



中 国 国 家 航 天 局  
CHINA NATIONAL SPACE ADMINISTRATION

# Overview of China's Space Technology and Space Science

**March 8, 2016**

1	Space Policy
2	Space Industry
3	Space Transportation System
4	Satellite Systems
5	Manned Space Project
6	Deep Space Exploration
7	Space Science
8	International Cooperation
9	Education and Training

# 1 Space Policy

- China always insists on peaceful use of the outer space.
- Three White Papers in 2000, 2006 and 2011. The 4<sup>th</sup> version will be published this year.



## 2 Space Industry

- Over 60 years, China's space enterprises have formed a self-contained industry system for developing and manufacturing.





# 3 Space Transportation System



CZ-2C

CZ-2D

CZ-2F

CZ-3A

CZ-3B

CZ-3C

CZ-4B

CZ-4C

CS-2C

CS-2D

CS-2F

CS-3A

CS-3B

CS-3C

CS-4B

CS-4C

Long March (CZ) launch vehicle family, 12 versions

■ 9,500kg (LEO)

■ 5,500kg (GTO)

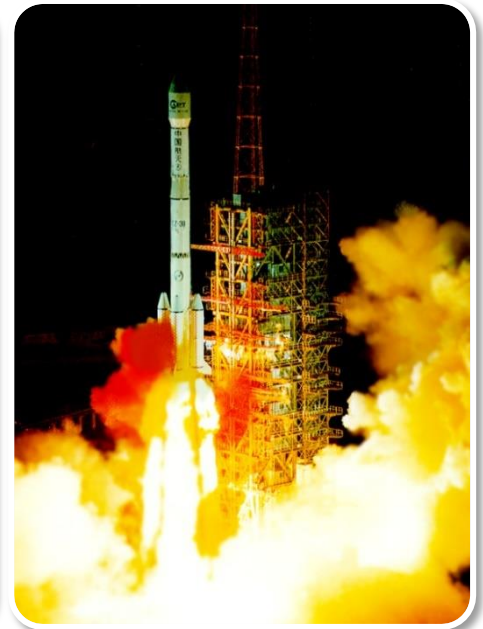
# 3 Space Transportation System



- CZ-5 will be capable of 25,000kg payload to LEO.
- A new heavy launch vehicle with much more payload capacity is in plan.

### 3 Space Transportation System

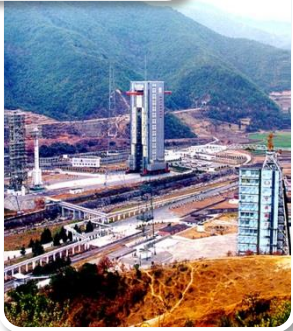
- Over 220 launches, successful launch rate 97.7%.
- Over 80 launches between 2010 and 2015.





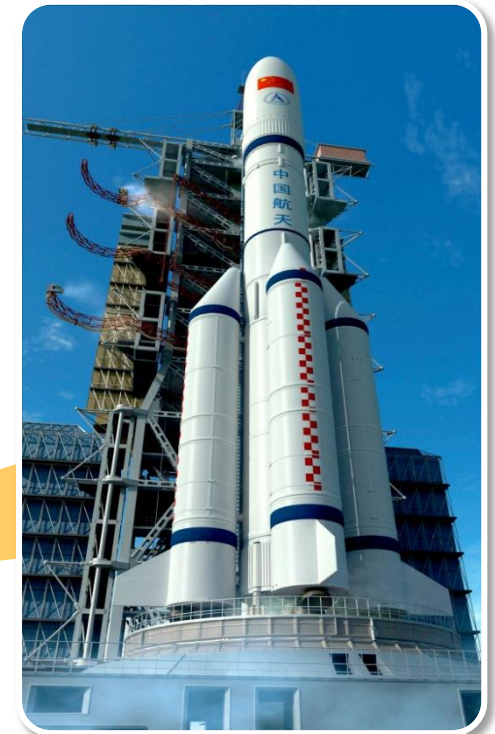
# 3 Space Transportation System

■ Hainan launch center will be in service in 2016.



 **In Service**

 **Under Construction**





# 3 Space Transportation System

- Providing TT&C support for missions such as satellite, manned spaceflight and deep space exploration.

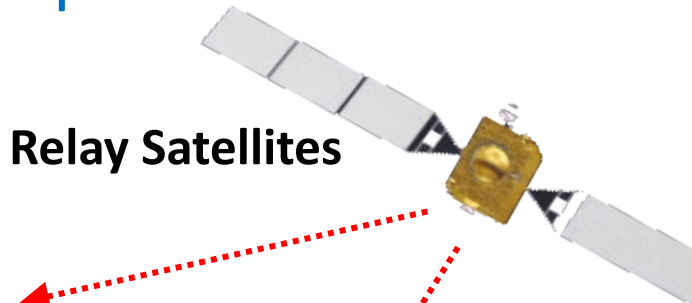


**Ground Station**



**Command & Control Center**

**Data Relay Satellites**



**Yuanwang Instrumentation Ship**



## 4 Satellite Systems

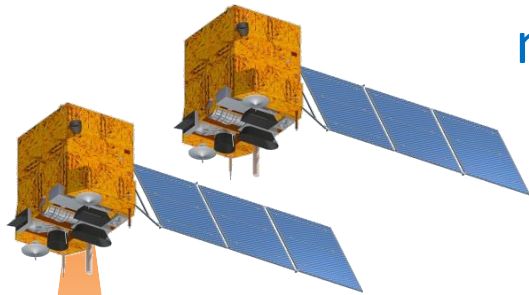
■ China has established satellite systems in the following areas, such as earth observation, navigation, communication.



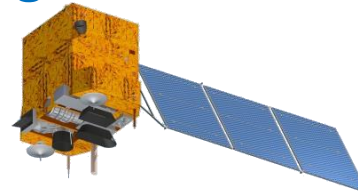
## 4 Satellite Systems

■ Earth observation satellite systems provide application services at multi-level, and become an important part of international earth observation system.

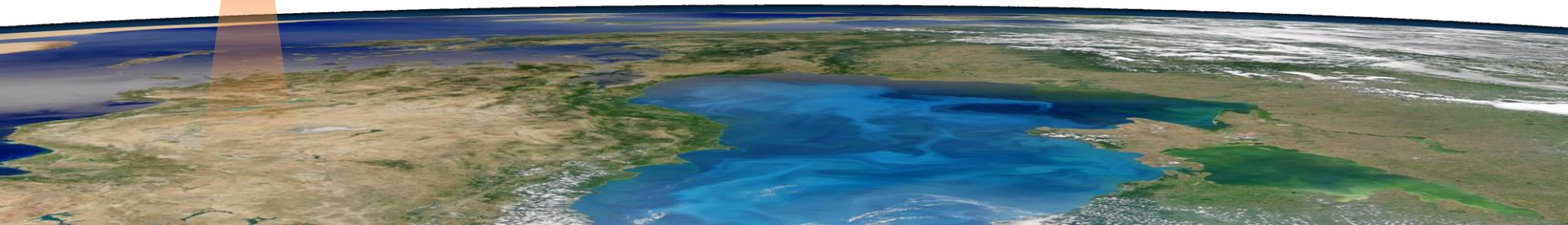
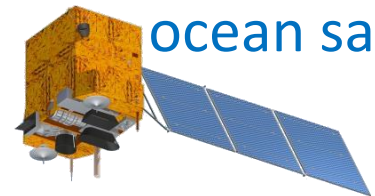
Ziyuan, Gaofen  
land observation satellite



Fengyun  
meteorological satellite



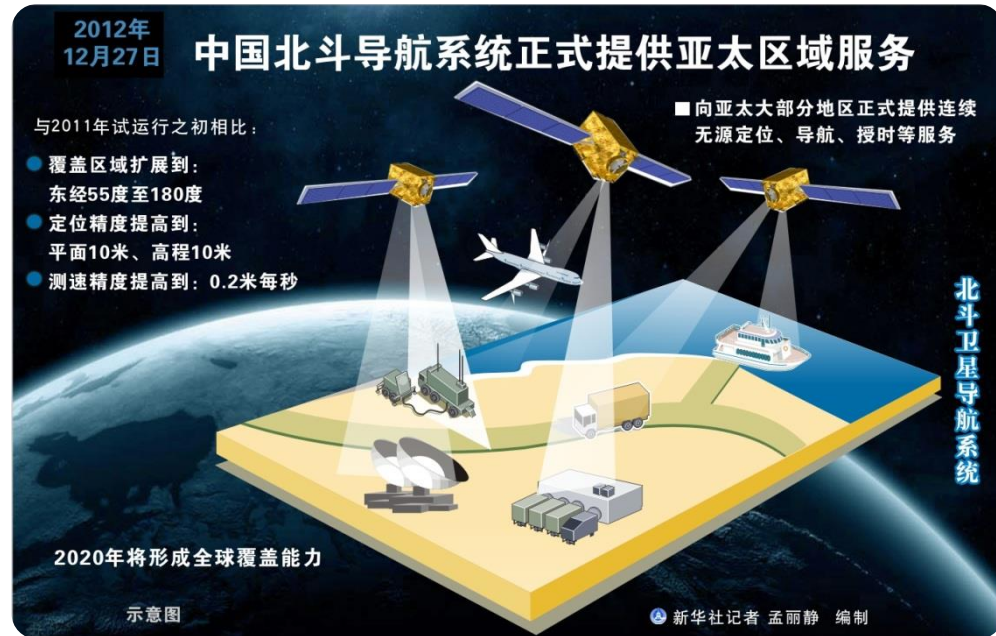
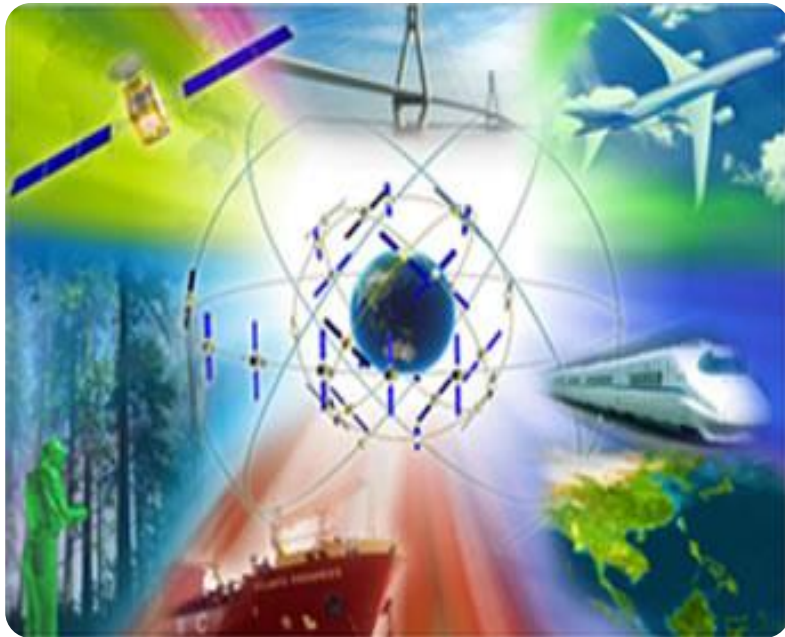
Haiyang  
ocean satellite





# 4 Satellite Systems

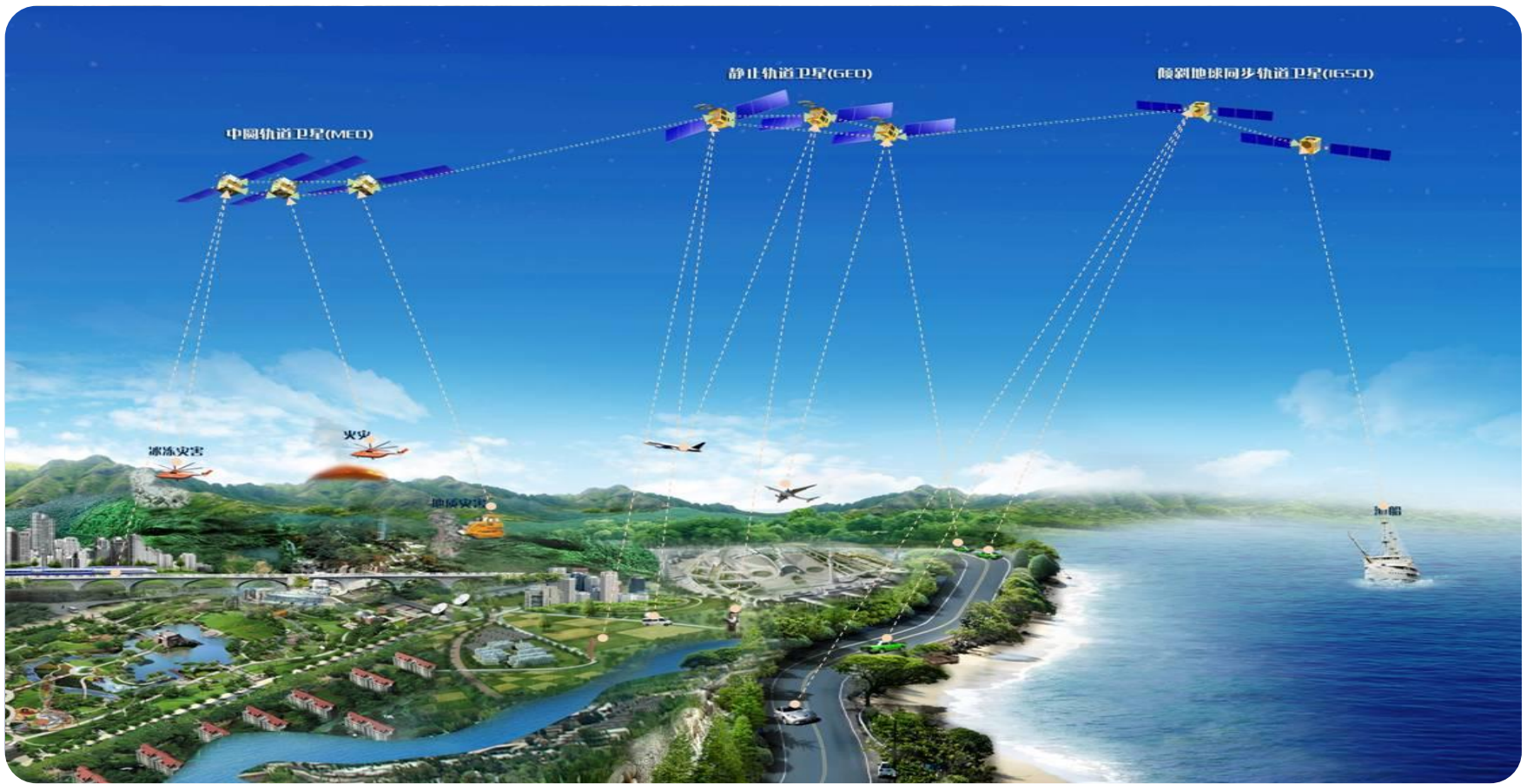
- Beidou-2 regional navigation system was put into services at the end of 2012.
- 35+ satellites are expected in orbit by 2020.





# 4 Satellite Systems

■ The capability of FSS, MSS, BSS, and data relay services were formed.



# 4 Satellite Systems

■ China promotes comprehensive scientific research and application of satellites.

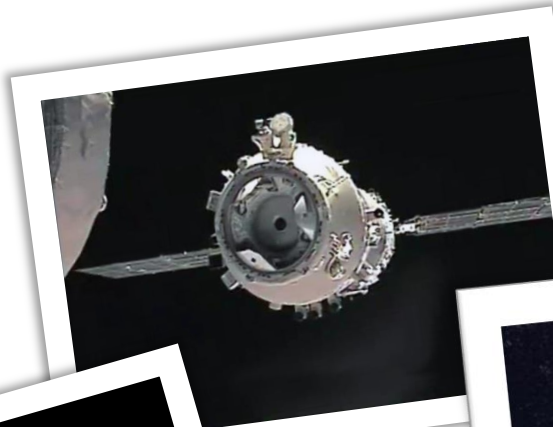
- Construction of smart cities
- Navigation and positioning
- Telemedicine
- Environmental protection, etc.





## 5 Manned Space Project

■ In Sep. 1992, Chinese government made the decision to implement the manned space program and prescribed the “Three-step Strategy” of development.



# 6 Deep Space Exploration

■ China has implemented the Lunar exploration program by another “Three-step Strategy”.

The First-step and the second-step have accomplished by 3 Chang’e spacecraft.

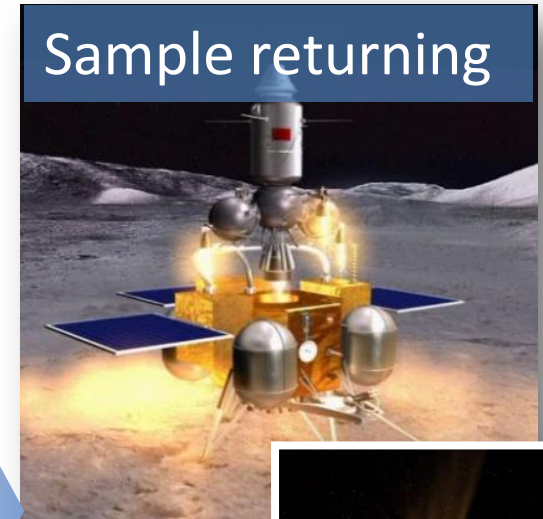
Chang’e-1/-2



Chang’e-3



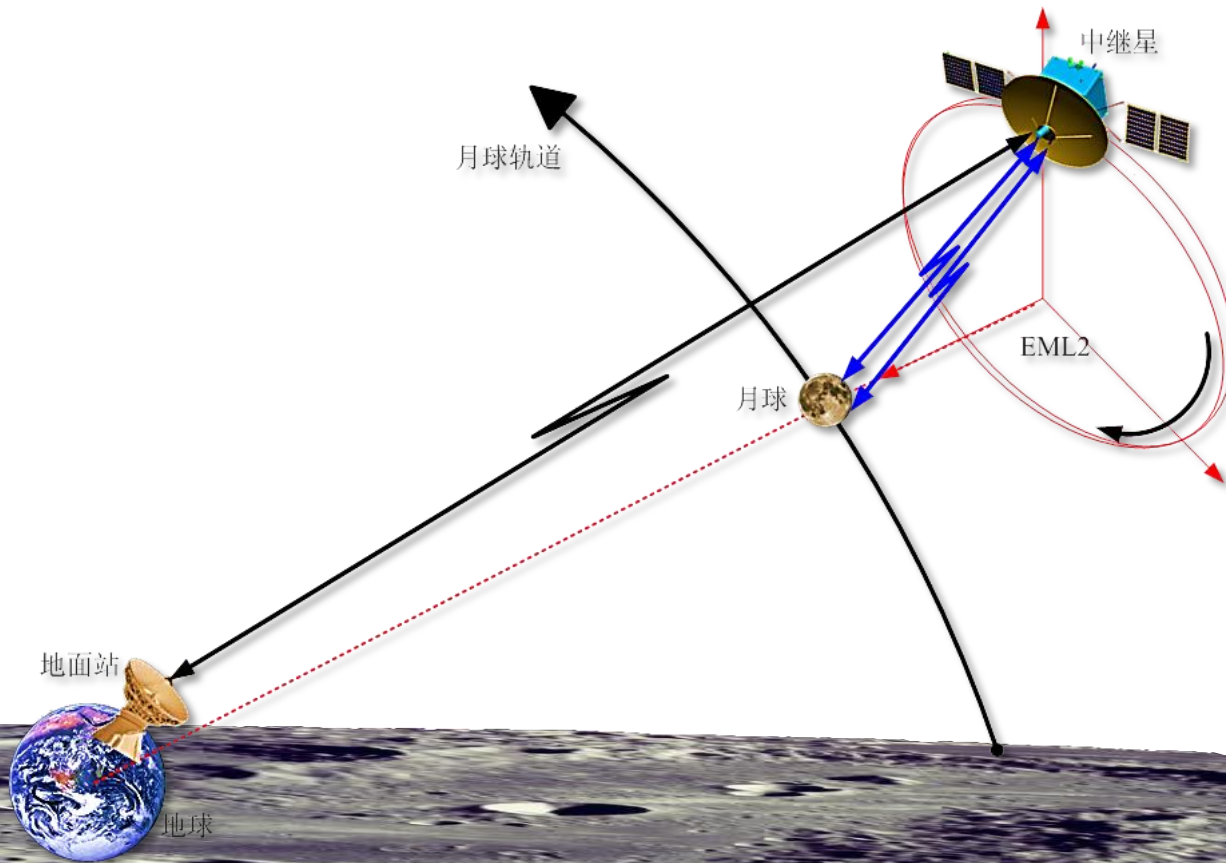
Chang’e-5, 2017  
Sample returning





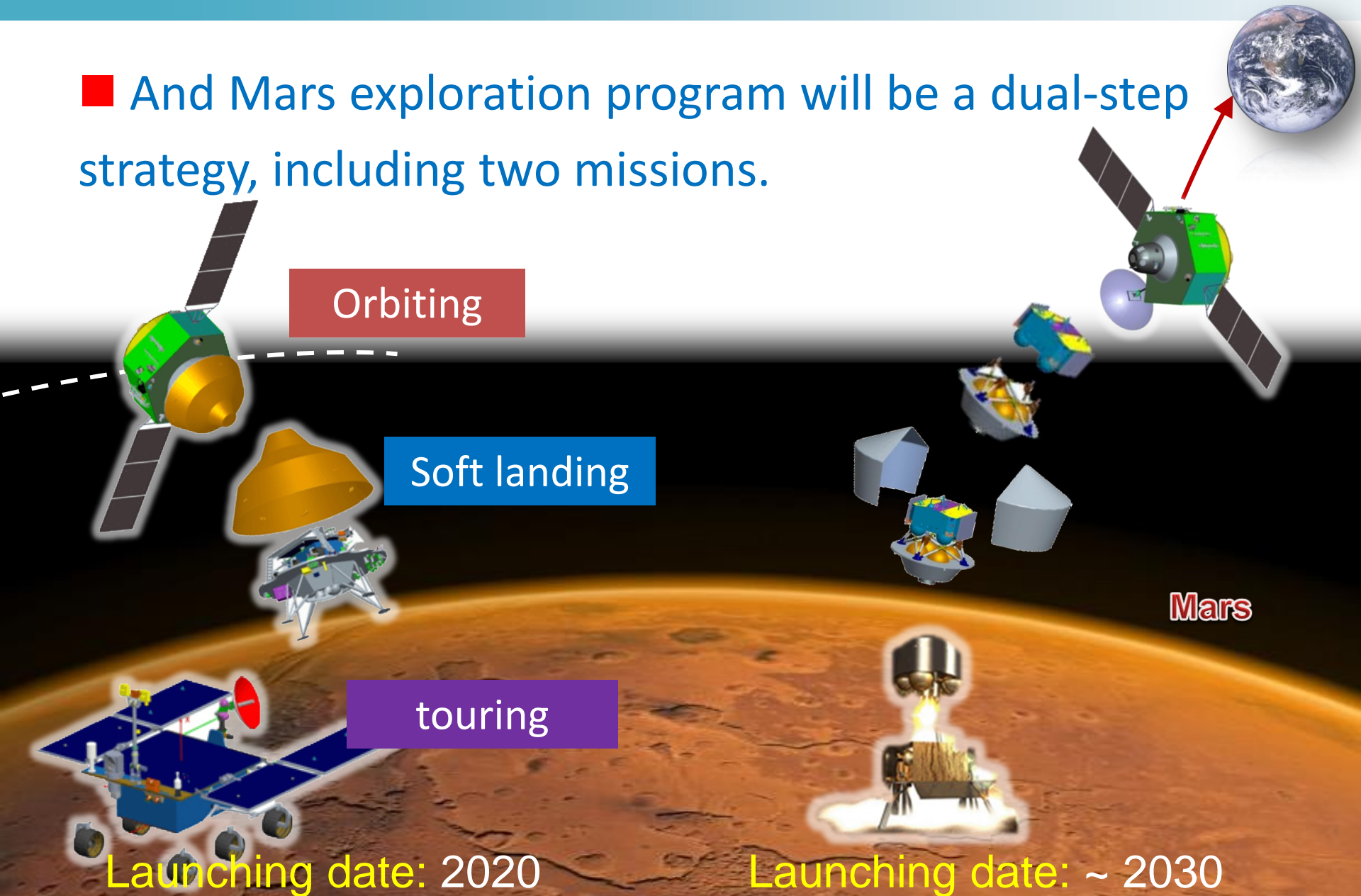
# 6 Deep Space Exploration

■ The following Lunar exploration mission, Chang'e-4, will land on the far-side of moon first in 2018.



# 6 Deep Space Exploration

■ And Mars exploration program will be a dual-step strategy, including two missions.

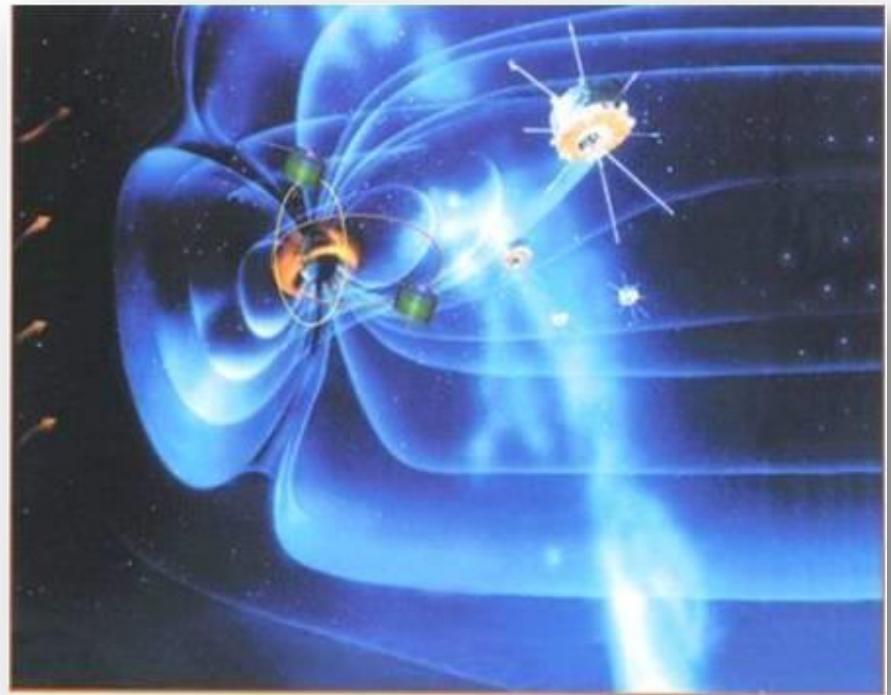


# 7 Space Science

■ A number of space science missions have been done, such as Geospace Double Star Exploration Project.



ESA and NSSC co-op space science project

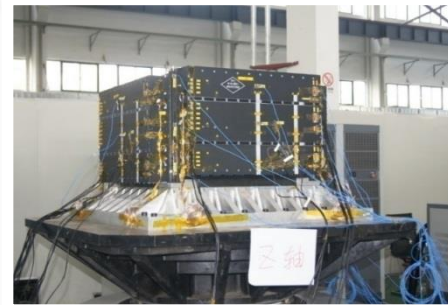
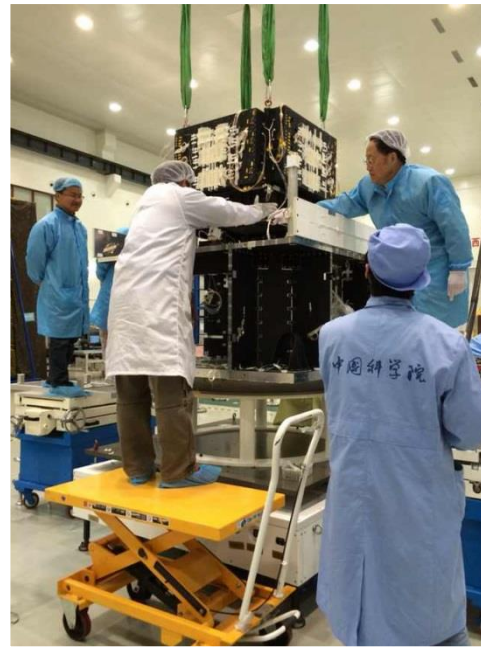


a six-point measurement to explore the geo-space



# 7 Space Science

■ Wukong, Dark Matter Particle Explorer launched on Dec. 17, 2015 is one of China space science missions, including Shijian-10 returnable microgravity experiment satellite, Hard X-ray Modulation Telescope, etc.





# 8 International Cooperation

■ China National Space Administration (CNSA) has signed more than 100 space cooperation agreements with more than 30 national space agencies.



国际合作网络

International Cooperation Network

# 8 International Cooperation

## ■ China- Brazil Space Cooperation



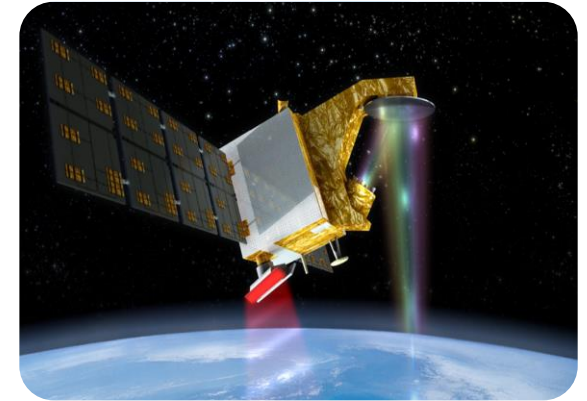
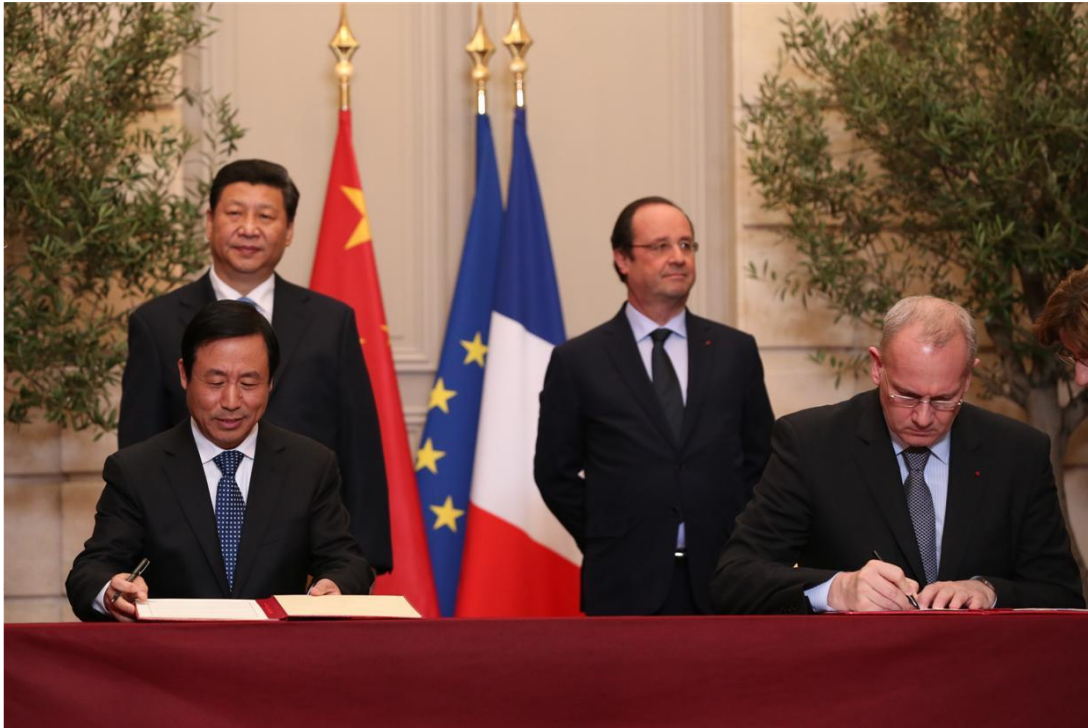
CBERS-04 Satellite

### Cooperation Agreement

- Governmental Agreement on CBERS cooperation signed on July, 1988
- Governmental Agreement on Space Technology cooperation signed on September, 2000
- 16 cooperation documents on Governmental level
- 4 CBERS satellites were jointly developed

# 8 International Cooperation

## ■ China-France



SVOM

### Cooperation Agreement

- Governmental Agreement on space cooperation signed on May, 1997



# 8 International Cooperation

■ In 2005, CNSA proposed to establish the APSCO, with 8 members and 2 observers so far.



- Bangladesh
- China
- Iran
- Mongolia
- Pakistan
- Peru
- Thailand
- Turkey

## 8 International Cooperation

■ In Aug. 2015, Director Mr. Xu Dazhe proposed to establish BRICS Remote Sensing Constellation. The first working group meeting was held in Vienna two weeks ago.



- **Brazil**
- **Russia**
- **India**
- **China**
- **South Africa**

## 9 Education and Training

■ In Nov 2014, the UN-affiliated Regional Center for Space Science and Technology Education in Asia and the Pacific was set up in Beihang University, China.



- Argentina
- Algeria
- Bangladesh
- Bolivia
- Brazil
- China
- Indonesia
- Pakistan
- Peru
- Venezuela





**Chinese government is willing to extensively cooperate with other countries on the basis of equality and mutual benefit, to peacefully utilize the outer space, and make contributions to human civilization and progress.**



**Thank You for your attention**