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# China's space program: A strategic and political analysis

## **Abstract**

Extract:

China has taken its place at the forefront of spacefaring nations: it joins only the United States and Russia in operating an independent manned space program. As a developing country this is a major feat. Moreover, its space program is a full-spectrum, comprehensive concept. From microsattelites to manned space missions, from satellite and rocket design to launch capabilities, it spans both civilian and military requirements.

## **Keywords**

China, nuclear power, Soviet Union, space program, satellite

## **China's Space Program: A Strategic and Political Analysis**

*By Rosita Dellios* <sup>(1)</sup>

### **A Nuclear Beginning**

On a winter's day in 1955 the Chairman of the Chinese Communist Party (CCP), Mao Zedong, addressed an enlarged meeting of the Politburo's Central Secretariat. At issue was whether the People's Republic of China (PRC) should become a nuclear power. There had been preliminary feasibility studies, and Chairman Mao pointed out that China possessed uranium deposits and rudimentary atomic technology. If the scientific community worked hard, he believed China could succeed. The meeting passed a resolution to proceed with the program. It was codenamed '02'.<sup>(2)</sup> To hasten the program Soviet assistance was sought and obtained, though the Sino-Soviet split of the early 1960s terminated this arrangement and China developed nuclear weapons independently. The first atomic test occurred in 1964 at a test site in Lop Nor in China's Northwest. The device was called '596' - short for 20 June 1959, the date that the Soviets denied China a prototype nuclear bomb.<sup>(3)</sup>

An integral part of the program was the development of aviation and rocket technology for the construction of the nuclear warhead delivery systems. In May 1956, it was decided at a meeting of the Central Military Commission to set up a missile research institute, the Fifth Academy of the Ministry of National Defence. The following year, 1957, the Soviet Union launched an artificial earth satellite, Sputnik I, into orbit. It was a world first and indicated the Soviet Union's mastery of heavy rocket propulsion, a precursor to intercontinental ballistic missile (ICBM) capability. Not only were the Americans spurred into action by this perceived 'missile gap', redoubling their space technology efforts, so were the Chinese. "We also want to make artificial satellites," Mao proclaimed at the Eighth Congress of the CCP in May 1958.<sup>(4)</sup> The Chinese Academy of Sciences and the Fifth Academy organised the scientific expertise in this field to come up with a long-term plan for satellite development.<sup>(5)</sup>

### **Venturing into the Politics of Power**

Thus China's space program was instigated in the 1950s by a decision to acquire nuclear weapons. The political reasons behind this decision were driven by the twin imperatives of territorial defence and national prestige. CCP Secretary General, Deng Xiaoping, who was later to play his most important policy role in introducing market-driven reforms and opening China to the world, addressed the matter succinctly. "The Soviet Union has the atom bomb. Where does the significance lie?" he asked in 1957. "It lies in the fact that the imperialists are afraid of it. Are the imperialists afraid of us? I think not . . . The United States stations its troops on Taiwan because we have no atom bombs or guided missiles."<sup>(6)</sup>

The US had demonstrated its nuclear capability - and the will to use it - the previous decade. While such a demonstration on Hiroshima and Nagasaki in 1945 was to China's benefit by ending Japanese aggression, it was a cause of concern for 'Red China' in the subsequent Korean War of 1950-1951 and the two Taiwan Straits Crises (1954-55 and 1958). The use of nuclear weapons against China had been contemplated at the highest levels and nuclear-capable weapons systems were deployed in Taiwan.<sup>(7)</sup> Mao's 'paper tiger' thesis aside,<sup>(8)</sup> the US 'imperialists' were viewed as posing a threat to China.

It was not only 'imperialist' America that caused consternation among the Chinese leadership in those early years of the People's Republic. Soon the Soviet 'social imperialists' or 'modern revisionists' - as the Chinese called them - were to join the Americans as perceived threats to China. While the escalation of Soviet forces on the Chinese border may be dated from 1969 when the two sides clashed on the Ussuri River, the build-up became noticeable in 1966 with the USSR's first deployment of nuclear missiles to the area. But by this time China had already detonated its first atomic weapon (in 1964). Threat perceptions afflicted both sides.

Initially, however, China's nuclear program did receive assistance from the Soviet Union. The Chinese program also benefited from American and European trained Chinese physicists who returned home.<sup>(9)</sup> Prominent among these was Shanghai-born Qian Xuesen, a missile specialist from the California Institute of Technology. His case is worth mentioning below as it reflects on the wider Sino-US relationship that influenced China's acquisition of space technology. Both the PRC and the United States were ideologically driven in the 1950s, but from opposite ends of the political spectrum. They were also embroiled in a power relationship in which the US regarded itself as exceptional and China as a great civilisation that had been robbed of its status by well-armed 'barbarians'. This sentiment was not dimmed by the passage of time. Rather, there were confirmations of the superiority of American power and the concomitant inferiority of China's international standing. During the Second World War, in particular, the Chinese Nationalists felt betrayed by the Americans who, although engaged in opposing the Japanese, were clearly more interested in Europe. While Washington claimed it viewed China as an important power, China was kept out of the Yalta Conference in 1945, and the US would not relinquish its extraterritorial rights for its citizens in China. This it did after the war, but other problems remained. As A. Doak Barnett saw it:

In the end, virtually all major Chinese groups were bitter and disillusioned with the United States - the Nationalists felt the Americans had failed to give them full-scale aid and in attempting to push for reforms and compromises had meddled excessively in Chinese internal affairs; the Communists felt the Americans had failed to maintain a really neutral posture but instead had bolstered the Nationalist regime throughout the period of mediation.<sup>(10)</sup>

By the end of the 1940s, the USA had become for many Chinese a "symbol and embodiment of Western colonialist intervention in China".<sup>(11)</sup>

### **Contributions from the Boxer Rebellion and American Educators**

Ironically, after China's much lamented 'century of humiliation' at the hands of 'foreign devils', the US gave Boxer Rebellion scholarships to talented Chinese students to study science in America. The scholarships were derived from the indemnity paid by China to Western powers when its anti-foreigner uprising failed in 1900.<sup>(12)</sup> One of the recipients, in 1935, was the above-mentioned Qian Xuesen. He was to become the 'father of Chinese rocketry'.

After graduating, Qian established himself as a leading figure in the development of American space science. His story is well told by Ryan and Summerlin in their historical account, *The China Cloud*.<sup>(13)</sup> Qian was conferred the rank of colonel by the US Army Air Force, and for his scientific contributions in aeronautics during the Second World War he was awarded a commendation for 'meritorious civil service'. After the war, Qian took up a full professorship at the Massachusetts Institute of Technology. He looked forward to acquiring American citizenship. However, with Mao's Communist Party coming to power in China in 1949 and the outbreak of anti-Communist hysteria during the McCarthy era in the United States, Qian Xuesen came under suspicion of being a spy for 'Red China'. After five years of house arrest, he left the United States, saying: "I do not plan to come back. I have no reason to come back. I have thought about it for a long time. I plan to do my best to help the Chinese people build up their nation to where they can live with dignity and happiness."<sup>(14)</sup>

He returned to China in 1955 and was soon appointed president of the Fifth Academy responsible for missile research and development. When, in 1966, China successfully conducted a guided missile nuclear weapon test, Qian had "repaid the Americans with interest" for their treatment of him.<sup>(15)</sup>

The Soviets thought the matter bizarre and said as much in a radio broadcast in Mandarin directed to Chinese listeners: "How did this high-ranking U.S. military officer, who was closely connected with nuclear and rocketry research, end up in People's China?"(16)

Putting aside the propaganda value of a conspiracy theory, it is remarkable that Qian was permitted to return to China. When China underwent its own ideological hysteria during the 'Great Proletarian Cultural Revolution', it did not disrupt the nuclear program or its scientists, as evidenced by the successful testing of a hydrogen (thermonuclear) bomb in 1967 - a year after the Cultural Revolution began. The Americans, by comparison, did allow politics to interfere with national power. They lost Qian, just as they had 'lost China' (to use the phraseology of the time) to Communism. Does American exceptionalism - its notion of 'manifest destiny' to lead and enlighten - collide with strategic realism? Alternatively, will the sources of Chinese state power, irrespective of ideological and 'dynastic' upheaval, always take priority?

For China, the 'failure' of the Boxer uprising (1898-1900) allowed for the education of a later generation of Chinese to help build China's nuclear defences against any future foreign domination. History's judgement on the outcome of this uprising by the 'Righteous and Harmonious Fists',(17) as the Boxers were properly known, may have been premature. So, too, might judgement be reserved on America's efforts to educate and modernise China. To borrow Premier Zhou Enlai's famous reply to the question of the significance of another historical event, the French Revolution: "It is too early to tell." Interestingly, it was Zhou Enlai who was credited with bringing Qian Xuesen back to his homeland.(18) Such long-term vision suggests that not only does China's space program reverberate back into history, perhaps as far back as the Chinese invention of gunpowder rocketry, but also well into the future. The PRC's acquisition of a space program via the need to develop nuclear weapons in the 20<sup>th</sup> century has still to run its course. The long-term ambition is a mission to Mars after implementing its lunar probe program.(19) However, the proverbial journey of a thousand *li* begins with one step. That step was taken in 1970 with the launch of China's first satellite, the DFH-1 (Dong Fang Hong or The East is Red). Its launch vehicle was the aptly named Long March-1 rocket.

### **The Power of Prestige: Domestic and External**

For the 26 days in orbit, China's DFH-1 transmitted the revolutionary song of its namesake, 'The East is Red'. Since then the PRC has successfully launched more than 75 spacecraft for commercial, scientific, and military purposes. In 1992, Project '921' began. Its mission was to put a human in space. Called the Shenzhou ('divine vehicle') program, the first four Shenzhou spacecraft were unmanned but the fifth and sixth carried *yuhangyuan* - 'travellers of the universe' - to use the Chinese term for astronauts. The fifth mission took place in October 2003. A Long-March 2-F rocket launched Shenzhou-5 and China's first astronaut, Yang Liwei, into space. The flight lasted almost a day. Two years later, Fei Junlong and Nie Haisheng, orbited in the Shenzhou-6 for five days. While decades separated China's first manned mission from those of the Russians and the Americans in the 20<sup>th</sup> century, the event did mark China as only the third country to develop an independent manned space mission.

For China, the former Celestial Kingdom reduced by imperialism to the 'sick man of Asia', the recovery of national honour is no trifling matter in the national narrative. Communist victory after the Chinese Civil War allowed China, in Mao's triumphant words of 1949, to 'stand up'. But to journey into space represents the rebirth of a new kind of Celestial state, one that can be regarded as a 'space power' in the prevailing technological age. Prestige is essential not only to recovery from historical insult, but to aspirations for future standing. When China released its first white paper on space in November 2000, called *China's Space Activities*,(20) it called attention to China having invented gunpowder and that this was the embryo of modern space rockets. The country saw itself as returning to its role as a great power in world affairs. Space missions are not free of hazard, but the rewards in terms of respect are great.

To avoid embarrassment in case of failure, the first manned mission (Shenzhou-5) was not telecast live. The confidence gained from that mission, however, and the hailing of Yang Liwei as a national hero upon his return to earth, allowed a great deal of publicity to accompany the second manned mission. The launch of Shenzhou-6 was broadcast live on state television. Later, the two astronauts were shown moving in their cabin and upon their return to Earth were also celebrated as heroes. President Hu Jintao praised the launch as reflecting gloriously on the motherland and showcasing China's technological advances. To consolidate the prestige associated with this second successful manned mission, China hopes to put a man on the moon and to set up a space station by 2017.(21) Despite still being a poor country with a per capita annual income of only \$1,293, China has signaled that it is embarked on a 'long march' into space. Like the historic Long March when Mao Zedong's retreating forces created a propaganda coup of heroic proportions, so too a 'long march' into space will be couched in the language of heroes and glorious deeds. Space exploration may be seen as another grand historical project, on a par with the Great Wall, as well as setting the tone for China's future. Like the forthcoming Beijing Olympics, success in space will give the state enormous prestige - prestige that is directed as much to its own citizens as to the international community.

#### *(a) Domestically Targeted Prestige*

If the Chinese Communist Party is to retain its legitimacy at a time of increasing irrelevance of Communist ideology, then a grand project like the space program may indeed be a unifying cause, a source of pride as to what China can do.

The CCP also needs the public acclaim that comes from such a prestige project as space exploration to offset a measure of public dissatisfaction with official corruption and social injustice. In 2004, according to government records, there were 74,000 protests in China, involving some three million people.(22) The space program helps improve the party's image. Yet China has been criticized for spending an estimated 19 billion yuan or US\$2.4 billion, though the PRC figure is half this,(23) on the Shenzhou-6 launch when such funds could have been better used to help the poor.(24) This is especially so in view of another event in October 2005 - the meeting of the CCP's Central Committee which decided to enhance efforts in adjusting income distribution and alleviating the widening wealth gap. One response by the Chinese to the criticism of privileging the glories of space over grim realities on the ground is that such criticisms are ill-informed. Space officials have defended their work by noting that their space program is used for "sustainable human development" in various sectors from improved food production to telecommunications;(25) while spending on the Shenzhou-6 mission was dwarfed by the 190 billion yuan (US\$23.5 billion) spent on pollution control in 2004. (26) In the end, assessments need to be made within the wider framework of China's code of 'comprehensive national strength'. This concept, to which discussion will return, alludes to coordinative efforts between space and terrestrial concerns, as well as between defence and the civilian economy generally.

#### *(b) Internationally Targeted Prestige*

In order to allay the fears of the international community that China might be preparing through its space program for a dominant role, Beijing's diplomacy has been carefully orchestrated. In 2002, Beijing joined Moscow to submit a working paper to the UN Conference on Disarmament that would ban weapons in space.(27) By developing its own space-based capabilities while at the same time renouncing the weaponisation of space, China can be both militarily credible - in that it has a program in play to counter any emergent hegemonic practices in space - and diplomatically persuasive insofar as it would like to join the international community it keeping space as a weapons-free zone. In this regard, it is notable that China's space white paper strongly backs the United Nations Office of Outer Space Affairs. It is also significant that in the 1990s China's space program was moved from the administrative control of the People's Liberation Army to a newly formed agency within the Commission of Science, Technology and Industry for National Defence: the China National Space Administration. CNSA has a user-friendly website(28) and has translated the space white paper "to explain China's purposes and goals for space science and technology".(29) The administrative change,

however, does not alter the unified effort in space research and development that has always been underway. Rather, it represents a "bifurcation at the applications level" to better align itself with international practices.(30)

This is not surprising in view of China's increasingly global image. It exhibits a desire to accord with international standards, particularly in economic and scientific practices. Once a closed society in which it was more important to be 'red' than 'expert', 21<sup>st</sup> century China is unrecognizable. Deng Xiaoping's post-1978 reforms have resulted in a China that is far more open to the world, participating in inter-governmental institutions, transnational regimes and the global market economy. Indeed, China's export success has been such that fear of the *China Inc* phenomenon has come to rival fear of a militarily powerful China. Beijing's diplomatic tasks in dampening threat perceptions are of considerable importance. In this regard, the space program can represent a window with a particularly attractive view of the new participatory China. Space may not only be an attractive *indicator* of Beijing's commitment to multilateralism. It could also be an *instigator* by leading to deeper international cooperation. This is strongly advocated in the above-mentioned white paper on space. Already cooperation has been established with Russia, Brazil, and Europe. For example, China has joined in the research and development of the European Union's Galileo satellite navigation system. This navigation and positioning system, with both civilian and military uses, is due to become operational in 2008 and will compete with the American GPS network.(31)

### **Sino-US Rivalry in Space: Asymmetrical Deterrence?**

While China is cooperating with the EU, and generally behaving in an accommodating fashion internationally, it is not doing so well with a more sceptical US. After all, the People's Republic has not been invited to join the premier international space venture: the 16-nation International Space Station. Admittedly, this is essentially a US-dominated club. China's exclusion is not surprising in light of US threat perceptions and disdain for the Chinese state's political system. Judging from the tone of the Pentagon's annual reports on the military power of the PRC, as well as the 2001 Rumsfeld Commission report that warns of a potential 'Pearl Harbor in space',(32) it may be argued that the US regards China as the most likely contender to challenge its dominance in space. Certainly, the US military satellite infrastructure is vulnerable to attack if a country like China acquires capabilities and the intention to use them. Specifically, the Pentagon's 2004 and 2005 annual reports on China's military power identify China's so-called 'counterspace developments', saying that it is working on plans to field anti-satellite (ASAT) systems.(33) If the US implicitly regards China as the most likely threat to its satellites, which are vital in enabling the US to engage in advanced technology warfare, then all that remains is for China to respond. This would essentially transform space relations from a largely benign political arena to a geopolitical frontier in Sino-US rivalry.

For China to engage in a space race, it needs funds and it needs political will. The US spends approximately seven times as much as China annually on its space program, \$16 billion compared to 2.2 billion,(34) but China's costs are lower. Even so, financially, an arms race in space is an expensive enterprise for a developing country like China. Moreover, China could lose such a race. During the live television coverage of the manned space launch in 2005, one commentator pointed out that the US may well be employing a strategy of luring China into a space race so that it would overstretch its resources and collapse.(35) This scenario is familiar both to Mao's classical People's War doctrine and the more recent spectacle of the Soviet Union's collapse. The first called for luring an enemy deep into one's territory before waging guerrilla warfare. The second refers to Moscow's purported inability to keep up with the US financially in the development of the Strategic Defense Initiative - or Star Wars - and hence its demise.

Such an assessment would have to weigh on the minds of Chinese government planners. Ultimately, it would depend on affordability of the Chinese counter-weapon and a continued defensive orientation in Chinese doctrine. After all, Mao had pondered the problem of how a weak army can defend against a strong one and he came up with a People's War employing insurgents. The enemy would be lured in and harassed by a hostile population and guerilla tactics, the object of which was to prepare for a

strategic counter-attack by the regular forces.(36) In the information age and space-based force enhancement systems, it could well be that China can develop a relatively cheaper guerilla ASAT system. For this, very small satellites (in 10-100 kg range) could be effective. They are regarded as "inexpensive but highly functional".(37) In 2004, China had launched a 25-kg microsatellite, and it is one of the countries (that include Algeria, Nigeria, Thailand and Turkey) participating in microsatellite research at the Surrey Space Centre in the UK, for the primary purpose of disaster monitoring.(38) China's current activities have been linked to reports in 2000 and 2001 of 'parasitic' microsatellites being developed. These reports have been deemed a 'hoax' by Jeffrey Lewis,(40) though it was probably more a supposition. The idea, however, is not without merit. Like a guerilla surprise attack on a vital military asset, so-called 'parasitic microsatellites' would secretly attach themselves to enemy satellites and destroy them in the event of war. If they were developed, they could be augmented by high-energy lasers and satellite intercepting missiles carried on what has been described as "a small aircraft-shaped space shuttle" capable of being converted to a weapons platform.(41) For example, if there was to be a Chinese military takeover of Taiwan, the risk of US intervention on Taiwan's side would be countered by disabling its satellites.

One lesson from this scenario is that it is better to cooperate than compete. For the US it means knowing what the Chinese have and what they are developing in their space program; for China it means (a) avoidance of a possible Soviet-style bankruptcy and (b) the ability to access dual-use technology within the framework of Sino-US cooperation. When a Chinese space official said in 2005 that: "This is not a competition like the Cold War", (42) his remark is plausible strategically and economically. Even if cooperative relations do not lead to a more systemically entrenched goodwill, as might well occur over time, at least it would delay the strategic contest for another day. For China in the 21<sup>st</sup> century, as in the old days of People's War, time is an asset. It allows the weak to grow strong. How China will use such strength is a foreign policy matter. If it seeks to foster a multipolar world as it does now, then it will attempt to bring the cooperative balance into play in space and prevent US hegemony. One step in this direction is to promote a more effective outer space legal regime, particularly through the UN in the areas of controlling orbital debris, space traffic and enhancing transparency by providing details on satellites launched.(43) Another step is to democratize the US-dominated International Space Station or set up an alternative one that is better attuned to a multipolar rather than unipolar world system.(44) China would then be an internationally progressive force. It would also make space research more affordable for all participants.

To be sure, the estimated cost of reaching humankind's next space goal, a manned mission to Mars, is prohibitive: over a trillion dollars.(45) Already China has signed an agreement with Russia to "conduct a feasibility study to jointly explore the moon as well as outer space", (46) including missions to Mars. The European Union, Russia, and China are also cooperating in their space research.(47) Together they represent a mixture of high-technology, space experience and commitment. "I think in the future we would like to have more international collaboration - not only with Europe, but also with India, with Japan, with the United States," Wu Ji, from the Centre for Space Science in Beijing, affirmed. "From the Chinese side we are very open."(48)

### **Regional Space Rivalry**

Such cooperation also has a competitive dynamic. India quickly followed China in showing interest in an unmanned lunar program, and turned to the European Space Agency for "joint experiments with Indian spacecraft".(49) Both Japan and India have space capabilities matching China's but, as China space specialist Johnson-Freese observes, not the "political will" to use them the way China has.(50) Japan has the technological credentials to advance in space, despite some notable launch failures,(51) but politics prevent anything but a cautious approach to space. As an ally of the US, it follows the American lead. The Japan Aerospace Exploration Agency (JAXA) has been contributing technological expertise in the creation of module tubes for the International Space Station and it has had eight astronauts trained by NASA, some of whom have flown in space-shuttle missions.(52) Besides being tied closely to the US, Japan is constitutionally constrained in military matters. This means that Japan's space program must be pursued for peaceful purposes only. It spends less than

China on its space program, \$1.8 billion(53) annually compared to China's \$2.2 billion, and this budget comes from a developed nation that can afford to spend more.

When China launched its first manned space mission in 2003, Japan reacted with surprise and a degree of anxiety in view of China and Japan having an underlying competitive relationship in terms of regional leadership and, at times, a tense one when bilateral issues flare up. These are usually about Chinese complaints over Japan's inability to come to terms with its wrong-doing in the Second World War and over demarcation disputes in their maritime border. A strengthening China is not necessarily in Japan's best interests. Moreover, China can excel in an area that Japan cannot: an independent military capability, empowered by space. In short, China can become a 'space power' and not just a terrestrial great power. If China is to become competitive with the US in space, then Japan's role will be as a competitor too, but in the framework of the US alliance and a space patronage system. If China is to become a space cooperator rather than competitor, then Japan will benefit from increased security and economic-technological opportunities.

India is not as constrained as Japan in its space program but it is also not as demonstrably ambitious as China in terms of international prestige. In the four decades of India's space program a manned mission has not been undertaken. Instead the emphasis has been on building rockets and satellites that have a socio-economic application, such as using the satellite network for improved healthcare for the rural areas.(54) The program aims are "developmental", according to the director of India's Space Commission, Rodham Narasimhan. They concern "communications, remote sensing, agricultural crop production".(55) This is the more pragmatic approach that China might learn from, and publicise more heavily, in view of growing social unrest in the poorer interior provinces.

In other words, its 'grand projects' should be accompanied by publicity for less flashy but practical projects, like lessening the wealth gap between the coast and interior. It is within this domain that the Chinese government should be keen to be seen to be active. Thus the space program's communication facilitation for the impoverished western regions of China should be treated with as much pomp and ceremony as a future space walk.

So while China is ahead of India in the manned aspect of space research, the Indians may be said to be more socially oriented in theirs. Given that the cost of India's space program is \$600 million a year - much less than China's \$2.2 billion - it can be used by 750 million rural Indians.(56) China needs to make similar claims to offset suspicion and enhance cooperation.

By the same token, India is not innocent of military aspirations. It should be remembered that India is a nuclear-armed power with strategic regional interests. Just as India did not become a declared nuclear weapons power until long after testing its nuclear devices, so too it is likely that India's space program will be employed for military-strategic purposes in time to come.(57) The important consideration for India is that it has an indigenous program and that it is capable of independent policy direction. India could be a great challenge for China - but it could also be a significant partner in a genuinely multipolar and multilaterally oriented world. After all, both are developing countries with similar needs to improve the quality of life of their populations, including environmental improvement. Both as great powers that account for over two billion people - a third of humankind - have a strategic stake in a multipolar world.

### **A Comprehensive Approach to Development and National Strength**

Both India and China are developing countries as well as developing powers. By necessity they need to maintain a coordinated approach to self-strengthening. In China's case this is captured by the terms 'comprehensive development strategy' and 'comprehensive national strength'. As stated in China's *Space Activities (White Paper)*:

The Chinese Government has all along regarded the space industry as an integral part of the state's comprehensive development strategy . . . The aims and principles of China's space activities are

determined by their important status and function in protecting China's national interests and implementing the state's development strategy.(58)

Moreover, the list of specific aims includes "national security" and the need to "build up comprehensive national strength".(59) *China's National Defense in 2004* white paper also emphasises the quest for "comprehensive national security in the political, economic, military and social areas".(60) It speaks of adhering "to the strategic guideline of combining military needs with civilian needs, reserving military potential in civilian capability" and enhancing "in an all-round way the overall quality and sustainable development capability of the defense-related science, technology and industry". In terms of developing "dual-purpose technologies", the white paper clearly identifies "space and aviation technologies".(61) More than being a concern peculiar to developing economies that are also developing 'powers', the 'comprehensive security' focus of Chinese policy suggests doctrinal continuity from Mao's People's War strategy. This holds that the whole country must be mobilised in the cause of defence, and that defence needs to support the country even in peacetime. The defence white paper clearly shows the linkage by dwelling on 'The Armed Forces and the People' (chapter 8) and 'Mobilization of National Economy' in which it is stated that "China's economic mobilization follows the strategic thinking of soldiers and the people being the foundation of victory and the strategic concept of the people's war".(62)

From this vantage-point of a mutually regarding civil-military relationship, it is easier to appreciate China's space aims. The Confucian-like 'reasonableness' that is conveyed in the tone of the space white paper - an emphasis on scientific and technological development, as well as cooperative ventures with the international space community - does not contradict the role of space research in enhancing "national security". To the contrary, it encourages a technologically literate society within China and an international "division of labor"(63) outside it.

More pointedly, China's military modernisation program needs space capability. Without it, China cannot credibly deter possible hostile military action, or threat of such action, from the world's premier military power, the United States, whose 2001 Space Commission Report clearly identified the inevitability of space becoming a battleground crucial to future warfare.(64) Moreover, the USA's commitment to building ballistic missile defence systems is hardly reassuring for Beijing whose nuclear force would thereby be robbed of its deterrent value. If China wishes to signal resistance to US monopolisation of high-tech military capabilities, it needs to project its power into space. China defence analyst, You Ji, has written that PLA intentions for the first two decades of the 21<sup>st</sup> century are "to launch defence space stations", and that the various services of air, army, navy and the strategic missile force "should have all established separate space command units".(65) This is not spelled out in the 2000 space white paper, but among the four "long-term development targets (for the next 20 years or more)" is "an integrated ground-space network system . . . in accordance with the overall planning of the state".(66) Another projection for this time period is to be found in a Chinese article published in *China Military Science* in 1995.(67) Nanosatellites are noted for their value in creating a "distributed" system, in case the integrated system should prove vulnerable to "malfunction". Or, to state the unspoken, attack. Certainly, such distributed systems are credited with increasing "the survivability and flexibility of future space systems".(68)

### **Mining the Moon and Making the Deserts Bloom**

Mindful of the comprehensive nature of China's space policy, it is worth remembering that the rhetoric of the 'peaceful' use of space is not simply a negation of its use as a battlefield. It also refers to anticipated economic benefits. Indeed, some of the peaceful uses are quite futuristic: the use of lunar energy reserves (isotope helium 3) to compensate for limited oil reserves on Earth.(69) In more immediate day-to-day terms, space-derived technology can help feed China's population of 1.3 billion people by improved species of crops and advances in animal husbandry. The Shenzhou-6 launch of October 2005, for example, included an experiment on the effects of weightlessness on pig sperm. Shenzhou-3 and Shenzhou-4 were used for maritime pollution control and desertification control projects. While energy, food and environmental projects can be of benefit to China and the world, the

Chinese economy itself may expect a boost in the high-tech direction from space-based experiments in new materials, pharmaceutical products and life sciences. In view of the fact that space technology is one of the PRC's seven designated fields in its national high-tech research and development program,(70) it is reasonable to assume that commercial applications of space experiments will benefit the economy sooner rather than later.

The Chinese economy will also benefit from the expertise required in the space industry. At present there are an estimated 300,000 people working on the manned space program alone. Those who are specialised are likely to stay in China rather than go abroad because they have employment; and more specialists will be generated through China's universities, adding to the quality of its workforce.

Many will find employment in the expanding satellite launch industry which forms part of the high-tech end of China's economy. It began in 1986 under the China Great Wall Industries Corporation. Despite technical and political setbacks in the 1990s (see below), China's launch program is growing. A new satellite launch site is to be opened in Hainan Island in China's southeast. It will be the country's fourth launch site, the other three being in Jiuquan, Xichang and Taiyuan, located in Gansu, Sichuan and Shanxi provinces, respectively. Other developments include the new Long March rocket scheduled for a test flight in 2008 and a rocket and satellite development centre near Shanghai, scheduled for completion in 2010.(71) China Great Wall Industries Corporation is building the Nigerian communication satellite (NIGCONSAT-1) that involves satellite development, rocket manufacture, construction of ground stations and the actual launch from Xichang Satellite Launch Centre.(72)

This growing indigenous capacity is understandable in view of the problems that have beset the history of China's commercial satellite launch industry as a result of its strong dependence on the US. As most commercial satellites are either built there or contain US components, they are subject to strict US export licences. While export for launching US satellites from Chinese launch sites was approved in 1988, the following Year's Tiananmen tragedy meant that all exports on the Munitions List - and this included satellites that were to be launched in China - were banned. While this embargo was lifted, and three satellites were launched, difficulties continued on another political front. The Cox Report of 1999 alleged that the Chinese had used espionage to obtain missile technology secrets from the US companies involved in launching commercial communications satellites from China.(73)

After restrictions imposed by the US and after some launch problems in recent years, the Chinese commercial satellite-launch industry needed a boost in international opinion. In this respect, the manned missions in 2003 and 2005 were evidence of the new level of sophistication that China had to offer international clients. The message conveyed was that Chinese technology was reliable enough to launch its own astronauts, and should therefore be trusted to succeed in launching a client country's satellites.

### **Conclusion: Historical Continuities**

China has taken its place at the forefront of spacefaring nations: it joins only the United States and Russia in operating an independent manned space program. As a developing country this is a major feat. Moreover, its space program is a full-spectrum, comprehensive concept. From microsattelites to manned space missions, from satellite and rocket design to launch capabilities, it spans both civilian and military requirements. Such ambition may see a Chinese astronaut landing on Mars, though the likelihood is that the Mars mission will be undertaken in the company of other nations.

While China has come a long way since 1955 when the nuclear program was approved, certain themes remain. The first and foremost is that the primary threat is still the United States. The young People's Republic feared for its survival in the face of US nuclear power. Today too, Major General Zhu Chenghu, Commandant and Professor at the College of Defence Studies at China's National Defence University, points out that the US has designated nuclear targets east of Xian. In the event of

a war breaking out between China and the US over Taiwan, he has told foreign visitors on two occasions in 2005 that: "We will prepare ourselves for the destruction of all the cities East of Xian."(74) He reminded his audience of China's nuclear targeting capacity on US cities. This disturbed post-Cold War sensibilities, and was not accorded official status by the Chinese Department of Foreign Affairs but treated as a private view. The deterrent threat it makes, however, is valid and in keeping with Deng Xiaoping's warning back in 1957 about the significance of nuclear weapons. Deterrence - the ability to frighten the adversary against taking action detrimental to one's territorial integrity - is as desirable in the 21<sup>st</sup> century as it was in the 1950s.

Just as the nuclear deterrent retains its logic, so too does the space program's service to military aims. Space has become crucial in future warfare. Thus while the space program was the handmaiden to the nuclear project in the fifties, half a century later it would give China's military its high-tech edge. That which remains the same is the element of deterrence. It may be postulated that through the guerilla warfare method of surprise attack on American satellites, plus Chinese survivability and flexibility in space through the operation of distributed systems (nanosatellites), an asymmetrical deterrence becomes possible.

Another factor that has not changed is the climate of great power competition. The United States occupies its place as the new Rome of global politics and China has not lost its sense of historical greatness. In other words, one cultivated its 'manifest destiny' to be great, the other its 'Mandate of Heaven' to be central. American exceptionalism continues to collide with realist policy.(75) Chinese state power will continue to prevail, with or without the Communist Party. If today the East is not particularly red in the ideological sense it is increasingly Chinese in geopolitical terms. China is a rising economic and military power with an expanding presence in regional diplomacy. Even the old triangular relationship has re-emerged with a return of Russian mentoring of China's capabilities. Russian assistance for the Chinese space program has been considerable and by 2005 a joint program for deep space exploration was signed - together with a pledge to pursue multipolarity. This means a diminished American leadership role. If the historical tide is to turn yet again, American realism may rendezvous with Chinese idealism in space cooperation. When Washington realizes it needs to concentrate on allies more than enemies, and Beijing decides that the world is truly a unity of diverse nations, or *datong*, in classical parlance(76), then both parties could give cause for a more auspicious reading of space. Instead of becoming the new strategic battleground between East and West, space could provide a lesson for cooperation on Earth.

## Endnotes

1. Rosita Dellios is Associate Professor of International Relations at Bond University and a China defence specialist.
2. Editorial Board of 'China Today Series', *China Today: Defence Science and Technology, Vol. 1, National Defence Industry Press*, Beijing, 1993, p. 28; Robert S. Norris, Andrew S. Burrows, and Richard W. Fieldhouse, Natural Resources Defense Council, Inc. (NRDC), *Nuclear Weapons Databook, Vol. 5: British, French, and Chinese Nuclear Weapons*, Westview Press, Boulder, Colorado, 1994, p. 331.
3. *Nuclear Weapons Databook*, p. 350.
4. *China Today: Defence Science and Technology*, p. 356.
5. Ibid.
6. Quoted in *Nuclear Weapons Databook*, p. 327.
7. *Nuclear Weapons Databook*, pp. 324, 326; Mark A. Ryan, *Chinese Attitudes Toward Nuclear Weapons: China and the United States During the Korean War*, M. E. Sharpe, Armonk, NY, 1989; and Gordon S. Chang, *Friends and Enemies: The United States, China, and the Soviet Union, 1948-1972*, Stanford University Press, Stanford, California, 1990, pp. 116-142.
8. 'All Reactionaries are Paper Tigers' (November 1957), *Selected Works of Mao Tse-tung*, Vol. 5, Foreign Languages

Press, Beijing, 1977. A reference to the US with its nuclear arsenal, the 'paper tiger' thesis pertains to the man-over-weapons concept, which does not tactically underestimate the power of the enemy and its nuclear weapons but morally questions it, and hence strategically despises it, on the basis that such power is 'divorced from the people'. Ironically, China's own nuclear program was largely divorced from the people. According to William L. Ryan and Sam Summerlin (*The China Cloud: The Untold Story of China's Rise to Nuclear Power*, Hutchinson & Co, London, 1969) China's nuclear weapons program was costing "several hundred million dollars a year" (p. 179) while the population remained poor and neglected (p.189).

9. "Of the top two hundred Chinese scientists ready to work in earnest on a nuclear program for newly Communist China, more than three quarters had received their training abroad, and of those the top eighty were men educated in the United States." (Ryan and Summerlin, p. 160.)

10. A. Doak Barnett, *China and the Major Powers in East Asia*, The Brookings Institute, Washington DC, 1977, p. 160.

11. Ibid., p. 161. See also John King Fairbank, *The United States and China*, 4<sup>th</sup> edn, Harvard University Press, Cambridge, Massachusetts, 1979, ch. 12; and Judith F. Kornberg and John R. Faust, *China in World Politics: Policies, Processes, Prospects*, Lynne Rienner, Boulder, Colorado, 2005, pp. 128-9.

12. Ryan and Summerlin., p. 43; Kornberg and Faust, p. 128.

13. Ryan and Summerlin., p. 43.

14. Quoted in Phillip C. Saunders, 'China's Future in Space: Implications for U.S. Security', *adAstra, The Magazine for the National Space Society*, 20 September 2005, [www.space.com/adastra/china\\_implications\\_0505.html](http://www.space.com/adastra/china_implications_0505.html)

15. Ryan and Summerlin, p. 237.

16. Moscow Radio Peace and Progress, 16 April 1968, quoted in *ibid.*, p. 269.

17. For an authoritative historical analysis, see John K. Fairbank, Edwin O. Reischauer, and Albert M. Craig, *East Asia: The Modern Transformation*, Houghton Mifflin Co., Boston, 1965, pp. 394-407; and Immanuel C. Y. Hsu, *The Rise of Modern China*, 4<sup>th</sup> edn., Oxford University Press, Oxford, 1990, ch. 16.

18. Editorial Board of 'China Today Series', *China Today: Defence Science and Technology*, p. 29. Zhou Enlai had exercised political leadership over the nuclear weapons program.

19. China Daily, 'Official: China has No Specific Plan for Mars Mission Now', *People's Daily Online*, 5 Jan. 2004, [http://english.people.com.cn/200401/05/print20040105\\_131842.html](http://english.people.com.cn/200401/05/print20040105_131842.html)

20. The State Council Information Office, PRC, *China's Space Activities (White Paper)*, November 2000, Beijing, <http://english.peopledaily.com.cn/features/spacepaper/spacepaper.html>

21. While at the time of writing, this is the latest timeline for China's planned space events, it should be noted that the timelines vary. See Min Lee, 'China Aims to Put Man on the Moon by 2020', *Space.com*, 27 November 2005, [www.space.com/missionlauches/ap\\_051127\\_china\\_moon.html](http://www.space.com/missionlauches/ap_051127_china_moon.html); *China's Space Activities (White Paper)*, <http://english.peopledaily.com.cn/features/spacepaper/spacepaper.html>; 'China Launches Rocket into Space', *BBC News*, 12 October 2005, <http://news.bbc.co.uk/2/hi/asia-pacific/4333158.stm>; 'China Makes Second Manned Fray into Space', Reuters, 12 October 2005, <http://taiwansecurity.org/Reu/2005/Reuters-121005.htm>; 'Chinese Astronauts Blast Off', *CNN.com*, 12 October 2005, <http://cnn.worldnews>; and 'China Claims Its Place in Space', *CNN.com*, 15 October 2003, [www.cnn.com/2003](http://www.cnn.com/2003)

22. 'China Summit Targets Poverty Gap', *BBC*, 8 October 2005; Jane Macartney, 'Changing the Fate of Those Left Behind', *The Australian*, 13 October 2005, p.8.

23. Min Lee, 'China Aims to Put Man on the Moon by 2020', *Space.com*, 27 November 2005, [www.space.com/missionlauches/ap\\_051127\\_china\\_moon.html](http://www.space.com/missionlauches/ap_051127_china_moon.html)

24. Editorial, 'China's Shenzhou VI: A Misplaced Priority', *China Post* (Taipei), 16 October 2005, <http://taiwansecurity.org/CP/2005/CP-161005.htm>

25. 'China's Space Program Aims at Peaceful Use of Space Resources', *Chinanews.cn*, 15 October 2005,

[www.chinanews.cn/news/2005/2005-10-15/12428.html](http://www.chinanews.cn/news/2005/2005-10-15/12428.html)

26. Hu Shixiang, deputy commander in chief of China's manned space flight program, quoted in Min Lee, 'China Aims to Put Man on the Moon by 2020', *Space.com*, 27 November 2005, [www.space.com/missionlauches/ap\\_051127\\_china\\_moon.html](http://www.space.com/missionlauches/ap_051127_china_moon.html)
27. See Congressional Research Service (CRS), 'China's Space Program: An Overview', *SpaceRef.com*, 14 November 2003, [www.spaceref.com/news.viewsr.html](http://www.spaceref.com/news.viewsr.html); and Phillip C. Saunders, 'China's Future in Space: Implications for U.S. Security', *adAstra, The Magazine for the National Space Society*, 20 September 2005, [www.space.com/adastra/china\\_implications\\_0505.html](http://www.space.com/adastra/china_implications_0505.html)
28. [www.cnsa.gov.cn/english](http://www.cnsa.gov.cn/english)
29. CNSA deputy director, Guo Baozhu, quoted in Dennis Normile, 'Sciences Emerges from Shadows of China's Space Program', *Science*, Vol. 296, 7 June 2002, [www.sciencemag.org](http://www.sciencemag.org)
30. Joan Johnson-Freese, 'Scorpions in a Bottle: China and the U.S. in Space', *Nonproliferation Review*, Vol. 11, No. 2, Summer 2004, p. 173. Whatever the appearance, the reality behind it is that: "Final approval for decisions about the direction of the manned program and satellite and launcher development rests with the military." (Joan Johnson-Freese, "'Houston, We Have a Problem": China and the Race to Space', *Current History*, Vol. 102, No. 665, September 2003, p. 262.)
31. *The Military Balance 2005-2006* reports that as "a partner in the European 'Galileo' project, and with its own analogous projects, China is building an extensive navigation satellite system". (The International Institute for Strategic Studies, *The Military Balance 2005-2006*, Routledge for IISS, London, October 2005, p. 259.)
32. Commission to Assess U.S. National Security Space Management and Organization, *Report of the Commission to Assess U.S. National Security Space Management and Organization*, 11 January 2001, [www.defenselink.mil/pubs/spaceintro.pdf](http://www.defenselink.mil/pubs/spaceintro.pdf)
33. Office of the US Secretary of Defense, *Annual Report to Congress: The Military Power of the People's Republic of China*, <http://www.globalsecurity.org/military/library/report/2004/d20040528prc.pdf>  
and [www.defenselink.mil/news/Jul2005/d20050719china.pdf](http://www.defenselink.mil/news/Jul2005/d20050719china.pdf)
34. Congressional Research Service (CRS), 'China's Space Program: An Overview', *SpaceRef.com*, 14 November 2003, [www.spaceref.com/news.viewsr.html](http://www.spaceref.com/news.viewsr.html)
35. Reported in Editorial, 'China's Shenzhou VI: A Misplaced Priority', *China Post* (Taipei), 16 October 2005, <http://taiwansecurity.org/CP/2005/CP-161005.htm>
36. *Selected Military Writings of Mao Tse-tung*, Foreign Languages Press, Beijing, 1966.
37. Jeffrey Lewis, 'Engage China, Engage the World', *adAstra*, May 2005, [www.space.com/adastra/china\\_engagement\\_0505.html](http://www.space.com/adastra/china_engagement_0505.html)
38. Joan Johnson-Freese, 'Scorpions in a Bottle: China and the U.S. in Space', *Nonproliferation Review*, Vol. 11, No. 2, Summer 2004, p. 178; and *ibid.*
39. The US Defense Department's 2004 *Annual Report to Congress: The Military Power of the People's Republic of China*, cited a 2001 Hong Kong press report on this. It is also noted in Michael Pillsbury, *China's Military Strategy Toward the U.S.: A View from Open Sources*, 2 November 2001, p. 20, citing Cheng Ho, 'China Eyes Anti-Satellite System', *Space Daily*, 8 January 2000. According to Joan Johnson-Freese, "China says it has developed 'parasite satellites' - orbiting bombs that attach themselves to enemy spacecraft for detonation when deemed necessary . . . It could be argued today that the Chinese may want to let America think that they have parasite satellites and other such capabilities in an attempt to gain respect for China's strength and ability to retaliate." ("Houston, We Have a Problem": China and the Race to Space', *Current History*, Vol. 102, No. 665, September 2003, p. 263.) Jeffrey Lewis, however, regards the matter as an over-reaction on the part of the US in a regulatory environment that lacks transparency. "Concern over China's 'parasitic microsatellite' arose because several countries, including the United States, are developing small satellites capable of conducting 'autonomous proximity operations' - maneuvers that would allow satellites to inspect other satellites, diagnose malfunctions and provide on-orbit servicing." (Jeffrey Lewis, 'Engage China, Engage the World', *adAstra*, May 2005, [www.space.com/adastra/china\\_engagement\\_0505.html](http://www.space.com/adastra/china_engagement_0505.html))

40. Lewis, *ibid.*
41. Richard Fisher, Senior Fellow, Jamestown Foundation, Washington, DC, cited in Leonard David, 'Red Dragon Rising: China's Space Program Driven by Military Ambitions', *Space.com*, 13 March 2002, [www.space.com/news/china\\_space\\_020313.html](http://www.space.com/news/china_space_020313.html)
42. Hu Shixiang, deputy commander in chief of China's manned space flight program, quoted in Min Lee, 'China Aims to Put Man on the Moon by 2020', *Space.com*, 27 November 2005, [www.space.com/missionlauches/ap\\_051127\\_china\\_moon.html](http://www.space.com/missionlauches/ap_051127_china_moon.html)
43. Jeffrey Lewis, 'Engage China, Engage the World', *adAstra*, May 2005, [www.space.com/adastra/china\\_engagement\\_0505.html](http://www.space.com/adastra/china_engagement_0505.html)
44. Johnson-Freese: "What China offers to the world is the opportunity to pursue space activity on a far more level playing field with the United States than any country could ever hope to do alone . . . The opportunity for countries to work together to design a vision (rather than having it presented to them fully defined) and then work together as partners toward achieving it (even if at a less sophisticated level of technology without the United States) could be very attractive to some countries." ('Scorpions in a Bottle: China and the U.S. in Space', *Nonproliferation Review*, Vol. 11, No. 2, Summer 2004, p. 179.)
45. 'The Dawn of a New Space Race?', *BBC News*, 14 Oct. 2005, <http://news.bbc.co.uk/go/pr/fr/-/1/hi/world/asia-pacific/4208176.stm>
46. Signed after the November 2005 meeting between Chinese and Russian Premiers in Beijing. (See 'Russia to Boost Oil Shipments to China, Collaborate on Space Exploration', *SpaceDaily*, 5 November 2005, [www.spacedaily.com/news/cina-05](http://www.spacedaily.com/news/cina-05))
47. See 'EU, Russia Launch Strategic Space Cooperation', *ISN Security Watch*, 16 November 2005, [www.isn.ethz.ch/news/sw/details.cfm?id=13412](http://www.isn.ethz.ch/news/sw/details.cfm?id=13412)
48. 'The Dawn of a New Space Race?', *BBC News*, 14 October 2005, <http://news.bbc.co.uk/go/pr/fr/-/1/hi/world/asia-pacific/4208176.stm>
49. Philip Clark, of Molniya Space Consultancy, UK, quoted in *ibid.*
50. Joan Johnson-Freese cited in Agence France-Press, 'China Space Program Could Trigger Race', 14 October 2005, *Top Tech News*, [www.toptechnews.com](http://www.toptechnews.com)
51. Such as the aborted launch in 2003 of two satellites that were intended for spying on North Korea.
52. Jim Fredrick, 'Asia's Space Race', *TIME*, 17 October 2005.
- 53 *Ibid.*
54. See Satinder Bindra, 'Space Program Helps the Masses', *CNN.com*, 22 September 2005, <http://cnn.worldnews.com>
55. Quoted in 'The Dawn of a New Space Race?', *BBC News*, 14 October 2005, <http://news.bbc.co.uk/go/pr/fr/-/1/hi/world/asia-pacific/4208176.stm>.
56. Jim Fredrick, 'Asia's Space Race', *TIME*, 17 Oct. 2005.
57. A hint of this came in December 2005 when India and Russia signed an agreement for India to join Russia's Global Navigation Satellite System (Glonass), comprising 14 satellites, which China also uses. This is an alternative to the USA's GPS. Like China, India is also a participant of the European Galileo system but cannot use it during conflict, whereas Russia would permit India to use Glonass for the purposes of "peace and security" ('India and Russia Plan High-Tech Arms Venture', *The Straits Times*, 6 December 2005, p. 12). Space cooperation and nuclear projects were part of a larger agreement on collaborative defence projects. With regard to helping India, considered Russia's "strategic partner" in the "the peaceful use of nuclear energy", Russian President Putin Vladimir noted that India had clearly separated its nuclear program into military and civilian purposes, and had legislated for this ('India and Russia Ink Major Defence Deal', *The Straits Times*, 7 December 2005, p. 9). This is perhaps a reflection on the potentially dangerous ambiguity of China's comprehensive civil-military space program, though the dual use of technology is a universal possibility and not confined

to China alone.

58. The State Council Information Office, *China's Space Activities (White Paper)*, PRC, November 2000, Beijing, p. 1, <http://english.peopledaily.com.cn/features/spacepaper/spacepaper.html>

59. Ibid.

60. The State Council Information Office, *China's National Defense in 2004 (White Paper)*, PRC, 27 December 2004, Beijing, p. 4, <http://www.fas.org/nuke/guide/china/doctrine/natdef2004.html>

61. Ibid., p. 28.

62. Ibid., p. 22.

63. Ibid., p. 30. The phrase is used in the context of China encouraging its "defense-related science, technology and industry [to] take an active part in international exchanges and cooperation . . . [to] participate in the international division of labor . . .".

64. Commission to Assess U.S. National Security Space Management and Organization, *Report of the Commission to Assess U.S. National Security Space Management and Organization*, 11 January 2001, [www.defenselink.mil/pubs/spaceintro.pdf](http://www.defenselink.mil/pubs/spaceintro.pdf)

65. You Ji, *The Armed Forces of China*, I. B. Tauris & Co., London, 1999, p. 83.

66. The State Council Information Office, *China's Space Activities (White Paper)*, PRC, November 2000, Beijing, p. 6, <http://english.peopledaily.com.cn/features/spacepaper/spacepaper.html>. Also notable is a 1993 government publication affirming that "remote sensing satellites provided the Strategic Missile Force, the Navy and the Air Force with the information and data needed by operation [sic], playing an important role in the construction of defence modernization". (Editorial Board of 'China Today Series', *China Today: Defence Science and Technology, Vol. 1, National Defence Industry Press*, Beijing, 1993, p. 383.)

67. Chang Mengxiong, 'The Revolution in Military Affairs - Weapons of the 21<sup>st</sup> Century', *China Military Science*, Spring 1995, reprinted in 'Chinese Views of Future Warfare, Part Four', Institute for National Security Studies, (National Defense University, USA), [www.ndu.edu/inss/insshp/html](http://www.ndu.edu/inss/insshp/html)

68. Ibid., p. 85.

69. 'China's Space Program Aims at Peaceful Use of Space Resources', *Chinanews.cn*, 15 October 2005, [www.chinanews.cn/news/2005/2005-10-15/12428.html](http://www.chinanews.cn/news/2005/2005-10-15/12428.html)

70. Ibid.

71. Kelly Young, 'China Announces New Launch Site', *NewScientist.com News Service*, 15 March 2005.

72. China National Space Administration, 'China's First Satellite for a Foreign Buyer Going on Smoothly as Scheduled', 12 July 2005, CNSA Website, [www.cnsa.gov.cn](http://www.cnsa.gov.cn)

73. *Report of the Select Committee on U.S. National Security and Military/Commercial Concerns with the People's Republic of China*, headed by Republican Representative Christopher Cox, 1999. [www.house.gov/hunter/CoxReport.htm](http://www.house.gov/hunter/CoxReport.htm). See also Johnson-Freese, "'Houston, We Have a Problem": China and the Race to Space', p. 262; and Congressional Research Service (CRS), 'China's Space Program: An Overview', *SpaceRef.com*, 14 November 2003, [www.spaceref.com/news/viewsr.html](http://www.spaceref.com/news/viewsr.html).

74. Zhu Chenghu, quoted in 'Top Chinese General Warns US Over Attack', *Financial Times*, 14 July 2005, available on <http://news.ft.com>. He was speaking to visiting journalists in July 2005. He also made this statement the previous month during a lecture to visiting academics (Zhu Chenghu, 'China's Defence Policy in the Context of Global Security', lecture, 9 June 2005, in *China Confronts New Security Issues*, lecture series, China Foreign Affairs University, Beijing, 6-10 June 2005). The author attended this lecture.

75. This has been witnessed by various interventionary wars, including the last Iraq War of 2003.

76. *Datong* may be translated as greater community, grand unity or universal commonwealth. It is a one-world philosophy which Confucius regarded as a higher ideal than the 'small tranquility' of a divided world, which he nonetheless tried to improve by advocating institutional, ceremonial (diplomatic) and ethical guidelines. The *Record of Rites* is the key document. See Wm. Theodore de Bary and Irene Bloom (comp.), *Sources of Chinese Tradition*, Vol. 1, 2nd edn, Columbia University Press, New York, 1999, pp. 342-344.

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