

Testimony before the U.S.-China Economic and Security Review Commission on  
The Implications of China's Military and Civil Space Programs

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Mr. Chairman and Members of the Commission, it is a pleasure to appear before you today, and I thank you for extending to me this invitation to discuss the important issue of China's military space policy and programs and their implications for the security of the United States and its allies and friends. I am speaking purely in a private capacity, and my comments do not represent the views of the United States Institute of Peace (USIP), which provides analysis, training and tools to help prevent, manage and end violent international conflicts, promote stability, and professionalize the field of peacebuilding. Prior to USIP, I led the Council on Foreign Relations study of China, Space Weapons, and U.S. Security, which built upon my years of national security policy work in and out of government, travel to China, and training as an aerospace engineer.

The Chinese Challenge

This hearing is timely, and one of rising urgency. In the more than four years since China destroyed an aging weather satellite, demonstrating not only an anti-satellite (ASAT) capability but the potential for strategic ballistic missile defense capability as well, it has proceeded to deploy more, and more advanced, military space capabilities as well. We should not be surprised by this, nor should we be stricken with fear. We would, however, be unwise to ignore both these developments, which are public knowledge, and other developments that are of a classified nature.

The Peoples' Liberation Army (PLA) appears to recognize what most thoughtful observers of national security also recognize, that U.S. space assets, coupled with our advances in brilliant weaponry, have provided the United States with unprecedented and unequalled global conventional military capabilities. Both China and the United States are fortunate that neither country is the enemy of the other. However, China's growing economic and military power, coupled with friction points in the relationship, most notably over Taiwan, suggest that a future U.S.-China conflict, though unlikely, cannot be ruled out. The PLA and U.S. armed forces both would be derelict in their duties if they did not have contingency plans for such a conflict. As the current inferior military power, the PLA has every incentive to develop options for offensive operations against weak points in U.S. military posture, just as our military establishment should develop options against weak points in Chinese defenses.

PLA officers have noted the great U.S. dependence upon space assets and capabilities and the way they multiply U.S. force effectiveness. Just recently, they saw how U.S. special forces, and the military and civilian leadership that commanded them, heavily depended upon satellite photographs, space-derived weather and electronic intelligence, GPS, other space-enabled information, and satellite communications

in executing the strike against Osama bin Laden's compound in Pakistan. This brilliantly successful operation was built on a firm foundation of information in which space played a vital role in creating..

Is it any wonder that the PLA would want the capability to interrupt these rivers of information and services that our space assets provide? This information allows our military decision-making, our weapons, and especially our warfighters to be far more effective than in the past, vital advantages across the spectrum of potential conflict. These "space-enabled information services" lie at the heart of U.S. military superiority. The PLA certainly wants to be able to greatly weaken U.S. military power in wartime, and I believe the PLA could do so within a decade using its kinetic kill and other ASAT weapons if it chose to deploy them in large numbers, and thus pose a serious threat to U.S. space assets. China is also pursuing other programs that have important ASAT implications, and other nations are interested in ASAT as well, such as India and Russia.

This strategic space situation is troubling. Though absolute U.S. advantages in space should increase over time, the margin of U.S. advantage seems likely to diminish as China increases its space capabilities and space exploitation, and the PLA will reap both the military advantages and vulnerabilities of greater space capabilities. These PLA efforts are funded by a vigorous, quickly growing economy and supported by a government with full appreciation for the roles that space-enabled information and information warfare play in modern conflict. U.S. and Chinese strategic interests in East Asia are not foreordained to lead to conflict; each has much to lose if this happens, and each appreciates the other's military capabilities.

China's demonstration of an anti-satellite (ASAT) capability through the downing of an old Chinese satellite in 2007, demonstrated at least basic hit-to-kill (HTK) technology capability. They further demonstrated their HTK prowess in January 2010 when they performed a successful ballistic missile intercept test. This shows growing mastery of HTK technology, as hitting a longer range ballistic missile or warhead is a more challenging HTK task than hitting an orbiting satellite. This successful missile defense test has important strategic implications for U.S. security interests that have to date been largely ignored. One Chinese source told me that Chinese scientists had been actively pursuing HTK technology development ever since the United States first demonstrated HTK technology in the homing overlay experiment (HOE) in 1984. This source said that Chinese scientists saw at that time the strategic significance of HTK technology and the importance of China mastering it – which they now appear to have done. Besides the kinetic ASAT the PLA tested in 2007, China reportedly has other offensive space programs under development, including lasers, microwave- and cyber-weapons. We also face the twin realities that defending space assets is more difficult than attacking them; and while advancing technology will help both defense and offense, the offense is likely to benefit more.

Senior Chinese military and political leadership also appears to appreciate the national security significance of space. 18 months ago, the PLA Air Force chief of staff, Gen. Xu Qiliang, spoke of the inevitability of space conflict, followed one week later by Hu Jintao's statement about the PLA-AF "requirement of [developing] both offensive and defensive space capabilities." Writings in authoritative Chinese military journals also show a clear awareness of the growing military role that space assets play in advanced conventional military capabilities. A recent article in China reporting on the launch of the latest Chinese Beidou (GPS-type) satellite cited one Chinese military expert as noting that 90% of

advanced weapons currently depend upon GPS for their operation. China's 2008 Defense white paper also notes the major role of "informationized warfare" in future conflicts and devotes an entire section to "promoting the informationization of China's national defense and armed forces in the paper. China seeks to have a significant capability in this area by 2020 and to be able to prevail in such warfare by 2050, according to their white paper. China's most recent defense white paper, released two months ago, acknowledges once again that space plays a prominent role in its security thinking. The paper notes, among other national defense taskings, to maintain China's "security interests in space, electromagnetic space and cyber space."

The website of the daily newspaper of the Central Military Commission recently criticized Deputy Assistant Secretary of Defense for Space Policy Greg Schulte's citing of China's "anti-space weaponry." I am particularly struck by the fact that the CMC newspaper, though it countered that some countries are worried about U.S. "anti-space" capabilities, did not deny the accuracy of Ambassador Schulte's statement, as China usually does. This is quite a change, one I believe is noteworthy given its origin.

The PLA views last year's revised U.S. space policy as "seeking space hegemony" as a "core U.S. objective," and claims that "developing and deploying space-based weapons is America's established strategy," according to published accounts. These and other distorted PLA views must be called out and refuted, lest more junior PLA officers, and others who read PLA publications accept them uncritically.

The key questions are what Chinese intentions are for these capabilities, and what the implications are for the United States.

### Chinese Military Space Intentions

A fundamental problem we face is that China says little at an official level about its military space policy and doctrine. Chinese counterspace capabilities may be intended purely for deterrence purposes, to be used in warfare at a time of their choosing, or some combination of the two. PLA leaders have informally told U.S. officials and others that it is in the interest of an inferior power to keep secret information about its weaknesses and strengths, and they appear to be following this advice quite strictly. Time and again the U.S. has been rebuffed in seeking greater openness and transparency in Chinese space and larger defense strategy. That said, the PLA publishes an increasing number of papers on these issues that have not received enough attention, the problem, I am told, being a resource constraint.

There is a sizable PLA literature on space conflict, but it is unclear how well this reflects Chinese government thinking, any more than U.S. military journals reflect official U.S. policy. However, China's ASAT and missile defense tests and this literature demonstrate a PLA awareness of the importance of offensive counterspace (OCS) capabilities and strongly suggest that such capabilities are part of China's larger plans for the future – and perhaps missile defense capabilities as well. It is also unclear whether this reflects PLA interest in OCS for warfighting or just for deterrence, though I suspect it is likely a mixture of both.

Should China choose to deploy its demonstrated ASAT system, or more advanced versions of it, U.S. space assets and the military and economic infrastructures they support would be put at risk. One thing is

certain – more clarity on PLA and Chinese government thinking on space deterrence, doctrine, space stability, and related issues – and Russian thinking, too -- are urgently needed and are important to U.S. security. If there is any aspect of space security that needs more resources, space intelligence and analysis is it.

In the face of this growing Chinese military space challenge, it is easy to assume the worst about Chinese intentions. China seeks to be able to prevail militarily at some point in the future should conflict come, but they see the United States as militarily superior to them and thus would be unlikely to consciously provoke any military conflict. While we should guard against a worst case, we should not treat it as a given. I do not believe China or the PLA is spoiling for a fight with the United States – China has come too far to want to place their substantial economic achievements at risk unless they faced an extraordinary threat to their national security. In addition, China faces serious demographic realities over the next couple of decades, where their ratio of workers to retirees will shrink substantially (the result of their one-child policy), which further underscores China's need for stability and continued economic growth for years to come. China also has additional needs, and vulnerabilities:

- Growing environmental problems and water shortages with no obvious solutions that are growing irritants to the public;
- A relentless search for new sources of manufacturing inputs;
- An increasingly restive working class that is making new demands for higher wages and political freedoms;
- A non-democratic one-party system that leaves its senior leadership constantly looking over its shoulder at possible challenges to its authority, especially in the aftermath of the “Arab Spring”;
- Growing citizen anger against corruption and cronyism that seems impossible for the CCP to root out; and many more.

These factors are reasons why China is probably not looking for war with the United States, though they also could inadvertently become factors in China's stumbling into a conflict they would ordinarily not want, through miscalculation or distraction.

One characteristic of too many wars in the last century is that they are the result of miscalculation that ignites the tinder of fundamental geopolitical tensions. Averting major power conflict requires skillful management of tensions by senior leaders of the major powers. China has become much more internationally sophisticated, though with important exceptions, in its dealings with the rest of the world than has been true in the past, and this is reflected in its civilian leadership. Unfortunately, the PLA's senior officer corps trails its civilian counterparts in this respect. They have much less interaction with foreign official and travel abroad much less frequently than their U.S. counterparts. This means that the PLA overall views world events from a less knowledgeable and sophisticated perspective, a danger in this increasingly complex world, and could explain, for example, the political “tone-deafness” of the PLA in the manner they conducted their 2007 ASAT test.

This PLA problem becomes more serious when one realizes that the PLA is organizationally separate from the rest of the Chinese government, and reports only to the Central Military Commission, currently chaired by President Hu Jintao. President Hu, and his likely successors, have no significant military background, and the majority of the CMC's members are top PLA officers, suggesting that civilian oversight of major military decisions and consideration of their larger implications are not as carefully reviewed as in the U.S. government. Normally this would not be too great a concern, but in a crisis this could be dangerous. Add to this the fact that China has no equivalent of our National Security Council, a critically important body for coordinating our security decision-making, and one comes away concerned about the relative insularity of the PLA in the Chinese power structure. In a crisis, the PLA probably cannot be counted on to show as sophisticated a sense of judgment as one would hope any country's military leaders, even an enemy's, to show. All these problems and many more pose potential threats to internal political stability and Communist Party control, providing ample opportunity for crisis and conflict in the years ahead.

### Overview of The Strategic Landscape of Space

Space assets, and the communications and cyber links that enable them to function, are the means by which essential national security information is either generated, transmitted, or both. This information is the lifeblood of U.S. conventional military superiority and plays a key role in U.S. strategic nuclear posture as well. As such, these space related assets represent extraordinarily appealing targets in any future conflict, and their relative vulnerability can provide dangerously attractive incentives in a crisis to pre-empt, escalating to war. Resisting this temptation to attack may be morally virtuous but could be strategically unwise: going first in a space conflict with a near-peer space adversary appears to offer many advantages, while absorbing such a strike, with all its attendant destruction of military capabilities, and then responding to the attack against an opponent fully expecting such a response, appears to be militarily and strategically quite undesirable.

As technology advances, the ways of interfering with, disrupting, or destroying information streams in space or supporting space systems will likely increase, as will U.S. and others' dependence upon such systems. Providing defensive options for U.S. space assets should be pursued where appropriate, but most space observers believe that offense has the advantage in space over defense, as General Cartwright observed last May. Cartwright also noted that the challenging issues that space poses has made the Space Posture Review "the most difficult of all the defense reviews" the Obama Administration has undertaken.

The overall U.S. goal in space should be to shape the space domain to the advantage of the United States and its allies, and to do so in ways that are stabilizing and enhance U.S. and allied security. The United States has an overriding interest in maintaining the safety, survival, and function of its space assets so that the profound military, civilian, and commercial benefits they enable can continue to be available to the United States and its allies. This need not mean that China and others must perforce be disadvantaged by such an arrangement – there should be ample opportunity for many countries to benefit and prosper from a properly crafted system of space management.

There is an inherent risk of strategic instability when relatively modest defense efforts create disproportionate danger to an adversary, as with space offense. And there is a serious risk of crisis

instability in space when “going first” pays off – destroying an adversary’s satellites before he destroys yours. We don’t know what would happen in a crisis, but the potential for space instability seems high and likely to grow.

The United States can and should remain pre-eminent in space, but many issues are begging to be addressed, including:

- How does deterrence function in space? Could limited counterspace attacks remain limited, or would they inevitably escalate into all-out space conflict?
- How can countries with less to lose in space than we be deterred? Are there asymmetric means available to us for deterrence?
- Is space deterrence possible without offensive space capabilities? If so, how? If not, what kinds of capabilities are most stabilizing?
- What U.S. space strategy, and resulting acquisition strategy, in that order, would promote U.S. security interests and reduce space instability over the longer term?
- How do China, Russia and others see space stability? How will this shape China’s space doctrine, acquisition, strategies, and diplomacy?

Creating a stable space domain requires the United States to respond to space threats in a responsible manner, one that ideally does not prod other nations to greater counterspace efforts than they would otherwise pursue. If not careful, the United States could create a self-fulfilling prophecy as nations like China or Russia would see evidence of U.S. attempted space hegemony, they likely would accelerate their own efforts, just as we would if the roles were reversed. China faces the same challenge as well. We should not seek offensive counterspace capability at the expense of effective steps to protect U.S. space capabilities; both can be accommodated.

### China and Space Diplomacy

As significant a role that space diplomacy can play in contributing to space stability and responsible space stewardship, China’s activities in space arms control sadly do not provide any basis for optimism on Chinese, or PLA, intentions in space. China and Russia have for years promoted their joint draft “Prevention of the Placement of Weapons in Outer Space, the Threat or Use of Force against Outer Space Objects (PPWT).” The PPWT proposes to ban all space weapons but provides no credible means for verification. When I approached one Chinese space specialist about verification a few years ago, he acknowledged that verification would be difficult but told me that “You Americans are so technologically clever – you’ll figure out a way”!

The PPWT likely serves primarily as a way for China to buy time to enable them to attain a stronger military position, perhaps even catch up to the U.S., in a field where they were far behind us. With the previous U.S. opposition to international agreements on space, it also left a diplomatic vacuum that China

and Russia skillfully filled with the PPWT, portraying an image of peaceful intentions in space. It is intriguing to note that with the EU and U.S. in recent months speaking favorably of a draft code of conduct that is a vastly more realistic step than the PPWT, the PLA is now attacking it as an attempt to impose Western regulations on China. This code of conduct provides an excellent vehicle to challenge China to support realistic and useful “rules of the road” for space, and other steps which I hope the U.S. will pursue. In my conversations with Russian and Chinese counterparts, I find serious Russian interest in this approach but sadly only intransigence from China.

Current U.S. space policy and strategy walks back the U.S. aversion to space diplomacy and strikes the right notes on responsible space stewardship and addressing the issues of a space frontier that, at least in the vicinity of earth, is becoming more of a settled environment that requires some form of management and rules of the road. This realistic direction for space diplomacy, and U.S. and allied support for such approaches, is both a sensible step and also diplomatically turns the tables on China

### Meeting the Chinese Challenge

Space is of major and growing national security importance, which introduces a potentially destabilizing element to U.S. and international security. In addition to responsible behavior, the U.S. ability to fully realize the national security and other benefits of space depends on space remaining a stable and peaceful environment, even in crisis situations if at all possible. Given the heavy and growing U.S. reliance upon space for communications, sensor information, and a host of other benefits, it is no wonder that the space policies of both the previous and current administrations have declared space to be a vital national interest of the United States. Where vital national interests are concerned, stability in space that enables the continuation of substantial U.S. conventional superiority should be a top priority. The primacy of space stability as a key U.S. strategic interest was recognized by the Congressional Commission on the Strategic Posture of the United States when it recommended in 2009 that the United States should

“develop and pursue options for U.S. interest in stability in outer space, includ[ing] the possibility of negotiated measures.”

Measures or actions that would threaten to upset the stability of space could thus be dangerous to our national security, and U.S. policy should seek to avoid such steps. This is why as long as the United States continues to derive more benefits from space than its adversaries, it should be very careful about initiating significant space hostilities with a near-peer space power such as China. Against non-peer space powers, we should be able to rely upon our overwhelming conventional superiority to achieve victory. Against a near-peer space power, we must weigh the cost of losing some significant fraction of our space-derived or-transmitted information against the incremental benefit of offensive counter space (OCS) steps versus other means to achieve comparable objectives. Most often, the use of OCS would be too costly to U.S. security interests, although some scenarios, such as the threat to U.S. aircraft carriers from ballistic missiles, would completely change this calculus. This entire area requires further study, tabletop exercises not just of space war games, but also “crisis games,” where more attention can be paid to crisis behavior in space, to understand whether certain actions are stabilizing or destabilizing.

While the Obama space policy, as did the Bush space policy before it, recognizes that space is a vital U.S. national interest, it seems to overlook the implications of this important reality. In this context, offensive space capabilities cannot be considered just one more weapon in the U.S. arsenal, to be used when tactical circumstances beckon to field commanders. When vital national interests are at stake, great caution must be exercised. As a general rule, where threats to vital national interests are involved, a doctrine of deterrence should be developed and embraced as U.S. policy. We would credibly threaten to use such a capability but not actually seek to do so unless the stakes were extraordinarily high. To do otherwise against a near-peer space power adversary such as China would put our vital national interests at risk.

### Recommendations

The United States should:

- Put greater effort and resources into understanding the PLA's space program and larger Chinese military intentions in space.
- Put more emphasis on understanding how space deterrence works, especially through simulation efforts that specifically target the crisis situation itself, in addition to conflict simulations.
- Continue seeking to engage China on key space stability issues and ensure that others understand why U.S. and Western diplomatic initiatives and the approach they embody are superior to the Chinese-Russian PPWT.
- Enhance U.S. space situational awareness and space intelligence capabilities
- Diversify how we provide space information and services to the warfighter and senior national security leaders to reduce dependence on any single link.