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**Committee on the Peaceful
Uses of Outer Space
Scientific and Technical Subcommittee
Forty-eighth session
Vienna, 7-18 February 2011**

Draft report

I. Introduction

1. The Scientific and Technical Subcommittee of the Committee on the Peaceful Uses of Outer Space held its forty-eighth session at the United Nations Office at Vienna from 7 to 18 February 2011, under the chairmanship of Ulrich Huth (Germany).
2. The Subcommittee held [...] meetings.

A. Attendance

3. Representatives of the following 57 member States of the Committee attended the session: Algeria, Argentina, Australia, Austria, 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, Libyan Arab Jamahiriya, Malaysia, Mexico, Morocco, Netherlands, Nigeria, Pakistan, Peru, Philippines, Poland, Portugal, Republic of Korea, Romania, Russian Federation, Saudi Arabia, Slovakia, South Africa, Spain, Sudan, Sweden, Switzerland, Syrian Arab Republic, Thailand, Tunisia, Turkey, Ukraine, United Kingdom of Great Britain and Northern Ireland, United States of America, Venezuela (Bolivarian Republic of) and Viet Nam.
4. At its 738th meeting, on 7 February, the Subcommittee decided to invite, at their request, observers for Azerbaijan, Costa Rica, the Dominican Republic, Israel, Namibia, the United Arab Emirates and Zimbabwe 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 Subcommittee concerning status.

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5. Observers for the International Atomic Energy Agency (IAEA), the International Telecommunication Union (ITU) and the World Meteorological Organization (WMO) attended the session.

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

7. The session was also attended by observers for the following non-governmental organizations with permanent observer status with the Committee: Association of Space Explorers (ASE), Committee on Space Research (COSPAR), European Space Policy Institute (ESPI), International Association for the Advancement of Space Safety (IAASS), International Astronautical Federation (IAF), International Astronomical Union (IAU), 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) and Space Generation Advisory Council (SGAC).

8. At its 745th meeting, on 10 February, the Subcommittee decided to invite, at its request, the European Union, to send observers to attend its forty-eighth session, 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 Subcommittee regarding status.

9. The session was attended by the observer for the Association of Remote Sensing Centres in the Arab World, in accordance with the invitation extended by the Committee at its fifty-third session for the Association to participate in the Committee's fifty-fourth session, as well as in the sessions of the Subcommittees in 2011 (see A/65/20, para. 310). The Subcommittee had before it A/AC.105/C.1/2011/CRP.18 and Add.1, containing the application of the Association for permanent observer status with the Committee.

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.1/2011/CRP.2.

B. Adoption of the agenda

11. At its 738th meeting, on 7 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. Implementation of the recommendations of the Third United Nations Conference on the Exploration and Peaceful Uses of Outer Space (UNISPACE III).
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. Use of nuclear power sources in outer space.
11. Near-Earth objects.
12. International Space Weather Initiative.
13. Long-term sustainability of outer space activities.
14. 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.
15. Draft provisional agenda for the forty-ninth session of the Scientific and Technical Subcommittee.
16. Report to the Committee on the Peaceful Uses of Outer Space.

D. National reports

12. The Subcommittee took note with appreciation of the reports submitted by Member States (A/AC.105/977 and Add.1 and A/AC.105/C.1/2011/CRP.8) for its consideration under agenda item 3, "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

13. On 14 February, COSPAR organized a symposium on the theme "Planetary protection and space exploration", which was moderated by John Rummel of COSPAR. The presentations given at the symposium included the following: "Planetary protection overview: the role of COSPAR in international missions", by John Rummel of COSPAR; "Mars lives? A planet worth protecting either way", by Charles Cockell of the Open University; "The international Mars exploration program and current planetary protection measures", by Gerhard Kminek of ESA; "Outer planet satellites as potential crucibles for life: extraterrestrial and terrestrial", by Kevin Hand of the Jet Propulsion Laboratory of the National Aeronautics and

Space Administration (NASA) of the United States; “Planetary protection beyond the living world: the role of COSPAR in future exploration missions and in preserving and promoting science”, by Pascale Ehrenfreund of COSPAR and George Washington University; and “We lost Pluto? Future steps in preserving planets, satellites and small solar system bodies”, by John Rummel of COSPAR.

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

14. After considering the items before it, the Subcommittee, at its [...] meeting, on [...] February 2011, 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

15. In accordance with General Assembly resolution 65/97, the Subcommittee considered agenda item 4, “United Nations Programme on Space Applications”.

16. At the 739th meeting, the Expert on Space Applications made a statement outlining the activities carried out and planned under the United Nations Programme on Space Applications.

17. The representatives of Japan and the United States made statements under agenda item 4. During the general exchange of views, statements relating to this item were also made by representatives of other member States, including the representative of Colombia on behalf of the Group of Latin American and Caribbean States.

18. 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 65/97. The Working Group of the Whole held [...] meetings, from 7 to [...] February 2011. At its [...]th 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.

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

(a) “Introduction of the United Nations/Japan Long-term Fellowship Programme on Nanosatellite Technologies”, by the representative of Japan;

(b) “Integrated space applications”, by the observer for ESA.

A. Activities of the United Nations Programme on Space Applications

20. 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.105/980, paras. 2-8). The Subcommittee noted that the Programme for 2010 had been carried out satisfactorily and commended the work accomplished by the Office under the Programme.

21. The Subcommittee noted with appreciation that, since its previous session, additional resources for 2011 had been provided by various Member States and organizations, as acknowledged in the report of the Expert on Space Applications (A/AC.105/980, paras. 56 and 57).

22. The Subcommittee expressed its concern that the financial resources available for carrying out the Programme remained limited. The Subcommittee appealed to Member States to continue supporting the Programme through voluntary contributions. The Subcommittee was of the view that the limited resources of the United Nations should be focused on activities with the highest priority.

23. The Subcommittee noted that the activities of the Programme in 2011 (see para. [...] below) would place emphasis on the following areas, among others: socio-economic benefits of space activities, small satellite technology for sustainable development, space weather, global navigation satellite systems, mountain regions and space law.

24. The Subcommittee noted with appreciation the provision of ground-based space weather instruments by Armenia, Brazil, France, Japan, Switzerland and the United States for the implementation of the International Space Weather Initiative (ISWI).

25. The Subcommittee noted with appreciation the participation of the International Space Station partners in the Outreach Seminar on the International Space Station, held on 8 February, organized by the Office in the framework of the Human Space Technology Initiative.

1. Year 2010

Meetings, seminars, symposiums, training courses and workshops

26. With regard to the activities of the United Nations Programme on Space Applications carried out in 2010, 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 referred to in the report of the Expert on Space Applications (A/AC.105/980, para. 53 and annex I):

(a) The Governments of Austria, Bolivia (Plurinational State of), the Czech Republic, Egypt, Nigeria, Republic of Moldova, Thailand, Turkey and the United States;

(b) APSCO, Centro de Investigaciones y de Servicios en Teledetección (CISTEL) of the Universidad Mayor de San Simón of the Plurinational State of Bolivia, the Ministry of Rural Development and Land and the Vice-Ministry of Science and Technology of the Ministry of Education of the Plurinational State of Bolivia, ESA, Geo-Informatics and Space Technology Development Agency of

Thailand, Helwan University of Egypt (through its Space Weather Monitoring Centre), International Academy of Astronautics (IAA), IAF, International Committee on Global Navigation Satellite Systems (ICG) (through its Executive Secretariat), Kyushu University of Japan, the Ministry of Higher Education and Scientific Research of Egypt, National Space Research and Development Agency and Obafemi Awolowo University of Nigeria, Regional Centre for Training in Aerospace Surveys in Nigeria, Japan Aerospace Exploration Agency (JAXA) and NASA.

Long-term fellowships for in-depth training

27. 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.

28. The Subcommittee expressed its appreciation to the Government of Japan and the Kyushu Institute of Technology for establishing the United Nations/Japan Long-term Fellowship Programme on Nanosatellite Technologies in the framework of the Basic Space Technology Initiative. The fellowship will contribute to building capacity in countries seeking to establish basic capabilities in the field of space technology development.

Technical advisory services

29. The Subcommittee noted with appreciation the technical advisory services provided under the United Nations Programme on Space Applications in support of activities and projects promoting regional and international cooperation in space applications, as referred to in the report of the Expert on Space Applications (A/AC.105/980, paras. 43-52).

2. Year 2011

Meetings, seminars, symposiums, training courses and workshops

30. The Subcommittee recommended the approval of the following programme of meetings, seminars, symposiums, training courses and workshops for 2011:

(a) United Nations/United Arab Emirates Workshop on the Applications of Global Navigation Satellite Systems, co-sponsored by the United States through ICG, to be held in Dubai, United Arab Emirates, from 16 to 20 January;

(b) United Nations/Argentina International Conference on the Use of Space Technology for Water Management, co-organized by ESA and the Prince Sultan bin Abdulaziz International Prize for Water, to be held in Buenos Aires in March;

(c) United Nations/Syrian Arab Republic Workshop on Integrated Space Technology Applications: Support to Monitoring Climate Change and its Impact on Natural Resources, to be held in Damascus in May;

(d) United Nations/Canada Workshop on the Contribution of Tele-epidemiology to Public Health Actions in the Context of Climate Change Adaptation, co-sponsored by ESA, to be held in Montreal, Canada, in June;

(e) United Nations/Viet Nam Workshop on Space Technology Applications for Socio-Economic Benefits, co-sponsored by ESA, to be held in Hanoi in October;

(f) United Nations/Islamic Republic of Iran Regional Workshop on the Use of Space Technology for Improving Human Health, to be held in Tehran in July;

(g) United Nations/Austria/ESA Symposium on Small Satellite Programmes for Sustainable Development, to be held in Graz, Austria, in September;

(h) United Nations/International Astronautical Federation Workshop on Space for Human and Environmental Security, to be held in Cape Town, South Africa, in September;

(i) United Nations/International Academy of Astronautics Workshop on Small Satellites in the Service of Developing Countries, to be held in Cape Town, South Africa, in October;

(j) United Nations/Nigeria Workshop on the International Space Weather Initiative, co-organized by NASA, JAXA, Kyushu University and ICG, to be held in Abuja in October;

(k) United Nations Expert Meeting on the Human Space Technology Initiative, to be held in Putrajaya, Malaysia, in the second half of 2011;

(l) United Nations International Meeting on Global Navigation Satellite Systems, co-sponsored by the United States of America through ICG, to be held in Vienna in December.

31. The Subcommittee noted that discussions were being held between the Office and the Government of Kenya on possible activities to be organized in connection with the fourth African Leadership Conference on Space Science and Technology for Sustainable Development.

B. International Space Information Service

32. The Subcommittee noted with satisfaction the publication of *Highlights in Space 2010*, which had been compiled in a CD-ROM from a report prepared in cooperation with COSPAR, IAF and the International Institute of Space Law. The Subcommittee expressed its appreciation to the contributors for their work.

33. The Subcommittee noted with appreciation that the Secretariat had continued to enhance the International Space Information Service and the website of the Office for Outer Space Affairs (www.unoosa.org).

C. Regional and interregional cooperation

34. The Subcommittee noted that the schedule of nine-month postgraduate courses for the period 2009-2012 offered by the regional centres for space science and technology education, affiliated to the United Nations, was included in the report of the Expert on Space Applications (A/AC.105/980, annex III).

35. The Subcommittee recalled that the General Assembly, in its resolution 65/97, 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 Declaration¹ and, to that end, fostered interregional dialogue on space matters between Member States.

36. 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” would be hosted by the Government of Kenya, and be held from 26 to 28 September 2011.

37. The Subcommittee noted that the seventeenth session of the Asia-Pacific Regional Space Agency Forum had been held in Melbourne, Australia, from 23 to 26 November 2010. The theme of the session was “The role of space technology and industry in addressing climate change”. The eighteenth session of the Forum would be jointly organized by the Government of Singapore and the Government of Japan and be hosted by Singapore in December 2011.

38. The Subcommittee also noted that APSCO held its fourth Council Meeting in Pattaya, Thailand, at the end of January 2011, at which it approved the implementation of the APSCO Applied High Resolution Satellite System as an optional project and the Asia-Pacific Ground-based Optical Space Objects Observation System as a basic activity. These two projects would be implemented in addition to the Data Sharing Service Platform project of APSCO.

39. The Subcommittee further noted that the Sixth Space Conference of the Americas had been held in Pachuca, Mexico, from 15 to 19 November 2010, hosted by the Government of Mexico. The Conference had concluded with the adoption of the Pachuca Declaration which, inter alia, calls for the creation of a space technical advisory group made up of representatives of space agencies and/or government agencies responsible for space matters in the countries of the continent, which shall provide advisory assistance to the work of Space Conferences of the Americas and its respective pro tempore secretariats.

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

40. In accordance with General Assembly resolution 65/97, the Subcommittee continued its consideration of agenda item 6, “Matters relating to remote sensing of the Earth by satellite, including applications for developing countries and monitoring of the Earth’s environment”.

41. The representatives of Austria, Canada, China, Germany, India, Italy, Japan, Ukraine and the United States made statements under the agenda item. During the general exchange of views, statements relating to this item were also made by representatives of other member States.

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

- (a) “ALSAT-2A”, by the representative of Algeria;

¹ General Assembly resolution 55/2.

(b) “National company Kazakhstan Gharysh Sapary”, by the representative of Kazakhstan;

(c) “Application of space technologies to the control of pirate fishing”, by the observer for ISU.

43. 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; safety; and search and rescue efforts.

44. 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.

45. The Subcommittee noted the increased availability of space-based data at little or no cost, including the remote sensing data from the China-Brazil Earth resources satellites made available on a free-of-charge basis to users on the African continent.

46. 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.

47. The Subcommittee recognized the important role played by organizations such as the Asia-Pacific Regional Space Agency Forum and its Space Applications for the Environment (SAFE) initiative; the Committee on Earth Observation Satellites (CEOS) and its Virtual Constellations for the Group on Earth Observations initiative; the Group on Earth Observations (GEO) and Sentinel Asia in promoting international and regional cooperation in the use of remote sensing technology, in particular for the benefit of developing countries.

48. The Subcommittee noted the progress made by GEO in the implementation of the Global Earth Observation System of Systems (GEOSS) and further noted that, at its seventh plenary session, held in Beijing from 3 to 4 November 2010, GEO had adopted the Data Sharing Action Plan to implement the GEOSS Data Sharing Principles, and had launched the Global Forest Observation Initiative, with the objective of helping countries to generate reliable, consistent and comparable reports on forest cover and forest cover change and estimate forest carbon stocks and trends.

49. The Subcommittee noted that the next CEOS plenary meeting would take place in Lucca, Italy, in November 2011, hosted by Italy, which had taken over the presidency of CEOS from the National Institute for Space Research of Brazil in October 2010. The Subcommittee further noted that India would hold the chairmanship of CEOS in 2012 and host the CEOS plenary meeting that year.

50. The Subcommittee welcomed the initiative of holding a side event on the margins of the fifty-fourth session of the Committee on the Peaceful Uses of Outer Space on the role and value of space technology in the protection and sustainable use of marine and coastal ecosystems.
