test (DART) of the National Aeronautics and Space Administration (NASA) on the asteroid Dimorphos.

168. The Subcommittee heard status reports by IAWN and SMPAG and noted with appreciation the increased international cooperation and efforts being undertaken by them to share information with regard to discovering, monitoring and physically characterizing potentially hazardous near-Earth objects in order to ensure that all nations, in particular developing countries with limited capacity to predict and mitigate the impact of a near-Earth object, were aware of the potential hazard of impact by an asteroid.

169. The Subcommittee noted that some 36.5 million observations of asteroids and comets had been collected in 2022 by the worldwide network of astronomical observatories, based in more than 40 countries. It also noted that the total number of known near-Earth objects came to 31,366 as at 5 February 2023, of which a record number of 3,190 had been discovered in 2022, and that currently a total of 2,328 catalogued asteroids with approximate diameters of 140 m or more had orbits

that brought them within 8 million km of Earth's orbit. In that regard, the Subcommittee also noted that, although that number seemed high, it was estimated that only about 42 per cent of the near-Earth objects in that size range had been found.

170. The Subcommittee noted that there were many national and international efforts and activities aimed at developing capabilities for the discovery, observation, early warning and mitigation of a potentially hazardous near-Earth object and that it was important to strengthen international collaboration and share information. In that regard, the Subcommittee noted the importance of contributing to the work of IAWN and SMPAG.

171. The Subcommittee noted the first-ever successful demonstration of the kinetic impact deflection technique, which was carried out by NASA on 26 September 2022. The NASA DART mission was the first planetary defence technology demonstration mission that altered the motion of a natural celestial body. In that regard, the Subcommittee noted that that mission involved international collaboration, including the contribution made by the Italian Space Agency (ASI) through its LICIA Cube. It also noted that experts from around the world were participating in evaluating the mission's results using Earth-based telescopes. The Subcommittee further noted that, as a follow-up, the Hera mission of ESA had been planned. The aim of the mission was to encounter the Didymos asteroid system in 2026, with a view to providing a valuable assessment of the deflection technique test of the DART mission.

172. The Subcommittee noted that the IAWN steering committee was generally holding review meetings twice a year, most recently on 7 February 2023, in conjunction with the sixtieth session of the Subcommittee. There were currently 50 signatories to the IAWN Statement of Intent, representing independent astronomers, observatories and space institutions from over 20 countries.

173. The Subcommittee noted that the signatories to the IAWN Statement of Intent recognized the importance of collaborative data analysis and of being adequately prepared for communications with a variety of audiences about near-Earth objects, their close approaches to the Earth and Earth impact risks. It was further noted that more information was available on the IAWN website, hosted by the University of Maryland (United States), at <http://iawn.net>.

174. The Subcommittee noted that, in 2022, the IAWN had conducted a coordinated campaign to observe a well-known near-Earth asteroid, 2005 LW3, which served as a second evaluation of the technical capabilities of the worldwide observing network. A record 82 observatories around the world participated.

175. The Subcommittee also noted that the worldwide astronomical community continued to observe the Didymos system in the weeks that followed the world's first attempt to change the motion of a body in space. In that regard, the Subcommittee noted the important role of the IAWN signatories that participated in conducting the critical measurements, helping to confirm the kinetic impactor as a tested, viable option for asteroid threat mitigation.

176. The Subcommittee noted that, should a credible threat of impact be discovered by the network, available information would be provided by IAWN and disseminated to all Member States through the Office for Outer Space Affairs.

177. The Subcommittee noted that, since the previous session of the Subcommittee, SMPAG had held two meetings: its nineteenth meeting, on 19 and 20 October 2022, and its twentieth meeting, on 8 and 9 February 2023, chaired by ESA as the re-elected Chair for the period 2023–2025, and supported by the Office for Outer Space Affairs as the permanent secretariat to SMPAG pursuant to General Assembly resolution 71/90. The Subcommittee was informed of the progress made in the work of SMPAG, as contained in the summary reports of the meetings (available at <http://smpag.net>).

178. The Subcommittee noted that SMPAG currently had 18 members and 7 permanent observers. It took note of the indication of interest expressed by space

agencies from Canada, India and Kenya to join SMPAG. In that regard, the Subcommittee noted that States and their space agencies and offices that were not yet members of SMPAG and were interested in contributing to its work were invited to express such interest in a letter to the Chair of SMPAG, with a copy to the secretariat.

179. The Subcommittee noted that SMPAG, at the meetings held since the previous session of the Subcommittee, had exchanged information on the ongoing and planned activities of its members related to planetary defence, from both a technical and policy standpoint. It also noted that SMPAG had been briefed, inter alia, on ongoing sample return missions, namely the Hayabusa2 extended mission and OSIRIS-REx, and on the DART and Hera planetary defence-related missions.

180. The Subcommittee noted the progress made in the first hypothetical impact threat exercise of SMPAG, which was launched in 2021, under the lead of the Italian Space Agency and the Polytechnic University of Milan. The primary objective of the exercise was to simulate a case of a hypothetical threat caused by an asteroid and to focus on SMPAG procedures to develop coordinated advice for a response to such an impact threat. In that regard, the Subcommittee noted that the first phase of the exercise, which focused on national procedures, had been completed, and that the second phase would concentrate on the coordination of tasks among SMPAG members.

181. The Subcommittee recalled an initiative that built on the unique opportunity presented by a close approach by the asteroid 99942 Apophis in 2029 to look at the possibility of organizing a United Nations-designated international year of asteroid impact hazard awareness in 2029, and that a small working group comprising interested members and observers of IAWN and SMPAG had been set up to work on the proposal.

182. The Subcommittee noted that the eighth IAA Planetary Defense Conference would be held from 2 to 7 April 2023 in Vienna, at the Austrian Academy of Sciences and at the Vienna International Centre. The conference was being hosted by the Office for Outer Space Affairs, in cooperation with ESA and the Commission of Geosciences of the Austrian Academy of Sciences.

183. The Subcommittee noted that the next meetings of the IAWN steering committee and of SMPAG were planned for 7 October 2023 and 8 and 9 October 2023, respectively, and were to be held in the United States.

## **X. Long-term sustainability of outer space activities**

184. In accordance with General Assembly resolution [77/121](#), the Subcommittee considered agenda item 12, entitled “Long-term sustainability of outer space activities”.

185. The representatives of Australia, Austria, Algeria, Belarus, Canada, Chile, China, Finland, France, Germany, India, Indonesia, Iran (Islamic Republic of), Italy, Japan, Luxembourg, Malaysia, Mexico, New Zealand, Pakistan, Peru, Philippines, the Republic of Korea, Romania, the Russian Federation, Rwanda, South Africa, Spain, Switzerland, Thailand, the United Kingdom, the United States and Venezuela (Bolivarian Republic of) made statements under agenda item 12. During the general exchange of views, statements relating to the item were also made by representatives of other member States.

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

- (a) “Green manufacturing contributes to space development”, by the representative of China;
- (b) “Satellite retroreflectors and laser ranging for space traffic management”, by the representative of Germany;
- (c) “Making space sustainable” by the representative of the United States;

(d) “Managing the plume effect for sustainable lunar operations”, by the observer for For All Moonkind;

(e) “Need for international cooperation and collaboration for safe and sustainable Moon operations” by the observer for the International Association for the Advancement of Space Safety;

(f) “Concentrated lunar resources”, by the observer for the National Space Society;

(g) “Empowering the next generation: the key to long-term sustainability in outer space activities”, by the observer for SGAC;

(h) “Update on the Consortium for Execution of Rendezvous and Servicing Operations (CONFERS) and industry standards for satellite servicing”, by the observer for SWF.

187. The Subcommittee had before it the following:

(a) Working paper by the Chair of the Working Group on the Long-term Sustainability of Outer Space Activities containing ideas for an information repository and for the agenda of the workshop to be held in 2024 ([A/AC.105/C.1/L.404](#));

(b) Note by the Secretariat containing information and views for consideration by the Working Group on the Long-term Sustainability of Outer Space Activities (Canada, Japan, United Kingdom, International Astronomical Union, International Organization for Standardization and World Space Week Association) ([A/AC.105/C.1/L.409](#));

(c) Note by the Secretariat containing information and views for consideration by the Working Group on the Long-term Sustainability of Outer Space Activities (India, Russian Federation and United States) ([A/AC.105/C.1/L.409/Add.1](#));

(d) Note by the Secretariat containing information and views for consideration by the Working Group on the Long-term Sustainability of Outer Space Activities (Algeria; Austria, Chile, Slovakia and Spain; France; and Committee on Space Research) ([A/AC.105/C.1/L.409/Add.2](#));

(e) Note by the Secretariat containing information and views for consideration by the Working Group on the Long-term Sustainability of Outer Space Activities (Australia, Brazil, Iran (Islamic Republic of), New Zealand, Norway, European Space Agency and European Organization for Astronomical Research in the Southern Hemisphere) ([A/AC.105/C.1/L.409/Add.3](#));

(f) Note by the Secretariat containing information and views for consideration by the Working Group on the Long-term Sustainability of Outer Space Activities (Austria, China, Germany, Italy, European Union, CANAEUS International and Moon Village Association) ([A/AC.105/C.1/L.409/Add.4](#));

(g) Conference room papers submitted by Australia containing input to the Working Group on the Long-term Sustainability of Outer Space Activities ([A/AC.105/C.1/2023/CRP.3](#) and [A/AC.105/C.1/2023/CRP.6](#));

(h) Conference room paper submitted by the Russian Federation containing a methodology for the identification, elaboration and further consideration of new draft guidelines for the long-term sustainability of outer space activities ([A/AC.105/C.1/2023/CRP.4](#));

(i) Conference room paper submitted by Brazil containing a review of the Guidelines for the Long-term Sustainability of Outer Space Activities ([A/AC.105/C.1/2023/CRP.7](#));

(j) Conference room paper submitted by Canada containing an update on its reporting approach for the voluntary implementation of the Guidelines for the Long-term Sustainability of Outer Space Activities ([A/AC.105/C.1/2023/CRP.8](#));

(k) Conference room paper submitted by Germany containing information on implementation of the Guidelines for the Long-term Sustainability of Outer Space Activities in Germany (A/AC.105/C.1/2023/CRP.9);

(l) Conference room paper submitted by India containing inputs to the Working Group on the Long-term Sustainability of Outer Space Activities (A/AC.105/C.1/2023/CRP.10);

(m) Conference room paper submitted by Italy containing information on voluntary implementation of the Guidelines for the Long-term Sustainability of Outer Space Activities by Italy (A/AC.105/C.1/2023/CRP.11);

(n) Conference room paper submitted by the European Union containing the European Union joint contribution on the implementation of the Guidelines for the Long-term Sustainability of Outer Space Activities (A/AC.105/C.1/2023/CRP.12);

(o) Conference room paper submitted by the International Organization for Standardization containing information on implementation of the Guidelines for the Long-term Sustainability of Outer Space Activities (A/AC.105/C.1/2023/CRP.13);

(p) Conference room paper submitted by the National Space Society containing information and views for consideration by the Working Group on the Long-term Sustainability of Outer Space Activities (A/AC.105/C.1/2023/CRP.15);

(q) Conference room paper submitted by Canada containing consideration of areas for possible new guidelines concerning the long-term sustainability of outer space activities (A/AC.105/C.1/2023/CRP.17);

(r) Conference room paper submitted by Austria containing a report on the voluntary implementation of the Guidelines for the Long-term Sustainability of Outer Space Activities (A/AC.105/C.1/2023/CRP.19);

(s) Conference room paper submitted by Norway containing an updated report on the voluntary implementation of the Guidelines for the Long-term Sustainability of Outer Space Activities in Norway (A/AC.105/C.1/2023/CRP.21);

(t) Conference room paper submitted by the United States containing the reporting by the United States on national implementation of the Guidelines for the Long-term Sustainability of Outer Space Activities (A/AC.105/C.1/2023/CRP.22);

(u) Conference room paper submitted by the Russian Federation containing an analysis of the Guidelines for the Long-term Sustainability of Outer Space Activities, adopted as a result of the sixty-second session of the Committee on the Peaceful Uses of Outer Space (A/AC.105/C.1/2023/CRP.26);

(v) Conference room paper submitted by the Hague Institute for Global Justice containing information on the Washington Compact on Norms of Behaviour for Commercial Space Operations (A/AC.105/C.1/2023/CRP.27);

(w) Conference room paper submitted by Japan containing a report on the implementation of the Guidelines for the Long-term Sustainability of Outer Space Activities in Japan (A/AC.105/C.1/2023/CRP.28);

(x) Conference room paper submitted by Canada, Italy, Japan, Luxembourg, New Zealand, the United Kingdom and the United States containing a practical and inclusive approach to identifying and studying challenges and considering possible new guidelines (A/AC.105/C.1/2023/CRP.31/Rev.2);

(y) Non-paper by the Chair the Working Group containing possible decisions to be taken by the Working Group at the sixtieth session of the Subcommittee.

188. In accordance with General Assembly resolution [77/121](#), the Working Group on the Long-term Sustainability of Outer Space Activities was reconvened at the present session, with Umamaheswaran R. (India) as Chair.

189. The Subcommittee noted the interconnection between the growing number of objects being launched into outer space, the increasing complexity of space operations

and the continuing importance of its work addressing the long-term sustainability of outer space activities.

190. The Subcommittee was informed of a number of measures that had been or were being undertaken to implement the Guidelines for the Long-term Sustainability of Outer Space Activities of the Committee (A/74/20, annex II). Those measures included, inter alia, the development of national space strategies and policies, including road maps and master plans; the creation, review and updating of relevant domestic legislation and regulation; the ratification of relevant international treaties; the enhanced registration of space objects; the revision of licencing processes; the streamlining of licensing procedures for small satellites; updates to rules on orbital debris mitigation for commercial, amateur, and experimental satellites; improvements to government and commercial space situational awareness capabilities to detect, track and identify both active space objects and debris; launch collision avoidance carried out for different lift-off timings within an entire launch window; expanded government-commercial partnerships to increase communications, exchange data and establish best practices for autonomous spacecraft collision avoidance; improved post-mission disposal of satellites; the design of spacecraft to prevent the dispersion of components; the adoption of measures to address the risks associated with uncontrolled reentry of space objects; the controlled re-entry of satellites in uninhabited regions over the ocean; regional coordination on space traffic management; the release of an orbital debris research and development implementation plan; more efficient and effective inter-agency cooperation on space debris; participation in the Inter-Agency Space Debris Coordination Committee, the IAA Space Debris Working Group, the IAF Space Traffic Management Technical Committee, ISO Working Group 7 on information communities, and the Subcommittee on Space Technology and Applications under the Association of Southeast Asian Nations; cooperation with domestic and international partners to specify, predict and forecast space weather; new dedicated commercial space-based space weather monitoring system capabilities; active debris removal missions; contributions to international cooperation and rule-making to enhance debris mitigation and remediation measures; facilitation of capabilities for in-space servicing, assembly and manufacturing; national guidelines that prescribe requirements to ensure safe, secure and transparent performance of on-orbit servicing; the strengthening of national resources and dedicated funding devoted to the sustainability of space activities; and awareness-raising and outreach to industry and the private sector, academia and other stakeholders on the topic of long-term sustainability of outer space activities.

191. The Subcommittee was also informed of various initiatives linked to the Guidelines for the Long-term Sustainability of Outer Space Activities, including their implementation. Those initiatives were, among others, the European Union space surveillance and tracking initiative (EU-SST); the BRICS Joint Committee for Space Cooperation; space situational awareness services and information shared through space-track.org; the “Statement for a responsible space sector”, a non-legally binding instrument expressing a commitment to the long-term sustainability of space projects and towards a socially and environmentally responsible management of space activities; international cooperation opportunities related to the International Space Station and the China Space Station; the Global Network Forum on International Cooperation on Lunar and Deep Space Exploration of China; the Space Sustainability Rating, implemented by the Swiss Federal Institute of Technology in Lausanne, Switzerland; the Summit for Space Sustainability co-hosted by the United Kingdom Space Agency and SWF in June 2022; an international workshop on space situational awareness and space traffic management organized by India in January 2023; a technical working group on orbital debris protocols in the Philippines; a national space data centre initiated in Thailand; the development of the Model for Ocean-Land-Atmosphere prediction (MONAN), a community model of the Earth system, in Brazil; the SpaceResources.lu initiative of Luxembourg; the Unispace Nanosatellite Assembly and Training capacity-building programme of the Indian Space Research Organization (ISRO); capacity-building undertaken through

collaboration with APSCO; the capacity-building work of the Asia-Pacific Regional Space Agency Forum; training and capacity-building opportunities offered through the regional centres for space science and technology education, affiliated to the United Nations; the project of the Office for Outer Space Affairs entitled “Awareness-raising and capacity-building related to the implementation of the LTS Guidelines”, funded by the United Kingdom; the project of the Office for Outer Space Affairs entitled “Space law for new space actors”, funded by multiple donors, including Belgium, Chile, France, Japan, Luxembourg, APSCO and SWF; and the project of the Office for Outer Space Affairs entitled “The Registration Project: supporting implementation of treaty obligations related to the registration of objects launched into outer space”, funded by the United Kingdom.

192. Some delegations expressed the view that the adoption of the Guidelines by the Committee in 2019 was a milestone achievement on which to continue to build, that the Guidelines assist States in adopting appropriate instruments and good practices for the sustainable use of outer space and that they encourage scientific research, capacity-building and international collaboration.

193. Some delegations expressed the view that Member States of the United Nations should implement the Guidelines in order to protect outer space from long-lived debris and ensure long-term orbital sustainability.

194. The view was expressed that implementation of the Guidelines should aim to promote the safe and sustainable use of outer space in the interest of all countries regardless of their level of economic or scientific development, without discrimination of any kind, including the principle of equity, and should emphasize the importance of international cooperation and the transfer of technology as effective means of promoting research programmes and build capacity in countries with emerging space sectors.

195. The view was expressed that while the adoption of the Guidelines for the Long-term Sustainability of Outer Space Activities was an important step, the adopted Guidelines ignored significant issues related to the safety of space operations. The delegation expressing this view referred to the conference room paper A/AC.105/2022/CRP.11, the content of which had first been made available in June 2022, and the views contained therein, which could provide a thematic basis for new draft guidelines.

196. Some delegations expressed the view that discussion of possible areas of new guidelines in the report of the Working Group on the Long-term Sustainability of Outer Space Activities should not disrupt the balanced approach proposed in conference room paper A/AC.105/C.1/2023/CRP.31/Rev.2 for advancing the consensus-based workplan contained in the Working Group’s terms of reference (A/AC.105/1258, annex II, appendix).

197. The view was expressed that one of the most important requirements for implementing the Guidelines was access to standardized and updated orbital data of space objects, that there was a dire need to have an international mechanism for the sharing of space situational awareness data and that, in that connection, the Office for Outer Space Affairs should pursue the creation and implementation of a database that would ensure free and non-discriminatory access to such data.

198. The view was expressed that contributions to the sustainability of outer space by States might be different according to their different technological capabilities and that all States had the right to benefit from space activities and must not be deprived from exploring or using outer space. The delegation expressing that view also expressed the view that, considering the efforts and the great desire of some space actors to provide broadband satellite Internet using megaconstellations and given the challenges posed by the placement of those systems in low Earth orbit, those challenges should be given high priority on the agenda of the Subcommittee and in the Working Group on the Long-term Sustainability of Outer Space Activities.

199. The view was expressed that the Committee on the Peaceful Uses of Outer Space was the correct multilateral forum to address topics relevant to safe and sustainable space activities, such as the new space economy and sustainable growth of the space sector.

200. The view was expressed that the Working Group on the Long-term Sustainability of Outer Space Activities should consider taking appropriate measures to promote the broad participation of developing and emerging countries in its discussions.

201. The view was expressed that, taking into account the security challenges addressed by the open-ended working group on reducing space threats through norms, rules and principles of responsible behaviours, established pursuant to General Assembly resolution [76/231](#), it was important to establish coordination mechanisms between the open-ended working group and the Working Group on the Long-term Sustainability of Outer Space Activities, through which the continuum of security and long-term sustainability of space activities would be intrinsically linked.

202. The view was expressed that the open-ended working group on reducing space threats through norms, rules and principles of responsible behaviours and the Working Group on the Long-term Sustainability of Outer Space Activities should both continue discussions following the unique mandate of each forum.

203. Some delegations expressed the view that General Assembly resolution [77/41](#), in which the Assembly called upon all States to commit not to conduct destructive direct-ascent anti-satellite missile tests, represented a commitment that was not solely a security issue but that also directly supported the long-term sustainability of the outer space environment and enabled the ongoing peaceful uses of outer space. The delegations expressing that view called upon States members of the Committee to consider making that commitment.

204. The view was expressed that, given the myriad of challenges being faced in the field of outer space activities, all global space actors, not only the traditional ones such as States but also industry and private companies, academia and civil society organizations, must take measures to address the issues and risks facing a new global order in space.

205. The view was expressed that the involvement of private actors in ongoing multilateral processes should be encouraged, as should the competitiveness and the innovative capacities of companies that provide solutions to the challenges associated with the long-term sustainability of space activities.

206. The view was expressed that the long-term sustainability of outer space activities must be extended to activities carried out on and around the Moon, that the current lack of coordination mechanisms for lunar activities posed a serious challenge to future missions and could lead to conflicts, and that the need to preserve the peaceful uses of outer space and a sustainable space exploration made it urgent to develop a common level playing field for upcoming lunar activities. That delegation, which considered that, at present, the promotion of voluntary cooperation on matters of mutual interest related to lunar operations, including an official exchange of information between the stakeholders involved in Moon activities, was of critical importance, as was mitigating the creation of space debris in lunar orbit, defining standards to enable interoperability, the coordination of safety zones and protection of the lunar environment, proposed a specific dedicated framework for debates and proposed measures focused mainly on operations on and around the Moon, to take the form of an international committee on lunar operations, which would report to the Committee and for which secretarial support would be provided by the Office for Outer Space Affairs.

207. Some delegations expressed the view that the IADC report on the status of the space debris environment provided critical insight into global compliance with space debris mitigation guidelines and the forecast environmental challenges that may be faced on-orbit. The delegations expressing that view were also of the view that the



report served as a timely reminder that global dialogue was essential for developing a common appreciation of the targets for a sustainable space environment that met the needs of the present generations while preserving the outer space environment for future generations.

208. At its 990th meeting, on 15 February, the Subcommittee endorsed the report of the Working Group, as contained in annex II to the present report.

## **XI. Future role and method of work of the Committee**

209. In accordance with General Assembly resolution [77/121](#), the Subcommittee considered agenda item 13, entitled “Future role and method of work of the Committee”.

210. The representatives of Canada, Chile, China, Indonesia, Iran (Islamic Republic of), Panama, Peru, the Russian Federation, Spain, the United Kingdom and the United States made statements under agenda item 13. A statement was made by the representative of South Africa on behalf of the Group of African States. The observer for IAA also made a statement under the item. During the general exchange of views, statements relating to the item were made by representatives of other member States.

211. The Subcommittee heard a technical presentation entitled “International consensus about standardization of interfaces for on-orbit servicing: a project held by the Space Generation Advisory Council”, by the observer for SGAC.

212. The Subcommittee had before it a note by the Secretariat on the governance and method of work of the Committee and its subsidiary bodies ([A/AC.105/C.1/L.408](#)).

213. The Subcommittee noted that the Committee and its subcommittees served as a unique platform for international cooperation in the peaceful uses of outer space.

214. Some delegations expressed the view that any rule-making activity aimed at the sustainable exploration, exploitation and utilization of outer space should be conducted within the framework of the Committee in order to avoid the fragmentation of governance of outer space activities.

215. The view was expressed that multiple parallel platforms for considering the subject matter that had been under the purview of the Committee for years were emerging and functioning without the consensus-based principle, and that one such platform was the open-ended working group established pursuant to General Assembly resolution [76/231](#).

216. Some delegations expressed the view that the Committee should focus on the safety and sustainability of outer space activities, while matters relating to security should be dealt with in the context of the United Nations disarmament platforms.

217. Some delegations expressed the view that the Committee should actively respond to new challenges in outer space and that it needed new approaches, tools and procedures to adjust to fast-paced space-related developments and activities.

218. The view was expressed that it was important to retain the intergovernmental nature of the governance of outer space activities.

219. Some delegations expressed the view that although non-governmental processes could benefit or supplement the work of the Committee in certain ways, such processes should not interfere with that work.

220. The view was expressed that the Committee could benefit from the latest research, practical experience and scientific practice through wider engagement with non-State actors, including the private sector and the scientific community, whether it was through more presentations or additional panel discussions.

221. The view was expressed that an international lunar year should be established in order to demonstrate how lunar activities could be carried out responsibly, and that

it could result in the open sharing of scientific data with the public and the international scientific community.

222. The view was expressed that the Committee could play a key role in facilitating access to databases to support the voluntary implementation of the Guidelines for the Long-term Sustainability of Outer Space Activities of the Committee ([A/74/20](#), annex II).

223. The view was expressed that discrimination with respect to certain Member States of the United Nations willing to participate in the work of the Committee was unacceptable.

224. The view was expressed that work on space accords, including the Artemis Accords, which was going forward on the basis of international organization frameworks, would result in fragmentation among Member States and should be considered by the Committee.

225. Some delegations expressed the view that the Artemis Accords facilitated cooperative activities based on open sharing of scientific data with the public and the international scientific community.

226. The view was expressed that persistent efforts should be made to achieve more diversified and institutionalized capacity-building, including with the support of the private sector, that continued support should be given to all the regional centres for space science and technology education, affiliated to the United Nations, and that those centres should enhance exchanges and cooperation with one another.

227. Some delegations expressed the view that the Committee and its subcommittees should jointly consider interdisciplinary issues such as the long-term sustainability of outer space activities and space resources.

228. The view was expressed that all decisions of the Committee and its subcommittees, except for routine administrative decisions, should continue to be made by consensus.

229. The view was expressed that new items should be added to the agenda of the Committee and its subcommittees only when other items were removed.

230. Some delegations expressed the view that the Subcommittee should work through the items on the agenda sequentially rather than have the items distributed in a non-sequential manner as that would allow for a more informal exchange of ideas and be more comprehensible for observers of the Committee.

231. Some delegations expressed the view that delegations should comply with the requirement to keep statements to a maximum of five minutes.

232. The view was expressed that a procedure to be followed in cases of force majeure should be established to ensure the continuity of the work of the Committee in crisis situations such as the COVID-19 pandemic.

## **XII. Space and global health**

233. In accordance with General Assembly resolution [77/121](#), the Subcommittee considered agenda item 14, entitled “Space and global health”.

234. The representatives of Canada, China, India, Indonesia, Japan, Mexico, Switzerland, the United Kingdom and the United States made statements under agenda item 14. The Coordinator of the Space and Global Health Network also made a statement under the item. During the general exchange of views, statements relating to the item were also made by representatives of other member States.

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

(a) “Australian outlook on initiatives for sustainable digital health”, by the representative of Australia;

(b) “The Health Beyond Initiative”, by the representative of Canada;

(c) “Health-related applications of remote sensing and geographic information systems in the Philippines”, by the representative of the Philippines;

(d) “Through ground-based international experiments to deep space *per aspera ad astra*”, by the representative of the Russian Federation.

236. The Subcommittee had before it a conference room paper containing a status report of the Space and Global Health Network (A/AC.105/C.1/2023/CRP.29).

237. The Subcommittee welcomed the adoption of General Assembly resolution 77/120, entitled “Space and global health”, in which the Assembly provided recommendations on strengthening collaboration between the space and global health sectors as an efficient strategy for making better use of space science and technology for access to global health. The Subcommittee also welcomed the adoption of resolution 77/121, in which the Assembly noted with satisfaction the establishment of the Space and Global Health Platform and welcomed the establishment of the Space and Global Health Network.

238. The Subcommittee recalled that it had been agreed that the Space and Global Health Network – established in 2022 as a result of the recommendations made by the Working Group on Space and Global Health, which were endorsed by the Committee on the Peaceful Uses of Outer Space at its sixty-fifth session (A/77/20, para. 168) – should provide annual reports to the Subcommittee through its Coordinator, and agreed to invite the Network to participate as an observer in the sessions of the Committee and its subcommittees.

239. The Subcommittee noted that the Space and Global Health Network and the Space and Global Health Platform had been presented at the “UN-Space” session of the United Nations/Austria World Space Forum 2022 on the theme “Sustainability in space for sustainability on Earth”, which had been held from 13 to 15 December 2022. Participants in the Forum had noted with satisfaction that the UN-Space session was the first concrete step in the implementation of the space and global health measures in General Assembly resolutions 77/120 and 77/121, and they encouraged greater participation of the health and space community in the work of the Network with the objective of increasing the use and application of space science and technology in the global health domain as a means of promoting equitable, affordable and universal access to health for all.

240. The Subcommittee heard a status report by the Coordinator of the Space and Global Health Network and noted that two meetings of the Network had been held on 8 and 10 February 2023 in hybrid format on the margins of the sixtieth session of the Subcommittee, at which participants agreed on a revised version of the statement of intent for participation in the Network (A/AC.105/C.1/2023/CRP.29, annex). The Subcommittee expressed its appreciation to the Office for Outer Space Affairs for facilitating the work of the Network within existing resources.

241. The Subcommittee noted that awareness-raising events would be organized in Geneva, possibly in May 2023, as well as in Vienna on the margins of the sixty-sixth session of the Committee on the Peaceful Uses of Outer Space.

242. The Subcommittee noted a broad array of activities relevant to space and global health in areas such as telemedicine, space life sciences, space technologies, tele-epidemiology and disaster management (including responses to epidemics), as well as activities undertaken through space-based research, including at the International Space Station.

243. The Subcommittee acknowledged the contribution of space science, space technology and space applications to the prevention and control of diseases, the promotion of human health and welfare, the addressing of global health issues, the advancement of medical research, the advancement of health practices and the provision of health-care services to individuals and communities, including in rural areas with limited access to health care.

244. The Subcommittee reaffirmed the vital role of space science, space technology and space applications in addressing the COVID-19 pandemic, and their critical role in supporting contact tracing, the identification of affected areas, modelling the spread of the disease and monitoring its transmission, connectivity for remote working, telehealth, communications, and methods for coping with social isolation.

245. The view was expressed that it was necessary to strengthen research on the use of space observation in order to better understand the emissions, trends and impacts on human health of air pollutants such as particulate matter (PM2.5 and PM10) and ozone.

### **XIII. Use of nuclear power sources in outer space**

246. In accordance with General Assembly resolution [77/121](#), the Subcommittee considered agenda item 15, entitled “Use of nuclear power sources in outer space”.

247. The representatives of China, France, Indonesia, the Republic of Korea, the Russian Federation, the United Kingdom, the United States and Venezuela (Bolivarian Republic of) made statements under agenda item 15. The observer for ESA also made a statement. During the general exchange of views, statements relating to the item were also made by representatives of other member States.

248. The Subcommittee welcomed the fact that States and an international intergovernmental organization were developing legal and regulatory instruments – and considering developing further instruments – on the safe use of nuclear power sources in outer space, taking into account the content and requirements of the Principles Relevant to the Use of Nuclear Power Sources in Outer Space and of the Safety Framework for Nuclear Power Source Applications in Outer Space, which was developed jointly by the Subcommittee and IAEA.

249. Some delegations expressed the view that the Principles and the Safety Framework provided a comprehensive foundation for supporting the safe use of nuclear power sources in outer space, and that the guidance provided in the Safety Framework enabled new approaches to safety based on continuing advances in knowledge and practice since the adoption of the Principles. The delegations expressing that view were also of the view that the practical application of the Safety Framework satisfied the safety intent of the Principles and therefore provided sufficient guidance to States and international intergovernmental organizations.

250. Some delegations expressed the view that the use of nuclear power sources in outer space had opened up the solar system to exploration, making it possible to observe and understand dark, distant planetary bodies that would otherwise be unreachable. Similarly, embarking on a new era for space exploration depended on mass-efficient, high-energy solutions to power deep-space vehicles, operate in harsh environments and increase mission flexibility; therefore, the use of nuclear power sources for the in-space propulsion of spacecraft offered potential with regard to crew and cargo missions to Mars and scientific missions to the outer solar system, enabling faster and more robust human and robotic missions.

251. The view was expressed that safety should be the key aspect and an integral part of the design of spacecraft using nuclear power source applications in all stages of their life cycle. The delegation expressing that view reaffirmed the importance of strict compliance with the Principles, adopted by consensus by the General Assembly in its resolution [47/68](#), and the Safety Framework.

252. The view was expressed that in order to ensure the highest standards of safety and security in the use of nuclear power sources in outer space, and that while recognizing, as set out in General Assembly resolution [47/68](#), that for some missions in outer space nuclear power sources were particularly suited or even essential owing to their compactness, long life and other attributes, it was equally important to recall principle 3 of that resolution, which states that the use of nuclear power sources in

outer space shall be restricted to those space missions which cannot be operated by non-nuclear energy sources in a reasonable way.

253. The view was expressed that in order to ensure the safe use of nuclear power source applications in outer space and maintain the safety and well-being of all humankind as the highest priority, it was important to strengthen cooperation and the sharing of best practices among countries. The delegation expressing that view was also of the view that consideration of an issue as important as the use of nuclear power sources should continue to remain exclusively within the framework of the relevant mandate of the Committee and its Scientific and Technical Subcommittee.

254. The view was expressed that the use of nuclear power sources in outer space posed a potential danger to human life and the environment that had not been sufficiently studied, and therefore the proliferation of such power sources should be restricted. The delegation expressing that view was also of the view that States should be encouraged to develop additional legally binding instruments that regulated in more detail the use of nuclear power sources in outer space, taking into account that any activity carried out in outer space must be governed by the principles of the protection of human life and the maintenance of peace.

255. The view was expressed that it was necessary to strengthen capacity-building efforts in order to enable States to develop emergency response mechanisms to mitigate the risk of force majeure accidents involving nuclear power source applications in outer space.

256. The view was expressed that in order to ensure the safe use of nuclear power sources in outer space, it was important to continue to provide opportunities and maintain effective processes for the sharing of information. To that end, it was important to agree on a new mandate and workplan of the Working Group on the Use of Nuclear Power Sources in Outer Space and to provide opportunities for the collection and analysis of relevant technical information about potential future uses of nuclear power sources in outer space, particularly those involving nuclear reactors, through the creation of a joint technical expert group with IAEA.

257. The view was expressed that the creation of a joint technical expert group with IAEA would facilitate the exchange of knowledge and best practices in the development and use of space nuclear power and propulsion systems among Governments, international intergovernmental and non-governmental organizations, academia and private commercial entities, with the aim of promoting the continued safe use of nuclear power and propulsion systems in space and of analysing the safety implications of such systems, for consideration by the Working Group on the Use of Nuclear Power Sources in Outer Space.

258. Some delegations expressed the view that it was important to continue to consider and increase knowledge of the current and future uses of nuclear power sources in outer space within the context of the Working Group on the Use of Nuclear Power Sources in Outer Space, under a renewed mandate and with the continued involvement of experts from IAEA. Those efforts should also involve States wishing to acquire nuclear power source capabilities in the near future.

259. The view was expressed that the mandate of the Working Group on the Use of Nuclear Power Sources in Outer Space should be renewed under a new multi-year workplan and in accordance with the rules and procedures of the Committee, in order to continue the work on that important subject matter.

260. In accordance with General Assembly resolution [77/121](#), the Subcommittee, at its 975th meeting, reconvened its Working Group on the Use of Nuclear Power Sources in Outer Space, with Sam A. Harbison (United Kingdom) as Chair.

261. The Subcommittee expressed its sincere appreciation to the outgoing Chair of the Working Group on the Use of Nuclear Power Sources in Outer Space, Sam A. Harbison (United Kingdom), for his many years of dedication and efforts in chairing the Working Group.

262. The Subcommittee also noted the indication of nomination of Leopold Summerer (Austria) for the position of incoming Chair of the Working Group on the Use of Nuclear Power Sources in Outer Space.

263. The Working Group on the Use of Nuclear Power Sources in Outer Space held four meetings. At its 989th meeting, on 15 February, the Subcommittee endorsed the report of the Working Group, which is contained in annex III to the present report.

#### **XIV. Examination of the physical nature and technical attributes of the geostationary orbit and its utilization and applications, including in the field of space communications, as well as other questions relating to developments in space communications, taking particular account of the needs and interests of developing countries, without prejudice to the role of the International Telecommunication Union**

264. In accordance with General Assembly resolution [77/121](#), the Subcommittee considered agenda item 16, entitled “Examination of the physical nature and technical attributes of the geostationary orbit and its utilization and applications, including in the field of space communications, as well as other questions relating to developments in space communications, taking particular account of the needs and interests of developing countries, without prejudice to the role of the International Telecommunication Union”, as a single issue/item for discussion.

265. The representatives of China, India, Indonesia, Netherlands (Kingdom of the), Pakistan, the Russian Federation, the United Kingdom and the United States made statements under agenda item 16. The observer for ITU also made a statement. During the general exchange of views, statements relating to the item were made by representatives of other member States.

266. The Subcommittee heard a technical presentation by the observer for ISU entitled “STELA: Starship–impact on the Satcom industry”.

267. In accordance with the invitation extended by the Subcommittee at its fifty-ninth session, in 2022 ([A/AC.105/1258](#), para. 252), the observer for ITU presented a report concerning the contribution of ITU to the peaceful uses of outer space, including the use of the geostationary satellite orbit and other orbits. In that connection, the Subcommittee took note with appreciation of the information provided in the annual report for 2022 of the Radiocommunication Bureau of ITU on the use of the geostationary satellite orbit and other orbits, as well as other documents referred to in conference room paper A/AC.105/C.1/2023/CRP.24. The Subcommittee invited ITU to continue to submit reports to it.

268. Some delegations expressed the view that the geostationary orbit possessed a strategic and economic value for States, that it was a limited natural resource at risk of becoming saturated and that its use must therefore be rationalized and made available to all, under equitable conditions, regardless of States’ current technological capabilities, taking into particular consideration the needs of developing countries and their geographical location.

269. Some delegations expressed the view that the Guidelines for the Long-term Sustainability of Outer Space Activities of the Committee ([A/74/20](#), annex II) played a role in ensuring the equitable and effective use of the radio frequency spectrum and orbital zones used by satellites, although more efforts were needed. The delegations expressing that view also urged States to continue working towards effective implementation of the Guidelines.

270. Some delegations expressed the view that it should be assessed whether there was a need to create specialized working groups and intergovernmental panels tasked with finding joint solutions to the challenges of the shared use of geostationary orbits.

271. Some delegations expressed the view that the allocation of slots of the radio frequency spectrum and geostationary orbit was a subject within the remit of ITU.

272. The view was expressed that given the scarcity of geostationary orbit positions and frequency resources, countries should strengthen cooperation for improved and efficient utilization of those resources and promote the use of limited frequency and geostationary orbit resources.

273. The view was expressed that for some States, geostationary satellites would continue to be irreplaceable, and provision No. 11.49 of the ITU Radio Regulations had made the access for developing countries to orbit and spectrum resources of the geostationary orbit less equitable because some satellite operators took advantage of the ITU provisions to retain orbital slots for three years while the slots went in effect unoccupied.

274. The view was expressed that there was a need to develop appropriate regulatory frameworks to ensure that non-geostationary satellite systems did not interfere with the operation of ground and space service station systems. The delegation expressing that view also made a note of the proposal expressed during the ITU Plenipotentiary Conference held in Bucharest in 2022 to include in the ITU annual report a section on the adoption by member States of policies supporting equitable access to the radio frequency spectrum and associated orbital resources.

## **XV. General exchange of views on dark and quiet skies for science and society**

275. In accordance with General Assembly resolution [77/121](#), the Subcommittee considered agenda item 17, entitled “General exchanges of views on dark and quiet skies for science and society” as a single issue/item for discussion.

276. The representatives of Algeria, Argentina, Australia, Austria, Brazil, Bulgaria, Canada, Chile, China, Czechia, France, Germany, Guatemala, India, Indonesia, Iran (Islamic Republic of), Italy, Jordan, Mexico, New Zealand, Nigeria, Pakistan, Paraguay, Peru, the Russian Federation, Slovakia, South Africa, Spain, Switzerland, the United Kingdom and the United States made statements under agenda item 17. A statement was made by the representative of South Africa on behalf of the Group of African States. The observers for IAU and the Square Kilometre Array Observatory also made statements under the item. During the general exchange of views, statements relating to the item were made by representatives of other member States.

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

(a) “Dark and quiet skies: an Australian perspective”, by the representative of Australia;

(b) “United States private sector contributions to dark and quiet skies”, by the representatives of the United States.

278. The Subcommittee had before it a conference room paper on the protection of dark and quiet skies for science and society, submitted by Bulgaria, Chile, the Dominican Republic, Peru, Slovakia, Spain, South Africa, ESO, IAU and the Square Kilometre Array Observatory (A/AC.105/C.1/2023/CRP.18/Rev.1).

279. The Subcommittee noted that, as an ever-increasing number of stakeholders, including private entities, were launching spacecraft into orbit, concerns had been raised about spacecraft that emitted radio signals and reflected sunlight into astronomical telescopes or crossed their field of view, thereby degrading astronomical observations. Thus, the importance of implementing mitigating measures on factors that could hinder scientific discoveries was highlighted.

280. The Subcommittee noted various national and international efforts, including the hosting of events to foster dialogue among stakeholders, the development of regulations and legal frameworks, the establishment of dark sky conservation areas

and radio quiet zones, research on technologies to mitigate light pollution and monitoring of the impact of satellite constellations on astronomy, to balance the provision of satellite services with astronomical observation activities.

281. Some delegations expressed the view that the establishment of the new IAU Centre for the Protection of the Dark and Quiet Sky from Satellite Constellation Interference in April 2022 fostered collaboration among a variety of stakeholders, in particular the astronomical community and the space industry, and encouraged further collaborative efforts.

282. Some delegations expressed the view that dark skies must be preserved and protected as common cultural and natural heritage of the world.

283. Some delegations expressed the view that their States' growing astrotourism industries relied on dark skies for further development.

284. The view was expressed that there would need to be trade-offs between the needs of the astronomical community and the needs of satellite operators.

285. The view was expressed that States that owned megaconstellation satellites should allocate a special budget to developing technical capability and technological support for scientific research in order to mitigate the negative consequences of such satellites and preserve dark skies.

286. The view was expressed that as a result of the rapid increase in megaconstellations, the issue of dark and quiet skies required greater attention and detailed guidance and should, therefore, be discussed on a separate occasion.

287. The Subcommittee took note with appreciation of the conference room paper on the protection of dark and quiet skies for science and society, submitted by Bulgaria, Chile, the Dominican Republic, Peru, Slovakia, South Africa, Spain, ESO, IAU and the Square Kilometre Array Observatory (A/AC.105/C.1/2023/CRP.18/Rev.1) and the broad support it had received. It noted that a decision was still pending, and it was noted that discussions would continue during the intersessional period with the view to reaching consensus.

288. Some delegations expressed their support for the establishment of an expert group for a duration of three years and for keeping the agenda item on dark and quiet skies for science and society on the agenda of the Subcommittee for the same period.

289. Some delegations expressed the view that such an expert group should include interested member States and a balanced representation of private satellite operators and the scientific and academic community to evaluate the challenges and the means to address the matters before them in an adequate manner.

290. Some delegations expressed the view that the observers for ITU and IADC should take part in the discussions of such an expert group, as established guidelines and practices in related fields, such as space debris mitigation and radio frequency management, needed to be taken into consideration.

291. Some delegations expressed the view that the terms of reference of such an expert group should fall firmly within the remit of the Committee and should not overlap with the responsibilities of ITU such as issues related to radio wavelengths.

292. The view was expressed that such an expert group should avoid covering the issues identified relating to artificial light at night, as that matter should be discussed at the national level.

293. Some delegations expressed the view that such an expert group should not have a short-term mandate, as a wide range of stakeholders would need to be involved in order to complete a sufficient amount of work.

294. The view was expressed that such an expert group could begin its work at the sixty-first session of the Subcommittee, after stakeholders' meetings had been held.



295. The view was expressed that the topic had been covered in the discussion of the agenda item on the long-term sustainability of outer space activities and that the establishment of a new expert group, which would need a significant amount of time to agree on its terms of reference, was inappropriate.

## **XVI. Draft provisional agenda for the sixty-first session of the Scientific and Technical Subcommittee**

296. In accordance with General Assembly resolution [77/121](#) and the decision of the Subcommittee at its 975th meeting, on 6 February 2023, the Subcommittee considered agenda item 18, entitled “Draft provisional agenda for the sixty-first session of the Scientific and Technical Subcommittee”.

297. The representatives of Australia, Brazil, Canada, Chile, Colombia, Denmark, Finland, France, the Russian Federation, Slovakia, South Africa, Spain, Switzerland, the United Kingdom and the United States made statements under the agenda item. The observer for IAU also made a statement. During the general exchange of views, statements relating to the item were made by representatives of other member States.

298. The Subcommittee noted that the dates for the sixty-first session of the Subcommittee would be confirmed at the sixty-sixth session of the Committee.

299. The view was expressed that the secretariat should explore the possibility of rescheduling the dates of the sixty-first session of the Scientific and Technical Subcommittee to avoid overlap with the Chinese New Year.

300. The Subcommittee agreed that the following items would be proposed to the Committee for inclusion in the agenda of the Subcommittee at its sixty-first session:

1. Adoption of the agenda.
2. Election of the Chair.
3. Statement by the Chair.
4. General exchange of views and introduction of reports submitted on national activities.
5. United Nations Programme on Space Applications.
6. Space technology for sustainable socioeconomic development.
7. Matters relating to remote sensing of the Earth by satellite, including applications for developing countries and monitoring of the Earth’s environment.
8. Space debris.
9. Space-system-based disaster management support.
10. Recent developments in global navigation satellite systems.
11. Space weather.
12. Near-Earth objects.
13. Long-term sustainability of outer space activities.  
(Work for 2024 as reflected in the multi-year workplan of the Working Group on the Long-term Sustainability of Outer Space Activities (see [A/AC.105/1258](#), annex II, appendix, para. 18))
14. Future role and method of work of the Committee.
15. Space and global health.

16. Use of nuclear power sources in outer space.  
(Work for 2024 as reflected in the new multi-year workplan of the Working Group on the Use of Nuclear Power Sources in Outer Space (see para. 263 above and annex III, para. 8))
17. Examination of the physical nature and technical attributes of the geostationary orbit and its utilization and applications, including in the field of space communications, as well as other questions relating to developments in space communications, taking particular account of the needs and interests of developing countries, without prejudice to the role of the International Telecommunication Union.  
(Single issue/item for discussion)
- [18. General exchange of views on dark and quiet skies for science and society.  
(Single issue/item for discussion)]
19. Draft provisional agenda for the sixty-second session of the Scientific and Technical Subcommittee.
20. Report to the Committee on the Peaceful Uses of Outer Space.

301. Some delegations expressed the view that the item entitled “General exchange of views on dark and quiet skies for science and society” that had been considered as a single-issue agenda item at the present session should remain on the agenda of the Subcommittee for the next three years and that a dedicated expert group should be established under the agenda item to promote awareness, provide guidance and enable communication and cooperation between member States and stakeholders with respect to the impact of satellite constellations on astronomy.

302. The view was expressed that matters related to the item entitled “General exchange of views on dark and quiet skies for science and society” should be addressed under the existing item on the long-term sustainability of outer space activities and by the Working Group on the Long-term Sustainability of Outer Space Activities.

303. The view was expressed that before adding a new item to the agenda, there should be a comprehensive assessment of the whole agenda of the Subcommittee.

304. Some delegations expressed the view that similar agenda items could be combined to save time in considering the agenda of the Subcommittee. For example, the agenda items entitled “United Nations Programme on Space Applications” and “Space technology for sustainable socioeconomic development” could be combined as an item entitled “Space for sustainable development and space applications”, and the agenda items entitled “Matters relating to remote sensing of the Earth by satellite, including applications for developing countries and monitoring of the Earth’s environment” and “Space-system-based disaster management support” could be combined as an item entitled “Space-based remote sensing and disaster management”.

305. Some delegations expressed the view that an expert group on the subject of dark and quiet skies for science and society should be established and that it should report to the Subcommittee under the item on space technology for sustainable socioeconomic development.

306. The Subcommittee noted that the decision on how to modify the agenda for the sixty-first session of the Scientific and Technical Subcommittee would be deferred until the sixty-sixth session of the Committee on the Peaceful Uses of Outer Space.

307. Some delegations expressed the view that online meetings, and the subsequent use also of hybrid meetings, were of an exceptional and temporary nature and did not set a precedent and since there was no longer a consensus for continuing the use of such a format, the Subcommittee should revert back to its consensus modality of in-person meetings. The delegations expressing that view also noted that the webcasting

of plenary sessions in the six official languages of the United Nations increased transparency and served as a capacity-building measure and should be continued.

308. Some delegations expressed the view that the secretariat should inquire about the modalities for holding sessions employed by other Vienna-based organizations, for example, assigning a fixed amount of time for online statements so that plenary meetings could continue to be 3 hours in length.

309. At its 986th meeting on 13 February, the Subcommittee agreed that the full duration of the slot normally allocated for the holding of an industry symposium during the sessions of the Scientific and Technical Subcommittee would be allocated, at the sixty-first session of the Subcommittee, in 2024, to the holding of the workshop of the Working Group on the Long-term Sustainability of Outer Space Activities, upon its request, and as mandated in the Working Group's multi-year workplan ([A/AC.105/1258](#), annex II, appendix).

## Annex I

### Report of the Working Group of the Whole

1. In accordance with paragraph 10 of General Assembly resolution [77/121](#), the Scientific and Technical Subcommittee, at its sixtieth session, reconvened its Working Group of the Whole.
2. From 8 to 16 February 2023, the Working Group held four meetings, with Prakash Chauhan (India) as Chair. The Working Group also held two informal consultations, on 9 and 10 February 2023.
3. The Working Group considered the following items:
  - (a) Space technology for sustainable socioeconomic development;
  - (b) Future role and method of work of the Committee;
  - (c) Draft provisional agenda for the sixty-first session of the Scientific and Technical Subcommittee.
4. The Working Group had before it the note by the Secretariat on the governance and method of work of the Committee on the Peaceful Uses of Outer Space and its subsidiary bodies ([A/AC.105/C.1/L.408](#)).
5. The Working Group agreed that statements by delegations should be limited to 5 minutes and that technical presentations should be limited to 10 minutes.
6. Some delegations noted a proposal that statements under agenda items other than the general exchange of views could be limited to three minutes, and noted that it could consider that proposal under the item on the future role and method of work of the Committee in the future.
7. Some delegations expressed the view that statements exceeding the allocated time should be cut off after the time limit had been reached.
8. The Working Group noted the benefits of the live webcasting of plenary meetings with interpretation into the six official languages of the United Nations.
9. The Working Group requested the secretariat to provide the Committee on the Peaceful Uses of Outer Space with an overview of the financial implications of webcasting and remote simultaneous interpretation services, for its consideration at its sixty-sixth session, in June 2023, with a view to reaching a decision regarding the format of future sessions of the Committee and its subcommittees.
10. Some delegations expressed the view that it was important to maintain a hybrid format at future sessions.
11. Some delegations stressed the importance of returning to in-person meetings, as the holding of hybrid meetings incurred significant additional costs for the secretariat.
12. Some delegations expressed the view that consideration of the substantive issues on the agenda should be scheduled consecutively rather than distributed throughout the session, in order to provide a holistic understanding of the different opinions expressed on the same topic and also facilitate the face-to-face participation of experts.
13. The view was expressed that flexibility should continue to be exercised in the timing of when consideration of agenda items was resumed.
14. The view was expressed that statements by national delegations should be made before statements by permanent observers.
15. Some delegations expressed the view that the practice of granting the floor to the coordinators of mechanisms, such as the Space Mission Planning Advisory Group, the International Asteroid Warning Network and the Space and Global Health

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Network, at the start of the consideration of agenda items should continue so that delegations were familiar with their reports before taking the floor.

16. The view was expressed that such a practice, of granting the floor first to the coordinators of mechanisms, was counterproductive given the existing time limits on interpretation services provided for the delegations of Member States.

17. Some delegations expressed the view that a greater degree of informality and more free-flowing exchanges among experts were needed.

18. The view was expressed that the proliferation of informal meetings made it challenging for small delegations to follow the session.

19. Some delegations expressed the view that informal meetings should be held with interpretation services.

20. The view was expressed that the provision of interpretation services to informal meetings would incur considerable costs.

21. Some delegations expressed the view that the allocation of more time to working groups during meetings with interpretation would allow delegations to engage in a more inclusive and constructive manner.

22. The view was expressed that States non-members of the Committee should comply with the deadline of submitting to the secretariat, one week prior to the opening of the session, their request to attend the Committee's session as an observer.

23. The Working Group requested the secretariat to inform States members of the Committee and international intergovernmental organizations with permanent observer status with the Committee about the procedure for voluntarily opting out of receiving paper copies of in-session documentation.

24. The Working Group noted that, in accordance with General Assembly resolution [77/121](#), the Scientific and Technical Subcommittee would submit to the Committee its proposal for the draft provisional agenda for the sixty-first session of the Subcommittee, to be held in 2024. The Working Group agreed that the draft provisional agenda was to be considered by the Subcommittee under item 18 of its agenda.

25. At its 4th meeting, on 15 February, the Working Group adopted the present report.

## Annex II

### Report of the Working Group on the Long-term Sustainability of Outer Space Activities

1. In accordance with paragraph 10 of General Assembly resolution [77/121](#), the Scientific and Technical Subcommittee, at its sixtieth session, reconvened its Working Group on the Long-term Sustainability of Outer Space Activities.
2. The Working Group on the Long-term Sustainability of Outer Space Activities held meetings from 7 to 15 February 2023, with Umamaheswaran R. (India) as Chair.
3. The Working Group noted that, in addition to the formal meetings that it had held with the benefit of interpretation services during the present session, it had also held extensive informal consultations on the margins of the session.
4. The Working Group recalled that it had also held informal consultations, in hybrid format, from 15 to 17 November 2022.
5. The Working Group had before it the documents listed in paragraph 187 of the report of the Subcommittee on its sixtieth session.
6. The Working Group noted the need to structure its work, giving equal importance and an equitable amount of time to each of the elements of its terms of reference ([A/AC.105/1258](#), annex II, appendix, paras. 4 and 6).
7. The Working Group requested the Chair of the Working Group on the Long-term Sustainability of Outer Space Activities to coordinate with the Chair of the Committee and the secretariat to make arrangements for the Working Group to be able to meet during the sixty-sixth session of the Committee, in June 2023, making use of available interpretation services.
8. The Working Group recalled that, in accordance with its multi-year workplan ([A/AC.105/1258](#), annex II, appendix), it was to hold, within existing resources, a workshop on the margins of the sixty-first session of the Scientific and Technical Subcommittee, in 2024, with the agenda to be defined in 2023, on the topics in paragraphs 4 and 6 of the terms of reference, methods of work and workplan of the Working Group, with inputs from national governmental organizations, international intergovernmental organizations, non-governmental organizations, the private sector and academia. In that connection, the Working Group agreed that the workshop would be aimed at raising awareness of the long-term sustainability of outer space activities and supporting capacity-building and that it would also represent an opportunity to collect views from entities that might not normally participate directly in the work of the Working Group.
9. The Working Group requested that the full duration of the slot normally allocated for the holding of an industry symposium during the sessions of the Scientific and Technical Subcommittee be allocated, at the sixty-first session of the Subcommittee, in 2024, to the holding of the above-mentioned workshop. That would allow for the workshop to benefit from interpretation services.
10. The Working Group agreed that the members of the Working Group would be asked to send suggestions for specific topics for the workshop to the Chair and the secretariat and that those could be discussed further by the Working Group during the Working Group's meetings at the sixty-sixth session of the Committee, in June 2023.
11. The Working Group agreed that the members of the Working Group would be asked to nominate speakers and/or panellists for the workshop well in advance of the sixty-first session of the Subcommittee, with such nominations to be sent to the Chair and the secretariat no later than 9 October 2023.
12. The Working Group agreed that the Chair, with the support of the secretariat, would use the nominations to create a final programme for the workshop, with the

aim of incorporating diverse views, taking into account both the geographical and gender balance among speakers and panellists.

13. The Working Group agreed that the views expressed during the workshop would be regarded as those of the panellists and other participants and not as the formal positions of States and noted that networking opportunities would also form part of the workshop.

14. The Working Group agreed that, in order to make the best use of time, panellists would be requested to prepare, and share in advance of the workshop, short abstracts covering the topic on which they had been invited to speak. The aim would be for presentations to be kept short so that the workshop could focus on active exchanges, including questions and answers.

15. The Working Group agreed that if there were more nominations for speakers and/or panellists than could be accommodated in the allotted time frame, those who were not assigned a formal speaking or presenting role would still be invited to attend the workshop and engage in the interactive discussions. They would also be invited to provide written contributions, which would be shared with the Working Group for further consideration and for possible inclusion in the report on the workshop.

16. The Working Group requested that the Subcommittee request the Office for Outer Space Affairs to explore providing funding for participants, in particular those from developing countries, to travel to Vienna to take part in the workshop in person, subject to the availability of existing resources of the Office.

17. The Working Group agreed that as increasingly more information and views were shared by States Members of the United Nations and permanent observer organizations of the Committee on the Peaceful Uses of Outer Space on the elements included in the Working Group's terms of reference (A/AC.105/1258, annex II, appendix, paras. 4 and 6), an easily accessible and searchable open-source repository of such information would be useful and could serve as a tool for building transparency, confidence and capacity.

18. In that connection, the Working Group requested that the Subcommittee request the Office for Outer Space Affairs, within existing resources and/or making use of extrabudgetary contributions, to develop and host such an information repository on a website of the Office, which would include search and filter functions so that users would be able to easily find content, for example, by specific guideline.

19. The Working Group invited voluntary contributions to the repository from States and from the permanent observer organizations to the Committee. Private entities and other non-governmental entities could also make submissions, with oversight by the respective State.

20. The Working Group agreed that the information shared should remain in the words or voice of the submitter. The Office for Outer Space Affairs would collect the submissions and make them available in the repository in the original form and language of submission.

21. The Working Group requested that shorter submissions or versions of submissions (i.e. texts up to a maximum of three pages per submission) continue to be translated by the secretariat into all the official languages of the United Nations.

22. On 15 February 2023, the Working Group considered and adopted the present report.

## Annex III

### Report of the Working Group on the Use of Nuclear Power Sources in Outer Space

1. In accordance with paragraph 10 of General Assembly resolution [77/121](#), the Scientific and Technical Subcommittee, at its 975th meeting, on 6 February 2023, reconvened its Working Group on the Use of Nuclear Power Sources in Outer Space, with Sam A. Harbison (United Kingdom of Great Britain and Northern Ireland) as Chair.
2. The Working Group recalled that, under the extended multi-year workplan ([A/AC.105/1258](#), para. 237 and annex III), the aim of the Working Group in 2023 was to finalize the report to the Subcommittee on the outcome of the multi-year workplan ([A/AC.105/1138](#), annex II, paras. 8 and 9) and explore options for gathering information about advances in knowledge, practices and plans for future space nuclear power source applications.
3. The Working Group had before it a draft report prepared by the Working Group on the Use of Nuclear Power Sources in Outer Space on the implementation of the Safety Framework for Nuclear Power Source Applications in Outer Space and recommendations for potential enhancements of the technical content and scope of the Principles Relevant to the Use of Nuclear Power Sources in Outer Space ([A/AC.105/C.1/L.407](#)).
4. The Working Group met in both informal and formal meetings during the sixtieth session of the Scientific and Technical Subcommittee to discuss the document before it, as referred to in paragraph 3 above, and recalled that during 2022 it held three intersessional meetings online to meet the objectives of the workplan for that year and had made substantial progress towards finalizing a report to the Subcommittee on the outcome of its work under the current workplan.
5. At its third meeting, on 10 February, the Working Group adopted its final report on the implementation of the Safety Framework for Nuclear Power Source Applications in Outer Space and recommendations for potential enhancements of the technical content and scope of the Principles Relevant to the Use of Nuclear Power Sources in Outer Space, as amended, and noted that it would be made available in the six official languages of the United Nations, as document [A/AC.105/C.1/124](#), to the Committee on the Peaceful Uses of Outer Space at its the sixty-sixth session.
6. The Working Group concluded that, while the application of the Principles, in conjunction with the guidance contained in the Safety Framework, had provided a sufficient basis for members States and international intergovernmental organizations wishing to establish national or regional safety frameworks to ensure the safe development and use of nuclear power sources in outer space, there was still a need for further work on the safety aspects of space nuclear power source applications, in particular nuclear fission reactors and new types and uses of radioisotope power systems.
7. The Working Group also concluded that for such further work, it would be beneficial to invite the International Atomic Energy Agency (IAEA) to continue to participate in the work of the Working Group. If such further work indicated that there was a need for additional safety guidelines, appropriate mechanisms could be established to address the need, such as establishing a joint expert group with IAEA, which would have a clearly defined role in relation to that of the Working Group and which would report back to the Subcommittee through the Working Group.



8. The Working Group recommended that the Subcommittee approve a new five-year workplan for the Working Group on the Use of Nuclear Power Sources in Outer Space, which would meet with the following objectives:

Objective 1. Promote and facilitate the implementation of the Safety Framework for Nuclear Power Source Applications in Outer Space by:

(a) Providing an opportunity for member States and international intergovernmental organizations considering or initiating involvement in space nuclear power source (NPS) applications to summarize and discuss their plans, progress to date and any challenges faced or foreseen in implementing the Safety Framework;

(b) Providing an opportunity for member States and international intergovernmental organizations with experience in space NPS applications to make presentations on challenges identified under subparagraph (a) above, and on their mission-specific experiences in implementing the guidance contained in the Safety Framework.

Objective 2. Collect and analyse relevant technical information about potential future uses of NPS in outer space, in particular those involving nuclear reactors, by:

(a) Inviting more member States and international intergovernmental organizations, in particular IAEA, to join the Working Group and share their views, plans and experiences;

(b) Agreeing on appropriate activities for collecting information about potential future uses of NPS;

(c) Producing a critical analysis of the safety implications of the information shared under subparagraphs (a) and (b) above and presenting this analysis to the Subcommittee.

Objective 3. Discuss within the Working Group the implications of the analysis described in objective 2 with respect to further work of the Working Group and recommend suitable actions to the Subcommittee.

9. The Working Group also agreed that, should the new five-year workplan be endorsed by the Subcommittee, the Working Group could hold intersessional meetings, facilitated by the secretariat, to further the objectives of the workplan.

10. The Working Group also agreed that the secretariat should, under the guidance of the Chair of the Working Group, update the contents of the website of the Office for Outer Space Affairs dedicated to the work of the Working Group ([www.unoosa.org/oosa/en/COPUOS/stsc/wgnps/index.html](http://www.unoosa.org/oosa/en/COPUOS/stsc/wgnps/index.html)).

11. The Working Group noted that Sam A. Harbison (United Kingdom) was concluding his tenure as Chair of the Working Group on the Use of Nuclear Power Sources in Outer Space and expressed its sincere appreciation for his invaluable commitment to the work of the Working Group over more than 20 years.

12. The Working Group noted that Leopold Summerer (Austria) had been proposed as a candidate to assume the role of Chair of the Working Group on the Use of Nuclear Power Sources in Outer Space.

13. At its 4th meeting, on 15 February, the Working Group adopted the present report.