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Chinese and English only

**Committee on the Peaceful
Uses of Outer Space**
Scientific and Technical Subcommittee
Fiftieth session
Vienna, 11-22 February 2013

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

Note by the Secretariat

I. Introduction

1. In the report on its forty-ninth 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.105/1001, para. 29).
2. In a note verbale dated 31 July 2012, the Secretary-General invited Governments to submit their reports by 19 October 2012. The present note was prepared by the Secretariat on the basis of a report received from China after 19 October 2012 in response to that invitation.
3. The replies contained in the present document are original documents, as submitted, and were not formally edited.

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II. Replies received from Member States

China

[English]

Outer space is the common wealth of mankind and exploration of outer space are an unremitting pursuit of mankind. China always adheres to the peaceful exploration and use of outer space, and works together with the international community to maintain a peaceful and clean outer space and endeavour to make new contributions to the lofty cause of promoting world peace and development. In 2012, based on the independent development, China positively conducted international exchanges and cooperation in diversified ways and has made rapid progress in the three areas including space technology, space applications and space science.

I. Space Technology

In 2012, China has made 19 space launches, sending 28 spacecraft including manned spaceship, communications satellites, navigation satellites, remote sensing satellites and scientific and technological test satellites.

1. Manned spaceship

On June 16, the Shenzhou 9 spaceship was launched successfully, sending first Chinese female astronaut into space. The Shenzhou 9 conducted automatic and manual rendezvous and docking with the target vehicle Tiangong 1 in space respectively on June 18 and June 24. On June 29, the Shenzhou 9 returned to the Earth safely.



3 astronauts returned to the Earth safely

2. Navigation satellite

Six Beidou navigation satellites were launched successfully on February 25, April 30, September 19 and October 25 respectively. Up to now, China has launched 16 Beidou navigation satellites successfully and the Beidou Regional Satellite Navigation System has been established formally. According to the planning, the Beidou Satellite Navigation System will formally provide free passive positioning, navigation and timing services for the most part of the Asia-Pacific Region from early 2013.



The 16th Beidou navigation satellite lifted off into space

3. Communications satellites

On March 31, the French Thales Alenia Space built APSTAR 7 communications satellite was sent into space successfully. The satellite was formally put into operation on May 15 to provide television transmission and satellite communications services for Asia, Middle East, Africa, Australia and Europe.

On May 26, the ChinaSat-2A was launched successfully. The satellite can provide broadcast, TV and broadband multimedia transmission services for radio and television stations, radio transmitting stations and cable television networks.

On July 25, China's third GEO data relay satellite Tianlian 1-03 was launched successfully. The Tianlian 1 satellites have realized a global networking operation, indicating that China's first generation of data relay satellite system has been established formally.

On November 27, the ChinaSat 12 developed by the French Thales Alenia Space was sent into space successfully. The satellite can provide commercial communications services for Asian, African and European countries.

4. Remote sensing satellites

On January 9, China's ZY-3 satellite, together with the Luxembourgian Vesselsat-2 microsatellite, was sent into space successfully. The ZY-3 is mainly used for geographic mapping and geographic information acquisition.



The 2m fusion image of Dalian produced by ZY-3 satellite

On January 13, the FY-2F satellite was successfully launched and formally put into operation. The satellite is mainly used for weather analysis, forecast and early warning such as typhoon, rainstorm and dense fog, monitoring disasters such as sandstorm, drought and forest fire and environment as well as meteorological support for space activities.



FY-2F satellite was successfully launched into space

On May 6, the Tianhui 1B mapping satellite was sent into space successfully. The satellite is mainly used for scientific experiments in such areas as scientific research, land resources survey and mapping.

On November 19, the SAR Earth observation satellite HJ-1C, a small satellite for environment and disaster monitoring and forecast, was successfully launched,

marking the formal establishment of China's Small Satellite Constellation for Environment and Disaster Monitoring and Forecast. The constellation is capable of conducting all-time, all-weather and large-scale dynamic monitoring for disasters, and providing stable and reliable remote sensing data support.

At present China is building its new-generation Earth observation system with emphasis on the development of the Earth observation platforms based on high-resolution satellites, stratospheric airships and airborne remote sensing, establishment of the data centres and ground operation systems, thus forming the capabilities of all-weather and all-time Earth observation data acquisition and applications. The system will provide spatial data and information services in such socio-economic development areas as disaster prevention and reduction, environment protection and climate change, and participate in the global environment protection and joint efforts to tackle serious natural disasters.



HJ-1C satellite lifted off into space

5. Scientific satellites and technological test satellites

The Yaogan 14, 15 and 16 satellites were successfully launched on May 10, May 29 and November 25 respectively. These satellites are mainly used for scientific experiments, land resources survey, crop yield estimation and disaster prevention and reduction.



The Yaogan 14 was successfully launched into space

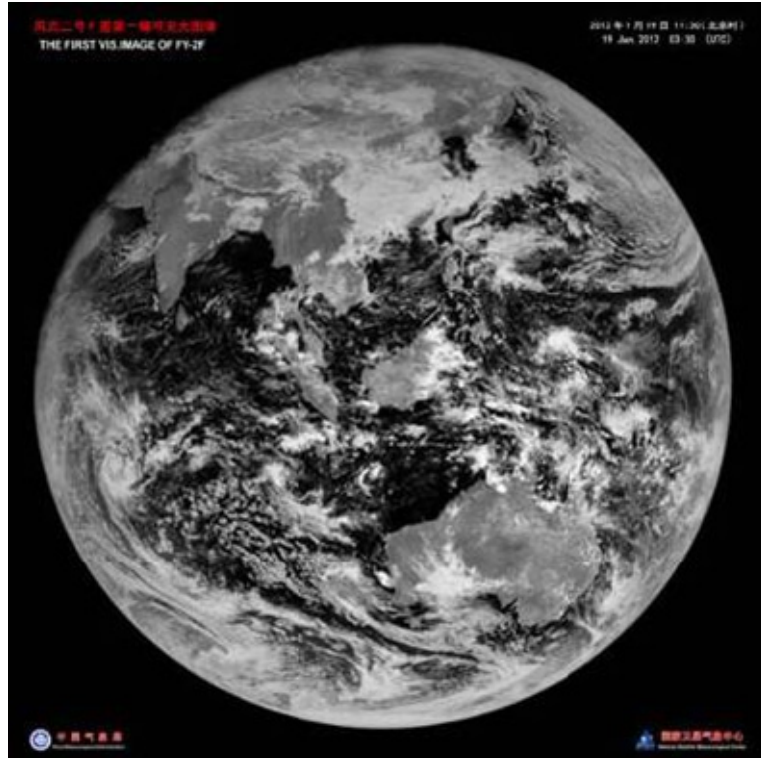
On October 14, SJ-9 A/B satellites were sent into space successfully. The two satellites are mainly used for experiments such as long lifetime and high reliability, high accuracy and high performance, indigenous core components as well as satellite formation and inter-satellite experiments.

II. Space Applications

In 2012, China has widely applied space technology in such areas as meteorology, ocean, disaster prevention and reduction, environment monitoring and navigation, which has made great contributions to economic construction, social development and scientific progress.

1. Meteorological observation

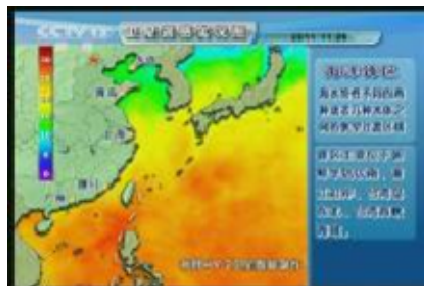
China has both polar-orbiting and geostationary orbit meteorological satellites with 7 in-orbit meteorological satellites. China has also formed a meteorological satellite ground receiving and processing system including 5 stations and 1 centre. Up to now, the FY meteorological satellite data has over 2500 users in more than 70 countries and regions all over the world and has played an important role in the early warning for typhoon, waterlogging, forest and grasslands fire, drought and sand storm as well as the weather forecast and climate change monitoring.



The first visible light cloud image from FY-2F on January 19

2. Ocean observation

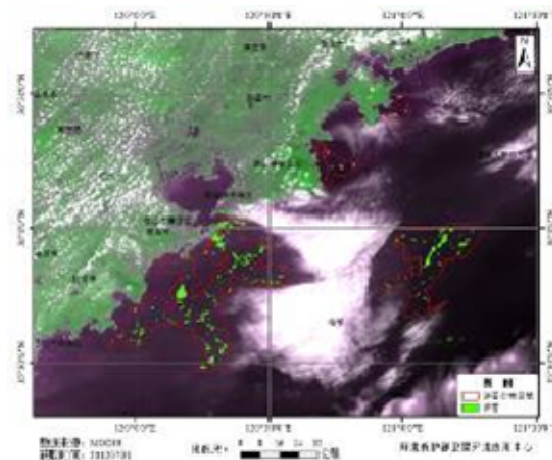
At present, the HY satellites can monitor China’s entire sea area including the Huangyan Island, Diaoyu Islands and the Paracel Islands. Recently, China actively promotes the applications and services of the HY satellite data in the fields such as oil spill, sea ice, green tide, sea surface temperature, ocean colour, sea surface wind field and marine fisheries, and has produced the sea surface temperature data products for the China seas and their vicinity and the global sea areas to realize the real-time monitoring report and timely distribution of the sea ice situation; produced the ocean colour information including the chlorophyll concentration distribution of China’s seas and their surrounding areas; irregularly produced the ocean colour environment information products of some regions; and made remote sensing survey of the sea surface wind field and waves in the area around the South Pole.



The sea surface temperature product from HY-2 satellite scanning microwave radiometer

3. Environment monitoring

China makes macro, rapid and dynamic ecological environment monitoring and evaluation and tracks the occurrence and development of the sudden environment pollution events such as oil spill and water blooms by use of the Small Satellite Constellation for Environment and Disaster Monitoring and Forecast. At present China has made the environment air remote sensing monitoring in the whole country and the key city groups and analysed the distribution and change patterns of the main pollutants such as aerosol grains and Sulfur dioxide; made remote sensing monitoring for the water environment in the Taihu Lake, Chaohu Lake, Dianchi Lake and the offshore area to provide important information on China's water environment quality; made remote sensing monitoring for the natural protection zones, ecological function zones and biodiversity protection zones; and made remote sensing monitoring applications for the environmental and ecological issues in the cross-border area, cities and typical river valleys.



The enteromorpha remote sensing monitoring image near Qingdao on July 1

4. Disaster prevention and reduction

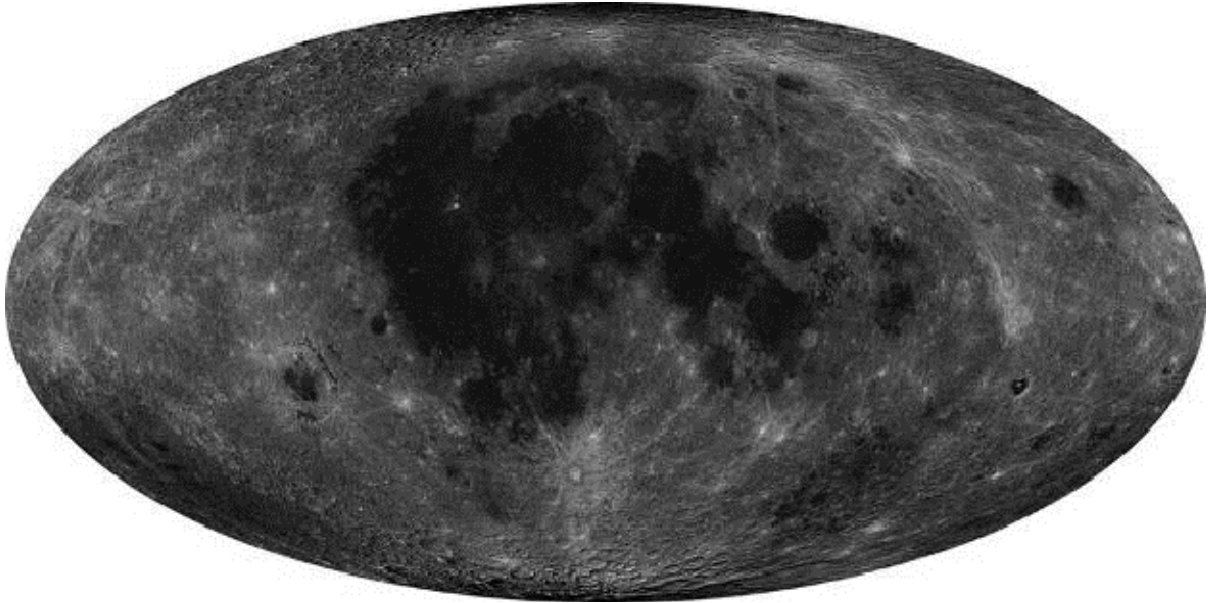
The ground disaster reduction applications system for the environment and disaster reduction satellites has been put into operation and successfully integrated into the operational system of the National Disaster Reduction Center of China, and has played a positive role in the daily disaster management. Now China has made disaster risk monitoring for flood, drought and snow within the whole country, conducted training on remote sensing technology applications for disaster reduction, and provided the relevant data products and services.

III. Space Science

In 2012, China continued to strengthen the construction of the space science research system to greatly improve its research level with emphasis on such areas as deep space exploration, space debris and space weather.

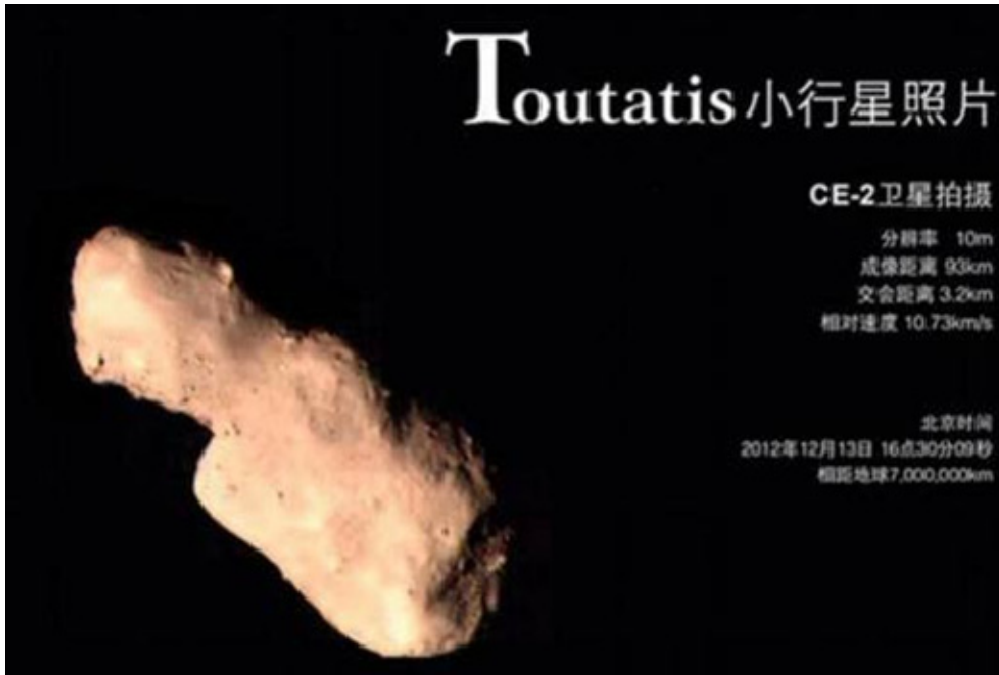
1. Deep space exploration

China released the full moon map with a resolution of 7 meters acquired by the Chang'e 2 lunar probe. It also made a total of 746 7-meter-resolution full moon framing image products, 50-meter-resolution standard framing image products and full moon data mosaic image products.



The full moon Mole Wade projection image

After finishing a series of extended tests beyond its lifetime, Chang'e 2 made further extended tests. Chang'e 2 flew away from the Lagrangian Point L2 orbit on June 1. And after flying for 196 days, it rendezvoused with the Asteroid Toutatis, about 7 million kilometres away from the Earth, realizing pass-by exploration of an asteroid for the first time.



The Toutatis photo taken by Chang'e 2

2. Space debris

China has conducted research on detection technology and accurate early-warning technology for space debris and provided early-warning services for launch and in-orbit operation of the important spacecraft. China has also finished the falling prediction of the body residue of the LM-4B launch vehicle, inactivated the final stages of the Long March rockets, and moved a few aging satellites out of orbit.

China has conducted comprehensive protection design for the manned spaceships and improved their in-orbit operation safety, and made material performance testing and protection structural tests for the advanced protection structure. Moreover, China has also made research on domestic protection database construction and hypervelocity ground test technology.

3. Space weather

China's ground-based space weather monitoring network has been preliminarily established and put into operation, initially resulting in a seamless exploration covering ground meteorology, middle atmosphere, upper atmosphere and ionosphere, which has provided an important data source for the space weather monitoring and early warning together with the FY series satellites.



China's ground-based space weather monitoring network

China has also established its national space weather forecast operation and service platform, which accurately forecasted the whole space weather situation and key weather process for supporting the manned rendezvous and docking between Tiangong 1 and Shenzhou 9, especially the occurrence and development of the magnetic storm and its effect on the spacecraft orbit.

IV. International Exchanges and Cooperation

In 2012, China positively conducted space exchanges and cooperation with many countries, space agencies and international organizations; participated in the related activities organized by the United Nations Committee on the Peaceful Uses of Outer Space (UNCOPUOS) and other relevant international organizations; actively provided resources to help mitigate the effects of disasters on human life and property as a member of the International Charter on Space and Major Disasters (CHARTER); supported international commercial space activities, which has yielded positive results.

1. China participated in all the activities organized by the UNCOPUOS and its Scientific and Technical Subcommittee and Legal Subcommittee. The Chinese Government continued to support the operation of United Nations Platform for Space-based Information for Disaster Management and Emergency Response (UN-SPIDER) Beijing Office, and co-organized in Beijing together with the UN-SPIDER Beijing Office.

2. China positively participated in the relevant activities organized by the International Committee on Global Navigation Satellite Systems (ICG), and hosted the Seventh Meeting of the ICG (ICG-7) from November 5 to 9, 2012 in Beijing. Nearly 20 topics relating to the construction and development of satellite navigation system were discussed during the meeting and a Joint Declaration on Global Satellite Navigation System (GNSS) (Beijing Declaration) was issued.

3. China has fulfilled the work relating to CHARTER in 2012. Altogether, China performed its duty as an Emergency on-Call Officer for 42 days in 6 periods, i.e. 1008 hours. While serving on duty, China received and responded to 4 help requests from all over the world and arranged timely satellite imaging plan for the disaster-stricken areas. China activated the CHARTER for the catastrophic flood in Min County, Gansu Province and the earthquake in Yiliang County, Yunnan

Province, and made the disaster scope evaluation as well as the monitoring and evaluation for the destroyed houses, the damaged roads, the affected crops and the damaged infrastructure.

4. China positively participated in the joint observation for the falling of the hazardous targets organized by the Inter-Agency Space Debris Coordination Committee (IADC). According to the requirements of the UN Space Debris Mitigation Guideline, China continued to promote and implement its management measures on space debris mitigation, conducted demonstration on space debris mitigation design and evaluation system, and carried out research on space debris mitigation technology.

5. China actively participated in all the activities organized by the World Meteorological Organization (WMO), and hosted WMO training courses and the workshop on applications of meteorological satellites in the fields of disaster prevention and reduction and environment. The FY-2 satellites have been listed into the operational satellites for global observation by the WMO and become an important part of the global integrated observing system.

6. China positively participates in all the activities organized by the International Astronautical Federation (IAF) and is preparing the 64th International Astronautical Congress (IAC), which will be held in Beijing in September 2013. The theme of the congress is “Promoting Space Development for the Benefits of Mankind”.

7. China positively promotes the international commercial space activities of its enterprises. On September 29, China successfully sent the Venezuelan Remote Sensing Satellite 1 (VRSS-1) into the preset orbit. The VRSS-1 is China’s first remote sensing satellite exported in an in-orbit delivery way and mainly used for land resource survey, environment protection, disaster monitoring and management, crop yield estimation and urban planning in Venezuela. On December 19, China successfully sent the Turkish GK-2 Earth observation satellite into the preset orbit with a LM-2D launch vehicle. GK-2 is mainly used for environmental protection, land and mineral resources survey, urban planning and disaster monitoring and management in Turkey. Moreover, the cooperative communications satellite projects between China and Bolivia, Belarus and Laos are proceeding smoothly.



The first remote sensing image of VRSS-1 was delivered to the customer.

2012年中国的航天活动

外层空间是人类共同的财富，探索外层空间是人类不懈的追求。中国始终坚持为了和平目的探索和利用外层空间，与国际社会一道，共同维护一个和平、清洁的外层空间，不断为人类和平与发展的崇高事业做出新的贡献。2012年，中国在立足自主发展的同时，积极开展多种形式的国际交流与合作，在空间技术、空间应用和空间科学三大领域取得了长足的进展。

一、空间技术

2012年，中国共进行19次发射，成功将包括载人飞船、通信卫星、导航卫星、遥感卫星和科学技术试验卫星在内的28个航天器送入了太空。

（一）载人飞船

6月16日，神舟九号飞船成功发射，将中国首位女航天员送入太空；6月18日和24日，神舟九号飞船先后与天宫一号目标飞行器成功实现了自动和手控交会对接；6月29日，神舟九号飞船顺利返回着陆。

（二）导航卫星

2月25日，4月30日，9月19日，10月25日，6颗北斗导航卫星先后成功发射。截至目前，中国已成功发射了16颗北斗导航卫星，北

斗区域卫星导航系统正式建成。根据计划，北斗卫星导航系统将于2013年初向亚太大部分地区正式提供免费无源定位、导航和授时服务。

（三）通信卫星

3月31日，

由法国泰雷兹·阿莱尼亚宇航公司研制的亚太七号通信卫星成功发射，该星于5月15日正式投入运营，将为亚洲、中东、非洲、澳大利亚、欧洲等地提供电视传输和卫星通信服务。

5月26日，

中星2A通信广播卫星成功发射，可为广播电台、电视台、无线电发射台和有线电视网等机构提供广播电视及宽带多媒体等传输业务。

7月25日，中国第三颗地球同步轨道数据中继卫星——天链一号03星成功发射，天链一号卫星将实现全球组网运行，标志着中国第一代中继卫星系统正式建成。

11月27日，由法国泰雷兹·阿莱尼亚宇航公司研制的中星12号卫星成功发射，将为亚洲、非洲和欧洲国家提供商业通信服务。

（四）遥感卫星

1月9日，资源三号卫星及搭载的卢森堡Vesselsat-2小卫星成功发射。资源三号卫星主要用于地理测绘及地理信息获取。

1月13日，风云2F气象卫星成功发射并正式投入业务运行，该卫星主要用于台风、暴雨、大雾等天气分析和预报预警，沙尘、干

旱、森林火灾等灾害和环境监测，以及航天活动气象保障服务。

5月6日，天绘一号02测绘卫星成功发射，主要用于科研、国土普查、地图测绘等诸多领域的科学试验任务。

11月19日，对地观测合成孔径雷达（SAR）小卫星——环境与灾害监测预报小卫星C星成功发射，标志着中国环境与灾害监测预报小卫星星座的正式建成，可为大范围、全天时、全天候连续动态的灾害监测与评估，提供稳定可靠的遥感数据保障。

中国目前正在建设新一代对地观测系统，重点发展基于高分辨率卫星、平流层飞艇和航空遥感的对地观测平台，建立数据中心和地面运行系统，形成全天候、全天时对观测数据获取与应用能力。将为防灾减灾、环境保护、气候变化等社会经济发展领域提供空间数据和信息服务，参与全球环境保护、共同应对重大自然灾害。

（五）科学技术试验卫星。

5月10日，5月29日，11月25日，遥感14号、15号与16号卫星先后成功发射，主要用于科学试验、国土资源普查、农作物估产及防灾减灾等领域。

10月14日，实践九号A/B卫星成功发射，主要用于长寿命高可靠、卫星高精度高性能、国产化核心元器件和卫星编队及星间试验等。

二、空间应用

2012年，中国深入推进空间技术在气象、海洋、减灾防灾、环境监测以及导航等领域的广泛应用，为经济建设、社会发展和科技

进步做出了突出贡献。

（一）气象观测

中国拥有极轨和静止轨道两大风云系列气象卫星，在轨气象卫星数量达到7颗。与此同时，形成了“五站一中心”的气象卫星地面接收处理系统。截至目前，风云气象卫星资料用户已达2500多家，遍及世界70多个国家和地区，在台风、雨涝、森林与草原火灾、干旱、沙尘暴的预警，以及天气预报和气候变化监测等方面发挥了重要作用。

（二）海洋观测

目前，海洋卫星的监测范围能够覆盖中国全海域，包括黄岩岛、钓鱼岛及西沙群岛全部岛屿附近海域。中国正在积极推动海洋卫星数据在溢油、海冰、绿潮、海温、水色、海面风场、海洋渔业等方面的应用与服务，已经制作了中国海、邻近海域和全球海温数据产品，能够对海冰冰情实时监测通报并及时发布；制作了中国管辖海域及周边海域叶绿素浓度分布等海洋水色信息；不定期制作了部分区域的海洋水色环境信息产品；开展了南极周边海域的海面风场和海浪遥感调查。

（三）环境监测

利用环境与灾害监测预报小卫星星座，深入开展宏观、快速、动态的生态环境监测及评价，跟踪溢油、水华等突发环境污染事件的发生和发展。目前已对全国及重点城市群组织开展了环境空气遥感监测，对气溶胶颗粒、二氧化硫等主要污染物的分布及变化规律

进行了分析；对太湖、巢湖、滇池及近岸海域的水环境状况进行了遥感监测，为掌握中国水环境质量状况提供了重要信息；对自然保护区、生态功能区、生物多样性保护区进行了遥感监测；对跨国境地区、城市、典型流域等的环境生态问题开展了遥感监测应用。

（四）防灾减灾

环境减灾卫星地面减灾应用系统已开始投入使用，并成功纳入到国家减灾中心业务体系，在日常灾害管理业务中发挥了积极作用。目前，已开展了全国范围洪涝、干旱、雪灾等灾害风险监测工作，开展了灾害遥感减灾应用技术培训，提供了相关数据产品服务。

三、空间科学

2012年，中国继续加强空间科学研究体系建设，以深空探测、空间碎片和空间天气等领域为重点，着力提升空间科学研究水平。

（一）深空探测

发布了嫦娥二号月球探测器获得的7米分辨率全月球影像图；制作完成了7米分辨率全月球分幅影像图产品共746幅，以及50米分辨率标准分幅影像图产品和全月球数据镶嵌影像图产品。

嫦娥二号在完成寿命期后的拓展试验任务后，又开展了再拓展试验。6月1日，嫦娥二号卫星飞离拉格朗日L2点轨道，经过196天飞行，与距离地球约700万公里的图塔蒂斯小行星交会，首次实现了小行星飞越探测。

（二）空间碎片

开展了空间碎片探测技术、精准预警技术等研究工作，为重要航天器提供了发射和在轨预警服务。完成了中国长征四号乙运载火箭箭体残骸的陨落预报。对运载火箭进行了末级钝化，对有关废弃卫星进行了离轨处理。

针对载人航天器开展了全面防护设计工作，提高了航天器在轨运行安全。针对先进防护结构，开展了材料性能测试和防护结构试验。此外，还就国内防护数据库建设和超高速地面试验技术开展了研究工作。

（三）空间天气

初步构建空间天气地基监测网，并陆续投入业务运行，初步实现了地面气象-中层大气-高空大气和电离层的无缝隙探测，与风云系列卫星一起为空间天气监测预警业务提供了重要的数据源。

建立了国家级的空间天气预报业务与服务平台，在天宫一号与神舟九号载人交会对接空间天气保障服务中准确预报了全部空间天气状态和关键天气过程，特别是精确预报了磁暴发生时间、持续情况及对航天器轨道的影响。

四、国际交流与合作

2012年，中国与多个国家、空间机构和国际组织积极开展空间交流与合作，参与联合国和平利用外空委员会及相关国际组织开展的有关活动；作为空间与重大灾害国际宪章的成员，积极提供资源

，帮助减轻灾害对生命和财产的影响；支持国际空间商业活动，并取得了积极成果。

（一）中国参加了联合国外空委及其科技小组委员会和法律小组委员会的各项活动。中国政府继续支持灾害管理与应急响应天基信息平台（UN-SPIDER）北京办公室的运行，并与UN-SPIDER北京办公室在北京联合举办了“联合国灾害管理天基技术——全球气候变化背景下的风险评估”国际会议。

（二）中国积极参与全球卫星导航系统国际委员会（ICG）的相关活动，并于2012年11月5至9日在北京举办了ICG第七届大会。大会对涉及卫星导航系统建设发展的近20个议题进行了深入交流，首次发表了全球卫星导航系统共同宣言。

（三）中国完成了空间与重大灾害国际宪章（Charter）有关工作。先后6个时间段参与紧急事务官员（ECO）值班，共计值班42天，1008小时。值班期间，共处理世界范围内请求4次，及时为受灾地区安排了卫星成像计划。针对甘肃定西岷县特大洪涝、云南彝良地震，两次启动空间与重大灾害国际宪章（CHARTER）机制，完成了灾害范围评估，倒损房屋、受损道路、受灾农作物和受损基础设施监测评估等工作。

（四）中国积极参加机构间空间碎片协调委员会(IADC)危险目标陨落预报国际联测活动，继续推进和落实空间碎片减缓管理办法，开展了空间碎片减缓设计和评估系统论证，开展了空间碎片减缓技术研究。

(五) 中国积极参与世界气象组织 (WMO) 组织的各项活动，承办了WMO培训和气象卫星在防灾减灾和环境领域的应用研修班。风云二号卫星已被世界气象组织 (WMO) 纳入全球观测业务卫星序列，成为全球综合观测系统的重要组成部分。

(六) 中国积极参与国际宇航联的各项活动，目前正在筹备第64届国际宇航联大会，会议将于2013年9月在北京召开，会议的主题是“推动航天发展，造福人类社会”。

(七) 中国积极推进企业参与空间领域的国际商业活动。9月29日，成功将委内瑞拉遥感卫星一号送入预定轨道，这是中国航天以在轨交付形式出口的第一颗遥感卫星，该卫星将用于委内瑞拉国土资源普查、环境保护、灾害监测和管理、农作物估产和城市规划等。12月19日，利用长征二号丁火箭成功将土耳其GK-2地球观测卫星送入预定轨道，该卫星主要用于土耳其的环境保护、国土矿物资源探测普查、城市规划和灾害监测与管理等。此外，中国与玻利维亚、白俄罗斯、老挝等国家合作的通信卫星项目也正在积极推进中。