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**Committee on the Peaceful  
Uses of Outer Space****International cooperation in the peaceful uses of  
outer space: activities of Member States****Note by the Secretariat****Contents**

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## **I. Introduction**

1. In the report on its forty-fourth session, the Scientific and Technical Subcommittee of the Committee on the Peaceful Uses of Outer Space recommended that the Secretariat continue to invite Member States to submit annual reports on their space activities (A/AC.105/890, para. 17).
2. In a note verbale dated 10 September 2007, the Secretary-General invited Governments to submit their reports by 30 October 2007. The present note was prepared on the basis of reports received from Member States in response to that invitation.

## **II. Replies received from Member States**

### **Japan**

[Original: English]

#### **1. Participation in the International Space Station programme**

1. Japan has been active in promoting the International Space Station (ISS), in cooperation with all countries involved in that project. Japan's main contribution to ISS has been the development of the Japanese Experiment Module ("Kibo"), which conducts experiments and research in outer space.
2. Kibo will be launched in the beginning of 2008. Japanese astronaut Takao Doi will fly aboard the Space Shuttle Endeavor of the National Aeronautics and Space Administration (NASA) of the United States of America on the first Kibo transportation and assembly flight. Astronaut Akihiko Hoshide will be on board the Space Shuttle Discovery on the second Kibo transportation and assembly flight.
3. During those two missions, the astronauts will mainly assemble the Pressurized Section and Pressurized Module of the Experiment Logistics Module onto ISS, but they will also conduct other activities.
4. The development of ISS and Kibo will contribute to the further utilization of outer space while improving the quality of human life.

#### **2. Remote sensing: international cooperation and Japan's initiative for disaster management**

5. Japan has been promoting international cooperation in a number of other fields, as described below.
6. In the field of Earth observation, Japan cooperates closely with organizations working on space-related issues through the Committee on Earth Observation Satellites and contributes to the advancement of the Integrated Global Observing Strategy.
7. As a member of the Executive Committee and a co-chair of the Architecture and Data Committee of the Group on Earth Observations, Japan has been promoting the establishment of the Global Earth Observation System of Systems (GEOSS).

Japan continues to take a leading role in the efforts towards the establishment of GEOSS, in accordance with the GEOSS 10-Year Implementation Plan.

8. The Asia-Pacific Regional Space Agency Forum (APRSAF) holds yearly meetings under the auspices of the Government of Japan and in cooperation with international partners.

9. At the thirteenth session of APRSAF, held in Jakarta from 5 to 7 December 2006, space and disaster management organizations in the Asia-Pacific region agreed to further collaborate in the Sentinel-Asia project initiated by APRSAF.

10. The Sentinel-Asia project aims to encourage States to share information on disasters in the Asia-Pacific region. To implement this project, joint project team meetings were held in the Philippines, Singapore, Thailand and Viet Nam. A total of 59 agencies from 20 countries and 8 international organizations including the Economic and Social Commission for Asia and the Pacific, as well as space, science and technology agencies, participated in the meetings. Japan, the country that has been leading the project in cooperation with its partners, is looking forward to the further expansion of such activities in the region.

11. The fourteenth session of APRSAF will be held in Bangalore, India, from 21 to 23 November 2007 and will be organized jointly with the Indian Space Research Organization. The main theme of the session will be "Space for human empowerment". Additional information is available on the APRSAF website (<http://www.aprsaf.org/index.html>).

## **Poland**

[Original: English]

1. International cooperation in the peaceful use of outer space in 2007 was carried out in the areas below.

### **1. Space technologies**

2. The bulk of Poland's activities in the area of space technologies focused on performing feasibility studies and on developing the means to enable the country to carry out space missions in the future.

3. During the course of a key event entitled "Warsaw Space Days", held from 21 to 24 May 2007, lectures and technical panels on space technologies were organized, together with an exhibition on items and models manufactured for space experiments.

4. Poland's signature of the Plan for European Cooperating States Charter of the European Space Agency (ESA) on 27 April 2007 represents a significant step forward in the development of space technologies since it grants Polish companies the opportunity to participate in ESA projects.

5. In 2007, a number of meetings were attended by representatives of the academic and industrial communities. One of those meetings was a conference entitled "Space for Humans: the Past 50 Years and beyond", held in Warsaw on 2 and 3 October 2007. On that occasion, Poland presented its achievements in space technologies.

6. Feasibility studies for assessing the capabilities of small launchers and small Earth-observation satellites were carried out. It was found that the Polish instruments on board ESA spacecraft performed well. The Space Research Centre of the Polish Academy of Sciences, the Warsaw University of Technology, the Warsaw Institute of Aviation, the Wrocław University of Technology, and the Military Institute of Aviation, among others, participated in the studies.

7. Students from Polish universities participated in the second Young Engineers Satellite (YES2) experiment and in projects that involved building nanosatellites.

## **2. Space physics**

8. Research in space physics was conducted in four areas: (a) space astronomy and astrophysics; (b) solar physics and physics of the heliosphere; (c) physics of the Earth's ionosphere and magnetosphere; and (d) physics of planets.

9. In the area of space astronomy and astrophysics, scientists from the Space Research Centre of the Polish Academy of Sciences and the Nicolaus Copernicus Astronomical Center participated in the International Gamma-Ray Astrophysics Laboratory (INTEGRAL) and Herschel missions of ESA by preparing some of the instruments used in the missions and by interpreting the data obtained from them.

10. In the area of solar physics and physics of the heliosphere, Poland constructed the SphinX X-ray spectrometer for the CORONAS-PHOTON mission and prepared the on board software module for the IBEX mission. Studies on the density of neutral interstellar H gas were carried out as part of a joint project with Poland's counterparts in the Russian Federation, Switzerland and the United States of America.

11. In the area of the Earth's ionosphere and magnetosphere, Poland interpreted data obtained from the following satellites: Cluster, Interball, Detection of Electro-Magnetic Emissions Transmitted from Earthquake Regions (DEMETER) and Compass-2. Those studies measured waves and plasma, auroral kilometric radiation, the ionospheric response to earthquakes and the kinds of interactions that take place between the upper atmosphere and the ionosphere.

12. Interball, Compass-2 and DEMETER satellites carried Polish instruments on board. The preparations for the launch of the Tool for the Analysis of Radiations from Lightning and Sprites (TARANIS) are also under way.

13. In the area of physics of planets, Poland participated in the Mars Express, Venus Express, Cassini-Huygens and Rosetta missions, which all carry instruments manufactured in Poland. Poland is also involved in interpreting data from the first three of those satellites mentioned.

## **3. Satellite geodesy and navigation**

14. The bulk of Poland's activities in the area of satellite geodesy and navigation focused on one of three main tasks:

(a) Global and regional Global Positioning System and Satellite Laser Ranging measurements in the framework of the International Global Navigation Satellite Systems (GNSS) Service, the International Laser Ranging Service, the

International Earth Rotation and Reference Systems Service, and the European Reference Frame Permanent Network;

- (b) Practical utilization of satellite methods in local geodesy;
- (c) Application of GNSS in overland, maritime and air navigation.

15. The institutions involved in the activities listed above were: the Space Research Centre of the Polish Academy of Sciences, the Warsaw University of Technology, the Institute of Geodesy and Cartography, the University of Warmia and Mazury, the AGH University of Science and Technology and the Maritime University in Gdynia.

#### **4. Remote sensing**

16. Remote sensing activities were carried out at the following academic and research centres: the University of Warsaw, the University of Lublin, the Institute of Geodesy and Cartography and the Institute of Meteorology and Water Management.

17. At the University of Warsaw, studies on hyperspectral methods in remote sensing were carried out, in cooperation with the Humboldt State University and the German Aerospace Center. Satellite imagery and geographic information systems were also applied to the study of environmental and land exploitation.

18. At the AGH University of Science and Technology, studies for the detection and monitoring of geothermal anomalies were carried out by using satellite, airborne and terrestrial imaging technology. Other studies were carried out on the extent of water contamination due to sulfur and lignite mining.

19. At the Institute of Geodesy and Cartography, research was done on the use of satellite images to create maps for crop prognosis, drought mapping, land cover monitoring and vegetation monitoring. The Institute cooperated with partners from the European Union and from countries in other regions.

20. The Institute of Meteorology and Water Management uses Earth-observation for meteorological applications. The bulk of the activities focused on the use of Meteosat Second Generation satellites in operational forecasting, on new product development and implementation and on international cooperation within the framework of the European Organisation for the Exploitation of Meteorological Satellites and the Sprite Watch campaign.

#### **5. Astrobiology**

21. The establishment of the Centre for Advanced Studies in Astrobiology and Related Topics at the University of Szczecin, which brings together five research and educational institutions, represented a significant development in the area of astrobiology. The Centre functions within the framework of the European Exo/Astrobiology Network Association.

22. The University of Szczecin also offered the Second European Astrobiology Course for the winter term 2007/2008.

23. A Polish astrobiological workshop was held in Warsaw on 26 and 27 May 2007.

24. Poland is also participating in an expert group that is preparing one of the scientific programmes for the ExoMars mission of ESA.
25. A Polish student was admitted to the Biological Planetary Internship Program of NASA in the summer semester of 2007. The programme was organized to study the development of seeds incubated in space during space shuttle missions.
26. A session on astrobiology was held at the thirty-third Meeting of the Polish Astronomical Society, held from 17 to 21 September 2007.

## **Saudi Arabia**

[Original: Arabic]

1. Aware of the progress made in the field of space technologies and their applications and the promise that such technologies hold for the benefit of humankind, the Government of Saudi Arabia issued several directives for the promotion of the peaceful application of space technologies.
2. The competent authorities, including the Space Research Institute of the King Abdulaziz City for Science and Technology (KACST), continued to cooperate with various space agencies in the field of satellite data reception and the dissemination of such information to beneficiaries.
3. Several scientific courses and conferences on space technologies were held. Representatives of the academic, public and private sectors have been cooperating on a five-year strategic plan aimed at localizing and developing a national programme for promoting research, development and innovation in space and aviation technologies and at establishing a sophisticated industry capable of supporting sustainable development in Saudi Arabia.

### **1. Communications**

4. Saudi Arabia is an active member of the International Telecommunication Union and has participated in the World Radio Communication Conference. Saudi Arabia has two main ground stations for receiving information, communication services and direct broadcasts from satellites of the Arab Satellite Communications Organization (ARABSAT), the International Telecommunications Satellite Organization (INTELSAT), the International Maritime Satellite Organization and other mobile satellite communications services, including Iridium, Thuraya and Viasat.

### **2. Studies and projects under implementation in the field of geographic information and remote sensing techniques**

5. The Space Research Institute, in collaboration with Governmental and private entities, carried out the following projects:
  - (a) Establishment of a database for the Saudi Communications Company (to be carried out in three stages);
  - (b) Production of corrected images and digital elevation models for railway tracks;

- (c) Creation of a baseline map of the city of Mecca;
- (d) Establishment of a national centre for geographic information systems;
- (e) Positioning for mobile telephone location-based services;
- (f) Creation of digital maps for the facilities of the general organization for desalination;
- (g) Carrying out of a forest survey in the south-western part of Saudi Arabia;
- (h) Carrying out of a survey of natural pastures in the central, northern and eastern parts of Saudi Arabia;
- (i) Production of a space atlas of Saudi Arabia.

6. For the above projects, images were provided by the KACST satellite imagery reception station in Riyadh through the following satellites:

Satellite	Resolution (metres)
Landsat 5 and 7	15-30
SPOT-2, 4 and 5	20, 10, 5, 2.5
RADARSAT-1	100, 50, 30, 25, 8
NOAA	1 000
IKONOS	4, 1

### 3. Satellites

7. Satellite systems have been developed in Saudi Arabia and experiments for their practical application have been conducted.
8. Since the launch of the first Saudi Arabian Sat-1 satellite in 2000, the Space Research Institute, represented by the Satellite Technology Centre, has designed, built and launched six communication and remote-sensing pilot satellites. Furthermore, it has designed and built ground stations and ground terminals for the control of small satellites.
9. Currently, the Space Research Institute, represented by the Satellite Technology Centre, is developing and building the next generation of satellites.
10. The Satellite Technology Centre consists of a laboratory, a ground station, a sensing laboratory, an air-table system for simulating weightlessness and control and radio communication devices. The satellite direction control system and the systems for communicating with satellites are being tested.
11. The following is a list of Saudi Arabian satellites that have been launched and of activities related to the launches:
- (a) Sat-1 a, b and c satellites;
  - (b) Sat-2, the first Saudi Arabian remote-sensing pilot satellite;
  - (c) Comsat 1 and 2 communication satellites;
  - (d) Design of Sat-4 remote-sensing satellite;
  - (e) Research of geostationary satellite technologies;

- (f) Commissioning and operation of the Saudi satellite control station and the ground reception station;
- (g) Registration of Saudi satellites with INTELSAT;
- (h) Participation in the Arab satellite committee.

**4. Meteorological satellites**

12. Saudi Arabia is an active member of the World Meteorological Organization. It has established a climate centre to serve Arab countries and adopted a number of regulations and laws aimed at protecting the environment and wildlife. Saudi Arabia has also established the National Commission for the Study and Prevention of Natural Disasters.

**5. Training**

13. Saudi Arabia has developed training programmes in which Saudi Arabian universities have cooperated with regional and international organizations and space agencies from around the world. Some of the programmes, such as the summer education programme for talented youth organized by the Space Research Institute, aim at educating young people.

**6. Space debris**

14. Saudi Arabia was actively involved in the study of space debris and nuclear power use through its participation in the main bodies established following the recommendations of the Third United Nations Conference on the Exploration and Peaceful Uses of Outer Space. Cooperative studies and research projects between scientists from Saudi Arabian universities and representatives of international organizations were also carried out.

**7. Near-Earth objects**

15. In cooperation with NASA, studies are being carried out on tectonic movements and efforts are being made to accurately determine the size of space objects and the distances between them.

**8. International Heliophysical Year**

16. Activities to mark the International Heliophysical Year in Saudi Arabia included preliminary studies on atmospheric electromagnetic interference and the development of mathematical, physical and geometric formulas.

17. Scientific research on space physics was also promoted, in cooperation with scientists from Saudi Arabian universities.



## Turkey

[Original: English]

1. Adhering to the peaceful uses of outer space, the Scientific and Technological Research Council of Turkey (TUBITAK-UZAY) started its work on space activities by establishing the Satellite Technologies Group in 1998.
2. After know-how was successfully transferred through the BilSAT-1 project<sup>1</sup> (2001-2004), TUBITAK-UZAY started on RASAT, Turkey's first national satellite project, in 2004.
3. The RASAT satellite was built with space technologies aimed at keeping space for peaceful uses. The satellite technology demonstration was designed by researchers at TUBITAK-UZAY.
4. The main goals of the RASAT project are:
  - (a) To improve the know-how gained from the BilSAT-1 project on all phases of a satellite project, from the design phase to the in-orbit commissioning phase;
  - (b) To develop space-qualified systems using current technologies and acquiring flight heritage by successfully operating such systems in outer space;
  - (c) To contribute to studies on remote sensing in Turkey;
  - (d) To investigate and use current space technology capabilities available in Turkey;
  - (e) To increase the number of researchers in Turkey who are experienced in satellite technologies;
  - (f) To meet the requisites for designing and building satellites in Turkey in the future;
  - (g) To demonstrate the space-based capabilities of TUBITAK-UZAY.
5. The RASAT microsatellite is based on BilSAT-1 modules. However, its X-band transmitter, the image compression module GEZGIN-2, the smart lithium battery and the new-generation on-board computer BILGE are all designed and manufactured by TUBITAK-UZAY.
6. With regard to the RASAT project, the following tasks were completed in the course of 2007:
  - (a) The design of the RASAT satellite was finalized and a critical design review was started;
  - (b) Most of the mechanical parts and electronic components of the satellite were in stock and engineering models of some modules were assembled;

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<sup>1</sup> The BilSAT-1 microsatellite flight model was designed and constructed by Surrey Satellite Technology Limited for TUBITAK-UZAY in cooperation with engineers from TUBITAK-UZAY and in a collaborative programme comprising the manufacture of the BilSAT-1 micro-satellite and training at the University of Surrey, Guildford, United Kingdom of Great Britain and Northern Ireland.

- (c) All tenders relative to RASAT engineering and flight models were completed;
- (d) The optical imaging system and the thermal vacuum testing system of RASAT were scheduled to be delivered to TUBITAK-UZAY in November 2007;
- (e) Negotiations for the 2008 launch were initiated.

**Other activities**

- 7. In 2007, educational activities were carried out by the astronomy and space sciences departments of Turkish universities. The main objective of those activities was to produce information on stellar surfaces and their general evolution.
- 8. At the Istanbul Technical University, a spacecraft systems test and development laboratory containing 1,000 clean rooms and a thermal vacuum chamber was being furnished.
- 9. A satellite communications laboratory was also established at the Istanbul Technical University. The necessary infrastructure to communicate with satellites, such as a rotating antenna and other hardware and software, was set up. The rotating antenna and the satellite communication technology was tested.
- 10. As part of the pico-satellite design project, initiated by students at the Istanbul Technical University in 2006, a desktop model of the satellite was designed and developed and work had started on the production of an engineering model. The satellite was expected to be launched in the third quarter of 2008.
- 11. The space engineering faculty of the Istanbul Technical University produced various publications at the undergraduate and graduate levels on space activities and updated its workplan for the period 2007-2010.
- 12. The Turkish State Meteorological Service regularly processed and distributed data received from the Meteorological Satellite Ground Receiving System. Those data were used for weather forecasting, for nowcasting (short-term weather forecasting), and for early warning applications.
- 13. The Turkish State Meteorological Service planned to acquire a dual X/L band satellite ground receiving system, which would be operational in 2008. The system is to receive and process data from the existing Terra and Aqua satellites, and from the National Oceanic and Atmospheric satellites and the European meteorological operational satellites. In the future, it will also process data from the National Polar Orbiting Operational Environmental Satellite System (NPOESS) and the NPOESS Preparatory Project satellites.
- 14. The following educational activities were also carried out in 2007:
  - (a) The international conference on Recent Advances in Space Technologies (RAST 2007), organized by the Aeronautics and Space Technologies Institute of the Turkish Air Force Academy, was held in Istanbul, Turkey, from 14 to 16 June 2007.
  - (b) The conference entitled "Areas and Mechanisms for Collaboration Between Turkish and European Actors in Space Activities," organized by ESA and TUBITAK-UZAY was held in Gebze, Turkey, on 22 and 23 October 2007.

## Ukraine

[Original: Russian]

1. Space activities carried out in Ukraine in 2007 were directed at meeting the commitments made by the country in the framework of international programmes and projects, implementing the priority projects of the Third National Space Programme for the period 2003-2007 and improving the effectiveness of the work of the national space sector through restructuring and commercialization, increasing the use of advanced space technologies, fostering the conditions for increasing competition and private initiative, and establishing broad cooperation with international financial, scientific and technical and other types of organizations. Activities that were carried out to implement priority projects under the Third Programme are described below.

### **1. Development of space technologies**

#### **(a) Global navigation satellite systems**

2. With a view to meeting Ukraine's international commitments, the parliament of Ukraine ratified the Cooperation Agreement on a Civil Global Navigation Satellite System (GNSS) between the European Community and its member States and Ukraine on 10 January 2007. An action plan to implement the Agreement was drafted by the National Space Agency of Ukraine (NSAU) and approved by the relevant ministries and governmental authorities of Ukraine.

3. Based on the results of consultations held by representatives of the Mission of Ukraine to the European Union with experts on the Galileo Satellite Navigation System from the Directorate-General for Energy and Transport in January and March 2007, a proposal was discussed and a decision was made ahead of schedule, even before the Agreement had entered into force, to begin discussing, among other matters, administrative issues and the structure of the management committee, how it would function in the future and items on the agenda for its first meeting.

4. In accordance with the above and with the approved action plan, NSAU brought together a group of experts from Ukraine to call for the implementation of the Agreement. NSAU also notified the Mission of Ukraine to the European Union to this effect.

5. According to information provided by the Mission of Ukraine to the European Union, as of 24 September 2007 a total of 13 European Union member States had ratified the Agreement (Austria, Czech Republic, Denmark, Estonia, Finland, Germany, Greece, Hungary, Latvia, Luxembourg, Slovakia, Slovenia and Sweden).

#### **(b) National Satellite Communications System**

6. On 3 May 2007 the Cabinet of Ministers of Ukraine adopted a decision to establish the National Satellite Communications System (NSCS) and the first national telecommunications satellite for communications and broadcasting.

7. That decision provided for the implementation of a package of legal, organizational and technical measures to launch, inter alia, a national communications satellite in 2011. NSAU was identified as the customer of NSCS. The utilization of the facilities to be offered by future space installations was

expected to promote the development of a national network of satellites for television and radio broadcasting, data transmission and Internet services provision.

8. Ukrkosmos, a State-owned enterprise that was already preparing for the launch of a telecommunications and broadcasting satellite, was identified as the operator of the NSCS. The first phase of NSCS, which consisted of the establishment of 41 satellite ground stations, was already under way in Ukraine.

**(c) Earth remote sensing**

9. With the aim of expanding and modernizing the Sich national space system for Earth observation, work continued on the development of the Sich-2 space system, which includes a radiometer with an optical range of approximately 8 m. NSAU and a number of ministries are the customers for the Sich-2 system, which was designed by the Yuzhnoye State Design Office in Dnepropetrovsk, Ukraine. The Sich-2 space system will perform Earth observations and may be used for national defence and in support of the national economy.

10. In 2007, work continued on the development of a geographical information system as part of the European Global Monitoring for Environment and Security system and GEOSS. Such an information system is expected to encompass all phases of the use of aerial and space data: the development of methodologies for processing data, the modelling of natural processes, the certification of data processing methodologies, the creation and certification of automated work stations, and the operation of those work stations.

11. The work on the system focused on three main areas:

(a) Data processing and interpretation:

(i) The Scientific and Applied Programme for the Use of Sich-2 Data project was developed;

(ii) Projects were developed to, inter alia, process data on the classification of substrata based on elements that cover the topography and to assess the condition of winter crops;

(iii) Automated work stations for processing Earth remote sensing (ERS) data from the Akvakosmos (which monitors the Black Sea and Sea of Azov) and the Agrokosmos (which monitors agricultural resources) information subsystems were put into operation on an experimental basis;

(b) Standardization:

(i) Two Ukrainian State standards entered into force to standardize terms and concepts used in ERS and the processing of ERS data;

(ii) Four draft Ukrainian State standards were developed to standardize requirements governing the development of methodologies for processing ERS data, general requirements for source data and on board ERS complexes, as well as requirements for calibrating, verifying and validating data;

(c) Information support and international cooperation:

- (i) A draft template for web pages on Ukrainian activities within the Group on Earth Observations was developed;
- (ii) Arrangements were made for the participation of NSAU in the work of the Committee on Earth Observation Satellites, the European Global Monitoring for Environment and Security, and GEOSS.

## **2. Space research**

12. The scientific research on space carried out by Ukraine focused on the following key areas:

- (a) Earth and near-Earth space;
- (b) Extra-atmospheric astronomy and astrophysics;
- (c) Space biology, microgravity physics and technological research.

13. Study of the Earth and near-Earth space included using on-contact and remote methods for diagnosing the ionosphere, magnetosphere, atmosphere and the Earth surface, studying Sun-Earth links and deepening knowledge about space weather.

14. The services provided by the space weather information system for a wide range of users interested in the collection, study, use and dissemination of data on space weather continued to be developed. A method was devised for evaluating the characteristics of solar activity and the dynamics of solar formations and their impact on solar wind. Satellite and ground-based data were processed and analysed carefully for the computer modelling of large-scale wave processes in the ionosphere and atmosphere.

15. Work on the development of a set of instruments to enhance antenna systems at the NSAU National Centre for Management and Testing of Space Resources continued in 2007. Preparations for the implementation of the international Radioastron project also continued.

16. Preliminary work was also carried out on high-priority experiments in the framework of a joint programme on scientific research between the Russian Federation and Ukraine and on technological experiments on board the Russian segment of ISS.

17. Work also started on developing promising space technologies in line with a convention on cooperation, within the framework of joint research project competition in the area of promising space technologies, that was signed by NSAU, the Centre national d'études spatiales (CNES) of France and the International Association for the Promotion of Cooperation with Scientists from the New Independent States of the former Soviet Union (INTAS). Within the framework of the projects, work was done, inter alia, on the scientific and technical principles of atomic clocks for space systems, on heat pipes and fuel cells for spacecraft, and on technologies for the processing of data obtained from space-based Earth observations.

## **3. Space systems**

18. A main reference room was set up at the National Centre for Management and Testing of Space Resources, and work continued on the development and operation of an NSAU information and analysis system.

19. The National System for Control and Analysis of the Space Situation, which could be used for activities under international programmes to minimize the danger posed by space debris and to prevent emergencies related to space objects, was tested. The system was ready to be implemented on a pilot basis.

#### **4. Cooperation with international organizations**

##### **(a) Cooperation with the Committee on the Peaceful Uses of Outer Space**

20. Representatives of Ukraine participated in the work of the Committee at its fiftieth session, held in Vienna from 6 to 15 June 2007.

21. At the session, special attention was devoted to the need to develop legislation on space-related matters and, in particular, to the drafting of a comprehensive convention on international space law.

22. It was noted that the United Nations Ukraine Workshop on Space Law on the theme "Status, application and progressive development of international and national space law" was held in Kyiv from 6 to 9 November 2006. The workshop was attended by representatives of 21 countries and two international organizations (the United Nations and the International Organization of Space Communications (Intersputnik)).

23. The representatives of Ukraine reaffirmed their country's commitment to the policy of exploring and using outer space for peaceful purposes and for the benefit of all nations, specifically speaking out against the deployment and use of weapons of mass destruction in space. Special mention was made of the importance of the United Nations Platform for Space-based Information for Disaster Management and Emergency Response (SPIDER), which promotes the use of space technologies for the prevention and remediation of disasters. The representatives also emphasized that SPIDER would serve as a reliable means of using outer space for the benefit of all peoples.

24. The representatives of Ukraine made technical presentations on the following topics:

(a) Observation and study of near-Earth objects;

(b) Use of the National System for Control and Analysis of the Space Situation for the observation of space debris;

(c) Disposal of long-lived radioactive waste in outer space: a contribution to solving the waste burial problem in general;

(d) The space technologies of the Yuzhnoye State Design Office (located in Dnepropetrovsk, Ukraine) in national and international space programmes.

25. The presentations, which were met with interest by those who attended the session of the Committee, served to promote bilateral cooperation between States and the participation of Ukrainian companies working in the space sector in international scientific and commercial projects.

##### **(b) Cooperation with the Inter-Agency Space Debris Coordination Committee**

26. NSAU continued to work on mitigating the potential damage caused by space debris by, in particular, minimizing the amount of debris in outer space. Thus,

launch vehicles and spacecraft were operated, modernized and designed in accordance with the recommendations of the Inter-Agency Space Debris Coordination Committee (IADC), of which NSAU is a member.

27. Within the context of IADC activities, NSAU exchanged information about research carried out with other space agencies and IADC member organizations on space debris, and increased cooperation on such research. NAUS was also developing new methods for addressing that problem.

28. NSAU representatives participated in a meeting of the twenty-fifth session of IADC, held in Toulouse, France from 2 to 6 July 2007. At the meeting, representatives of NSAU made a presentation entitled "Rules for space activities in Ukraine: preventing the contamination of near-Earth space in the operation of spacecraft" and presented reports entitled "The status of work in Ukraine on preventing the contamination of space" and "The status of research on the space debris problem using Ukrainian radio-engineering equipment". In the course of the meeting, NSAU representatives spoke in favour of stepping up international cooperation in the peaceful uses of outer space, of supporting the activities of the Committee on the Peaceful Uses of Outer Space and its two subcommittees and of implementing the recommendations of IADC for mitigating the pollution of outer space.

29. At the national level, NSAU continued to support research and other activities related to the space debris problem carried out by organizations and enterprises in Ukraine that operate in the space sector. The main objectives of the research carried out was:

(a) To prevent the formation and reduce the quantity of space debris produced by launch vehicles;

(b) To prevent the pollution of outer space caused by the operation of spacecraft;

(c) To study space debris using Ukrainian radio-engineering resources;

(d) To develop and introduce regulatory and technical documentation to define general requirements for limiting the pollution of near-Earth space caused by the operation of spacecraft.

## **5. Launch vehicles**

30. In 2007, five launch vehicles produced in Ukraine were launched, four of which successfully:

(a) One launch of a Zenith-2 carrier rocket;

(b) Three launches of a Dnepr carrier rocket;

(c) One unsuccessful launch of a Zenith-3SL carrier rocket.

## **6. Bilateral cooperation**

31. In 2007, Ukraine's cooperation with other States in space exploration and the peaceful uses of outer space was based on international treaties related to the development of outer space, the Country's international obligations regarding space activities and current Ukrainian legislation governing space activities.

32. Ukraine's policies with regard to international cooperation were guided by the following core principles:

- (a) Compliance with international obligations with respect to space activities;
- (b) Fulfilment of the priorities and objectives of Ukrainian foreign policy;
- (c) Strengthening the position of national businesses in the global market for space technology and services;
- (d) Concentration of efforts on priority areas of Ukrainian space activity.

33. Most international cooperation efforts focused on fostering an international legal environment that would promote the participation of Ukrainian businesses in international space projects on promoting the participation of such businesses in foreign trade and on ensuring the companies' stable and active presence in the space services market.

34. Ukraine's many years of collaboration with the Russian Federation are based on close cooperation among firms, joint participation in international space projects, the use of Russian launch complexes for Ukrainian launch vehicles, the existence of a long-term cooperation programme and of a coordinated plan of action among space agencies premised on a long-term vision for the development of space technology.

35. In 2007, Ukraine and the Russian Federation continued to work on the implementation of four international commercial space projects, namely Sea Launch, Dnepr, Ground Launch and Cyclone-4 and on preparations for carrying out research and experiments on board the Russian segment of ISS.

36. NSAU representatives attended the third joint meeting of the subcommission on cooperation in the space industry of the committee on economic cooperation of the Ukrainian-Russian Interstate Commission, held in Moscow on 18 May 2007. At the meeting, participants discussed the results of the implementation of the decisions taken at the second meeting and the status of the implementation of the programme for Ukrainian-Russian cooperation in space research and the peaceful uses of outer space for the period 2007-2011.

37. Special attention was devoted to the implementation of certain projects (Ground Launch, Dnepr, the Russian segment of ISS, Coronas-Photon and Radioastron) and of preparatory measures ahead of high-priority experiments on the Russian segment of ISS, in accordance with the long-term joint programme of Ukrainian-Russian scientific research and technological experiments on board the Russian segment of ISS, signed by NSAU, the Russian Federal Space Agency (Roskosmos) and the Ukrainian and Russian academies of sciences.

38. The subcommission noted that great potential existed for cooperation in the establishment of ground-based infrastructure in Ukraine and the Russian Federation capable of supporting the use of GNSS and other satellite navigation systems by Russian and Ukrainian consumers. The subcommission outlined practical steps for building such ground-based infrastructure, including the placement and certification of control correction stations and a system for disseminating information on any corrections.



39. The subcommission expressed the opinion that it would agree to the deployment of an experimental component of a unified differential correction and monitoring system in the border areas of Ukraine (Crimea) and the Russian Federation (Krasnodar) with the aim of developing navigation information support technologies.

40. The fourth meeting of the subcommission, held in Yevpatoria, Ukraine, on 4 September 2007, resulted in the signature of a protocol calling for:

(a) The continuation of work on the Russian Segment of ISS and Coronas-Photon projects, on fundamental applied scientific research, on the development of ERS equipment and on the use of ERS data;

(b) The development of an umbrella project for creating a unified ground-based differential correction and monitoring system for satellite navigation systems;

(c) The holding of a meeting among representatives of NSAU, the National Academy of Sciences of Ukraine, Roskosmos and the Russian Academy of Sciences to discuss areas for joint research by no later than February 2008;

(d) The carrying out of a study by experts on the possibility of using antenna facilities at the National Centre for Management and Testing of Space Resources in Yevpatoria, Ukraine, in support of the Radioastron and Phobos-Ground missions.

41. Brazil has been an important partner of Ukraine in recent years. The Ukrainian-Brazilian company Alcântara Cyclone Space was established in 2007. An NSAU delegation, led by the company's General Director Yu. S. Alekseyev, visited Brazil from 27 to 31 August 2007 to attend a general stockholders' meeting and a meeting of the Board of Directors of Alcântara Cyclone Space Joint Venture, as well as to outline measures aimed at effective operation of the company.

42. At the general stockholders' meeting of Alcântara Cyclone Space, members of the company's board of directors and Financial Board were appointed. At the meeting, key areas of the company's activities were approved and internal documents governing the functioning of the company were reviewed.

43. In order to speed up the establishment of a ground-based complex for the Cyclone-4 rocket at the Alcântara launch centre, participants decided that a range of measures should be carried out shortly thereafter to enable the surveying and mapping of a section of the site allocated by the Government of Brazil for the construction of the complex. Plans to determine the geophysical properties of the site and to perform environmental surveys in order to obtain the appropriate licence from the Brazilian Institute of Environment and Renewable Natural Resources are also under way.

44. The planned package of measures would make it possible to execute the first launch of the Cyclone-4 rocket in 2010.

45. China continued to be a key partner of Ukraine with regard to space activities. Joint projects were carried out successfully as part of a plan for strengthening Ukrainian-Chinese cooperation in the exploration and peaceful uses of outer space for the period 2006-2010, which was signed by the two parties during the fifth meeting of the Ukrainian-Chinese subcommission, held in Beijing in June 2006.

46. The Plan calls for the joint implementation by Chinese and Ukrainian firms of projects to develop rocket and space technology. The Plan includes 29 joint projects in four areas: launch vehicles, satellites, space hardware (rocket technology components), and space science and electronics.
47. Within the framework of cooperation between Ukraine and the United States of America, preliminary efforts were made to carry out joint projects with leading aerospace firms in the United States, such as Boeing Integrated Defense Systems, Orbital Science Corporation and Lockheed Martin.
48. Ukraine also undertook measures to step up cooperation on space issues with member States of the European Union and ESA with the aim of promoting conditions for Ukraine's becoming an ESA member.
49. An important step in that direction was taken during the preparations for the conclusion of an agreement between the Government of Ukraine and ESA on cooperation in the peaceful uses of outer space, which would serve as the organizational and legal foundation for Ukraine's participation in European space projects. The text of the draft agreement had already been approved by the Ukrainian Cabinet of Ministers, which authorized the General Director of NSAU to sign the agreement. The ESA board of directors unanimously approved the draft agreement on 14 December 2007.
50. With the aim of strengthening cooperation on space activities between Ukraine and European Union member States, INSAU signed a framework agreement with CNES of France on cooperation in the sphere of space activities, and a memorandum of understanding with Finmeccanica of Italy. The agreements were signed during the International Paris Air Show – le Bourget, held from 18 to 24 June 2007.
51. Cooperation with the North Atlantic Treaty Organization (NATO) continued in the framework of the Ukraine-NATO Action Plan in the following areas:
- (a) Holding consultations on issues such as arms control, export controls and the non-proliferation of weapons of mass destruction;
  - (b) Monitoring of Ukraine's compliance with international commitments on arms control, including by exchanging information with participants in the Wassenaar Arrangement on Export Controls for Conventional Arms and Dual-Use Goods and Technologies and the Missile Technology Control Regime;
  - (c) Ensuring that measures permitting the export and import of goods designated for military purposes and of dual-use goods comply with the requirements of the relevant multilateral export control regimes;
  - (d) Implementing a project to destroy PFM-1 anti-personnel mines, with financial assistance from the European Union.
52. Preparations were completed for a twinning project between Ukraine and the European Union on the establishment of a partnership and the sharing of experience between public authorities of Ukraine and European Union member States in space activities.
53. Preparatory work for a twinning project on the acceleration of Ukrainian-European cooperation in the space sector was under way with the aim of

strengthening cooperation between firms and organizations in Ukraine and in European Union member States on space activities. At a meeting of an evaluation committee of the European Commission, held on 27 April 2007, a French-German consortium comprised of CNES and the German Aerospace Center (DLR), was identified as a partner of NSAU for the project.

54. On 4 and 5 July 2007, experts from CNES, DLR and NSAU held a final meeting at NSAU as part of the preparations for the twinning project, at which they agreed upon and signed the workplan for implementing the twinning project and a protocol on the completion of work on drafting the relevant contract.

55. Ukraine has also increased cooperation with Argentina, Egypt, the Republic of Korea and Turkey.

56. An integrated project on the development, production, launch and operation of an ERS satellite was carried out on behalf of Egypt, for the first time, in 2007.

57. The Egyptsat-1 satellite was placed into orbit on 17 April 2007 using a Dnepr conversion launch vehicle from the cosmodrome in Baikonur, Kazakhstan.

58. Egyptsat-1, an ERS spacecraft weighing 157 kg, was developed by the Yuzhnoye State Design Office and produced by the State Enterprise Production Association Yuzhny Machine-Building Plant. The ground-based satellite control complex was built by Ukrainian firms operating in the space sector and installed at various sites in Ukraine (including at the National Centre for Management and Testing of Space Resources, Yevpatoria) and in Egypt.

59. A delegation from the Korea Aerospace Research Institute of the Republic of Korea visited Ukraine from 14 to 25 May 2007. The delegation visited leading enterprises operating in the space industry of Ukraine and held talks with NSAU managers. Members of the delegation expressed interest in finding new partners for the development and delivery of rocket engines for the forthcoming KSLV-II launch vehicle. The Ukrainian side emphasized its readiness to cooperate in this effort and proposed other areas for possible cooperation, such as in the launch of satellites of the Republic of Korea using Ukrainian launch vehicles, in the development and improvement of rocket technology of the Republic of Korea that is not limited solely to liquid rocket engines, and in the training and provision of hands-on experience, of specialists from the Republic of Korea in Ukraine.

60. With the aim of discussing areas for strengthening cooperation with the Republic of Korea in the space sector, a delegation from LG International Corporation visited NSAU in early June 2007. One possible area of cooperation with that company was through the creation of infrared systems for use in a multi-purpose satellite system of the Republic of Korea.

61. On 19 June 2007, NSAU representatives took part in the third meeting of the Ukrainian-Korean committee on scientific and technical cooperation, where participants discussed the establishment of a joint committee on cooperation in the exploration and peaceful uses of outer space of Ukraine and the Republic of Korea.

62. At the meeting, it was agreed that after the State procedures necessary for the entry into force of an agreement between the Ukrainian Cabinet of Ministers and the Government of the Republic of Korea on cooperation in the peaceful uses of outer space were completed, there would be a joint working group meeting to discuss a

plan between Ukraine and the Republic of Korea for cooperation in space and to prepare for the first meeting of the joint committee on cooperation in the exploration and peaceful uses of outer space. The agreement entered into force on 20 August 2007.

63. A delegation from the Ministry of National Defence of Turkey and the Turkish company Roketsan visited NSAU on 5 March 2007. A meeting with the Turkish delegation was held in accordance with an agreement made with the Turkish side regarding preparations for the implementation of the joint projects in the space sector planned for in the framework of an agreement between the Government of Ukraine and the Government of Turkey on cooperation in the exploration and peaceful uses of outer space.

64. During the meeting with the Turkish delegation, organizational measures to implement a joint project for the establishment of an aerospace rocket complex, as well as measures that are being carried out by the Turkish side for the entry into force of the intergovernmental agreement and the memorandum of understanding between NSAU and the Ministry of National Defence of Turkey on cooperation in the establishment of the aerospace rocket complex were discussed.

65. On 6 and 7 March 2007, a Turkish delegation visited the Yuzhnoye State Design Office to discuss next steps in the implementation of the aerospace rocket complex project, in particular organizational measures needed to prepare administrative and technical documents for the project. Based on the results of the visit, the parties agreed to step up efforts to implement the project.

66. Within the context of cooperation with Argentina, the Government of Ukraine signed a framework agreement with the Government of Argentina on cooperation in the peaceful uses of outer space in 2006. On 26 September 2007, the Ukrainian Cabinet of Ministers adopted a resolution approving that agreement.

67. The main areas of cooperation outlined under the Agreement are: fundamental space science; meteorology; remote sensing; radio engineering; space biotechnology; the development of satellite systems for research and for applied and commercial purposes; space transportation systems; joint scientific research work; the design, production, launch, control and use of launch vehicles, satellites and other space systems; and ground-based infrastructure for space complexes, including launch centres.

68. Initial steps were also taken in 2007 to develop long-term plans for cooperation in outer space with Belarus, India, Kazakhstan and Uzbekistan.

## **7. Main events in Ukraine marking space anniversaries in 2007**

69. In 2007, Ukraine also marked important anniversaries in space activities: the fiftieth anniversary of the International Geophysical Year, the 100th anniversary of the birth of Sergei Pavlovich Korolyov and the fiftieth anniversary of the space age.

70. To mark these anniversaries, many events were held in Ukraine, the most important of which are listed below.

71. The year 2007 also marked the fiftieth anniversary of the International Geophysical Year, which was declared upon the initiative of the United Nations.

72. As part of the scientific and organizational efforts carried out by Ukraine related to the International Geophysical Year and to the forthcoming International Year of Planet Earth in 2008, as well as in honour of the fiftieth anniversary of the launch of the first artificial Earth satellite, the National Aviation University in Kyiv hosted a scientific conference entitled "Earth and Space Sciences for Society" from 25 to 27 June 2007.

73. The conference, which was organized by the Ministry of Education and Science of Ukraine, NSAU and the National Academy of Sciences of Ukraine, was aimed at:

(a) Deepening understanding about the links that exist between the Sun and the Earth and about the processes that take place on the Sun, in interplanetary space and in the geosphere and the biosphere;

(b) Sharing new scientific results from the study of geospace processes and systems; and studying methods and means of ERS;

(c) Facilitating the contribution of Earth and space sciences to the development of society;

(d) Discussing the role of information technologies in Earth and space sciences;

(e) Coordinating the scientific tasks carried out by Ukrainian scientists as part of programmes within the framework of the International Geophysical Year and the International Year of Planet Earth;

(f) Promoting the integration of Ukrainian scientists in the global scientific community.

74. The conference brought together more than 100 representatives from over 40 organizations, among them leading national specialists in geospace research involved in the areas of Sun physics, near-Earth and interplanetary space, the physics of the ocean and the atmosphere, geological sciences and ERS.

75. The current state of Earth and space sciences in Ukraine and the key problems faced in developing such sciences, were addressed, discussions took place on how space-related research could promote the development of society. Significant scientific and technological programmes were also addressed at the conference.

76. On the basis of the talks that took place during the two plenary sessions and the five panel discussions, the participants at the conference concluded that:

(a) It would be worthwhile to hold similar conferences in the future;

(b) Efforts to observe the International Geophysical Year in Ukraine should be actively supported;

(c) The initiative of the Earth Sciences Division of the National Academy of Sciences of Ukraine to observe the International Year of Planet Earth in Ukraine should be supported. The following most urgent problems in this area need to be identified, namely: (i) study of the climate system and prediction of climate changes, determination of the man-made and natural components of global processes; (ii) research on the ocean and marine ecosystems; (iii) groundwater research in the context of regional development security and sustainable use of

water resources; (iv) study and forecasting of the development of natural disasters in the context of global changes; and (v) development of effective technologies, including aerospace technologies, for the monitoring of processes in the atmosphere, near-Earth space, in the seas, on land;

(d) The scientific community should be called upon to research the social component of work in the area of Earth and space sciences and to publicize the results of this research more broadly;

(e) The scientific and educational communities need to focus special attention on improving the training of specialists in the Earth and space sciences sectors, as well as on the need to raise the level of cooperation among scientific and educational institutions in the training of young scientists.

77. World Space Week, which was declared by the General Assembly in its resolution 54/68 of 6 December 1999, takes place every year from 4 to 10 October to celebrate at the international level the contributions of space science and technology to the betterment of the human condition.

78. The World Space Week begins every year on the anniversary of the launch of the first artificial Earth satellite by the former Union of Soviet Socialist Republics in 1957. That date (4 October) also marks the beginning of the space age, whose fiftieth anniversary was celebrated in 2007.

79. Ukraine joined States around the world in commemorating this momentous date, in particular since its enterprises and organizations played an active role in preparations for and in support of the launch of the first artificial Earth satellite in 1957.

80. An international conference devoted to advanced space technologies for the benefit of humankind was held at the Ukrainian Youth National Aerospace Education Center in Dnepropetrovsk from 18 to 20 April under the auspices of the International Academy of Astronautics.

81. The conference was organized by the Ukrainian branch of the International Academy of Astronautics, NSAU, the Yuzhnoye State Design Office, the State Enterprise Production Association Yuzhny Machine-Building Plant and the Ukraine Youth National Aerospace Education Center. Representatives of member States of the European Union and of Japan, the Russian Federation and the United States attended the conference.

82. The conference addressed ways in which space rocket systems could contribute to solving the global problems of humankind, for example through the creation of anti-asteroid protection for the Earth, the disposal of radioactive waste in space and the removal of man-made debris from near-Earth space. Other key topics addressed at the conference were:

(a) Contemporary and future space satellite systems for Earth observation, communications, science and navigation;

(b) Advanced rocket engines and energy units of the future;

(c) Contemporary space rocket materials and technologies and methods for evaluating their quality;

(d) Space and society issues, including: prospects and methods for educating young people about space; remote design and distance learning via the Internet; the political, economic and legal aspects of space research and international cooperation; the impact of space activities on socio-economic development and the daily life of society.

83. As part of World Space Week, extracurricular activities devoted to the development of cosmonautics and the popularization of Ukraine's achievements in the space sector were held at general educational institutions from 1 to 5 October 2007. Those activities, organized in accordance with an order by the Ministry of Education and Science of Ukraine, included student conferences, meetings with scientists and developers of space rocket technology, the screening of films on related topics and exhibitions of drawings.

84. The seventh Ukrainian Conference on Space Research, dedicated to the 100th anniversary of the birth of the Ukrainian academic Sergei Pavlovich Korolyov and to the fiftieth anniversary of the space age, was held at the National Centre for Management and Testing of Space Resources in Yevpatoria, Ukraine, from 3 to 8 September 2007.

85. The conference, which was attended by representatives of the international scientific community, was organized by NSAU, the Space Research Council of the National Academy of Sciences of Ukraine, the joint NSAU and National Academy of Sciences of Ukraine Space Research Institute and the National Centre for Management and Testing of Space Resources.

86. Fifteen papers were presented at the conference by leading scientists from Norway, the Russian Federation, Ukraine and the United Kingdom of Great Britain and Northern Ireland. Approximately 200 participants attended the eight parts of the conference that were dedicated to current problems in space research. Two round tables were also held to discuss the future of Ionosat and Exploration-Ukraine projects.

87. As part of the conference, two workshops for young scientists took place. The first one was entitled "Information Technologies in Space Research" while the second was devoted to geospace research and was organized in cooperation with the European Incoherent Scatter Scientific Association.

88. Based on the outcomes of the conference, a decision was adopted that outlined the measures for preparing and implementing advanced research projects. Plans were also made to ensure that the eighth Ukrainian Conference on Space Research would be an international event.

89. On 12 January 2007 the space community marked the 100th anniversary of the birth of Korolyov, the founder of practical cosmonautics and a world-renowned scientist. In Ukraine celebrations were held on 18 and 19 January.

90. A monument dedicated to Korolyov was unveiled on 18 January on the grounds of the National Technical University of Ukraine "Kyiv Polytechnic Institute", where Korolyov studied for two years. Attending the ceremony were Dmitry Tabachnik, Vice Prime Minister of Ukraine; Boris Paton, President of the National Academy of Sciences of Ukraine; Yuri Alekseyev, General Director of NSAU; Natalya Korolyova, Korolyov's daughter; Victor Chernomyrdin, Ambassador of the Russian Federation to Ukraine; pilot-cosmonauts

Pavel Popovich, Vitaly Zholobov and Leonid Kadenyuk; Mikhail Zgurovsky, rector of the National Technical University of Ukraine “Kyiv Polytechnic Institute”; representatives of enterprises and organizations; and veterans of the space industries of Ukraine and the Russian Federation. The unveiling of the monument was followed by a meeting at which the president, the prime minister and the president of the parliament of Ukraine welcomed the participants.

91. A press conference was held on 19 January in the city of Zhitomir, Ukraine, for representatives of the regional and national mass media. The press conference was attended by numerous guests, including Korolyov’s daughter Natalya Korolyova, NSAU General Director Yu. S. Alekseyev and L. K. Kadenyuk, the first cosmonaut of independent Ukraine. The conference was followed by the opening of an exhibition in the museum located at the Korolyov farmstead, where the academic was born.

92. On 26 January 2007, representatives of the Ukrainian space rocket industry met to celebrate the 100th anniversary of the birth of Korolyov. The meeting was held at the Ukrainian Cultural Centre in Moscow.