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**Committee on the Peaceful
Uses of Outer Space**
Scientific and Technical Subcommittee
Forty-sixth session
Vienna, 9-20 February 2009

Draft report

I. Introduction

1. The Scientific and Technical Subcommittee of the Committee on the Peaceful Uses of Outer Space held its forty-sixth session at the United Nations Office at Vienna from 9 to 20 February 2009, under the chairmanship of Aboubekr Seddik Kedjar (Algeria).
2. The Subcommittee held [...] meetings.

A. Attendance

3. Representatives of the following 54 member States of the Committee attended the session: Algeria, Argentina, Austria, Belgium, Bolivia, Brazil, Bulgaria, Burkina Faso, Canada, Chile, China, Colombia, Cuba, Czech Republic, Ecuador, France, Germany, Greece, Hungary, India, Indonesia, Iran (Islamic Republic of), Italy, Japan, Kenya, Libyan Arab Jamahiriya, Malaysia, Mexico, Morocco, Nigeria, Pakistan, Peru, Philippines, Poland, Portugal, Republic of Korea, Romania, Russian Federation, Saudi Arabia, Sierra Leone, Slovakia, South Africa, Spain, Sweden, Switzerland, Syrian Arab Republic, Thailand, Turkey, Ukraine, United Kingdom of Great Britain and Northern Ireland, United States of America, Uruguay, Venezuela (Bolivarian Republic of) and Viet Nam.
4. At the 698th meeting, on 9 February, the Chairman informed the Subcommittee that requests had been received from Angola, Azerbaijan, Croatia, the Dominican Republic, Israel and Tunisia to attend the session as observers. Following past practice, those States were invited to send delegations to attend the current session of the Subcommittee and address it, as appropriate, without prejudice to further requests of that nature; that action did not involve any decision



of the Subcommittee concerning status but was a courtesy that the Subcommittee extended to those delegations.

5. The following United Nations entities were represented at the session by observers: the International Telecommunication Union (ITU) and the International Atomic Energy Agency (IAEA).

6. The following were also represented by observers: the African Organization of Cartography and Remote Sensing (AOCRS), the Association of Space Explorers (ASE), EURISY, the European Space Agency (ESA), the European Organisation for Astronomical Research in the Southern Hemisphere (ESO), the European Space Policy Institute (ESPI), the secretariat of the Group on Earth Observations (GEO), the International Academy of Astronautics (IAA), the International Astronautical Federation (IAF), the International Astronomical Union (IAU), International Institute for Applied Systems Analysis (IIASA), the International Mobile Satellite Organization (IMSO), the International Society for Photogrammetry and Remote Sensing (ISPRS), the International Space University (ISU), the Space Generation Advisory Council (SGAC), the Prince Sultan Bin Abdulaziz International Prize for Water (PSIPW), the World Space Week Association and the Secure World Foundation (SWF).

7. 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/INF/[...].

B. Adoption of the agenda

8. At its 698th meeting, on 9 February 2009, the Subcommittee adopted the following agenda:

1. Adoption of the agenda.
2. Statement by the Chairman.
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. 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.
13. International Heliophysical Year 2007.
14. Draft provisional agenda for the forty-seventh session of the Scientific and Technical Subcommittee.
15. Report to the Committee on the Peaceful Uses of Outer Space.

C. General statements

9. The Subcommittee welcomed the European Organisation for Astronomical Research in the Southern Hemisphere (ESO), the European Telecommunications Satellite Organization (EUTELSAT-IGO), the Prince Sultan Bin Abdulaziz International Prize for Water (PSIPW) and the Secure World Foundation (SWF) as the newest permanent observers of the Committee.

10. Statements were made by representatives of the following member States during the general exchange of views: Algeria, Austria, Argentina, Bolivia (on behalf of the Group of Latin American and Caribbean States), Brazil, Canada, Chile, China, Cuba, Czech Republic (on behalf of the European Union), France, Germany, India, Indonesia, Iran (Islamic Republic of), Italy, Japan, Libyan Arab Jamahiriya, Malaysia, Mexico, Nigeria, Pakistan, Poland, Portugal, Republic of Korea, Romania, Russian Federation, Saudi Arabia, South Africa, Spain, Switzerland, Syrian Arab Republic, Thailand, United States, Ukraine and Venezuela (Bolivarian Republic of). The observers for Croatia made a general statement. General statements were also made by the European Space Policy Institute (ESPI), the International Academy of Astronautics (IAA), the International Astronautical Federation (IAF), the International Astronomical Union (IAU), the Space Generation Advisory Council (SGAC), the Prince Sultan Bin Abdulaziz International Prize for Water (PSIPW) and the Secure World Foundation (SWF).

11. At the 698th meeting, the Chairman made a statement outlining the work of the Subcommittee at its current session and reviewing the global space activities of the previous year, including important advances that had been made as a result of international cooperation.

12. Also at the 698th meeting, the Director of the Office for Outer Space Affairs of the Secretariat made a statement reviewing the work programme of the Office and the budgetary cuts expected for the biennium 2010-2011.

13. The Director of the Office for Outer Space Affairs informed the Subcommittee that following the Committee's agreement, expressed at its fifty-first session, that the Inter-Agency Meeting on Outer Space Activities should report directly to the Committee, the General Assembly, in its resolution 63/90, had invited the Inter-Agency Meeting to report to the Committee on the work conducted at its annual sessions. The Inter-Agency Meeting was expected to hold its twenty-ninth session in Vienna from 4 to 6 March 2009 and to report to the Committee at its fifty-second

session under a new agenda item on the use of space technology in the United Nations system.

14. The view was expressed that the Subcommittee should consider whether States that had not acceded to the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies,¹ should participate in the sessions as observers. The view was also expressed that the status of non-governmental organizations having permanent observer status with the Committee should be reviewed.

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

(a) “60th International Astronautical Congress: space for sustainable peace and progress”, by the representative of the Republic of Korea;

(b) “GOSAT greenhouse gases observing satellite ‘IBUKI’ and its contribution to improve our understanding of global warming”, by the representative of Japan;

(c) “The Canadian space program: a brief report on current activities and future directions”, by the representative of Canada;

(d) “Phoenix, the first mission to the Mars polar region”, by the representative of the United States;

(e) “Programme VENESAT-1”, by the representative of the Bolivarian Republic of Venezuela;

(f) “THEOS: a new era in space missions of Thailand” by the representative of Thailand;

(g) “Chandrayaan-1: India’s first lunar mission”, by the representative of India;

(h) “Omid satellite launch report”, by the representative of the Islamic Republic of Iran;

(i) “New beginnings: commercial space transportation regulations of the Federal Aviation Administration”, by the representative of the United States.

D. National reports

16. The Subcommittee took note with appreciation of the reports submitted by Member States (A/AC.105/923 and A/AC.105/C.1/2009/CRP.3) 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.

¹ United Nations, *Treaty Series*, vol. 610, No. 8843.

E. Symposium

17. On 9 February 2009, IAF organized, pursuant to General Assembly resolution 63/90, a scientific symposium on the theme “The role of Earth observation satellites in promoting understanding of and addressing climate change concerns”. The symposium consisted of two round tables: one on the theme “Space systems observation/monitoring of climate change” and the other on the theme “Space systems contribution to understanding and forecasting climate behaviour”. The symposium was moderated by Gérard Brachet of the International Astronautical Federation (IAF). The presentations given at the symposium included the following: “Concept to reality”, by Valanathan Munsami of the GEO secretariat; “Space systems observation/monitoring of climate change”, by Barbara Ryan of the World Meteorological Organization (WMO); “Space observation and monitoring of climate changes: Indian initiatives”, by K. Radhakrishnan of the Indian Space Research Organisation (ISRO); “Climate change, the oceans and sea-level rise”, by Stan Wilson of the National Oceanic and Atmospheric Administration (NOAA) of the United States; and “Space technologies and climate change: the socio-economic angle”, by Claire Jolly of the Organization for Economic Cooperation and Development (OECD).

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

18. After considering the items before it, the Subcommittee, at its [...] meeting, on [...] February 2009, 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

19. In accordance with General Assembly resolution 63/90, the Scientific and Technical Subcommittee continued its consideration of agenda item 4, “United Nations Programme on Space Applications”.

20. At the 703rd meeting, the Expert on Space Applications made a statement outlining the activities carried out and planned under the United Nations Programme on Space Applications.

21. The representatives of Greece, India, Japan, the Russian Federation, the United States and [...] made statements under agenda item 4.

22. In accordance with General Assembly resolution 63/90, the Subcommittee, at its 703rd meeting, reconvened the Working Group of the Whole under the chairmanship of K. Radhakrishnan (India). The Working Group of the Whole held [...] meetings, from 11 to [...] February 2009. 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

23. The Subcommittee heard a presentation on the theme “Telemedicine: status and future”, by the representative of Germany.

A. Activities of the United Nations Programme on Space Applications

24. The Subcommittee had before it the report of the Expert on Space Applications, which outlines the mandate and orientation of the United Nations Programme on Space Applications (A/AC.105/925, paras. 2-8). The Subcommittee noted that the Programme for 2008 had been carried out satisfactorily and commended the work accomplished by the Office under the Programme.

25. The Subcommittee noted with appreciation that, since its previous session, additional resources for 2008 had been provided by various Member States and organizations, as acknowledged in the report of the Expert (A/AC.105/925, paras. 46 and 47).

26. The Subcommittee expressed its concern that the financial resources available for carrying out the Programme remained limited. The Subcommittee noted that the expected reduction in resources from the regular budget of the United Nations for the biennium 2010-2011 would have an impact on whether the full range of activities under the Programme could be carried out. 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.

27. The Subcommittee noted that, in addition to the United Nations conferences, training courses, workshops, seminars and symposiums planned for 2009 (see para. [...] below), other activities of the Programme in 2009 would place emphasis on the following areas:

(a) Providing support for education and training for capacity-building in developing countries through the regional centres for space science and technology education, affiliated to the United Nations, and by continuing the long-term fellowship programmes for training;

(b) Promoting the use of and access to space-based technologies and information in the fields of climate change, mountainous regions, search and rescue, tele-health and basic space technology;

(c) Increasing the awareness of knowledge-based themes, including in the fields of basic space science and space law, and conducting educational outreach activities for youth;

(d) Providing technical advisory services, upon request, to Member States, bodies and specialized agencies of the United Nations system and relevant national and international organizations.

1. Year 2008

Meetings, seminars, symposiums, training courses and workshops

28. With regard to the activities of the United Nations Programme on Space Applications carried out in 2008, 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.105/925, para. 43 and annex I):

(a) The Governments of Austria, Bulgaria, Burkina Faso, Colombia, India, Indonesia, Japan, Kenya, Saudi Arabia and the United Kingdom;

(b) The Ministry of Health of Burkina Faso, ESA, the Climate Prediction and Applications Centre of the Intergovernmental Authority on Development (IGAD), ISRO, IAA, IAF, the Japan Aerospace Exploration Agency (JAXA), the King Abdulaziz City for Science and Technology (KACST), the National Aeronautics and Space Administration (NASA) of the United States, the National Institute of Aeronautics and Space (LAPAN) of Indonesia, the Prince Sultan Bin Abdulaziz International Prize for Water (PSIPW), the Sanjay Gandhi Postgraduate Institute of Medical Sciences (SGPGIMS), the Solar-Terrestrial Influences Laboratory of the Bulgarian Academy of Sciences, the Space Research Institute of the Austrian Academy of Sciences and Joanneum Research, the University of Glasgow, the Office of the Vice-President of Colombia and the Colombian Space Commission (CCE).

Long-term fellowships for in-depth training

29. 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.

30. The Subcommittee noted with satisfaction that, in October 2008, the Programme and the National Commission on Space Activities (CONAE) of Argentina had held a second annual six-week training course in the framework of a fellowship programme, established jointly by the United Nations and the Government of Argentina, for advanced training in landscape epidemiology at the Mario Gulich Institute for Higher Space Studies in Córdoba, Argentina.

Technical advisory services

31. 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 cooperation in space applications, as referred to in the report of the Expert on Space Applications (A/AC.105/925, paras. 35-42).

2. Year 2009

Meetings, seminars, symposiums, training courses and workshops

32. The Subcommittee recommended the approval of the following programme of meetings, seminars, symposiums, training courses and workshops, to be organized jointly by the Office for Outer Space Affairs, host Governments and others in 2009:

(a) United Nations/United States of America Training Course on Satellite-Aided Search and Rescue, to be held in Miami, United States, from 19 to 23 January;

(b) United Nations/Azerbaijan/United States of America/European Space Agency Workshop on Applications of Global Navigation Satellite Systems, to be held in Baku from 11 to 15 May;

(c) United Nations/Austria/European Space Agency Symposium on Small-Satellite technologies for Developing Countries, to be held in Graz, Austria, from 8 to 11 September;

(d) United Nations/Peru/European Space Agency/United Nations Environmental Programme/United Nations Educational, Scientific and Cultural Organization Workshop on Integrated Space Technology Applications for Sustainable Development in the Mountain Areas of Andean Countries, to be held in Lima from 14 to 19 September;

(e) United Nations/European Space Agency/National Aeronautics and Space Administration/Japan Aerospace Exploration Agency Workshop on the International Heliophysical Year 2007, to be held in Jeju, Republic of Korea, from 22 to 25 September;

(f) United Nations/International Astronautical Federation Workshop on Integrated Space Technologies and Space-based Information for Analysing and Predicting Climate Change, to be held in Daejeon, Republic of Korea, from 9 to 11 October;

(g) United Nations/International Academy of Astronautics Workshop on Small Satellites in the Service of Developing Countries, to be held in Daejeon, Republic of Korea, on 13 October;

(h) United Nations/Islamic Republic of Iran Workshop on Space Law, to be held in Tehran in late 2009;

(i) United Nations/United States of America/European Space Agency Training Course on Satellite Navigation and Location-Based Services at the African Centre for Space Science and Technology—in French language, to be held in Rabat from 29 September to 24 October 2009.

B. International Space Information Service

33. The Subcommittee noted with satisfaction the publication of *Highlights in Space 2008*,² which had been compiled in a CD-ROM from a report prepared in cooperation with IAF, COSPAR and the International Institute of Space Law. The Subcommittee expressed its appreciation to the contributors for their work.

34. 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 (<http://www.unoosa.org>).

C. Regional and interregional cooperation

35. The Subcommittee noted that the highlights of the activities of the regional centres for space science and technology education, affiliated to the United Nations, supported under the United Nations Programme on Space Applications in 2008 and planned activities for 2009 and 2010 were included in the report of the Expert on Space Applications (A/AC.105/925, annex III).

² United Nations publication, Sales No. E.09.I.4.

36. The Subcommittee noted that the China National Space Administration and the Secretariat of the Asia-Pacific Multilateral Cooperation in Space Technology and Applications (AP-MCSTA) were providing full and partial scholarships for participants from developing countries in the region of Asia and the Pacific who were attending postgraduate courses on space technology applications at Beihang University in Beijing, based on the educational curricula developed by the United Nations.

37. The Subcommittee noted that the fifteenth session of the Asia-Pacific Regional Space Agency Forum (APRSAF) had been held in Hanoi and Ha Long Bay, Viet Nam, from 9 to 12 December 2008. The theme of the session had been "Space for sustainable development". Participants at the session had considered activities related to Sentinel Asia, the APRSAF Satellite Technology for the Asia-Pacific Region (STAR) Programme, the JAXA Satellite Application for Environment (SAFE) programme, communication satellite applications, space education and awareness and space environment utilization.

38. The Subcommittee also noted that the Asia-Pacific Space Cooperation Organization, headquartered in Beijing, formally started operating on 16 December 2008.

39. The Subcommittee further noted that the proceedings of the Second African Leadership Conference on Space Science and Technology, held in Pretoria from 2 to 5 October 2007, had been disseminated in issue 12 of the journal *African Skies/Cieux Africains* and that the third African leadership conference on space science and technology for sustainable development was to be held in Algeria in 2009. The Subcommittee also noted that the 2009 IAA African Regional Conference would be held in Abuja from 24 to 26 November.

40. The Subcommittee further noted the preparations being undertaken for the Sixth Space Conference of the Americas and that a second meeting with representatives of the pro tempore secretariat of the Fifth Space Conference of the Americas, the International Group of Experts and the Office for Outer Space Affairs was held in the Galapagos Islands, Ecuador, on 28 and 29 August 2008, following a regional seminar on space law held in Quito on 26 and 27 August 2008.

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

41. In accordance with General Assembly resolution 63/90, the Subcommittee continued its consideration of agenda item 6, "Matters relating to remote sensing of the Earth by satellite".

42. In the course of the discussions, delegations reviewed national and cooperative programmes on remote sensing. Examples were given of national programmes and bilateral, regional and international cooperation. The representatives of Brazil, Canada, China, India, Japan, Malaysia, Nigeria, South Africa and the United States made statements under the agenda item.

43. The Subcommittee heard the following scientific and technical presentations:
 - (a) “Remote sensing for marine security and safety”, by the representative of Germany;
 - (b) “Progress in GEOSS implementation”, by the observer for the GEO secretariat;
 - (c) “International Society for Photogrammetry and Remote Sensing”, by the observer for ISPRS.
44. The Subcommittee emphasized the importance of Earth observation satellites for sustainable development and noted with satisfaction that an increased number of developing countries were becoming actively engaged in developing and deploying their own remote-sensing satellite systems and in utilizing space-based data to improve socio-economic development.
45. The Subcommittee noted that the increased convergence of space-based data, geographic information systems (GIS) and GNSS technologies was generating valuable information for policy- and decision-making. The Subcommittee also noted that regional and international cooperation and partnerships were important for all countries. As no single State could afford to develop a complete system that would meet all its needs, sharing data and information was essential.
46. The Subcommittee recognized the important role played by organizations such as the Committee on Earth Observation Satellites (CEOS), IAF and the International Society for Photogrammetry and Remote Sensing and by international initiatives such as the Integrated Global Observing Strategy Partnership in promoting international cooperation in the use of remote sensing technology, in particular for the benefit of developing countries.
47. The Subcommittee noted the increased availability of space-based data at little or no cost, including the high-resolution global digital elevation model provided by Japan and the data from the China-Brazil Earth resources satellites (CBERS) provided free of charge by Brazil and China to users in Latin America via the Internet. The Subcommittee also noted with satisfaction that, in August 2008, the United States Secretary of the Interior had announced a schedule for making the entire satellite image archive built up through the Land Remote Sensing Satellite (Landsat) available over the Internet at no cost. The Landsat archive is a record of the Earth’s surface that is valuable for a variety of uses, from climate change to forestry management and emergency response.
48. The Subcommittee also took note of the intention of Canada to make data from future RADARSAT missions available internationally, to the extent allowed by its national legislation.
49. The Subcommittee also noted that the issue of data dissemination, which in the past had been identified as a major hurdle preventing access to and use of satellite-based data, was now being addressed by low-cost data dissemination systems such as GEONETCast and regional initiatives such as Sentinel Asia.
50. The Subcommittee acknowledged the progress made by GEO in the implementation of the Global Earth Observation System of Systems (GEOSS). At the fifth plenary session of GEO, held in Bucharest on 19 and 20 November 2008, GEO members and participating organizations reviewed the GEO workplan for the

period 2009-2011. The Subcommittee also noted the substantial contributions made to GEOSS by member States of the Committee, entities of the United Nations system and other organizations having permanent observer status with the Committee.
