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**Committee on the Peaceful
Uses of Outer Space
Scientific and Technical Subcommittee
Forty-ninth session
Vienna, 6-17 February 2012**

Draft report

I. Introduction

1. The Scientific and Technical Subcommittee of the Committee on the Peaceful Uses of Outer Space held its forty-ninth session at the United Nations Office at Vienna from 6 to 17 February 2012, under the chairmanship of Félix Clementino Menicocci (Argentina).
2. The Subcommittee held [20] meetings.

A. Attendance

3. Representatives of the following [55] member States of the Committee attended the session: Algeria, Argentina, Australia, Austria, Azerbaijan, Belgium, Bolivia (Plurinational State of), Brazil, Burkina Faso, Canada, Chile, China, Colombia, Cuba, Czech Republic, Ecuador, France, Germany, Hungary, India, Indonesia, Iran (Islamic Republic of), Iraq, Italy, Japan, Kazakhstan, Kenya, Lebanon, Malaysia, Mexico, Morocco, Nigeria, Pakistan, Peru, Philippines, Poland, Portugal, Republic of Korea, Romania, Russian Federation, Saudi Arabia, Slovakia, South Africa, Spain, Sweden, Switzerland, Syrian Arab Republic, Tunisia, Turkey, Ukraine, United Kingdom of Great Britain and Northern Ireland, United States of America, Uruguay, Venezuela (Bolivarian Republic of) and Viet Nam.
4. At its 758th meeting, on 6 February, the Subcommittee decided to invite, at their request, observers for Costa Rica, the Dominican Republic, El Salvador, Israel, Jordan and the United Arab Emirates 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. The Subcommittee took note of the applications by



Costa Rica and Jordan for membership in the Committee (A/AC.105/C.1/2012/CRP.19 and A/AC.105/C.1/2012/CRP.7, respectively).

5. At the same meeting, the Subcommittee decided to invite, at its request, the observer for the European Union 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 International Atomic Energy Agency (IAEA), the International Telecommunication Union (ITU), the World Health Organization (WHO) and the World Meteorological Organization (WMO) attended the session.

7. The session was attended by observers for the following intergovernmental organizations with permanent observer status with the Committee: Asia-Pacific Space Cooperation Organization (APSCO), Association of Remote Sensing Centres in the Arab World (ARSCAW), European Organisation for Astronomical Research in the Southern Hemisphere (ESO), European Space Agency (ESA), European Telecommunications Satellite Organization (EUTELSAT-IGO), International Mobile Satellite Organization (IMSO) and Regional Centre for Remote Sensing of North African States (CRTEAN).

8. The session was also attended by observers for the following non-governmental organizations having permanent observer status with the Committee: Association of Space Explorers (ASE), EURISY, European Space Policy Institute (ESPI), International Academy of Astronautics (IAA), International Association for the Advancement of Space Safety (IAASS), International Astronautical Federation (IAF), International Astronomical Union (IAU), International Institute of Space Law (IISL), International Society for Photogrammetry and Remote Sensing (ISPRS), International Space University (ISU), Prince Sultan bin Abdulaziz International Prize for Water (PSIPW), Secure World Foundation (SWF), Space Generation Advisory Council (SGAC) and World Space Week Association (WSWA).

9. At its 758th meeting, on 6 February, the Subcommittee decided to invite, at its request, the observers for the Scientific Committee on Solar-Terrestrial Physics (SCOSTEP) to attend the session and to address it, as appropriate, on the understanding that doing so would be without prejudice to further requests of that nature and that it would not involve any decision of the Committee regarding status. The Subcommittee took note of the application of SCOSTEP for permanent observer status with the Committee (A/AC.105/C.1/2012/CRP.20).

10. A list of the representatives of States, United Nations entities and other international organizations attending the session is contained in A/AC.105/C.1/2012/INF/41.

B. Adoption of the agenda

11. At its 758th meeting, on 6 February, the Subcommittee adopted the following agenda:

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. Implementation of the recommendations of the Third United Nations Conference on the Exploration and Peaceful Uses of Outer Space (UNISPACE III).
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. Use of nuclear power sources in outer space.
12. Near-Earth objects.
13. International Space Weather Initiative.
14. Long-term sustainability of outer space activities.
15. 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.
16. Draft provisional agenda for the fiftieth session of the Scientific and Technical Subcommittee.
17. Report to the Committee on the Peaceful Uses of Outer Space.

C. Election of the Chair

12. At its 758th meeting, the Subcommittee elected Félix Clementino Menicocci (Argentina) Chair for the period 2012-2013, pursuant to General Assembly resolution 66/71.

D. General statements

13. Statements were made by representatives of the following member States during the general exchange of views: Algeria, Argentina, Austria, Azerbaijan, Brazil, Burkina Faso, Canada, Chile, China, Czech Republic, Cuba, Ecuador, France, Germany, Hungary, India, Indonesia, Iran (Islamic Republic of), Italy, Japan, Kazakhstan, Kenya, Malaysia, Mexico, Nigeria, Pakistan, Philippines, Poland, Republic of Korea, Romania, Russian Federation, Saudi Arabia, South Africa, Switzerland, United States of America and Venezuela (Bolivarian Republic of). Statements were also made by the representative of South Africa on behalf of the Group of African States, and by the representative of Ecuador on behalf of the Group of Latin American and Caribbean States. General statements were also made by the observers for El Salvador and the United Arab Emirates. The observers for ITU, WHO and WMO also made general statements. General statements were also made by the observers for APSCO, ESA, IAA, IAF, IAU, ISU, SGAC, SWF and WSWA. A general statement was also made by the observer for SCOSTEP.

14. The Subcommittee welcomed the election of Félix Clementino Menicocci as Chair for a two-year term, starting in 2012. The Subcommittee expressed its appreciation to the outgoing Chair, Ulrich Huth (Germany), for his leadership and contribution to furthering the achievements of the Subcommittee during his term of office.

15. The Subcommittee welcomed Azerbaijan as the seventy-first member of the Committee on the Peaceful Uses of Outer Space, and the Association of Remote Sensing Centres in the Arab World (ARSCAW) was welcomed as the newest permanent observer of the Committee.

16. The Subcommittee conveyed its condolences to the peoples of Australia, Ethiopia, Japan, Kenya, the Philippines, Somalia and Thailand for the loss of lives and infrastructure caused by natural disasters that had occurred in those countries. The Subcommittee stressed the critical role that space-based systems and international space cooperation could play in supporting disaster management by providing accurate and timely information and communication support.

17. At the 758th meeting, the Chair made a statement outlining the work of the Subcommittee at its current session. The Chair emphasized the Declaration on the Fiftieth Anniversary of Human Space Flight and the Fiftieth Anniversary of the Committee on the Peaceful Uses of Outer Space, adopted by the General Assembly in its resolution 66/71, and stressed the need to strengthen the role of space science and technology for sustainable development and for meeting the challenges facing humanity.

18. Also at the 758th meeting, the Director of the Office for Outer Space Affairs of the Secretariat made a statement reviewing the work programme of the Office.

19. The Subcommittee noted that the ability of the Office for Outer Space Affairs to continue to deliver the same number of activities in a broad range of thematic areas as in the past would be possible only if the Office continued to attract the same level of cash and in-kind contributions.

20. The Subcommittee expressed its gratitude to Hans Haubold and Viktor Kotelnikov of the Office for Outer Space Affairs, on the occasion of their

retirement, for their dedication to the work of the Office and to the Committee, and wished them well in their future endeavours.

21. The Subcommittee noted the remarkable space-related events in 2012, including the fortieth anniversary of the Landsat series of satellites.

22. The Subcommittee congratulated ESA on the successful launch of the VEGA launcher on 13 February 2012.

23. Some delegations reiterated the commitment of their countries to the peaceful use and exploration of outer space and emphasized the following principles: equal and non-discriminatory access to outer space and equal conditions for all States, irrespective of their level of scientific, technical and economic development; non-appropriation of outer space, including the Moon and other celestial bodies, by claim of sovereignty, use, occupation or any other means; non-militarization of outer space and its strict exploitation for the improvement of living conditions and peace on the planet; and regional cooperation to promote space activities as established by the General Assembly and other international forums.

24. Some delegations were of the view that developing countries should benefit from space technologies, in particular to support their social and economic development, and that it was necessary to promote cooperation to facilitate data exchange and the transfer of technology among States.

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

(a) “Summary of APRSAF-18: regional cooperation for tomorrow’s environment”, by the representative of Japan;

(b) “Space biomimetic biomining and applications”, by the representative of Germany;

(c) “The search for dark matter particles in space”, by the representative of the Russian Federation;

(d) “Into space for a better understanding of planet Earth: high-tech for future Earth observation satellites”, by the representative of Germany;

(e) “Présentation des activités du CNES (spécial 50 ans)”, by the representative of France;

(e) “Megha Tropiques: India-France joint mission”, by the representative of India;

(f) “ASTROSAT”, by the representative of India;

(g) “Portuguese activities in space”, by the representative of Portugal;

(h) “The Royal Jordanian Geographic Centre”, by the observer for Jordan;

(i) “Israel space programme: past, present and future”, by the observer for Israel.

26. The Subcommittee noted the screening of videos presented on the margins of the current session: “The launch of the VEGA launcher”, by the representative of France, and “COSPAR Scientific Assembly in July 2012, in Mysore, India”, by the observer for the Committee on Space Research (COSPAR).

27. The Subcommittee expressed its gratitude to the Austrian Research Promotion Agency (FFG) and ESPI for organizing a scientific and technical event on the margins of the current session.

E. National reports

28. The Subcommittee took note with appreciation of the reports submitted by Member States (A/AC.105/1008 and Add.1 and A/AC.105/C.1/2012/CRP.8) for its consideration under agenda item 4, “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.

F. Symposium

29. On 13 February, the Office for Outer Space Affairs held a symposium on the theme “The Earth observation services industry: market opportunities”, which was moderated by the Director of the Office for Outer Space Affairs. The presentations given at the symposium included the following: “Opportunities in Earth observation satellite services: lessons of the past for the future”, by Rachel Villain of Euroconsult; “The European EO service industries: development of the market and the impacts of GMES”, by Geoff Sawyer of the European Association of Remote Sensing Companies (EARSC); “The Nigeria space programme and data challenges in Africa”, by Halilu Shaba of the National Space Research and Development Agency (NASRDA) of Nigeria; “Earth observation data in Brazil: CBERS data distribution and impact of open data policy”, by Geraldo Antonio Diniz Branco of Brazil; “The benefits of open availability of landsat data”, by Jean Parcher of the United States Geological Survey (USGS); “The use of Russian space means of remote sensing of the Earth for the benefit of developing countries”, by Dmitry Gorobets of the Russian Federal Space Agency (Roscosmos); and “The EO services industry in support of decision-making towards sustainable development”, by Lorant Czaran of the Office for Outer Space Affairs.

G. Adoption of the report of the Scientific and Technical Subcommittee

30. After considering the items before it, the Subcommittee, at its [...] meeting, on [...] February 2012, 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

31. In accordance with General Assembly resolution 66/71, the Subcommittee considered agenda item 5, “United Nations Programme on Space Applications”.

32. At the 761st meeting, the Expert on Space Applications made a statement outlining the activities carried out and planned under the United Nations Programme on Space Applications.
33. The representative of Japan made a statement under agenda item 5. During the general exchange of views, statements relating to the item were also made by representatives of other member States and by the representative of Ecuador on behalf of the Group of Latin American and Caribbean States and by the representative of South Africa on behalf of the Group of African States.
34. The Working Group of the Whole was reconvened under the chairmanship of S. K. Shivakumar (India), in accordance with paragraph 7 of General Assembly resolution 66/71. At its [...] meeting, on [...] February, the Subcommittee endorsed the report of the Working Group of the Whole, which is contained in annex I to the present report.
35. The Subcommittee heard the following scientific and technical presentations:
- (a) “Capacity-building in space science and technology: achievements of the African Regional Centre for Space Science and Technology Education — in English language (ARCSSTE-E)”, by the representative of Nigeria;
 - (b) “University Space Engineering Consortium challenge: what we can do for capacity-building in space science and technology in developing countries”, by the representative of Japan;
 - (c) “Guidebook on small satellite programmes”, by the observer for ISU;
 - (d) “Status report on the United Nations/Japan Long-Term Fellowship Programme on Nanosatellite Technologies”, by the representative of Japan;
 - (e) “Outcome of the Fourth African Leadership Conference, in 2011”, by the representative of Kenya;
 - (f) “BRITE: the first nanosatellite constellation”, by the representative of Austria.

A. Activities of the United Nations Programme on Space Applications

36. The Subcommittee had before it the report of the Expert on Space Applications, outlining the mandate and orientation of the United Nations Programme on Space Applications (A/AC.105/1011, paras. 2-7). The Subcommittee noted that the Programme for 2011 had been carried out satisfactorily and commended the work accomplished by the Office under the Programme.
37. The Subcommittee noted with appreciation the voluntary contributions (cash and in-kind) provided by various Member States and organizations for 2011 (A/AC.105/1011, paras. 51-52).
38. The view was expressed that Member States and international organizations should continue to support the Programme through voluntary contributions.
39. The Subcommittee noted that the priority areas of the Programme were: (a) environmental monitoring; (b) natural resources management; (c) global health; (d) disaster management; (e) global navigation satellite systems applications;

(f) basic space science, including the International Space Weather Initiative; (g) space law; (h) climate change; (i) the Basic Space Technology Initiative (BSTI); and (j) the Human Space Technology Initiative (HSTI).

1. Year 2011

Meetings, seminars, symposiums, training courses and workshops

40. With regard to the activities of the United Nations Programme on Space Applications carried out in 2011, the Subcommittee expressed its appreciation to the following for co-sponsoring the various workshops, symposiums and training courses that had been held within the framework of the Programme, as referred to in

the report of the Expert on Space Applications (A/AC.105/1011, para. 48 and annex I):

(a) The Governments of Argentina, Austria, Iran (Islamic Republic of), Malaysia, Nigeria, South Africa, United Arab Emirates and Viet Nam;

(b) Developing Countries Support Programme, ESA, IAF, International Committee on Global Navigation Satellite Systems (ICG), ISPRS, Japan Aerospace Exploration Agency (JAXA), National Aeronautics and Space Administration of the United States (NASA), Prince Sultan bin Abdulaziz International Prize for Water, SWF, and Space Environment Research Center (SERC) of Kyushu University, Japan.

Long-term fellowships for in-depth training

41. The Subcommittee expressed its appreciation to the Government of Italy, which, through the Politecnico di Torino and the Istituto Superiore Mario Boella and with the collaboration of the Istituto Elettrotecnico Nazionale Galileo Ferraris, had continued to provide four 12-month fellowships for postgraduate studies in global navigation satellite systems (GNSS) and related applications.

42. The Subcommittee expressed its appreciation to the Government of Japan, which, through the Kyushu Institute of Technology, provided two 3-year fellowships for postgraduate studies in nanosatellite technologies.

Technical advisory services

43. The Subcommittee noted with appreciation the technical advisory services provided under the United Nations Programme on Space Applications in support of activities promoting regional and international cooperation in space applications, as referred to in the report of the Expert on Space Applications (A/AC.105/1011, paras. 38-47).

2. Year 2012

Meetings, seminars, symposiums, training courses and workshops

44. The Subcommittee recommended the approval of the following programme of meetings, seminars, symposiums, training courses and workshops for 2012:

- (a) United Nations/Latvia workshop on the applications of global navigation satellite systems, to be held in Riga from 14 to 18 May;
- (b) United Nations Human Space Technology Initiative expert meeting on human space technology, to be held in Vienna in June;
- (c) United Nations/India training course on satellite-aided search and rescue, to be held in Bangalore, India in August;
- (d) United Nations/Austria symposium on space-derived data analysis and image processing, to be held in Graz, Austria, in September;
- (e) United Nations/IAF workshop on space technologies applied to the needs of humanity: lessons learned from cases in the Mediterranean area, to be held in Naples, Italy, from 28 to 30 September;
- (f) United Nations/Ecuador workshop on the International Space Weather Initiative, to be held in Quito from 8 to 12 October;
- (g) United Nations/Japan workshop on the Basic Space Technology Initiative, to be held in Nagoya, Japan, from 10 to 13 October;
- (h) United Nations/Chile workshop on space technology applications for socio-economic benefits, to be held in Santiago from 12 to 16 November;
- (i) United Nations/Argentina workshop on space law, to be held in Argentina in November or December.

B. Regional and interregional cooperation

45. The Subcommittee noted that the schedule of nine-month postgraduate courses for the period 2010-2013 offered by the regional centres for space science and technology education, affiliated to the United Nations, was annexed to the report of the Expert on Space Applications (A/AC.105/1011, annex III).
46. The view was expressed that more participation was needed from the member countries of the Centre for Space Science and Technology Education for Asia and the Pacific (CSSTEAP).
47. The Subcommittee recalled that the General Assembly, in its resolution 66/71, had emphasized that regional and interregional cooperation in the field of space activities was essential to strengthen the peaceful uses of outer space, assist States in the development of their space capabilities and contribute to the achievement of the goals of the United Nations Millennium Declaration and, to that end, had requested relevant regional organizations to offer the assistance necessary so that countries could carry out recommendations of regional conferences; and that the Assembly had recognized, in that regard, the important role played by conferences and other mechanisms in strengthening regional and international cooperation among States, such as the African Leadership Conference on Space Science and Technology for Sustainable Development, the Asia-Pacific Regional Space Agency Forum, the Asia-Pacific Space Cooperation Organization and the Space Conference of the Americas.

48. The Subcommittee noted that the Fourth African Leadership Conference on Space Science and Technology for Sustainable Development, on the theme “Building a shared vision for space in Africa”, had been hosted by the Government of Kenya in Mombasa from 26 to 28 September 2011. The Subcommittee noted that the proceedings of the Conference, including the Mombasa Declaration on Space and Africa’s Development, would be posted on the website of the National Council for Science Technology of Kenya (www.ncst.go.ke).

49. The Subcommittee noted that the eighteenth session of APRSAF had been held in Singapore from 6 to 9 December 2011. The theme of the session was “Regional collaboration for tomorrow’s environment”. The nineteenth session of the Forum would be jointly organized by the Government of Malaysia and the Government of Japan and be hosted by Malaysia in Kuala Lumpur from 11 to 14 December 2012.

50. The Subcommittee also noted that APSCO had held its fifth Council Meeting, in Beijing on 7 and 8 September 2011, at which it had approved a number of new projects and reviewed the progress being made on those approved earlier. The Subcommittee also noted that the sixth Council Meeting would be held in Tehran in May 2012.

51. The Subcommittee recalled the Pachuca Declaration, adopted by the Sixth Space Conference of the Americas, held in Pachuca, Mexico, from 15 to 19 November 2010, and noted that the pro tempore secretariat of the Conference would organize, in Mexico City from 17 to 20 April 2012, a regional meeting on the use of outer space in the areas of, inter alia, health, food security and climate change and, in July 2012, a meeting of the heads of space agencies to provide further impetus to the implementation of the recommendations of the Conference that had not yet been implemented.

III.

[...]

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

52. In accordance with General Assembly resolution 66/71, the Subcommittee considered agenda item 7, “Matters relating to remote sensing of the Earth by satellite, including applications for developing countries and monitoring of the Earth’s environment”.

53. The representatives of China, Germany, India, Italy, Japan, the Russian Federation and the United States made statements under the agenda item. During the general exchange of views, statements relating to the item were also made by representatives of other member States.

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

(a) “Environmental satellite contributions to Global Earth Observing Programs”, by the representative of the United States of America;

(b) “Recent remote sensing activities in the Republic of Korea”, by the representative of the Republic of Korea;

(c) “Recent applications of RESOURCESAT-2”, by the representative of India;

(d) “Global applications of OCEANSAT-2”, by the representative of India;

(e) “Towards building national spatial data infrastructures for Pakistan”, by the representative of Pakistan.

55. In the course of the discussions, delegations reviewed national and cooperative programmes on remote sensing. Examples were given of national, bilateral, regional and international programmes to further socio-economic and sustainable development, notably in the following areas: agriculture and fishery; monitoring climate change; disaster management; hydrology; managing ecosystems and natural resources; monitoring air and water quality; mapping biodiversity resources, coastal zones, land use, wasteland and wetlands; oceanography; rural development and urban planning; and safety.

56. The Subcommittee noted with satisfaction that comprehensive, coordinated and sustained Earth observation systems were essential for the benefit of humankind and that significant efforts were being made to build the capacity of developing countries in using Earth observations to improve quality of life and advance their socio-economic development.

57. The Subcommittee noted the increased availability of space-based data at little or no cost, including the remote sensing data, made available free of charge, from the China-Brazil Earth resources satellites and from the Argentine Earth observation satellite SAC-C.

58. The Subcommittee took note of the number of continued launches of Earth observation satellites and the innovative research conducted using such satellites, data from which could be used to develop advanced, global-integrated Earth system models.

59. The Subcommittee recognized the important role played by organizations such as APRSAF and Sentinel Asia and its Space Applications for the Environment initiative, the Committee on Earth Observation Satellites (CEOS) and its virtual constellations for the Group on Earth Observations initiative, and the Group on Earth Observations (GEO) in promoting international and regional cooperation in the use of remote sensing technology, in particular for the benefit of developing countries.

60. The Subcommittee noted the progress made by GEO in the implementation of the Global Earth Observation System of Systems (GEOSS) and other initiatives, such as those on forest carbon tracking, climate and agriculture monitoring, development and integration of observation networks in cold regions and capacity-building efforts towards expansion of access to and use of Earth observation in developing countries. The Subcommittee also noted the “GEOSS in the Americas” symposium, held in Santiago from 5 to 7 October 2011.

61. The Subcommittee noted the successful conclusion of the 25th plenary meeting of the Committee on Earth Observation Satellites, hosted by Italy and held in Lucca, Italy, in November 2011, which resulted in the adoption of the Lucca

Statement in support of climate change studies and sustainable development, and the development of a more integrated approach to disaster mitigation and management. The Subcommittee further noted that India had taken up the chairmanship of the Committee on Earth Observation Satellites for 2012 and would host its next plenary meeting.

62. The Subcommittee noted with satisfaction the fortieth anniversary of the launch of the Landsat series of satellites by the United States, representing the longest-running effort to acquire satellite imagery of the Earth. The Subcommittee further noted that during those four decades, millions of images had been acquired and archived in the United States and at Landsat receiving stations around the world, providing a unique and valuable source for a variety of uses, from climate change analysis to forestry management and emergency response.

63. The view was expressed that the free availability on the Internet of high-resolution imagery of sensitive areas was a point of concern, for strategic reasons.