

QUAD-PLUS Dialogue



Cooperation on Space Capability and Common Threats The Space Development of China

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The space development of China is closely related to military affairs.

- China established the 5th Institute in the Ministry of National Defense on October 8, 1956. That was the start of the space development of China.
- On February 19, 1960, China's first proven space rocket, T-7M, was launched, and it reached an altitude of 8 kilometers.
- In November 1960, China launched an SS-2 missile which was made in the Soviet Union. It was the first time China succeeded in launching a missile.
- And then on August 20, 1961, the Chinese Communist Party agreed to develop "Liang Dan," which means two bullets: nuclear bomb and missile.
- China launched a missile with a nuclear warhead on October 27, 1966. The missile was DongFeng-2 (DF-2).
- The National Planning Commission of China started a plan to develop the Earth Observation Satellite in May of the next year, 1967. The National Planning Commission is the predecessor of the National Development and Reform Commission (NDRC).
- On January 30, 1970, China's first Intermediate-range Ballistic Missile, DongFeng-4 (DF-4), was launched.
- On April 24, 1970, China launched its first satellite, DongFangHong-1, by

ChangZheng-1 rocket.

- Chinese Central Military Commission uses the phrase “Liang Dan Yi Xing,” which means “Nuclear Weapon,” “Missile,” and “Satellite.”
- The space development of China is concerned with military buildup.

The Positioning Satellite Navigation System is used for military operations, too.

- China has already had 23 “Beidou” satellites, and it intends to complete the “Beidou” Positioning Satellite Navigation System, which consists of 35 satellites. China will establish the system by 2020. The system must be a Global Positioning System.
- In 2012, the Chinese Beidou system had 10-meter resolution within China.
- China is considering to use the Beidou system for military operations.

Maritime Surveillance and Reconnaissance Satellite Network

- China successfully launched its first Remote Sensing Satellite “Yaogan-1” in 2006.
- China finished establishing a Remote Sensing Satellite Network by launching “Yaogan-30” in May 2016.
- Maritime Surveillance and Reconnaissance Sensor Network in space helps the Chinese navy and air force to expand their operational area.
- Open data in China shows that the “Gaofen-2” Remote Sensing Satellite has 0.8 meter of ground resolution.
- China Aerospace Science and Technology Corporation will establish Marchant Remote Sensing Satellite Network in 2022. The Network has 0.5 meter of ground resolution.
- Sources say Chinese military has equipped a Remote Sensing Satellite Network which has more precise resolution.

ASBM – Anti-Ship Ballistic Missile

- The area of search which provides ASBM the firing data is approximately 5 million square meters.
- China launched 30 “YaoGan” satellites within the last years, equipped with SAR, S Aperture RADAR.

Other technologies for the deep space probe

- China is developing “Ion engine” and currently conducting demonstrations. China

says its technology has reached global standard.

- China will launch the high-speed broadband communication satellite by the end of 2018, and it will start operating the satellite in 2019. China has already invested about \$170 billion (in U.S. dollars). It will make contributions to the “One Belt, One Road” strategy and the development of overseas strategy. It provides high-speed and high-capacity communication to aircraft and ships which navigate in the world.
- The satellite as a platform for communication and high-orbit remote sensing can be used for space development.
- “DongFangHong-5” is an ultra-large platform which has a 1.5 ton payload. The department of communication satellite development in China Aerospace Science and Technology (CASC) has a plan to launch the satellite in 2018.
- China Aerospace Science and Technology Corporation (CASC) was established as an organization of Ministry of National Defense in 1956. The original name was the 5th Institute in the Ministry of National Defense.
- The State Council of the People’s Republic of China changed the name of the organization, and decided to give the name of a private company to the organization in 1993. “China Space Industry” was a private entity, but the organization was “National Space Bureau” as an official status at same time.
- China recognized that private status is convenient when it comes to proceed the space development. The State Council decided to give the private status with the name of CASC in July 1999.

People’s Liberation Army (PLA) Strategic Support Force

- Main mission of the force: dominance in space, deep space, network, and cyberspace, and provide superiority to the PLA’s military operation.
- The operational arena includes intelligence, spying technology, electronic warfare, cyber warfare, and psychological warfare. The force performs searching, detecting, and tailing the target, and transmits the target information to headquarters and other units.
- The force is in charge of navigation aid and maintenance of the measures of gathering information to include satellite, cyber attack/security, and network security.
- The force takes over the duties of 2nd Division and 3rd Division of People’s Liberation Army General Staff Department, even though it does not operate human intelligence and some other intelligence operations.

- China understands the importance of the communication/intelligence network with satellites. And China recognizes that it cannot deter the U.S. while the U.S. operates its huge network, including satellites in space.
- It is a kind of Chinese asymmetric warfare against the U.S. And we also can say “the choice of the weak.” China would try to destroy U.S. satellites as a key node of the network, in order to disable U.S. capability of reconnaissance, communication, and intelligence.
- China destroyed its own satellite as a test of its anti-satellite (ASAT) weapon in 2007. Also, a U.S. report said China got the capability to destroy a satellite on geostationary orbit in 2013. The Chinese anti-satellite missile, DN-2, can destroy satellites on high-earth orbit, including GPS and reconnaissance satellites.
- China says it can disable the U.S. communication and intelligence network by 24 missiles. China recognizes that the anti-satellite weapon guarantees Chinese nuclear retaliation against the U.S.
- However, China is building up the capability of communication and intelligence network by launching many satellites. China now has to worry about the vulnerability of its own satellite network.

China has a “Three Step Jump” strategy for Chinese manned space development.

“Three Step Jump” strategy was called “921 Project” because it launched on September 21, 1992. Originally, it was “863 Project” which was led by Deng Xiaoping and started in 1986.

The 1st Step: Launched manned space vehicles and made round trips between Earth and space. It must be a basic and experimental stage.

Shenzhou-1 (November 1999) – Shenzhou-6 (October 2005)

The 2nd Step: Docked the shuttle with the Space Station. Short-term stay in space laboratory.

1st Stage: Shenzhou-7 (September 2008) – Shenzhou-10 (June 2013) Tiangong-1

2nd Stage: Shenzhou-11 (October 2016), Tiangong-2 (Astronauts stayed in it for more than 30 days.)

The 3rd Step: “Tiangong” Space Station – Long-term stay

China will build the “Tiangong” Space Station before 2022.

ISS (International Space Station) will come to the end of its life in 2024. After that, only Chinese space station will be operational.

Chinese space development is in the 13th Five-Year Plan (2016–2020).

Chinese Lunar Exploration

“Chang’e” project was started in 2004. It has three stages of exploration: “Unmanned Lunar Exploration,” “Manned Moon Landing,” and “Building a Base on the Moon.” Again, lunar exploration has three stages: “Round,” “Land,” and “Return.”

The 1st period (2007): “Chang’e-1” explored topography, geology, and environment on the Moon.

The 2nd period (2007–2016): “Chang’e-2” and “Chang’e-3” succeeded in an unmanned Moon landing, and a lunar rover, “YuTu (Rabbit)”, explored on the Moon. (December 2013–August 2016).

The 3rd period (2016–2020): “Chang’e-5” (plan to launch in 2017) brings another lunar rover to the Moon. The rover will explore the Moon and pick soil/rock samples. A space vehicle will collect the lunar rover and bring it back to Earth.

Significance of Manned Lunar Exploration and Development

- China has the idea to develop natural resources on the Moon. As the Chinese see it, it is another kind of resource development competition with the U.S.
- China is afraid that the U.S. would monopolize natural resources on the Moon after the U.S. succeeds in controlling all of the resources on Earth.
- The most important resource on the Moon is He-3. It is easily applied to nuclear fusion. The whole world can use He-3 on the Moon as energy for 1,000 years.
- But we need many technical breakthroughs for getting He-3 on the Moon as energy which we can use on Earth.
- China is trying to build a base on the Moon, but nobody knows what kind of problems will occur. The biggest problem is how to transport the energy to Earth. We can generate electricity on the Moon if we succeed to operate the bases on the Moon.
- We can use laser/microwave technology for a power supply. Laser/microwave can be a carrier of the energy and transmit electricity to Earth.
- If we can cooperate to develop technologies, then we can consider resource development on the Moon. The bases on the Moon can also be used for deep space development as a relay station.
- And we can monitor the situation of satellites and the space station orbiting nearby the Moon if we can jointly operate the bases on the Moon.