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English and Spanish only

**Committee on the Peaceful
Uses of Outer Space**
Fifty-fifth session
Vienna, 6-15 June 2012

**International cooperation in the peaceful uses of outer
space: activities of Member States**

I. Note by the Secretariat

1. In the report on its forty-eighth session, the Scientific and Technical Subcommittee of the Committee on the Peaceful Uses of Outer Space made a recommendation, endorsed by the Committee on the Peaceful Uses of Outer Space at its fifty-fourth session (A/66/20), that the Secretariat continue to invite Member States to submit annual reports on their space activities (A/AC.105/987, paragraph 27).
2. In a note verbale dated 31 August 2011, the Secretary-General invited Governments to submit to the Secretariat their reports by 31 October 2011.
3. The present document was prepared on the basis of reports received from the following Member States after 31 October 2011: Cuba.
4. The reply contained in the present document has been translated into English and was not formally edited. Original document in Spanish language will be issued in a separate conference room paper.



Cuba

[Original: Spanish]
[7 February 2012]

Report on space activities carried out by Cuba in 2011

General considerations

Cuba is continuing to support peaceful space research and, in particular, the efficient use of space applications in the interests of its sustainable development. The economic and financial sanctions against Cuba by the United States of America continue to hamper the development of its space activities, and the situation has been worsened by the global financial crisis. However, Government involvement and support has allowed progress to be made in the area of space research and the peaceful uses of outer space.

The main activities of 2011 are described below.

Space meteorology

Of all natural phenomena, hurricanes cause the most damage to the national economy; in the light of this, Cuba considers the development of space meteorology to be a priority.

1. The Institute of Meteorology of the Ministry of Science, Technology and the Environment provides high-quality meteorological forecasts, thanks not only to its use of eight meteorological radar systems and the automation of its meteorological stations, but also the optimal use of its high-resolution satellite station. The Higher Institute of Technologies and Applied Sciences (INSTEC) offers a degree course in meteorology, providing training for careers in space technology.
2. The dissemination of the meteorological forecasts of the Institute of Meteorology has also improved, thanks to the use of new forms of regional social media that allow the general public to access the forecasts.
3. In the area of meteorological research, new procedures were developed and implemented for the processing of meteorological data and the use of such data in environmental disasters.
4. During the Sixth Cuban Congress of Meteorology, which was held in 2011, two projects were presented.

Remote sensing of the Earth

The Environment Agency, the umbrella institution for the institutes of the Ministry of Science, Technology and the Environment, whose work covers a wide variety of environmental issues, has carried out detailed research to assess climate change, taking into account a number of factors, such as the impact of various natural disasters. The complexity of such research requires space data at many different space-time scales and on a variety of spectral ranges.

5. Satellite images continue to be used in order to gain a better understanding of the country, in particular in danger, vulnerability and risk assessments and in natural disaster mitigation.
6. The Institute of Tropical Geography and the Institute of Geophysics and Astronomy continue to develop the so-called “environment space data infrastructure system”, which aims to promote and maintain the use of space data.
7. As part of its diploma in geomatics, the Institute of Tropical Geography has provided training to 20 specialists on remote sensing and digital image processing.
8. As a result of scientific and technical cooperation between the Institute of Meteorology of Cuba and the National Institute for Space Research of Brazil, the Brazilian “Queimadas” system continues to be used for the satellite detection and monitoring of vegetation fires. The system allows information about active fires within “protected areas” of Cuba to be provided quickly.
9. The Institute of Tropical Geography worked on the establishment of the normalized difference vegetation index for Cuba for 2011 and on the development of methodologies to determine areas vulnerable to desertification, the country’s vegetation coverage and land use.
10. Assessments of the environmental sensitivity of different coastal regions of Cuba using satellite images continue.
11. The high-resolution images obtained at the Institute of Meteorology station continued to provide information used in tracking sea currents and monitoring oil spills at sea.
12. Agriculture in Cuba is benefiting from applications of advanced techniques such as global positioning using satellites, satellite remote sensing, the digital processing of images, geographical information systems and digital mapping, and important results have been achieved in areas such as the production of detailed thematic maps of farms showing their infrastructure and crops and the soil conditions of fields and indicating, inter alia, the presence of weeds, insects and diseases.

Space sciences

13. INSTEC has prepared the course “Satellite orbital mechanics” and is waiting for it to be approved as an optional subject. It is currently preparing the courses “Astrodynamics I and II” as part of the master’s degree in meteorology.
14. INSTEC has published the following handbooks:
 - Keplerian orbital elements
 - Satellite tracking
 - Obtaining meteorological images using polar-orbiting satellites

The Central University “Marta Abreu” de Las Villas, the Institute of Geophysics and Astronomy and the Institute of Cybernetics, Mathematics and Physics continue to undertake basic research in the areas of cosmology, condensed matter and solar and stellar astrophysics.

15. The Institute of Geophysics and Astronomy of the Ministry of Science, Technology and the Environment continued to monitor the Sun, the ionosphere and the Earth's geomagnetic field on a daily basis and continued to relay solar and geomagnetic data to centres worldwide.

16. A doctoral thesis is being prepared on the topic of ionospheric studies, using global positioning system (GPS) technologies.

17. A doctoral thesis is being prepared on the topic of stellar astrophysics, which develops a photometric method for selecting stellar systems in order to demonstrate the phenomenon of symbiotic stars; as a result, data have been obtained allowing assessments on an observational basis of the population of those objects in the galaxy.

18. A doctoral thesis is being prepared on the topic of long-period variable stars.

19. A doctoral thesis has been completed on the topic of star formation, using Very Large Array (VLA) data, in which the distribution of water masers in this process is observed.

20. A method of segregating the different components of solar noise storms was developed and research was undertaken into the relationship between the temporal behaviour of the emission and the dimensions of the regions where the different components are produced.

Distance learning

21. Cuba has continued to accord high priority to distance learning, with a varied schedule of programmes on its two educational television channels, which place strong emphasis on the acquisition of knowledge, as well as on culture. Classes are offered in all subjects at different levels; in geography, at the grade 12 level, for example, two lessons have been given on astronomy. Specialized courses continue to be offered in important disciplines such as geography and history; language courses also continue to be offered.

World Space Week

22. Nocturnal sky observations were carried out during World Space Week by different institutions, in particular the National Natural History Museum. The press and radio reported on the objectives of World Space Week.