

## Short Communication

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## INTRODUCTION

China is clearly seeking to acquire by all possible means the modern space know-how required to gain a command of civilian applications for its own use and to give work to the Chinese industry in fields like earth observation, meteorology, satellite television, telecommunications and navigation. In addition it is developing projects for the use of space in the field of defense. It even successfully experienced in January 2007 an anti-satellite (ASAT) weapon test directed on one of its own aged satellite. It is said to prepare another one. At the same pace, a 'man in space' program is rapidly shaping up. China conducts since 2008, human flights on board the *Shenzhou* vehicle. In 2011, the same vehicle, *Shenzhou VIII*, for the first time provided two docking/rendezvous with the *Tiangong* orbital module. In 2012, the first female Chinese astronaut, Liu Yan, flew on-board *Shenzhou IX*. Above all, PRC possesses the high-performance Long March space launch vehicle which is regularly increasing its performances. In 2010, 15 launches were realized, including the launching of the *Chang'e* lunar probe. In 2011, 19 launches were per-

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## Will the US be overtaken by China in space?

### Abstract

The only serious question today for most analysts is: will China appear at the end of the decade with a spectacular landing on the Moon's surface as the new leading force in space exploration on the world space stage? The author reviews where and how credible are the factors of such an accomplishment. Some facts and figures show that with no discussion that China is now more than emerging country and is going to be soon able to compete with the Russians, Indians, Japanese, Europeans, and even the United States. The aerospace and military complex is drastically different from the others and may seem to be of an old age. But even if in terms of hi-technology, China is lagging behind, the efficiency of its visible capabilities—launchers, ASAT systems, orbital vehicles—is real. So the perception that China's objectives are only able to use space as a means of enhancing its development in the civil sector (i.e.: earth observation) cannot be no more considered as true. The author suggests that the other space nations should not remain passive and start to examine what kind of response or possibly a partnership that could be proposed for the next phase after the first success of the Chinese space policy.

### Keywords

China; Space policy; World aerospace competition; Space exploration.

formed which represents 22 % of the world launch activity!

Such data mean necessarily for the country ambition, at the regional level and at the international scale; it shows at the same time that the ambitions are not only for the civil sector but also for the sector of security and defense. The willingness of the Party leaders to demonstrate that in the space field they are not only wishing autonomy but also of leadership sends a message of importance to other dominant space powers.

## CHINA'S SPACE CIVILIAN AND MILITARY AMBITIONS

Some facts and figures consequently show that with no discussion that the Chinese in the space business are more than emerging, able to compete with their neighbors to include the Russians, Japanese, Indians, but also Europeans (Ariane), and even the United States. The space technology of this late country considered as the world leader is still far ahead, in particular in the field of launchers and military space capabilities, but its policy for the rest—that

means space exploration policy headed by NASA- is rather vague. So, one could ask whether China is not going to be at the end of the decade as the new leading force. How did we get into such a situation?

Historically China inherited the Soviet space program to a great extent and made an intensive use of Russian space technology in 'heritage', in particular the *Shenzhou* manned spacecraft. Yet China does not possess the resources provided by the scientific and technical complex that existed in the former Soviet Union. Its space program is a central government-steered management to an extent that cannot be compared with Moscow's steering of its own Soviet military-industrial sector. It is of course even truer if you compare the US space complex and budgets. On the other hand, China is benefiting from the dynamism of its market industrial sector and of reliable public budgets, if not huge, however provided on dual sources and is timely affected. It has overhauled aerospace project management structures and procedures. As an emergent great power, it looks forward to acquiring more military and security space capabilities and the geostrategic 'posture' which comes along. And, finally, the main incentive, PRC is able to present a strategic vision and a clear political motivation for investing in space technology -which seems not to be the case of the traditional competitors, would they be the Americans, Russians or Europeans.

Concerning the strategic and strictly speaking military space program, little is known. China does make use of civilian orbiting systems in meteorology, earth observation and telecommunications. Observation tasks are not conducted on a permanent basis in the surveillance and military imagery areas. In telecommunications, China is reported to have only one true military satellite (*Fenghuo-1*) as a backup for civilian capabilities. The Pentagon's Annual Report on Defense in China mentions only a few defense related programs dedicated to a real direct use by the armed forces. There is, however, the exception of counter space programs, such as ASAT interceptors, ASAT laser directed energy weapons (DEW) and communication or navigation satellite jammers, but all of these are ground deployed systems. There is also the new PRC's interest for the technologies linked to Missile defense (DAMB).

The *Jane's* at the same time suggests that the Chinese leaders are beginning to view the space sector as a channel for the modernization of the capabilities of the armed forces with the objective of mastering the art of modern warfare or information warfare by the 2050s. China would be called upon to develop a new generation of some 15 satellites, including imagery, electronic eavesdropping and communications equipment, in addition to counter space capabilities. In 2008, a LM-4B launcher would have launched a new couple of signal or electronic intelligence mini-satellites (derived from the *FY-1*). China's *BX-1*

microsatellite or "CompanionSat" launched to provide inspection images of the *Shenzhou* capsule-7 that would in fact be a test of some capabilities required for a co-orbital anti-satellite attack... According to the U.S. Department of Defense (DOD) analysis, China's budgetary global effort for defense ranges between \$85 B and \$125 B. A study of reference published in 2005 by the RAND Corporation, *Modernizing China's Military: Opportunities and Constraints*, estimates China's budgetary total effort for defense at \$30 B to \$40 B, a considerable amount of public funds even if it is only a small part of it which is spent on space technologies. Today, it seems that after years of effort the global defense budget would be as high as \$100 B<sup>[5]</sup>. Several analysts contend that, with the help of a civilian-military space budget in Euros in the range probably of 2 B€ a year, China is about to become a world space leader (a space power fist back to the Moon in 2020?), possessing at least credible eavesdropping and ASAT weapon capabilities and making the decision to build a series of 100 orbiting satellites.

#### **SOME FACTORS OF ACCOMPLISHMENT OF THE CHINESE SPACE AMBITIONS**

Other analysts observe that China is still twenty to thirty years behind in terms of major arms programs; that suggests defense modernization only ranks fourth in terms of political priority; and that China is not in any case a global threat in terms of operational space capabilities. In fact, China's capacity to translate foreign technology into autonomous modern and operational technology is thought to be still limited at least in the industrial domain of aerospace and armament. Furthermore, since the 1998 administrative reforms, space developments have officially been conducted in an officially "civilian" framework under the authority of the Industry Ministry. A recent survey conducted by the *Strategic Studies Institute of the U.S. War College* pointed out in its conclusions that while China has made spectacular progress in space technology (space in-orbit operations, satellite navigation), it still lags behind compared with the major world space powers.

But, according to Pr F. Godement, head of one of the best think tank on Asia called *Asia Centre* of Paris, "one only has the vaguest idea about the real strength of the Chinese army"<sup>[6]</sup>. We cannot rule out that technical and scientific investments made in the civilian sector with government support drawn from economic growth margins, or the support of foreign knowledge, may be used ultimately in the service of the defense forces or spectacular space adventures. Vigilance about export controls on sensitive technologies is still required, as we should not underestimate the power of seduction of a state, which is better than others at playing on its weakness to restore

its power. On the geopolitical ground, one cannot exclude the possibility that the Chinese government may be determined to acquire advanced technology for military telecommunications, eavesdropping, satellite radio navigation, reconnaissance and ASAT weapons in addition to the ASAT demonstrators it already possesses - with a view to modernizing its equipment and creating an instrument for implementing at least an asymmetric strategy. The development of Chinese naval capabilities, the change from a "brown-water navy" to a "blue-sea navy," as the acquisition of sophisticated satellite radio navigation systems and electronic eavesdropping or very high resolution observation systems, would likely accelerate Chinese projecting sea power and manoeuvring naval capability. And naturally it would heavily nurture the industrial base which is necessary to build an ambitious space exploration policy ...

Recently the Japanese journal called "Daily Yomiuri Shinbun" (March 2012) stated that PRC though having a slightly declining performance in terms of economic growth (7%) increased its budget for defense in 2012 by more than 11%, the budget for Ballistic Missiles and submarines were not quoted. There is also the information that, at the present time, the PRC's Army wants to use ELINT/SIGINT electronic eavesdropping systems ("Technical experimental satellites" initiated as early as the 1970s albeit unsuccessfully and discontinued after the death of Mao Zedong) in addition to using satellites (*Beidou-Compass* regional constellation of 16 GPS like satellites) with radio navigation signals for its needs. Ground-based eavesdropping, the solution envisaged up to now and satellite-based eavesdropping are indeed particularly useful for the precision use of long-range antiship missiles that have been purchased in Russia. U.S. experts contend that, to meet these needs, China already uses *Shenzou* civilian platforms, on which it places adequate antennas, and possibly commercial communication satellites sold by Western firms. The document of the U.S. *Office of Naval Intelligence* "A modern navy with Chinese characteristics - PLA Army Navy", accessible through the Internet, states that 'non-contact warfare' implies that PLA (Navy) acquire or develop long range weapons to be launched from ships or submarines as well as the associated detection and targeting capabilities (space assets). China is even said to build a ballistic missile used in the anti-ship role. It is anyway developing a near-continuous at-sea strategic deterrent with the Jin SSBN, follow-on to the first generation *Xia* (presently 3 nuclear ballistic missile submarines existing), carrying a 4000nm SLBM JL-2. These new means are not fully operational but they will exist; and the benefits of the military technology advances again might be later partly translated to the civilian space exploration programs.

As for the civilian effort itself, the Chinese White Paper

on "China's Space Activities in 2006" emphasized, over and above military targets, a thrust of Chinese space activities in line with the government's economic objectives since the 1980s. Space science research, lunar exploration and manned spaceflights are discussed, yet these themes, as well as ultimate defense purposes, are not explicitly listed as top priority objectives at the highest government level where industrials are paramount. In 2012, China launched several satellites for the needs of Third World countries (Congo, Sri Lanka) and for its own needs a telecommunication satellite *Chinasat 12* and a radar imagery satellite called *Huajing 10*. The third White Paper published in 2012 reaffirms the priority for the GNSS regional constellation of navigation satellites (35 navigation satellites in 2020) and the plan to get a 60 tons space station ready for 2020 as well. During the 63<sup>rd</sup> International Astronautics Federation (IAF) Congress held in Naples in 2012 and which will hold the next session in Beijing Chinese delegates stated that between 2014 and 2016, a new module *Tiangong 2* will be launched and that in 2017-2020 the space station will be assembled in low orbit.

One thing is sure: up to now China wants above all to control the entire space industry chain to cover manufacture, launch services, ground-based equipment and dual-use derivative services in communications, television broadcasting, radio navigation and remote sensing satellites with respect to various current and future civilian and military needs. The White Papers on Space above mentioned demonstrated again how the Chinese government is committed to back an ambitious space policy as a whole, while maintaining the policy line of progressive and non-aggressive progression towards the ideological of developing in harmony...

## CONCLUSION

To conclude, it seems necessary to confess that a precise assessment of the Chinese space technology level of performance remains - as it is actually in the defense sector - rather difficult. The state and industrial organization, complex and opaque as it is, does not permit a full, comprehensive and transparent comprehension of the decision making process. If it is not advisable to overestimate the effort achieved by the PRC in the space domain - as most space policy analysts are tempted to do - it would be risky to underestimate - as too many businessmen are inclined to think it is possible - the raw and handy way the Chinese build and use high technology for space. Simplification, when you consider the progression in all kinds of domains of a country like China - emerging as a true power in a world which is less than ever "in harmony" - is not the right method. But would you have to bet about the chances of seeing a Chinese cosmonaut

walking on the Moon surface before ten years, the answer would be yes with no hesitation! So the good question here should be: what reactions from the other competitors, the US of course, but also Europe, India, Japan or Russia? Could a first place in the front seat for China would constitute enough of a clock to stimulate the creativity of the space policies of the other nations in the world after 2020...

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