The Chinese Space Program

INFN Spazio
R. Battiston

Part I

Overview

CAST

Prime contractor of China national spacecrafts

A key member of CASC

CASC, China Aerospace Science & Technology Corporation, is government-authorized investment organization of space development.

Main entities:

- China Academy of Space Technology
- China Academy of Launch Vehicle Technology
- Shanghai Academy of Spaceflight Technology
- Sinosat Corporation, satellite operation company
- CGWIC, foreign business company

Company Profile

CAST was founded in 1968, has successfully launched 65 spacecrafts.

Employees：*8854*

2003 Revenue: 3.3 Billion RMB

Yuan Jia-jun

President & CEO

Wang Yonghan
Vice president

Yang Baohua
Vice president

Liu Qiang
Vice president

Zhang Tingxin
Vice president

Liu Fang
Vice president

Zhu Yan
Vice president

Zhao Xiaojing
Vice president


CAST,Beijing China
Tai Gu
YanTai
Lan Zhou
Xi An
Shang Hai
Shan Tou


CAST Beijing Center
Office Building
Small & Micro-satellite AIT center
Large-scale spacecraft AIT center
Power center
Rendezvous and docking research center

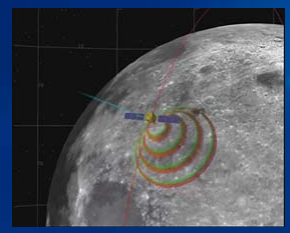
Part Ⅱ

Capability

CAST Major Activities:

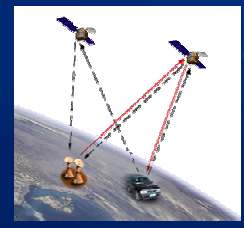
Telecommunications Satellites

Manned Spaceship



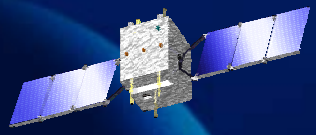
Exploration

Recoverable Satellites



Navigation

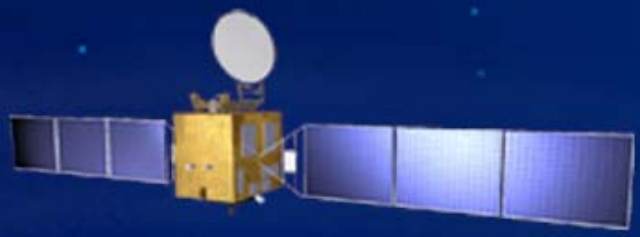
Earth Observation Satellites



Small & Micro satellites

Subsystems & Equipments

Telecommunication Satellite



DFH3-02 Telecommunication Satellite

7 Telecommunication satellites based on DFH-3 bus were launched successfully, 6 in orbit operation.

DHF3-02

Chinasat-20

Chinasat-22

Manned Spaceship

Length: 8.8M

Diameter: 2.8M

Mass in orbit: 7.6T

SZ-5 manned spaceship was launched and recovered successfully on Oct. 16, 2003

Manned Spaceship

First Chinese taikonaut Mr. Yang Liwei finished Space flight successfully on Oct, 16. 2003.

The third country grasps independently manned flight technology in the world.

Recoverable Satellite

First recoverable satellite was Launched on November 26,1975

The third country in the world that mastered the satellite recovery technology.

20 have been launched and recovered successfully.

Piggyback capability:

In orbit module:

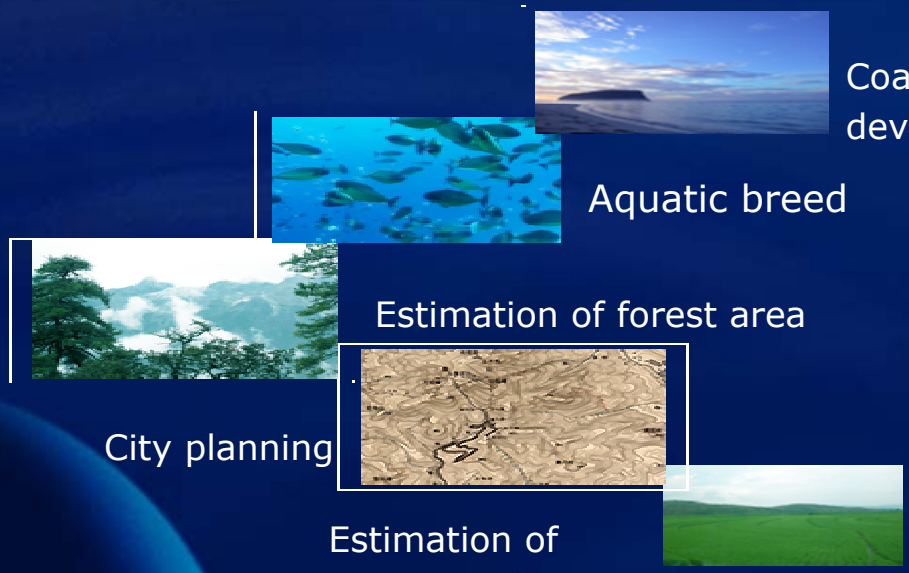
≤1.2m^3, ≤500kg

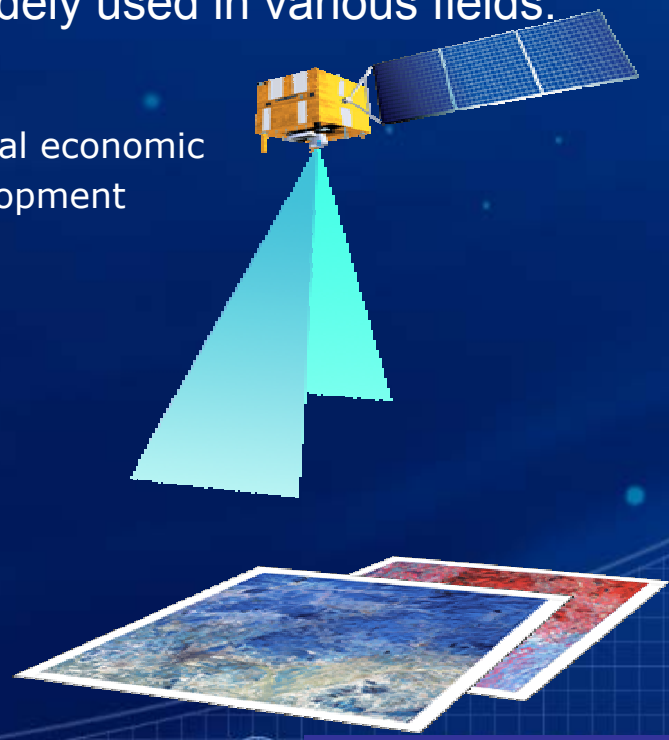
Recoverable module:

≤ 0.3m^3, ≤250kg

Earth Observation Satellite

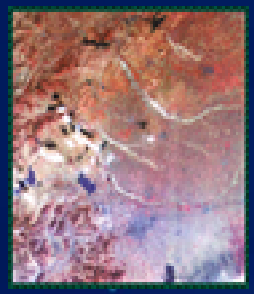
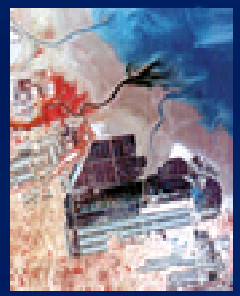
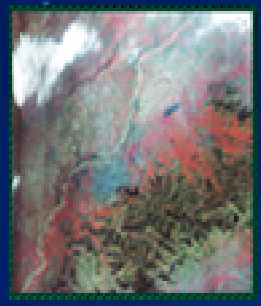
- China Brazil Earth Resource Satellite (CBERS) is a joint program in which 70% invested by China and 30% by Brazil. CBERS-01/02 has been launched successfully.
- ZY-2 resource satellites are developed for earth resource investigation, and have been successfully lunched.
- In the past five years, the satellites have obtained hundreds of thousands of remote sensing images, which have been widely used in various fields.





Earth Observation Satellite

CBERS 03/04


For the success of CBERS 01/02, CBERS 03/04 cooperation agreement has been signed by governments, China and Brazil each invest 50% on the project.

Main payload on CBERS 03/04:

- 5-band CCD camera : 5/10m (Spatial resolution)
- 5-band CCD camera : 20m (Spatial resolution)
- 4-band IRMSS : 78m Pan/ 156 Multi (Spatial resolution)
- Wide Field of view Imager (WFI)

Navigation satellite system

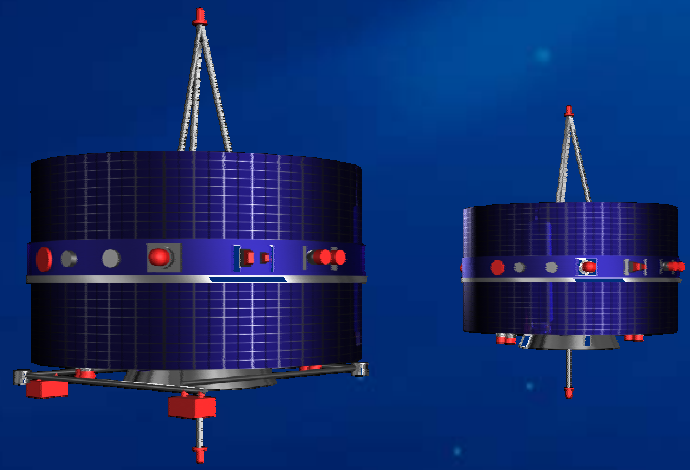
The Beidou navigation system is the china first generation navigation constellation, include three navigation satellites, were successfully launched respectively in October 2000, December 2000, and May 2003.

It is an all-weather, all-time, regional system providing navigation information and positioning service for the fields of highway traffic, railway transportation, operation on the sea, etc.

Small & Micro satellite

Double-Star Detection Plan

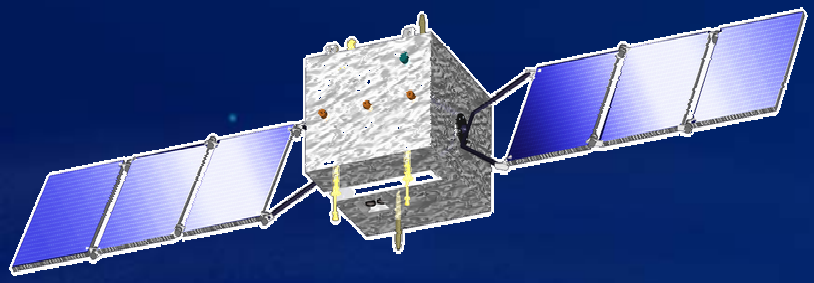
- Jointly Developed by CNSA and ESA.
- 8 science instruments were provided by ESA, the satellite bus was manufactured by CAST
- Working with Cluster II of ESA as 6 pointed constellation to detect and research near-earth space environment and generation of space magnetic storm



TC-1 was launched in Dec. 2003.

TC-2 was launched in July, 2004.

Small & Micro satellite



CAST 968 Small Satellite Bus

Service life : 2~3 years

Orbit: 800 Km , SSO

Attitude Control:

Earth-pointing three-axis stabilized

Size of satellite body:

1200mm×1100mm×1000mm

Mass: 360~800kg

Power (EOL): ≥900 W

Pointing accuracy:

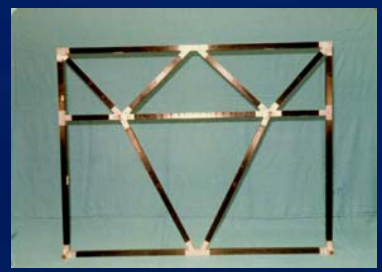
roll and pitch≤0.4°, yaw ≤0.5°

Subsystem and Payload

Structure subsystem

Structure Central Tube

Carbon Skin
Aluminum
Honeycomb
Sandwich Panel



Composite Material Components

Part Ⅲ

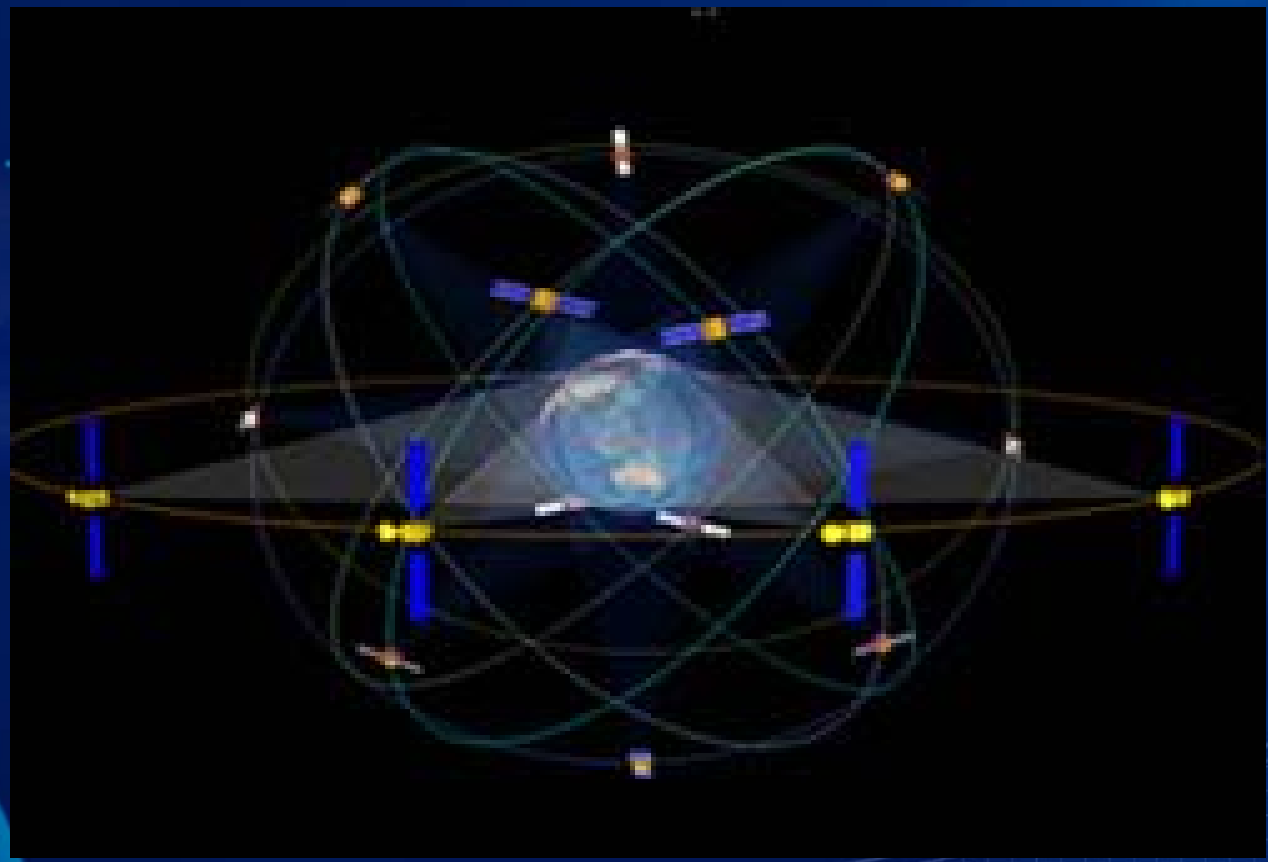
Future

Manned Spaceship Second Phase

- Another New manned spaceship
- Rendezvous and docking in orbit
- Space laboratory

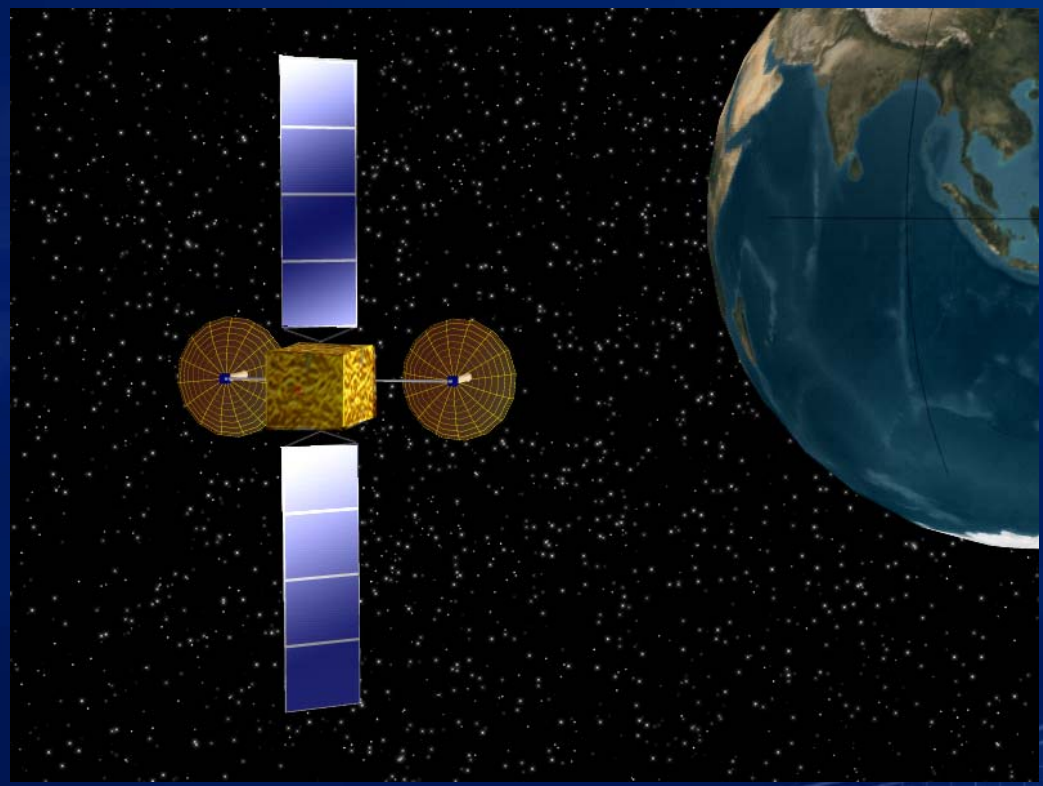
New Generation Navigation Constellation

Base on the Beidou navigation technology, the second generation navigation constellation include 5 GEO,3 IGSO and 4 MEO. The first satellite of will be launch in 2007.



China Tracking and Data Relay Satellite (CTDRS)

CAST is going to develop tracking and data relay satellite, a new generation of communications satellite, used to relay in real-time the data obtained by transmission type satellite in medium altitude and low orbits.

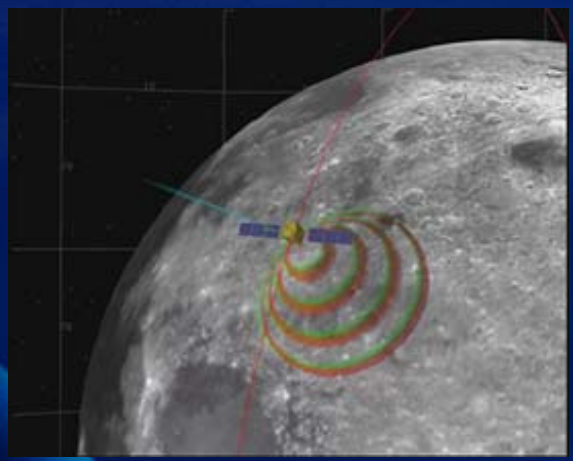


Direct Broadcasting Satellite

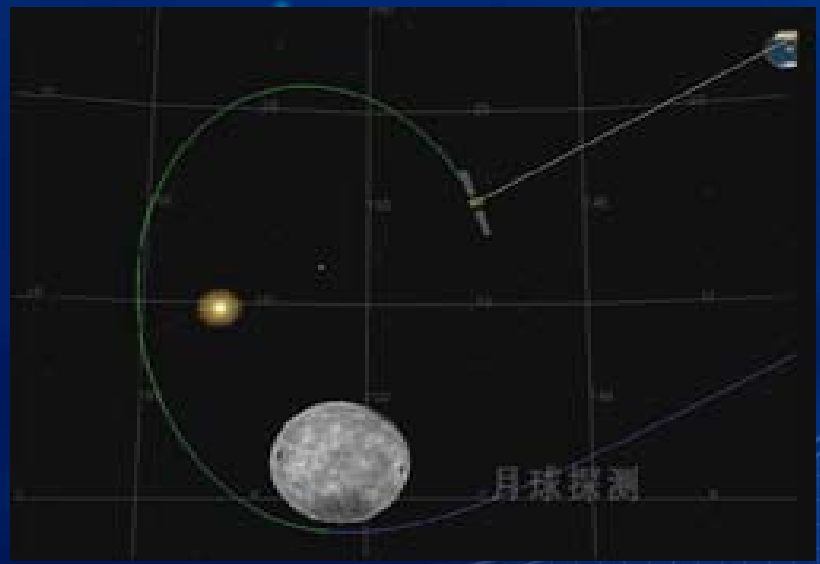
By utilizing Dongfanghong-4 satellite platform, a direct broadcasting satellite are under developing to realize direct TV broadcasting and internet data transmit, increase the coverage rate, so as to meet the public demand for culture,life and recreation.

Lunar Exploration

- Circling the moon to get an understanding of the Moon environment
- Lunar rover to realize roving inspection
- Mini-lunar recoverable lander capable of lunar surface sampling



Lunar exploration satellite



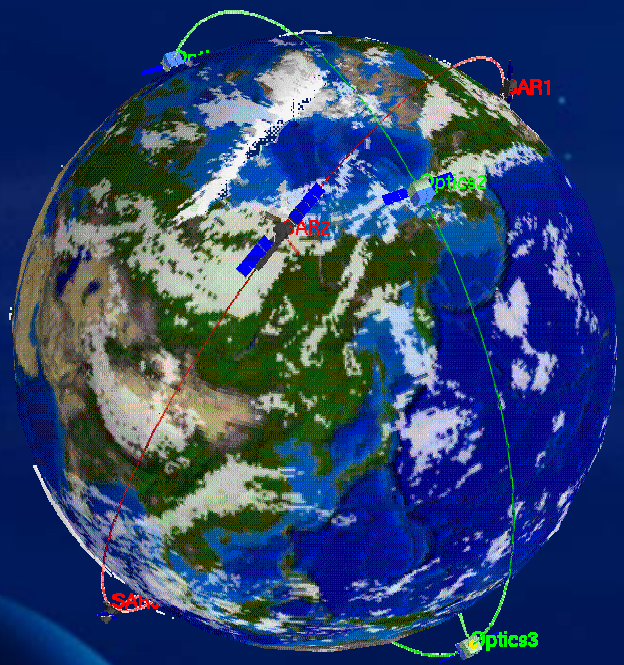
An Orbit version for lunar exploration satellite

High Resolution Remote Sensing Satellite

Continuing to carry out international cooperation to develop the follow-on of the resources satellites.

Developing ocean environmental and dynamics satellites and ocean comprehensive monitoring satellite.

Disaster and Environment Monitoring and Forecast Small Satellite Constellation

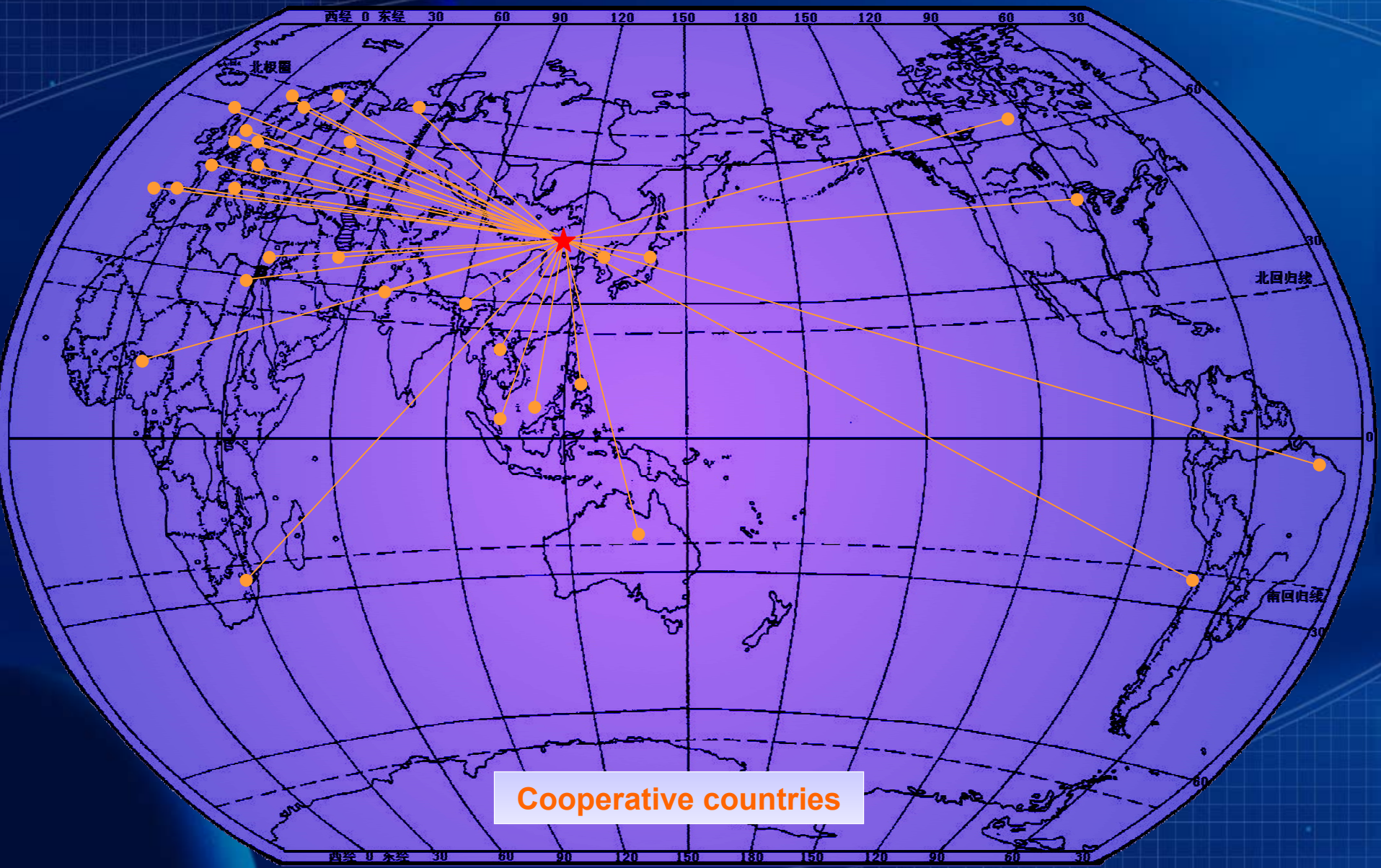


Phase A

Two optics satellites and one SAR satellite, the system will be established in 2006.

Phase B

Establish an 8 satellites constellation with 4 optics satellites and 4 SAR satellites.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北极圈
北回归线
南回归线
0
Cooperative countries

They are expecting cooperation with European friends!

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