

Mutually Assured Vulnerabilities in Space

Eric Hagt

Introduction

China is pursuing space primarily as a market, not as a battleground. Imperative economic development priorities steer China's interests overwhelmingly toward peaceful exploitation of space. However, a number of factors threaten to alter that course. China is growing increasingly concerned that U.S. plans to develop a robust missile defense and space control capabilities are both inevitable and directed squarely at it. If the United States were successful in those pursuits, China fears its nuclear deterrent would be jeopardized, which in turn would force Beijing into a destabilizing arms race.

Less understood are the uncertainties emerging from China's rapidly-evolving space program. Driven by perceived strategic threats as well as commercial interests, an increased Chinese focus on developing capabilities and placing assets in space is creating a new environment that will influence the security of space. China's bold plans in commercial space, coupled with the inherent dual-use application of satellite technology, are bringing about vulnerabilities for China and arousing misgivings with its potential peer competitors, particularly the United States. China thus is even further compelled to hedge against perceived threats from U.S. missile defense systems, especially a future system based in space.

China's consideration of hedging strategies to counter the United States in space in turn further drives U.S. military space plans in the direction of a weaponization strategy – thus entrenching a security dilemma. This impasse can be ameliorated by greater transparency regarding both capabilities and intention. Transparency, however, is conceived differently by the Chinese and American sides, with the former focusing on underlying strategic objectives, and the latter, capabilities.

It is vital that both countries work to enhance communication regarding their programs, bilaterally and within international forums. However, as the nation with vastly superior capabilities in space, America must first confront the central issue upon which the possibility of transparency and greater cooperation with China rests: Does the United States intend to control space?

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Traditional Threat

The security environment in space is rapidly deteriorating as the United States continues to vigorously pursue missile defense, including space-based systems, and appears ready to develop attack weapons for space. The administration of President George W. Bush has declared the goal of being able to shoot down missiles of all ranges, in all phases of their flight (boost, midcourse and terminal) and to do this from land, sea, air and space.¹ Each of the components of this layered missile defense system will rely on space-based early warning systems, and the Missile Defense Agency now plans to include space-based interceptors having both defensive and offensive capabilities. Meanwhile, the U.S. Air Force is advocating an aggressive space strategy that would include the future development of anti-satellite (ASAT) weapons and perhaps even weapons based in space for striking terrestrial targets. Experts have noted the significant financial, political and technical barriers to most of these programs.² Yet, given the growing budgets for U.S. military space and missile defense activities in a highly politicized climate, the current administration is set to continue pursuing these systems.³

Although the U.S. government claims ‘rogue states’ such as North Korea and Iran as putative targets for such programs, China increasingly perceives itself as an intended loser – as a robust U.S. missile defense network and an arsenal of space-based weapons could effectively negate China’s nuclear deterrent and thus trigger a destabilizing arms race.⁴ The rationale for China’s angst comes from a number of places. In terms of background, in 1998 the Pentagon reinstated China as a strategic nuclear target in the U.S. nuclear war plan, and Bush’s 2001 *Nuclear Posture Review* identifies China for the first time in two decades as an “immediate or potential nuclear contingency.”⁵ Coupled with a U.S. national defense strategy that asserts a preference for preemptive strikes, even a modest missile defense capability would dramatically raise the risk for Beijing that the United States would be capable of disabling China’s strategic nuclear force. Considering that China has always maintained a policy of minimal deterrence with its immobile, liquid-fuel strategic nuclear force, circumscribed by a declared No-First-Use policy, Beijing feels particularly vulnerable.

Other factors serve to aggravate China’s fears. In 2001, before he became U.S. secretary of defense, Donald Rumsfeld called for the U.S. government to vigorously pursue “the option to deploy weapons in space” if national interest exigencies require it.⁶ Additionally, a number of doctrinal papers by the Air Force reinforce a clear intent to develop such weapons, with the capability for war-fighting “in, from and through space.”⁷ The 2003 *Transformation Flight Plan* speaks of denying the high ground of space to adversaries while the most recent *Counterspace Operations Doctrine* calls on the United States to achieve space superiority, which will provide the “freedom to attack as well as freedom from attack.” While none of these documents single out China as a threat, the fact that the ‘Shriever’ space war games conducted by the Air Force in 2001, 2003 and 2005 were thinly veiled

contests with China strongly suggests U.S. defense planners consider China a potential adversary in space.⁸ The Pentagon's annual report on China's military power has also grown increasingly alarmist regarding China's military capabilities in space.⁹

Perhaps the most important of China's concerns is U.S. cooperation with India and Japan on missile defense.¹⁰ As both are rising Asian powers neighboring China and potential military competitors, their participation in missile defense could deeply upset the region's strategic balance. Japan's involvement is particularly alarming to China considering the close U.S.-Japanese strategic alliance and tense Sino-Japanese relations. China is anxious about the possibility that co-development of missile defense systems will drive Japan's military build-up to new heights and lead to regional proliferation.¹¹ Moreover, China is fearful that its leverage over Taiwan would be adversely affected by U.S. and Japanese common interests there, which were recently highlighted in a joint defense statement released in early 2005.¹²

Thus, the apparent steady march toward missile defense and space warfare capabilities by the United States has raised deep concerns about the consequences for China's national security, and fears in Beijing about the potential for future conflict. However, a second development in space is creating a new security environment that will alter the strategic calculus of both China and the United States: China's deep and growing interest in space programs, especially the development of a satellite fleet.

Space Ambitions

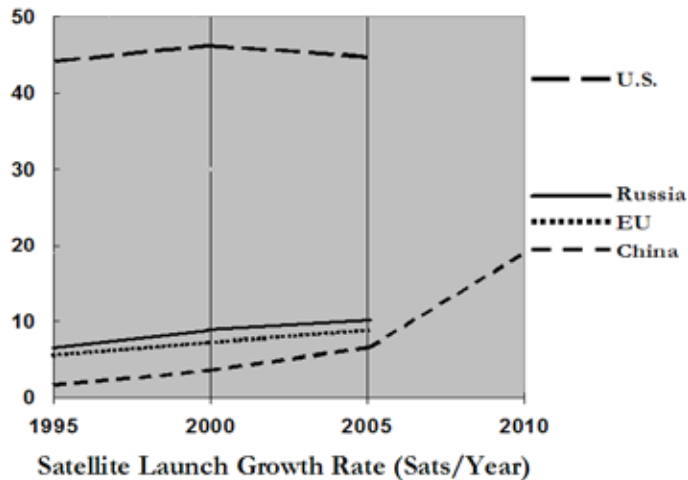
Bolstered by its successful manned space program, China has launched an impressive satellite program, with a clear determination to advance its capabilities in satellite technology and application, production and launch capacity and infrastructure.¹³ This ambitious plan is primarily driven by the attraction of gaining a larger share of the current annual \$100 billion global commercial satellite market, which is set to grow to \$150 billion by 2010.¹⁴ It also, however, has implications for China's future military capabilities and thus will rapidly alter the security architecture in space.

China's Shenzhou manned space missions have been powerful advertisements for its satellite launch industry, though the current growth in satellite capacity is also a culmination of strong national policies promoting China's satellite and satellite launch industry that date back to China's first White Paper on Space.¹⁵ This document arrived in the wake of the 1999 Cox Commission Report mandated by the U.S. Congress, which accused China of illicitly acquiring sensitive technology through its commercial ties with U.S. satellite firms,¹⁶ and the subsequent U.S. move to place satellite exports under the International Traffic in Arms Regulations (ITAR), which effectively shut down China's international trade in the space sector.¹⁷

Mutually Assured Vulnerabilities

These highly politicized actions by the U.S. Congress ended any cooperation between the United States and China in space, and set the latter on the determined path to develop an expansive and autonomous space program defined by a high level of industrial production capacity and commercialization. This process began in earnest with the deep institutional reforms to China's space industry beginning in 1999.¹⁸ At that time, China Aerospace & Science Corporation (CASC) and China Aerospace Science & Industry Corporation, China's two space industry giants, were established as state-owned enterprises rather than government entities – with the Commission on Science, Technology and National Defense Industry no longer managing them in an administrative capacity. CASC, while still providing military products, was pressured to operate under market principles in the civilian and commercial space sectors. Such reform was pivotal, infusing the space industry with greater profit-driven vitality.¹⁹

In the past 10 years, China has launched a total of 39 satellites. At present, China has 27 satellites on orbit, with an estimated 18 owned and operated by the government, eight by the military, and one civilian satellite owned and operated by Beijing Landview Mapping Information Technology Co. Ltd.²⁰ Based on these numbers alone, China has the world's fourth largest satellite space program.²¹ And given that 75 percent of those satellites have been launched since the year 2000, China has had the fastest growth in launch rate of any space-faring power in the past five years.



China's plans to develop its satellite industry reveal a dramatic rise in its interest in space. Judging by the increase in satellite assets during the past Five Year Plan (FYP), the number of Chinese satellites looks set to grow significantly. A high-end estimate by Ma Xingrui, deputy general manager of CASC, suggests that China will launch an average of 25-30 satellites per year for the next five years.²² This may be a little ambitious, at least for this year, as it was recently announced at the National People's Congress that China will launch nine satel-

lites in 2006.²³ Nevertheless, the overall goals for satellite launch show a steep upward curve. Sun Laiyan, president of the China National Space Agency, stated that China's goal through 2010 is to triple the number of satellites China will launch.²⁴

National policy statements also demonstrate the Chinese government's resolve in this regard. China's 10th FYP (2001-2005) was the first of such plans to place priority on the development of satellite applications.²⁵ The recently published 11th FYP (2006-2010) reinforces the importance of the space program in the next five years as a spearhead for China's drive to be a leader in science and technology, with specific mention of a number of satellite programs for development.²⁶ The recent rise in the number of government and industry-sponsored international and domestic conferences on space development also testifies to a salient shift in China's ambitions.²⁷

China's plans are more than just rhetorical. An impressive array of infrastructure to support satellite research and development, manufacturing and application technology has been built or is under development. Beijing now boasts the world's largest micro-satellite industry park, which was established in December 2004. The park stretches over 16,000 square meters, and has an annual capacity to manufacture and test six to eight advanced small and micro-satellites as well as their application technologies.²⁸ Two other projects to research, design and produce micro- and nano-satellites are housed at the Shanghai Institute of Microsystems and Information Technology and the Haerbin Institute of Technology; a third is at Tsinghua University – a program in cooperation with the University of Surrey in the United Kingdom.²⁹ A number of other satellite design, production and launch projects are in progress jointly with Brazil, France, Germany, the European Space Agency (ESA) and a group of Asian countries.³⁰

The significant expansion of infrastructure will soon give China considerably increased capacity for domestic satellite launch. China's new launch site in Hainan Island, which is to be functional by 2010, will more than double the payload launch capacity for satellites going into geosynchronous orbit, an ability that China has been critically lacking in the past.³¹ A new generation of launch vehicles is also under development using the strategy "making the big, bigger, and the small, smaller."³² At the one end, the Long March 5, planned to be tested and operational by 2008, will provide heavy lift for China's space exploration missions and larger communications satellites.³³ At the other end of the scale, several smaller rockets are being developed to satisfy the growing requirement for launching micro-satellites to Low Earth orbit. These include the liquid-fuel LM-1D, and the solid-propellant commercial satellite launch vehicle series known as Kaituoazhe.³⁴ China has also achieved launch of multiple satellites on a single rocket.³⁵

These comprehensive capabilities constitute an autonomous program that enable China to offer the full package of satellite services including development,

production, launch and applications. China's goal of building a complete and self-reliant space sector is designed to meet the demands of its domestic satellite industry market.³⁶ Also spurring indigenous growth of the commercial space sector are China's obligations under the World Trade Organization (WTO), which as of this year (2006) will require China to fully open its satellite application and launch market to foreign competition.³⁷

Beyond the domestic sphere, China's current strategy for space is to dominate the Asia-Pacific market and become the market leader in the developing world.³⁸ As satellites and launch costs decrease, access to space will expand, including to countries with lesser economic means.³⁹ China is jointly engaged in developing a number of satellite programs, including an Earth observation constellation, with Bangladesh, Indonesia, Iran, Mongolia, Pakistan, Peru and Thailand. The burgeoning regional relationship in the area of space has been codified with the Asia-Pacific Space Cooperation Organization treaty, signed in October 2005 and the first treaty of its kind in Asia.⁴⁰ Further afield, contracts have also been concluded with Nigeria and Venezuela, in December 2004 and November 2005, respectively.⁴¹ These latter two projects are particularly important because they are China's first so-called 'turnkey projects,' in which it will provide all segments of the project from design and production to launch and servicing the satellite on-orbit. China naturally has ambitions to become a real player in the lucrative international market, after having been excluded from it in 1999 and only recently reentering, as of April 2005, with the launch of Apstar 6, of APT Satellite Holdings Ltd.⁴²

Building a strong domestic satellite and launch industry is a key to China's aims in space, which are centered on its overarching goal to become a technological and scientific powerhouse. This larger goal, in turn, is the foundation for China's long-term sustainable development. To achieve these goals, the government is nurturing a new generation of scientists and engineers. In the 10th FYP, China's space industry increased its workforce with newly graduating engineers by roughly 10 percent while paring down the total employed by an equal percentage. China's goal is to reproduce this feat during the 11th FYP by providing incentives in salaries and benefits for its space sector two to three times higher than the national average for comparable professions.⁴³ As a result, 70 percent of space sector employees are under the age of 35, far younger than NASA's aging workforce.

Vulnerabilities in Space

China's growing satellite and commercial interests will complicate space security. Drawing parallels with the American experience, the U.S. National Security Strategy in 2002 declared the goals of the military space program as: to defend the homeland, to ensure U.S. access to distant theaters and to *protect critical U.S. infrastructure and assets in outer space*.⁴⁴ As China's satellites increase in number,

whether they are civilian or military, its vulnerability in space will grow – forcing China to find methods to protect itself in space.

Satellites are intrinsically vulnerable to attack and interference.⁴⁵ Traveling in fixed, predictable orbits, they can be targeted by relatively cheap and technically easy methods such as ground-based ASATs or jammers. This is true for all satellites, although in general commercial assets are more vulnerable in that they are rarely protected with robust anti-jamming and electronic hardening technologies or extra fuel for maneuvering.

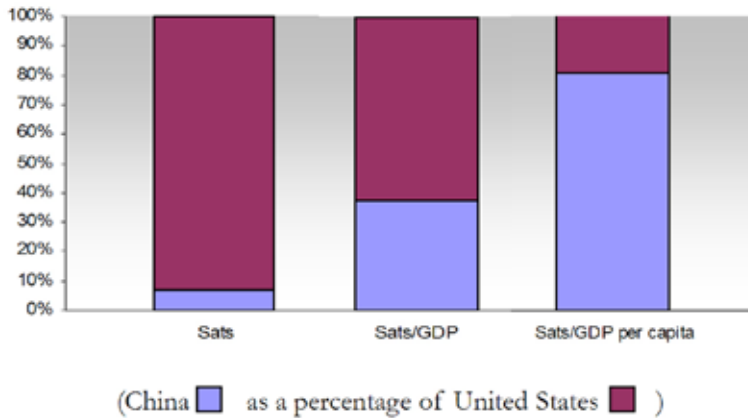
Thus, as the U.S. Department of Defense (DOD) has become heavily dependent on commercial satellites for communications and reconnaissance missions, the protection of all space assets has become a national security imperative.⁴⁶ DOD was slow to address the vulnerabilities of commercial satellites but this is now becoming a key element of American national space strategy, as was laid out by the White House in 2003.⁴⁷ This plan proposed a number of measures for resource allocation, information sharing, and interagency and international response in order to protect critical infrastructure assets in space that face imminent and long-term threats. As operational rules for protecting commercial assets with military force are still ill-defined both at national levels and internationally, an integrated strategy for commercial satellite protection is essential to any country's national security as well as global space security.

The structure of China's satellite industry falls along different lines than that of the United States: there are no exclusively privately-owned satellites, rather they are under operation of the government and civilian entities, with a number of them used for military purposes. However, the degree to which China's space program has become increasingly dependent on civilian and commercial incentives is often underestimated.⁴⁸ The Chinese military is undoubtedly deeply involved in the country's space activities; however, a robust space program quickly grew too expensive for the military to develop independent of economically viable principles. China has historically had very limited resources (compared to the United States) to devote to space, compelling the military to substantially divest itself from development and production and become highly reliant on market-oriented activities to build a sustainable space program.⁴⁹

It is reasonable to assume the military's need for space support and force enhancement will grow, and along with it the dependency on non-military space assets. As with the United States, all of China's space assets will become critical national infrastructure requiring protection.

Although presently China has less than one-tenth of America's approximately 413 satellites, the number of China's satellites holds a strategic importance greater than it implies.⁵⁰ If space assets are measured against a country's GDP, the significance of China's satellite base increases dramatically, and if compared with GDP per capita, it rises to a level on a par with the United States. This is to say, in the context of China's overall level of development, its current interests in

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space are already substantial (and are rising dramatically) and should therefore be considered strategically important to China, even vis-à-vis the largest global space power.

China's relative strategic isolation in relation to the United States is a further complicating factor for Beijing in calculating the vulnerability of its space capabilities. It is worth considering that during operations in Iraq, up to 77 percent of the communications bandwidth used by U.S. deployed forces was provided by commercial suppliers, a significant percentage of which were foreign.⁵¹ Thus, strategic allies will potentially be very important in the new global space environment. Not all commercial satellite operators are under the institutional control of the nations they are registered in.⁵² However, the United States has become acutely aware of the need for cooperation amongst treaty allies for protection of satellite infrastructure and sharing of selected threat and vulnerability data.⁵³ Although China has a 'strategic partnership' with seven of the top 10 space powers,⁵⁴ five are in NATO and all but one (Russia) would arguably be considered to fall within a formal or informal alliance structure with the United States.⁵⁵

China has no firm security alliance with any of the major space-faring nations. Cooperation with the European Space Agency on Galileo, providing China access to satellite navigation capabilities independent of the U.S. Global Position System, has posed real concern in the United States. However, though China has invested 200 million euro in the 3 billion euro program, its participation in development and production of the system will be limited.⁵⁶ In addition, under pressure from the United States, the European Union has taken precautions to ensure that China will not have access to sensitive technologies or functions.⁵⁷ Even Russia, which will work with China on a number of civilian space missions, has been highly ambiguous in its position on granting China access to Russia's space and other military technologies and capabilities during a time of conflict.⁵⁸ This makes China more dependent on its own space assets and thus more strategically vulnerable than any of the other major powers and/or space faring nations.

China's increasing vulnerability will create both an opportunity and a dilemma. Its significant commercial space assets coupled with a comparable strategic weakness vis-à-vis the United States could engender a powerful incentive for China to keep space non-weaponized, which may in turn be a strong motivator to reach accommodation with the United States and the international community on legal measures to maintain a peaceful environment in space. On the other hand, as China reaches a point of strategic vulnerability, the need to mitigate threats to its assets in space and thus to its national security will intensify. It is essential to come to grips with the parameters of this strategic shift and its implications for security as China pursues its ambitions in space.

China's Response

Already, the changing security environment in space has begun to raise deep concerns in China. The direction of U.S. military space strategy has led to increasingly vigorous diplomatic efforts by Beijing, along with intensified efforts by academia to analyze these developments and find prescriptions to address them.

China's official policy position on space weaponization has been unequivocal in its opposition to testing and deployment of weapons of any kind in outer space, whether nuclear or conventional.⁵⁹ "The deployment of weapons in outer space would result in a series of grave repercussions: breaking [global and regional] strategic balance and stability, undermining international and national security...damaging existing arms control treaties...and triggering an arms race." Furthermore, "...the deployment and use of weapons in outer space would seriously threaten the security of outer space assets."

However, going beyond China's diplomatic call for a weapons ban – which appears increasingly unrealistic considering the present security environment – there is no official policy addressing the real possibility that space does become weaponized. What if the United States (or other country) deploys ASATs or space weapons? What if China's diplomatic efforts fail? Does China have a Plan B? There is a growing body of academic discourse on this subject within China. There is also speculation within the United States about what direction China is taking, some of which assumes the worst.

A number of politicians and analysts in the United States have claimed that China is already developing anti-satellite weapons that pose a direct threat to the United States.⁶⁰ "China's offensive anti-satellite programs," it has been stated, indicate that "Beijing's strategy to confront the United States in this area is clear."⁶¹ Such analysis takes the view that China's official promotion of a multi-lateral treaty to ban space weapons is merely the gambit of a country still playing catch-up, with the purpose of constraining U.S. political freedom to act in space while China continues to develop its own weapon systems to destroy American space assets. The Pentagon's 2005 report to Congress directly asserts that "China

is working on, and plans to field, ASAT systems.”⁶² However, China has not tested or deployed any ASAT weapon and there is no evidence that it intends to do so.

China’s diplomatic response to space security has failed to convince the skeptics’ about the direction of China’s space program. Yet, the more pessimistic claims by U.S. analysts and the Pentagon remain unsubstantiated. Indeed, the writings of Chinese space strategists and experts inside China suggest a more nuanced path.

A recent proliferation of literature among military analysts in China indicates an urgent need to prepare for what is seen as the inexorable trend toward weaponization of space.⁶³ It is a general consensus amongst Chinese space experts that future war-fighting will not only extend into outer space, but also that space will be the key to integrating ground, sea, air and space forces, with such integration increasingly a dominant feature in warfare.⁶⁴ There is also agreement that the United States (and perhaps Russia) is on a course to seizing the advantage and preventing adversaries from using space to their own strategic benefit. As such, many Chinese experts are calling for a full range of capabilities to give China plausible means of safeguarding its nuclear deterrent and protecting its space assets. However, contrary to the more dire pronouncements in the United States regarding China’s goals in space, offensive measures are largely dismissed as being strategically destabilizing and not within China’s reach for the foreseeable future.

Most Chinese analysts take a decidedly defensive posture when considering preparation for confrontation in space. Furthermore, the concept of defense is often divided into ‘passive defense’ and ‘active defense,’ with a premium placed on the former.⁶⁵ The concept of passive defense for space assets emphasizes a preventative quality but also something that is inherent and inert in the satellite. It stresses protection against attack, rather than deterrence against attack. Passive defense measures for satellites include hardening, encryption, camouflage, stealth, and redundancy and duplication in satellite network systems and subsystems.⁶⁶

Secondarily, there are also active defense measures, which entail actions of avoidance such as orbital maneuvering; or countermeasures such as anti-interference and anti-jamming techniques. At the extreme would be the use of micro-satellites to actively ‘guard’ other satellites and act as decoys, or even counter-attack.⁶⁷ While these remain defensive measures, they take on a quality of dissuasion and even deterrence.

Greater situational awareness through enhanced monitoring and surveillance in space is also crucial to this idea of defense in space. One of the driving forces behind China’s efforts to research space debris identification and tracking is to also improve China’s ability to monitor military assets.⁶⁸ The ability to identify and discriminate objects in space is crucial to evaluating threats from non-threats in space.

The above constitute ‘comprehensive defensive actions,’ centered on ca-

pabilities to enhance survivability of China's satellite networks, and ensure China's access to space that is considered indispensable for future 'informationalized warfare.'⁶⁹ At the heart of this defensive strategy is the need to protect against an adversary's ability to prevent or restrict China from using space to its economic and national security advantage; that is, the ability to 'deny the denial.'

It is the dual-use nature of China's satellite program that will provide the means to achieve that comprehensive defense in space. For example, China's plan to increase indigenous development and production capacity of durable and miniaturized satellites for missions of data transmission and Earth remote sensing is aimed primarily at civilian and commercial purposes. However, such technologies offer lower cost access to space with greater maneuverability and thus would have a direct impact on military space capability. China also intends to increase its capacity to launch on demand and achieve launch redundancy,⁷⁰ which also could markedly enhance its military space potential. Chinese slogans such as 'applying military to civilian,' and 'integrating military and civilian' are used in official discussions to stress the integration and embedding of military with civilian technology development and production.⁷¹ Since the early 1990s, the revolution in military affairs has been the central theme for China's military modernization program, of which space is an indispensable part.⁷² Such notions indicate the importance of a dual-use strategy.

As for existent capabilities in space, although there is no official admission, China does have satellites for navigation, remote sensing, reconnaissance and communication that have military uses.⁷³ These are mainly for 'power enhancement and support' capabilities. However, as others have noted, they remain vastly insufficient for gaining any real advantage vis-à-vis U.S. dominance in space⁷⁴. Nevertheless, it is reasonable to assume that the number of these assets would grow substantially under the planned satellite development program and thus rapidly improve China's force enabling capacity.

In addition, a number of U.S.-based analysts of Chinese military affairs have noted that China is exploring some research areas relevant to ASAT technologies, such as the use of kinetic-energy vehicles, ground-based laser and radar capabilities, and high-powered microwaves.⁷⁵ However, this research remains at the theoretical level and there is no conclusive evidence of a concerted program to develop such capabilities.⁷⁶

Security Dilemma

The inherent dual-use potential of China's space program combined with the analysis of the above literature on defensive capabilities in space indicates a hedging strategy. Yet, the extent and nature of such a hedging policy remains unclear as official and public discourse on the subject is entirely absent, thus leaving open a number of possibilities.

First, it is possible that China is indeed considering binding itself to

a voluntary self-ban on the development, testing and deployment of space weapons of any kind, regardless of whether the United States proceeds with the weaponization of space. However, such a strategy seems implausible as it would be inordinately risky for China's national security. Furthermore, China has declined to declare a no-first deployment of space weapons – as the Russians have done and urged China to do. It seems logical that China would hesitate to declare a no-first deployment policy when it is ostensibly not even developing or testing space weapons. Although this rationale holds in isolation of other factors, it falls short of providing deeper assurances regarding China's commitment to non-weaponization.

Alternatively, China may be determined to develop, test and deploy a full range of defensive measures, both active and passive, but is attempting to keep it secret for fear of antagonizing the United States. An 'active defense,' as some analysts in the United States have concluded, may be merely an offensive strategy in sheep's clothing. This has been a suspicion regarding China's overall defense strategy, but it applies equally, if not more so, to the realm of space. A guardian or body-guard satellite, to take an example, would also have ASAT capabilities. Nevertheless, a dedicated yet secretive space weapons program, however defined, is unlikely as such an effort would be difficult, if not impossible, to keep concealed. More importantly, the political fallout for China if caught at this game makes this scenario highly implausible.

Another possible scenario is that China is continuing to study and research applicable space technology, but will wait to see whether the United States will deploy robust missile defenses and space-based weapons before it in turn responds. A final possibility may be that there is an ongoing and unresolved internal debate on the issue – with diplomats firmly opposed to any form of hedging measures in space, but with the military dissenting. These latter two options better reflect the reality of China's strategic concerns and its goals in space. China is growing increasingly suspicious of U.S. military intentions in space, and likely is striving to find a strategy that at once protects itself against the risk of space weaponization and at the same time does not propel that risk further along.

Although a hedging strategy would seem to make sense for China at this time, nowhere does the PLA officially condone or admit to developing or testing anti-satellite or offensive space capabilities. That said, there are a number of factors that point in that direction. One key indicator is the mind-set expressed by senior-level officers convened for a task force on military space issues.⁷⁷ In concluding that the weaponization of space is inevitable, they argue that China must prepare itself and should not tie its hands through overly restrictive international legal treaties. In other words, while it is in China's interest to work diplomatically to the extent it can, it should not limit its options if the United States proceeds with missile defense and space weapons. In theory, this is fair, especially from military planners concerned with national security. Yet, to the degree the PLA holds sway

over national policy, this engenders certain strategic uncertainties about China's intentions.

For one thing, the PLA's lack of enthusiasm for a weapons ban treaty exacerbates the concerns of many in the United States about what they see as inherent ambiguities in China's diplomacy. Since 1984, China, joined by Russia and most of the world, has taken an unequivocal stance at the Conference on Disarmament (CD) in opposition to space weapons.⁷⁸ Yet, the CD has been in a perpetual state of gridlock, without even a working agenda, since 1996.⁷⁹ Therefore, some analysts – particularly in the United States – view the various Chinese-proposed resolutions to begin treaty negotiations on a space weapons ban as a ploy on the part of the Chinese (and Russians); China's position provides international prestige that costs it little since there is a slim-to-none chance of its resolutions ever being accepted.⁸⁰ This may seem to be unfair when it is not China, but the United States, which is the principal country blocking the CD agenda – and the United States furthermore has the power to call such a bluff by engaging it. Still, even some U.S. analysts less hawkish than those accusing China of an offensive strategy believe Beijing is undertaking a classic two-track strategy – pursuing negotiations while also pursuing a military space program to eventually trade away – a suspicion that stems from America's own past behavior vis-a-vis arms control.⁸¹ There is a strong perception in the United States that China's diplomatic assurances about its dedication to the peaceful use of space conflict with a military space program that is, for the U.S. security community, unquantifiable and unqualifiable. A clear hedging strategy would be entirely consistent with China's diplomacy. However, the possibility that China might have a clandestine or hidden agenda of trying to secretly achieve space weapons breakout is an unacceptable risk for U.S. military planners.

Thus, the lack of clarity of China's apparent hedging strategy feeds suspicion of China's capabilities and intentions in space. This helps drive the rationale for a more aggressive U.S. military space program, which predictably pushes China's military toward pursuit of the same. Such an environment, where each fears the other will be first to develop and deploy weapons and gain the military advantage in space, creates a vicious circle that threatens to undermine the security interests of both countries as well as the international community. Thus, the central question for space security at this juncture is how this negative cycle can be broken. In the broad sense, greater communication and understanding of capabilities and intention are fundamental to any solution.

Transparency

China's lack of transparency exacerbates suspicions regarding both its space capabilities and intentions – and thus undermines Beijing's own interests. Unfortunately, for a variety of historical, strategic and cultural reasons, China remains allergic to the Western approach to transparency.

Mutually Assured Vulnerabilities

China has in the past justified a degree of secrecy in operations and capabilities as essential to the security of weaker states who must exploit uncertainty as a deterrent. In this way, non-transparency of China's nuclear forces arguably played to its advantage. With a minimal deterrent strategic nuclear force structure based on a policy of No-First-Use and facing a threatening security environment, China had little choice but to maintain a high level of secrecy so that a strategic competitor would be forced assume the high end of China's nuclear capability. This would work for space as well only if China indeed felt it needed a clear deterrent in space. In an environment of opacity, China's strategic competitor naturally assumes the worst-case scenario: that China is developing military means to challenge it in space, either clandestinely or through its dual-use systems. But China does not have a (declared) space weapons program or an overt policy of deterrence in space. The alternative choice, and one China has repeatedly made clear, is a policy aimed at avoiding an arms race in space. Considering the far-reaching goals of its domestic space program coupled with its current weaker position vis-à-vis the United States, China's interests are indeed served by keeping space a peaceful frontier. This viability of this policy choice, however, is being undercut by China's lack of transparency.

A number of models to enhance the exchange of information, ideas and concerns amongst space-faring powers are available from non-governmental organizations that range from bi-lateral and multilateral data exchange on non-threatening topics such as space debris to military-to-military contacts.⁸² However, any measures to improve transparency would invariably run up against the barrier of fundamentally diverging approaches between China and the United States.⁸³ The difference may be less a matter of culture than in perceived national interests.

The United States prefers a more operational orientation of transparency that sidesteps complex, intractable political issues. Instead, U.S. transparency efforts focus on moving incrementally using practical measures, such as technology exchanges, that build trust from the ground up and eventually contribute to confronting root political differences. What this boils down to is an emphasis on transparency with regard to capabilities. Despite declarations or national policy statements, the United States will suspect China's intentions without definitive knowledge of the capabilities and programs that have the potential to challenge U.S. military superiority.

Conversely, the Chinese place an emphasis on the transparency of intentions, such as official statements of a government's position on vital issues of security. Capabilities of even a vastly superior military power are less of a worry for China if they are set within larger security guarantees. China thus seeks strategic assurances on the Taiwan issue, China as a target of U.S. nuclear policy and the U.S. decision to pursue a robust missile defense.

CD and International Fora

Even if the disparate approaches of the United States and China regarding transparency can be bridged, an ongoing problem is the lack of international fora to help spur efforts at bridge-building. Unfortunately, as noted above, the forum for negotiating an international security architecture for space, the CD, is completely dysfunctional at the moment. This international body has the mandate to negotiate disarmament issues but requires a consensus to pass resolutions to the United Nations, thus allowing one country to single-handedly block progress⁸⁴. The United States has been instrumental in vetoing all the major resolutions and papers introduced at the CD to limit and control space weaponization. A multi-national effort was recently made to shift the CD dialogue on disarmament and nonproliferation to the UN First Committee in the General Assembly, where a resolution would be decided through majority vote, but this faced strong opposition by the five nuclear-weapon states, as well as India, Israel and Pakistan.⁸⁵

The present U.S. position of antagonism to the CD is unlikely to change under the Bush administration, but pressure is growing in the international community to create “democratic and multilateral alternatives to a situation where the security interests of the many are being held hostage by the policies of the few.”⁸⁶ While such a change would not solve the flaws inherent in an unwieldy UN body, it would at least remove the monopoly of decision-making on space weapons by any one country and move the discussion firmly into a forum better able to consider the interests of the entire international community.

This could be done by formulating measures to prevent the weaponization of space in fora outside, but parallel to, the CD. Such discussions could include ‘Track 1.5’ or ‘Track 2’ sessions as well as discussions amongst intergovernmental agencies.⁸⁷ Such an environment would have a number of potential advantages. Rather than involving a large unwieldy group of nations, such as at the CD, alternate venues could include a smaller group of space-faring powers making it easier to reach consensus and find necessary common ground.

Also, rather than discussing long-term binding issues such as treaties to ban weapons, early, practical steps could be taken on space security issues where wide measures of consensus already exist. One such approach might be the pursuit of measures to limit and/or prohibit the creation of debris in space, including a treaty to restrict or prohibit debris-creating weapons and weapons tests.⁸⁸ Another might be an effort to pass a UN resolution on non-interference with non-military satellites.

In addition, such alternative fora could engage in preparatory work on a treaty while the current U.S. administration’s political opposition remains, including unifying definitions of ASATs and space weapons, setting limits on permissible military assets in space, drafting verification measures and the allocation of space among various users.⁸⁹

However, a sea change in the operations and functioning of international

mechanisms may come too slowly to stem the emerging U.S.-China space security dynamic. U.S. missile defense programs continue apace, and nascent plans by the United States to test and develop ASATs and weapons remain on the books. Meanwhile, China's concern about its growing vulnerability in space also increases with each passing day. Thus, the United States and China, two of the defining powers in space in the 21st Century, must move in the near-term to interact together directly.

Opportunities for bilateral cooperation in space are beginning to open up with a number of exchanges among space sector officials and, most recently, Chinese space officials and members of the U.S. Congress.⁹⁰ But much deeper dialogue among political leaders and military officials is required to address underlying strategic issues in space. The two countries have already initiated a strategic dialogue between the U.S. State Department and China's Foreign Ministry.⁹¹ Space, a crucial element of both countries' future security, should become a part of that discourse. Through such interaction, both the United States and China can express their legitimate security concerns as well as make clear the possible consequences if those concerns are not addressed. At present, bilateral communication on all such issues remains virtually non-existent.

Paramount Issue

Meanwhile, there is a fundamental question that the United States must ask itself regarding its overarching strategic goal in space. It is the same essential question that China and the international community are asking; indeed, it is the central question to international space security. What is the endgame for the United States in space? If the answer is to maintain a strategic advantage, even relative dominance, in space without necessarily weaponizing it, then there is hope for averting an arms race in space. Within such a theoretical construct, there is a rationale and even a responsibility for China to apply itself to greater transparency with the United States to mitigate the security dilemma. However, if the U.S. endgame is to maintain absolute superiority in space, including control of space through unilateral weaponization, regardless of other countries' interests and actions, then there is no point in Beijing seeking accommodation and negotiation of arms control measures in space.

Assuming it is the former, the United States must engage China. It is true that if the United States sees China as a 'bad actor' or military peer competitor, the pressure not to engage is surely high. Yet, since the mid-1990s, China has shown itself increasingly receptive and even proactive in participating in arms control and nonproliferation regimes. Again, given China's growing stakes in space as a tool of economic development, there is no reason to doubt China would not undertake a correspondingly earnest attempt to reach agreement and accommodation on military space.

Unfortunately, the present policies and behavior of the United States

point to the latter strategy as the answer to the above question. In the field of military space, the United States outspends the rest of the world, accounting for over 90 percent of global military space budgets.⁹² Despite its overwhelming predominance in space, the United States sees space as a zero-sum game. Any gain by China or other potential competitors in space is seen as a strategic loss for the United States. And so, the United States – a vastly superior power in space and one which has the ability to shape the rules of the road for peace in space – has instead chosen to ignore China, and worse, ostracize it. Whether this is due to an adversarial intent toward China or a fear of China as a potential aggressor, such action only gives China reason to develop defensive measures in space.

Until now, China has been primarily concerned with the risk of space weaponization and the potential for U.S. missile defenses to undercut its strategic deterrence. But, as noted above, China's interests in space are growing rapidly, and along with that, its own vulnerabilities in space. As China advances towards its goals in space, there should be no doubt that it can, and will, develop the means to protect its interests there. If the United States denies this reality and proceeds with plans for unimpeded or unbounded space control, then it may indeed drive China to pursue space as a battleground rather than as a market. Forcing China down such a path would not only be detrimental to U.S. strategic interests, but also to those of China and the rest of the world. 🌐

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