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Space as a Strategic Asset

Joan Johnson-Freese

COLUMBIA UNIVERSITY PRESS New York

NINE

Avoiding a Clash of Ambitions:

Toward a Comprehensive U.S. Space Strategy

And the stars of heaven shall fall, and the powers that are in heaven shall be shaken.

—Mark 13:25

Much of the American public views space as an interesting museum exhibit, and Congress largely ignores it unless constituents' jobs in their district are at stake. Yet space has become an integral part of everyday life, not only for those in the United States, but for individuals all over the world. Space-based commercial navigation capabilities have evolved into a global utility; though they are currently available only through the GPS, other providers are likely to appear in the future. People will not be denied—or even take the risk of being denied—the services that these navigation satellites provide. The GPS is an American program and another example of the United States leading the way into space as it did with the Apollo program. The effect of Apollo on everyday lives was perhaps less explicit, but just as powerful.

When U.S. astronauts walked on the moon, an interplanetary "us" and "them" was inherently created, "us" being the people of earth and, if you believe that space is too big a place to have only one populated planet, "them" potentially still to be found. No other person will ever have the same role in history as Neil Armstrong. He was the first person from earth to step onto another celestial body. He, an American, led the way for all humanity. He demonstrated to people everywhere that no dream was too big and thereby dared them to dream as well.

Global leadership has characterized the role of the United States in space, and it is part of the conception of America as the "shining city on the hill." Forgoing that leadership dims the lights in the city at a time when the place

of the United States in the world must be more pronounced and positive than ever before. Fighting the (long) global war on terrorism and shaping the world into a more stable place where the needs of human security are provided for all requires both U.S. leadership and global cooperation.

The United States needs a comprehensive space strategy that simultaneously addresses its leadership in manned space exploration, maintains a healthy aerospace industry to accomplish its goals, and protects its security interests. There are times when strategy is best executed through a number of separate policy initiatives, but this is not one of them. The current mismatch of strategies and resources, and the failure to consider the unintended consequences of particular policies and programs, are the results of that approach, mistakenly assuming that it is possible to separate parts of issues that inherently overlap. The new National Space Policy,[1] a sweeping document intended to provide guidance for America's multiple space programs, continues the country on its current, disjointed path, with shifts from the 1996 policy coming mostly in tone and priorities. The new tone asserts the unhindered rights of the United States in space, rather than acknowledging the rights of all nations.

The policy was released late in the afternoon of October 6, 2006, a Friday before a three-day weekend, by the White House Office of Science and Technology Policy. The document had been signed by President Bush on August 31, but deliberately released more than a month later with as little fanfare as possible—thus continuing the established government approach of maintaining a low profile to avoid too much scrutiny and, consequently, potential controversy.

At first blush, the National Space Policy of the Bush administration appears much like that of the Clinton administration,[2] which it supersedes. Upon closer examination, however, and reading it in the context of actions taken over the past six years, the changes are dramatic—as well as ambiguous and sometimes inconsistent with existing policies and programs. Most important, the policy enunciates an American space program that is first and foremost about military security. While not necessarily inappropriate, it does support the idea that the United States views space activity through a lens different from that of most other spacefaring nations.

The background section of the policy states that "those who effectively utilize space will enjoy added prosperity and security and will hold a substantial advantage over those who do not." Hence the importance of space is recognized—indeed, have- and have-not-country status based on effective space utilization is implied—but the realization that therefore all nations will seek and expect full utilization privileges seems not to be in evidence in much

of the rest of the document. In fact, the next sentence states, "Freedom of action in space is as important to the United States as air power and sea power." That assertion not only focuses on the security (that is, military) aspect of utilization, but raises a question that can be raised elsewhere in the document as well: Are similar rights and expectations considered legitimate for countries other than the United States? While one might assume that if the United States claims a right or expresses an expectation for itself, it implicitly grants the same right or recognizes the same expectation for others, the language of the National Space Policy does not explicitly say that and, in fact, at times infers otherwise.

For example, one of the principles stated to guide American space programs and activities is that "the United States rejects any claims to sovereignty by any nation over outer space or celestial bodies, or any portion thereof, and rejects any limitations on the fundamental rights of the United States to operate in and acquire data from space." If no nation can claim sovereignty over space, why doesn't every nation have a fundamental right to operate in and acquire data from space? Another principle states that "the United States considers space systems to have the rights of passage through and operations in space without interference. Consistent with this principle, the United States will view the purposeful interference with its space systems as an infringement on its rights." Is it implied that other countries have the same rights?

The very first principle—and one cannot overlook the possibility that priorities can be inferred from order—says that "the United States is committed to the exploration and use of outer space by all nations for peaceful purposes, and for the benefit of all humanity. Consistent with this principle, 'peaceful purposes' allow U.S. defense and intelligence-related activities in pursuit of national interests." National interests are, of course, whatever the powers-that-be deem them to be. Before September 11, 2001, the national interests of the United States were configured hierarchically: from defense of the homeland as critical to survival, through economic well-being as vital and favorable world order as serious, to promotion of values as desirable. After September 11, all these interests have been on an equally critical footing. Linking "peaceful purposes" to national interests more closely connects space to defense and the military than ever before.

The Air Force's request in May 2005 for explicit rather than implicit approval in the National Space Policy to move ahead with the development and deployment of space weapons resulted in more attention being paid to the subject than the White House wanted. Most of the scrutiny remained in policy circles, but the potential for it to spill over into the public arena proved enough

to preclude the overt approval of weaponization. Consequently, ambiguous language is employed where explicit language might have drawn the ire of Congress or the public. For example, in the discussion of the rights regarding the space capabilities the United States considers vital to its national interests, the policy states that the United States preserves its rights, capabilities, and freedom of action to "dissuade or deter others from either impeding those rights or developing capabilities intended to do so." Given the dual-use nature of space technology, what capabilities might be specifically targeted? The document goes on to say that the United States has the right to "take those actions necessary to protect its space capabilities, respond to interference, and deny, if necessary, adversaries the use of space capabilities hostile to U.S. national interests." That language is not new, but in its current context, it takes on more of a right of preemption than of defense.

The policy explicitly reiterates the four military space missions and support for missile defense, and then restates that the secretary of defense shall "develop capabilities, plans, and options to ensure freedom of action in space, and if directed, deny such freedom of action to adversaries." While the phrase "space weapons" is never uttered, it can be heard if one listens closely.

Other new, noteworthy areas of emphasis appear in the policy as well. It specifically rejects, for example, new legal regimes or other restrictions that would inhibit American access to space. It recognizes the need to train space professionals, addressing the kind of workforce issues raised by George Abbey and Neal Lane.[3] It also states much needed support for—hopefully, improved and expanded—space situational awareness: the ability to know what is happening in space, especially near one's satellites. Somewhat curiously, the policy gives considerable space to support for space nuclear power. This likely refers not to the large propulsion systems of the past, which were used to propel spacecraft to the outer solar system and beyond, but to specialized equipment used in smallsats and microsats, which have considerable potential military value. The need to improve development and procurement issues that have resulted in space projects routinely being overbudget and behind schedule is addressed, as is that for more interagency space partnerships. The latter can be expected to yield more NASA–DOD partnerships, which is likely the only way NASA's budget will be increased. On that note, the policy offers support for a "human and robotic program of space exploration" but fails to note that NASA's budget is not adequately funded to accomplish the goals set by the administration for travel to the moon, Mars, and beyond.

Gratefully, international cooperation is given a nod, with the secretary of state taking the lead in "diplomatic and public diplomacy efforts, as appropriate,

to build an understanding of and support of U.S. national space policies and programs and to encourage the use of U.S. space capabilities and systems by friends and allies." Unfortunately, the more those friends and allies hear about the new policy, the less inclined they might be to work with the United States.

On October 11, 2006, less than a week after the new National Space Policy was released, Robert Luaces, alternate representative of the United States to the United Nations General Assembly First Committee, made a statement about the NSP:

> The international community needs to recognize, as the United States does, that the protection of space access is a key objective. . . . It is critical to preserve freedom of action in space, and the United States is committed to ensuring that our freedom of space remains unhindered. All countries should share this interest in unfettered access to, and use of, space, and in dissuading or deterring others from impeding either access to, or use of, space for peaceful purposes, or the development of capabilities intended to serve that purpose.[4]

What Luaces apparently did not realize, however, is that many countries regard the United States as the biggest obstacle to unhindered access to space.

Finally, Luaces presented a summary characterization of the space landscape from the U.S. perspective: "One: there is no arms race in space. Two: there is no prospect of an arms race in space. Three: the United States will continue to protect its access to, and use of, space." The same perspective was reiterated by an administration official, who spoke on the condition of anonymity: "This policy is not about developing or deploying weapons in space. Period." He further stated that new arms control agreements were not needed because there is no space arms race.[5] Skepticism remains.

The National Space Policy of 2006, even more than those before it, is disconnected from considerations of the ways that other countries might react to or the unintended consequences of the policy itself. Because the United States does not have a monopoly on developing space capabilities, a comprehensive U.S. space strategy must be developed considering the goals and capabilities of other countries. Not doing so, as Alfred Kaufman pointed out, puts a perpetual burden on the United States to keep outdoing itself technologically, because others can counter U.S. achievements with less technical skill and far less money. As Robert Jervis noted, it also keeps escalating the security dilemma (as discussed in chapter 1), a situation in which parties are drawn into conflict even though neither desires it. Finally, policy created in a vacuum also misses an opportunity to build U.S. soft power with

other countries, which is critical to meeting our own needs and enhancing the stature of the United States in the world.

Developing a comprehensive space strategy for the United States, one that would still stress space security but on a broader basis, would take rigorous analysis by people from many disciplines and areas of interest. This has not been done yet, and in some areas seems to have been deliberately avoided. It would also require the National Security Council; the Departments of Defense, State, and Commerce; NASA; other government organizations; aerospace industries; academia; advocacy groups; and others to work together. It would take real government leadership.

The rationale for Congress to stay the funding course would have to come from the executive branch, not just with an announcement, but with a willingness to prioritize the program. Initially, funding for the Apollo program was "fenced," meaning that it was not subject to the kind of bureaucratic and congressional horse-trading common in the budget process. The executive branch would also have to sell the program, reminding the U.S. public of its importance. Based on the past, public buy-in cannot be assumed or overlooked. Space security through leadership would be the intended goal of a comprehensive space strategy, and it must be effectively conveyed as such to the public.

The book *Space Security 2004* defines space security as "secure and sustainable access to and use of space, and freedom from space-based threats."[6] That publication provides assessments of trends and developments in space based on survey results from global space experts. It also acknowledges that "U.S. experts have a tendency to view space security developments differently from EU, Chinese, or Russian expert participants."[7] All security is a matter of perspective. So far, how U.S. security is best served in and from space has been a question left to too few people, and from a very narrow military perspective that created the security dilemma in the first place. Space security must be redefined in the United States to ease the tension of the security dilemma and preserve American space leadership in the military, civilian, and commercial domains. The recommendations offered toward achieving those multiple goals are not all-inclusive. Rather, the intent is to suggest the kinds of issues that need to be considered.

Ameliorating the Security Dilemma and Maintaining Military Space Leadership

Thomas M. Nichols argues that Ronald Reagan's initial strategy against the Soviet Union was one of "overdoing it."[8] In both actions and rhetoric, Reagan

made his offensive against the so-called Evil Empire clear. That included the Strategic Defense Initiative, dubbed "Star Wars," the legacies of which are now in silos in Fort Greely, Alaska, and Vandenberg Air Force Base, California. The rationale during the Reagan years was that if SDI caused the Soviets to pause for one minute before firing a nuclear weapon, then it was worth whatever it cost, as a nuclear exchange between the United States and the Soviet Union would certainly not have stopped at one nuclear weapon being fired; annihilation of both populations was the more likely outcome. While SDI eventually died under the weight of its own cost, it was an initially effective as part of a larger strategy to scare the Soviets.

After a while, though, the Soviets worried about ideological extremists making their way into the White House, and worried further that such extremists and what the Soviets regarded as their somewhat insane ideas were becoming the majority. The Soviets came precariously close to crossing a line from a useful and healthy fear of the United States to a counterproductive assumption that U.S. policy makers were unhinged, supporting arguments for Soviet preemptive nuclear strikes against the United States. There was also domestic concern in the United States about Reagan's campaign, with many Americans afraid of the direction their own government was taking.

Luckily, Reagan realized the counterproductive nature of going too far, and in the late 1980s, the United States made an abrupt turn away from competition and confrontation, toward cooperation. Reagan will certainly not go down in history as dovish, unpatriotic, or wimpy; he knew, however, when to change direction to best serve U.S. national interests. The United States today may be precariously close to crossing a line again, away from engendering healthy respect and fear and toward creating the perception that American policy makers are simply irrational. That perception will serve hardliners and radicals in other countries well. And while some might like to dismiss outside perceptions of U.S. policies, in fighting the global war on terrorism in Iraq, the United States has certainly found that it ignores such perceptions at its peril. Many countries feel that the United States does not consider others in foreign policy making and implementation.[9] When it comes to U.S. space policy as a subset of foreign policy, based on weaponization attitudes and the politics of the International Space Station, that view has been repeatedly validated.

The Russians and the Chinese have been seen as both susceptible to the irrational rantings of fear-mongers who say that space weapons are coming and perpetuators of propaganda on the same topic. Nevertheless, what some dismiss as merely "bold rhetoric" by the Air Force with little substance behind it,[10] others view differently. As chapter 8 discusses, analysts in the United States take

Chinese "bold rhetoric" seriously. Why would the United States expect anyone else to do otherwise? It is time to step back from the bold rhetoric, if that is all it is, and focus on how to best protect the national interests of the United States.

It is also time to be clear about the intentions of the United States. The *Report of the Defense Science Board Task Force on Strategic Communication*, published in 2004, suggests that "strategic communication describes a variety of instruments used by governments for generations to understand global attitudes and cultures, engage in a dialogue of ideas between people and institutions, advise policy makers, diplomats, and military leaders on the public opinion implications of policy choices, and influence attitudes and behavior through communications strategies."[11] The United States is lacking in its strategic communication about space in a number of areas, particularly regarding China.[12]

Rather than the "Space Pearl Harbor" analogy that appears to broadly drive American attitudes toward Chinese space activities, perhaps another analogy should be considered instead: "Space 1914." While far from a perfect analogy, the image of two countries becoming locked in a particular understanding of a strategic environment and unnecessarily setting themselves on a course for future crisis with considerable escalatory potential does fit. The resultant conflict could perhaps be wholly avoidable, if the participants had a better understanding of the true situation. Better strategic communication is required to prevent history from repeating itself, and engaging in a dialogue of ideas between people and institutions, according to the definition of the Defense Science Board Task Force, is one of the four fundamental premises of strategic communication. But the United States has to date summarily rejected that premise regarding China and space. The message from the United States has been clear in that regard. Whether it is the right message, however, is increasingly doubtful.

If the United States seeks to use strategic communication to influence decision makers and general populations—with influence defined as the ability to shape or affect others' beliefs and actions—then engagement appears necessary, though not necessarily sufficient. Engagement is also necessary to learn about China. Misunderstandings are better avoided through direct communication than inferences and speculation based on sometimes less than credible sources. A number of potential avenues can be pursued to begin dialogue, which could lead to greater transparency and expanded cooperation.

When General Richard Myers visited China in 2004, he announced the intent of the United States to pursue greater bilateral military relations, which up to that time had been fairly nominal. Donald Rumsfeld's visit to Beijing in October 2005 advanced that policy. General James Cartwright, commander

of the U.S. Strategic Command (Stratcom), has expressed interest in establishing closer ties with both China and Russia on space issues, specifically to reduce the potential for misunderstandings. In fact, he has suggested that an exchange of field-grade officers might be one approach to forming better relationships.[13] Greater military–military contact could reap considerable rewards for the United States. Perhaps most important, some of the opacity of Chinese programs could be penetrated, allowing for more accurate analytic considerations of Chinese intentions in space. Also, better military–military relations could lead to an environment more conducive to backing away from the zero-sum attitude toward space that creates the security dilemma.

One of the results of NASA administrator Michael Griffin's trip to China in September 2006 is an agreement for officials from CNSA and NASA to meet annually to discuss potential areas of cooperation. There is considerable work to be done in merely beginning to understand how to effectively work with China. At the highest level, the United States has attempted to convey to Chinese elites a general willingness to work with them. Translating that general willingness to work together into meaningful dialogue in functional areas has been problematic because at the functional level, the United States tends to want to delve into specifics uncomfortable for Beijing. In United States–China defense consultation talks and military maritime security, for example, the United States seeks transparency on specific capabilities, deployment, and spending, which China avoids. For its part, China is more interested in engaging in functional area dialogue to better understand U.S. strategic intent on issues such as support for Taiwan, the military alliance between the United States and Japan, the nuclear ambitions of North Korea, and space. Consequently, even when dialogue infrequently occurs, both sides can end up frustrated by lack of progress on their goals. Part of strategic communication is learning how to create an effective dialogue.

Traditionally, space cooperation has often started small, in nonthreatening areas such as space science, and grown when confidence is established between partners. Environmental monitoring and astronaut rescue also offer mutually beneficial, relatively nonthreatening areas of potential cooperation. Scientists are always willing to work together on goals of mutual interest and benefit to all mankind, providing a good place for cooperation to start, out of the way of politics. This was evidenced in the United States quietly providing limited information about space debris to the Chinese before the launch of *Shenzhou VI*. Nobody wants to see astronauts or *taikonauts* endangered.

While not the norm, there is also precedent for official U.S. cooperation with China. Chinese scientist Guo Huadong was the only Chinese representative on a team of forty-three scientists working on the Shuttle Radar Topographic Mission (SRTM), a program to map the world in three dimensions, flown by the shuttle *Endeavor* in 2000. Guo, director of the Remote Sensing Application Research Institute under the Chinese Academy of Sciences and an expert on radar remote sensing, also worked in the *Endeavor* radar scientific working group between 1991 and 1996. Ironically, the SRTM mission was not pure science; the product of the mission was very practical and dual use, capable of being employed or purposes ranging from environmental and crop monitoring to targeting. The mission was cosponsored by NASA, the National Geospatial-Intelligence Agency (NGA) of the Department of Defense, and the German and Italian space agencies.

The Chinese also actively participate in international groups, such as the Committee on Space Research (COSPAR) and the International Lunar Exploration Working Group (ILEWG). Chinese space scientists engage in exchanges with American universities and, even more frequently, with universities outside the United States. Cooperation does occur; for the most part, it has simply been outside the official, government realm.

Besides incremental moves toward cooperation, there is also the option of taking a more dramatic step, such as flying a Chinese *taikonaut* on the shuttle and perhaps even to the ISS for a quick visit. There are benefits that could be rendered by such a gesture.

With an authoritarian government in place, Chinese public opinion does not have the power it has in the United States, but it is increasingly becoming a force with which the Chinese leadership must contend. A full spectrum of attitudes toward the United States can be found, as evidenced in a study by the Pew Global Attitudes Project, conducted in June 2005.[14] Clearly, however, the Chinese are influenced by single events. Chinese citizens reacted virulently to both the accidental U.S. bombing of the Chinese embassy in 1999 and the death of the Chinese pilot in the EP-3 incident over Hainan Island in 2001. If the Chinese are negatively affected by events, perhaps they can be positively affected, too.

The current U.S. approach to strategic communication seems to understate the importance of positive "singular opportunities" and images, though the increase in favorable opinion toward the United States after its tsunami relief efforts in 2004 clearly demonstrated that opportunities exist. A single bold act, such as allowing a Chinese *taikonaut* on a shuttle flight, could generate a powerful, positive effect on Chinese public opinion. Such a shuttle flight would produce tangible images and news coverage much the same as the

Apollo-Soyuz program did in 1975. If a goal with strategic communication is, in part, to alter Chinese public opinion, these images could be very potent.

Globally, the message that the United States is trying to send regarding its intentions in space is unclear. The United States seems almost to have multiple personalities when it denies any intentions to develop space weapons, on the one hand, and lets Air Force officials boast of their accomplishments and flashy programs in that very area, on the other. Further, holding and widely publicizing a space war game with China as the obvious "enemy" could be interpreted as indicating U.S. plans. Was that the intent?

The United States must decide what message it wants to send to China and other countries about space, and do so clearly and consistently. That effort would be very useful in alleviating the security dilemma. If the United States intends to use space hardware for purely defensive purposes, the dilemma created by the difficulty of distinguishing between the offensive and the defensive nature of space technology could be relieved by a no-first-use policy from the United States. The overwhelming dominance of U.S. assets means that any attempt to interfere with those assets would be damaging but not crippling, and would certainly ensure the full wrath of American power in return if such interference was attempted.

China is interested in developing military space capabilities as part of its military modernization effort, as are most countries in the world. It is further interested in developing space capabilities as part of globalization efforts and to send a techno-nationalist message regionally and globally. But China is also responding to the message it hears from the United States. We must make sure what we intend to convey is what is being heard.

Moving Toward Strategic Stability

Strategic stability occurs when countries maintain a defensive advantage, making offensive movements imprudent. Currently, the United States has and is seeking to maintain an offensive technological advantage, regardless of the implicit or explicit path to reach that goal. Relying exclusively on technology for security—in this case, space weapons—does not provide an asymmetric advantage; it creates a strategically unstable environment. Even in 1978, Jervis pointed out that "the security dilemma is at its most vicious when commitment, strategy, or technology dictates that the only route to security lies through expansion."[15] Currently, technology is driving strategy in an ultimately counterproductive manner.

Developing space weapons is also, as pointed out throughout this book, horrifically expensive. Continuing on the current path of development not only exacerbates the security dilemma, but puts manned space leadership in jeopardy, because classic guns-or-butter decisions become inevitable. Cold War images of a space "race" succeed only in generating more spending on military space programs to counter the "threat," rather than generating momentum to re-create the Apollo program.

Further, through clumsy rather than intentionally nefarious use of its considerable power, the United States is perceived as a rogue nation in it own right. Other nations regard the United States as skirting international law in its treatment of war prisoners, lack of support for international treaties, and proclivity toward preemption and unilateralism. In the space arena, movement toward space weapons further reinforces this perception. The commitment of the United States to a regime in space based on legal premises and parameters would demonstrate its commitment to the rule of law at a time when that commitment is doubted, and when it is dearly needed to support U.S. efforts to spread democracy and principles of good governance. A new paradigm must be considered.

The United States should adopt a military space strategy that refocuses its efforts back to space support and force enhancement in the near term, and away from active forms of space control, including missile defense and force application. Quite simply, the benefits that accrue from such a shift outweigh the risks. With limited funding for space activities generally and military space activities specifically, providing maximum support to the warfighter through space support and force enhancement offers the United States the most bang for its buck and, ultimately, greater space security. As part of this approach, a threat-based risk analysis is inherently needed, based on facts rather than seeking confirmation of a predetermined, ideological conclusion. Such an analysis is imperative to decide the levels of effort in research, development, deployment, and funding that are appropriate among the multitude of programs available to be pursued. Refocusing U.S. efforts to space support and force enhancement is not enough, however. Additionally, the United States must solidify its position of strength by codifying the status quo.

Formal, legally binding agreements such as treaties can be difficult to negotiate and ratify, but they are sometimes the best way to manage complex security issues. In the case of space, they appear to be the only way to break away from the security dilemma currently defining the space environment. However, rather than focusing on the same kinds of frustrating arms control efforts of the past, which tried to control ambiguous dual-use technology and

created difficulties that justified forgoing further arms control efforts, these efforts would focus on establishing parameters for acceptable space activity. In conjunction with technical, economic, diplomatic, and military efforts, such measures could provide more security for the United States in the long run than could measures using technology only. Using all the policy tools available to the United States rather than relying primarily on technology "fixes" allows the United States to avoid a costly arms race with itself, codify the current status quo with it as the clearly dominant power, and step away from the hair-trigger security dilemma that not only prevails, but is escalating. On a broader level, it also allows the United States to lead by example, which it has always done better than any other country, rather than by force. Many kinds of legal arrangements can be considered.

Confidence-Building Measures

Confidence-building measures (CBMs) are a time-honored way to deal with security apprehensions. They are most often used with strategy or policy changes in which one or both parties perceive considerable risk. When changes were made in post–Cold War nuclear strategy, "Washington took the initiative by announcing a shift in nuclear doctrine, negotiating strategic force reductions, and introducing confidence-building measures that were intended to reduce tension and foster relations."[16] The same must be done in space.

Surveillance is an important confidence-building measure that has not received sufficient attention and, consequently, funding. Gratefully, both the new National Space Policy and Strategic Command commander General Cartwright support increased attention to surveillance. More and better information is needed about what is going on in space. Space surveillance provides inspection capabilities, and, according to Jervis, "by relieving the immediate worries and providing warning of coming dangers, inspection can meet a significant part of the felt need to protect oneself against future threats, and so make current cooperation more feasible."[17] If anything has been learned in the post–September 11 world, it is the value of solid information. Therefore, better situational awareness in space through upgrading and expanding the Space Surveillance Network must be a U.S. priority. It is also critical that the United States preserve its commitment to transparency, as it requires a similar commitment from others.

To be sure, the issues involved with space surveillance are complicated. One that has been repeatedly raised in this book has been the difficulty in determining intentions, American, Chinese, or otherwise. Space surveillance

offers concrete information about what is happening in space. Yet not only are space surveillance assets limited, but what is available is becoming increasingly restricted.

Since the 1960s, NASA has published data through the SSN's Space Control Center, making it free and available to the public through its Web site. The data is widely used by amateur sky-watchers, academic researchers, industry groups, and foreign governments, but recently, it has been increasingly restricted. In 2003, legislation was passed stating that the secretary of defense must preapprove all users of the data, and those approved are not allowed to redistribute it.[18] The latter provision could prove difficult to enforce and lead to more restrictions. The net result, however, is that there is increasingly less transparency regarding activity in space—and just as a lack of transparency in China heightens U.S. concerns, so too does restricting U.S. transparency raise concerns outside the United States, especially when accompanied by bold rhetoric. Consideration must be given to the benefits of access to information, as well as to the risks, and a workable solution must be found. When the United States becomes more opaque regarding space issues while insisting that the Chinese open up, it smacks of hypocrisy.

Rules of the Road

As has been done on land, at sea, and in the air, defining what is acceptable and what is not in space is both prudent and necessary. What constitutes a threat? How close does a spacecraft have to move toward another spacecraft before it is considered a hostile act? Defining threats and establishing rules allows actors to plan for potential responses to those who break the rules. Nefarious actors often do not play by the rules, but rules provide parameters for identifying nefarious actors as such. Taking action against the space asset of another country would draw worldwide public attention. Therefore, it is essential that the United States be able to define and validate claims of hostility against its space assets according to recognized international parameters.

Rules provide parameters of action, and various groups have been working on developing rules of the road for space for some time. The Center for International and Security Studies at the University of Maryland, for example, in collaboration with the Committee on International Security Studies at the American Academy of Arts and Sciences, is engaged in the Reconsidering the Rules for Space Project. The project's goal is to explore "operational rules and transparency measures that could be used to balance the interests of commercial, civilian, and military constituencies in the United States and

other major space-faring countries."[19] Another group at the Henry L. Stimson Center has developed *A Model Code of Conduct for the Prevention of Incidents and Dangerous Military Practices in Outer Space*,[20] which provides examples of areas where defining parameters of operation might be useful, such as

- "Special caution zones" around spacecraft: areas around spacecraft off-limits to others without prior notification and approval
- Agreement that parties not simulate space attacks by any methods
- A noninterference rule for satellites
- Development of safer "space traffic" management procedures, based on International Telecommunications Union rules

There is already precedent for such strictures, such as the 1972 Soviet-American Agreement on the Prevention of Incidents on and over the High Seas. Since the military compares space with the air, land, and sea in other ways, creating rules of the road for space should not be too far a stretch. In discussing possible areas of cooperation on space policy with Russia and China, General Cartwright expressed interest in formulating joint standards for satellite station keeping, including routine maneuvering, to ensure that the military of one country is not alarmed by the sudden maneuvering of the satellite of another country and does not assume that it is the beginning of an attack. This is exactly the kind of activity envisioned by those interested in the development of rules of the road.[21]

Develop the Principles of the Outer Space Treaty

Categories of technologies could be established, with some designated as permissible and some prohibited. The Outer Space Treaty prohibits orbiting weapons of mass destruction. Expanding on the concept of "peaceful uses" of space in the OST, a protocol could include other categories of weapons as well. Part of the challenge would be to define what was to be prohibited, given the difficulty in defining what constitutes a space weapon due to the dual-use nature of much of the hardware involved. A first step might be prohibiting certain "active" space-based systems, such as hypervelocity rod bundles or shooting systems, such as lasers.

Taking a legal approach to ensuring space security does not mean forgoing other options. The United States can adopt a hedging strategy toward

space weapons development, not crossing any provocative lines, but retaining the technical ability to build and deploy hardware if circumstances change and the need arises. In the meantime, however, the United States has more to lose in space than anyone else, due to both the number of its space assets and the consequent reliance on them. The United States has never been in a stronger position militarily in space relative to the rest of the world, but that position cannot be maintained through technology alone.

Unfortunately, between fears about U.S. intentions to weaponize space, constraints on American companies' abilities to act as reliable and rational aerospace business partners, and the United States potentially backing out of international commitments like the ISS, the U.S. leadership image has taken a beating. America is a leader. It is strategically in our interest to remind other countries of the positive aspects of our strong leadership capabilities, and manned space offers an opportunity to do so.

Manned Spaceflight: A Leadership Opportunity

Does the leadership image of the United States need a makeover? It is sometimes more important to be feared than loved, but it appears that the United States is precariously close to overdoing it, if it has not already. Tanks, planes, and lasers will not stop the spread of feelings or ideology. And whether the United States likes it or not, a poor image clouds any positive, progressive message that we want to project. For the United States to lead in the long term, it must have willing followers.

In the 1960s, leadership was the motivation that took the United States to the moon, as the country wanted to show itself as the winner in a technology-based competition against the Soviet Union. It was a techno-nationalist show of prowess. Today, post–September 11 and, equally or more important, with the ongoing war in Iraq, the United States needs to again recognize and embrace the leadership opportunity offered by manned space exploration, but this time based on cooperation, not competition. Leading an international, inclusive expedition from earth allows the United States to counter its unilateralist, militarist image, which has prevailed due to both the Iraq war and U.S. moves toward space weaponization. Such a choice would go a long way toward rebuilding American soft power by positively leading the world on a global endeavor to step into space together, for exploration, development, and applications useful on earth. It is the ultimate positive "big event" strategic communication message of leadership. From the global participants' side, tak-

ing part in a grand space program does more than just help countries construct technology and create industries; it builds dreams and generates pride. Working cooperatively with other countries on a space venture would also alleviate fears about U.S. intentions to monopolize space. The United States has demonstrated its military ability to make others bend to its will. Now it must work at not having to use that ability. Soft power is essential to build a stable, peaceful world in which the human security needs of all are met.

The Bush Space Vision was intended to be bold; it hoped to show the innovative and daring spirit of the United States, which is admirable. However, lessons learned from the past seem to have been ignored, and extrapolations forward or considerations of new models seem not to have been made. The capabilities and motivations of other countries have also not been considered. Finally, the United States has an unrealistic budget for its space ambitions. All this has left the United States in a position where failure, as much as one hopes otherwise, is not just possible but probable. It is increasingly unlikely that the United States will be able to finish the ISS within the original timetable[22]—or meaningfully move forward with the new transportation vehicle necessary to realize the new space vision. This is especially true given the continuing problems with the shuttle. The United States needs to regroup, and there are several obvious parameters for consideration:

Do not abrogate commitments on one international program to begin another one. The current web of mismatched commitments and time lines needs to be unraveled. The United States committed to completing the ISS with international partners. Abrogating one commitment while trying to interest the same partners into entering a new commitment is incongruent at best. President Bush, in his January 2004 vision announcement, stated that "our first goal is to complete the International Space Station. We will finish what we have started, we will meet our obligations to our 15 international partners." The United States needs to follow through.

Establish realistic timelines. If the ISS is to be finished, and it should be, then time lines have to be rewritten. Since the vision in its current form is by all accounts unworkable, there appears to be time to finish the station while developing a realistic way forward on what is here referred to as the Space Exploration Partnership (SEP). It is more important to do it right than to do it quickly. The "rush to failure" approach that the missile defense program followed is not to be repeated.

Clearly, a new space transportation vehicle is imperative to any new program. Whether or not the crew exploration vehicle is the right one or

not is debatable. Every attempt should be made to develop a new vehicle, whatever it may be, but the timetable for its development should not rely on or compete for funds allocated for the shuttle or the ISS. Funding competition and unrealistic timelines create potential safety conflicts of interest that must be avoided. They are a recipe for failure.

Develop the SEP as a strategic program, not a science program. While the annual budget process in the United States inherently makes long-term budget commitments on the part of the United States impossible, political commitments do vary significantly, according to program purpose. Apollo was a strategic program and was consequently funded to completion because its goals were considered important to American security. The SEP must be developed along the same rationale. The purpose of the SEP must be understood by policy makers and conveyed to the public as restoring the U.S. global leadership image, not only exploring space. The SEP becomes a program of positive patriotism, America as the "shining city on the hill," to contest the images of negative, chest-thumping patriotism and militarism that much of the world sees as pervasive. This is imperative for U.S. efforts to build a more stable world, free from terrorism.

Develop the SEP inclusively rather than exclusively. All interested countries must be included. The United States has had more success in shaping the space activities of other countries through cooperation than competition. Cooperation in space with China does not excuse the Communist regime from its commitment to Communism or its abysmal record on human rights. But precisely because China is an authoritarian state at the crossroads of its political development, the United States, as the world's leading democracy, must help shape China's aspirations in space toward peaceful and cooperative ends, rather than see them turned toward more threatening ideological or military goals. At a press briefing on April 20, 2006, Dennis Wilder, acting senior director of the National Security Council, talked about President Bush's meetings with President Hu Jintao as related to space:

> The President, in the area of trying to deepen the relationship between our two societies and our two cultures, offered to send the NASA Administrator to China to begin to talk about lunar exploration with the Chinese, to talk about some of the things we need to do in space—for example, debris avoidance and other subjects. There are some things that the Chinese also have in terms of sensor technologies and information that we are interested in, in terms of global climate and other issues. So the NASA Administrator will probably go to China later on this year to begin to consult on the subject of space exploration and where we might

> have common interests and where we might begin to work together as the two nations on the Earth with the most ambitious space programs in the 21st century at this point.[23]

The visit by NASA administrator Mike Griffin to China offered a timely opportunity to begin a new and improved space relationship with China. Whether space cooperation between the United States and China is undertaken as part of a "grand bargain" or initiated incrementally, the benefits such cooperation offers the United States far outweigh the potential risks. The key to success will be if functionaries can and will follow through with the president's apparent new strategic guidance. Griffin is a known supporter of international cooperation and has long experience in working with partners in ways beneficial to all parties. While a change of policy is not up to him alone, he is well suited to move an initiative forward.

There will also be those in both China and the United States who do not want to see relations improve. Every so often, opponents of greater cooperation in space rediscover the "Chinese laser threat" to American satellites. It is unlikely a coincidence, for example, that on the first day of Griffin's visit to China, news stories appeared—citing the usual unnamed experts—that decried supposed recent Chinese attempts to blind U.S. satellites with lasers.

Such stories are to some extent true, but they are also unremarkable. The Chinese have on occasion "dazzled" (rather than permanently blinded) American satellites with ground-based lasers, both to test Chinese capabilities and to remind the Americans that dominating space will not be easy. No doubt, it reflects as well a certain amount of chest-thumping by those in China who are not keen to cooperate with the nation they regard as their chief enemy in the world. Still, no American satellites have actually been damaged or even interfered with, despite nearly a decade of this sort of orbital mischief. But that does not stop the "laser threat" story from being dragged out at opportune moments—along with other urban legends, such as the infamous "Chinese killer mini-sats" story—as proof that cooperation with China is a dangerous idea.

Link the ISS and the SEP. If the SEP includes both Russia and China, there might be an opportunity to make a package-deal arrangement with either or both for transportation to the ISS while it is being finished as part of their contribution to the new program. With continuing issues with the shuttle, the imperative is further heightened. Linking the ISS and the SEP rather than jettisoning one to start the other alleviates the concerns of the ISS partners, maximizes U.S. investments already made, and facilitates a transportation deal among partners from which all benefit.

Bring in partners early. While the United States will, by virtue of intent, stature, resources, and technology, lead the SEP, the partnership will be strongest if all involved feel they have a voice in determining program goals. The program should begin with a space summit to bring in potential partners early and give them such a voice. The two NASA exploration strategy workshops held in 2004 and 2006 have been intended as a step in that direction. The fog and friction surrounding implementation plans and U.S. commitment to completing the ISS have left potential partners hesitant, however. Additionally, the United States must be prepared to accept partners, not participants. Some countries could be partners, giving them a voice in decision making, depending on their contributions, or what works best politically.[24]

Cooperative programs can be accomplished with partners providing unique hardware to minimize the risk of technology transfer, but the entire area of technology transfer and export control is still sorely in need of reexamination as part of a comprehensive space policy. For the United States to lead in space, its aerospace industry must be healthy and globally competitive. Globalization should benefit the industry, not put it at risk.

Maintaining Commercial Space Leadership

Truth is often stranger than fiction. In February 2005, DirecTV Group agreed to pay $5 million in fines for having violated export-control regulations incurred in connection with providing China with technology "to enhance secure satellite communications." DirecTV's subsidiary, Hughes Network Systems, sold voice and data transmission equipment to China, India, South Korea, Turkey, and South Africa between 1993 and 2003. Apparently, the company modified the equipment and provided the always nebulous "services" related to the sales without appropriate—and who knows what that means—government approval. Encryption, increasingly an integral part of commercial data transmission requirements to protect against identity theft, can also be of value to the military. The U.S. government was concerned that equipment sold to China with encryption capabilities, regardless of intended purposes, could find its way to the Chinese military. But at the same time that communications technology remains on the "sensitive" list, and American companies continue to be beaten with the export-control club if they risk selling it abroad, the United States is considering relaxing export controls on missile technology, which it is spending billions to defend against.

The United States sees a threat to missile proliferation, so it builds a missile defense system to defend against those missiles. Admirably, to show that it is not building the system either to create Fortress America or to have both the Sword and the Shield against the rest of the world, and to get access to needed global ground stations, the United States seeks international partners. For the partners to participate, however, missile technology must be transferred, which would violate export controls. So the government is considering relaxing the controls imposed by the Missile Technology Control Regime (MTCR), which the United States has long supported and been a member of, and encouraged other countries—specifically China—to join and support as well.

If the United States revises the MTCR export controls, technology would initially be transferred to only a handful of countries in partnership with the United States on missile defense. However, a second tier of countries might be considered as well—those considered U.S. friends and allies. But which are they? Those on the list for consideration include Israel, Taiwan, South Korea, and even Pakistan and Egypt.[25] How to protect against subsequent transfers has long been the rationale for what many have considered an overly restrictive export-control policy on such technologies as voice and data transmission equipment. Even the closest and most reliable U.S. allies have had technology slip through their fingers. For missiles, however, apparently the risks are considered worth taking. Whether missile defense is worth the risk or not—a question well worth asking—or whether it ends up creating a bigger missile problem than we started with, abrogating MTCR controls would certainly exacerbate an already irrational export-control environment in the United States. It also supports the view that the United States adheres to the rule of law and international regimes only when convenient, a view that must be dispelled.

Untangling the export-control process remains an American industry priority, and should be a government priority as well, though it is not. To raise the issue's importance for government officials, the Aerospace Industries Association, one of the largest aerospace industry trade associations, hired a new vice president of international affairs in June 2005. The AIA announced that Rear Admiral Craig Steidle, formerly in charge of executing the Bush Space Vision for NASA, would be spearheading industry efforts "to promote government policies that support exports, avoid protectionism, and foster fair principles of international trade."[26] Whether extricating Alice from Licenseland will prove any easier than returning the United States to the moon, and reaching Mars and beyond, remains to be seen.

Reforming its export-control regulations and processes is in the national interest of the United States, to protect a critical national industrial sector, create a

nonproliferation plan that makes sense and is globally viable, and address global concerns that the United States is deliberately denying technologies to developing countries so that it can exploit them economically, politically, and culturally. The current system negatively affects all those goals and is the worst of all possible worlds. Nevertheless, the system continues to have its supporters.

According to Jon Howland of the Jewish Institute for National Security Affairs, "If the United States is to remain the leader in space, law makers and military planners within the U.S. government need to appreciate the inherent dangers involved in the continued proliferation of dual-use technology under the guise of commercialization."[27] Certainly the dilemmas of dual-use technology are appreciated. But does that mean that the United States should be the only country allowed to own or even have access to the benefits of space technology? That would be the equivalent of twenty-first-century colonialism. Since a U.S. monopoly is, first, impossible because the technology has been globalized and, second, not conducive to fostering the type of global cooperation needed to fight the global war on terrorism and address other transnational issues, even the appearance or perception of support for that option is one to avoid, both directly and as an unintended consequence of other actions.

Export-control reform does not mean choosing between commerce and national security, nor does it always mean loosening controls. Export regulations are intended to strengthen national security by providing the United States with some rational "control" over technology. Since the end of the Cold War, however, and especially since the Cox Committee in the late 1990s, just the opposite has occurred. By trying to stop what it ultimately does not really control, the United States increasingly ends up with 100 percent control of nothing. This dizzying dance must be stopped.

While eliminating conflicting legislative mandates about export controls is imperative, as a congressional responsibility, it is in all likelihood unlikely to occur quickly or easily. Attempts that have been under way for more than ten years seem to bear out that conundrum. In the meantime, however, other actions can still be very useful:

Set achievable export-control goals. This will require a restructuring of the munitions list. The nearly 10,000 items on it include many that neither are sensitive nor contain or involve unique technologies, some of which are available commercially in the United States. Some very tough decisions have to be made. If an item is commercially available in the United States, should it still be subject to export-control regulations? If an item is available from another country, does it make sense for the United States to prohibit

American manufacturers from selling it? Is the United States better off in the long run regulating technology proliferation rather than trying to stop it—that is, allowing a less than newest version of the technology be made available for export? Once the initial "scrub" of the list is done, the list should then be reviewed regularly and transparently.

The United States must also determine which countries it is trying to keep technology from. Clearly, the same set of rules should not apply to Canada and Great Britain as would apply to China or countries in the Middle East. For some countries, blanket exemptions for entire categories of technology might be granted, though the number of countries receiving such exemptions should be limited, if only because technology can outlast friendships. Equipment that the United States provided to Afghanistan and Iraq earlier was used against U.S. troops in 2001 and 2002. Do we really now want to send missile technology to Pakistan and Egypt?

Considerations of third-party transfers also need to be considered, which will most likely involve multilateral discussions toward building an agreed export-control framework for all. Admittedly, agreement will likely not be as defined and strict as the United States would want. But perhaps agreement can be reached on what technology should be absolutely prohibited for export sale, a useful step forward. That model is useful in many areas.

Clarify the export-control rules. Clearly defining what is allowed and what is not is critical in each proposed reform, and for the process in general. The aerospace industry is important to U.S. national security, and it must not be put in a disadvantaged position when making a transaction with a foreign country. Companies should not have to guess what is allowable and then find themselves in the wrong later.

A first step in this direction would be to clarify what items specifically are under the purview of the Department of Commerce for licensing and the rationale behind the selection of the items. Knowing what is on the list, agreed to by Commerce, State, and Defense, will expedite the process. Knowing the rationale might also help the aerospace industry avoid some potential potholes by better understanding why one item is considered "sensitive" and another is not.

Simplify the export-control rules. Because of the dilemmas of dual-use technology, another suggested approach has been to move from a transactional approach to licensing to one of a more process-based approach. The current system potentially requires a separate license or technology assistance agreement for each transaction, whether a meeting, sending a part from the manufacturer to the buyer, returning a defective part, or other such activity. In other words, unless the government specifically says a company may do

something, it may not do anything. This is incredibility inefficient and costly to both the buyer and the seller. Parameters should be given that approve limits of acceptable activity, anything beyond which requires a license or TAA. This incorporates techniques already used in quality-control processes, which say that it is acceptable to proceed up to a certain boundary. There are still a multitude of issues that remain to be worked out, and on which reasonable people may disagree, including many definitional issues. But such a system would give the aerospace industry some breathing space and negate some of the lure of European ITAR-free satellite advertisements. Foreign firms and governments want U.S. aerospace products, but not at the risk of betting the company on a nebulous U.S. export-control regime that decides their fate behind closed doors, sometimes over prolonged periods, based on seemingly arbitrary and ambiguous rules.

Clarify organizational responsibility. Make it clear who is responsible for executing the rules and hold those people responsible for timely, clear answers. Sellers and buyers should be held accountable for abiding by export-control regulations; those responsible in the government for implementing the regulations should be held accountable as well. While the vast majority of license applications are eventually approved, some are not, and some take much longer than the median time period of thirty days. Use of median statistics rather than averages is a deception in itself, since median figures mitigate the statistical impact of those that take ten times the average. Further, if the license sits in processing for 120 days and is then returned with no action taken, it disappears from the statistics. During processing, the applicant can go online and see the status of its license, but can do nothing about it if the application is stalled. Not being able to find out why an application is being delayed, and not having the opportunity to explain or fix whatever issue is holding it up—or even speak with someone on the telephone about the issue—is unacceptable.

Transparency and efficiency. A transparent and efficient administrative process for license examination and issuance must be in place. That requires adequate funding to deal with the number of licenses to be processed. While that number would be substantially reduced if the munitions list was revised or a process-based approach adopted, well-trained personnel in sufficient numbers are still needed. Then, the process itself must be streamlined and made transparent, to avoid decisions being made by unnamed, faceless people behind closed doors on an apparently arbitrary basis. In some cases, streamlining involves making sure that all the involved government offices can electronically talk to one another and share files. In others, it involves making

sure that delays are neither inadvertently nor intentionally imposed due to bureaucratic or governmental turf battles. Finally, toward allowing applicants to function better in the business world while allowing government concerns to be addressed, a government–industry consultation process should be established as part of the process, to make export controls logical and useful to all.

The Pentagon's *Military Power of the People's Republic of China*, an annual report to Congress, usually released in May of every year, was finally released on July 20, 2005.[28] The grapevine story on the delay was that there were disagreements between Pentagon hardliners and those with more reasoned views at the CIA and State Department on the tone of the report. Judging from the space section, the latter seemed to have won out. Language about Chinese parasite satellites and speculation about Chinese intent was gone, replaced by toned-down rhetoric concerning what "China is studying" and what "China is interested in." Apparently, reason prevailed.

Space is a subset of foreign policy. For the space ambitions of the United States to prevail without an unintended and counterproductive clash with other countries, the connectivity between activities in the manned, military, and commercial arenas must be not only recognized, but considered and factored into decision making. If the United States expands its military space capabilities and continues to thwart the spread of space technology, it can be expected that other countries will expand their efforts to obtain the technology they feel is needed to protect their sovereignty. If the United States intends to retain space superiority through dominance, a healthy aerospace industry is critical. If the United States abrogates its leadership position in manned spaceflight, China will be willing to assume the position by default, with all the techno-nationalists perceptions that accrue with that position. If the United States needs global cooperation to fight the global war on terrorism, cooperation in manned space provides an opportunity to foster cooperation, gather soft power, and counter perceptions that U.S. military space activity seeks to shut other countries out of the heavens. Such a space program, however, requires the United States to recognize the inherent links between its space efforts and its foreign policy. Such links are rarely acknowledged, let alone factored into decisions.

Iranian writer Azar Nafisi succinctly summarizes the U.S. worldview compared with those of other countries: "We in ancient countries have our past—we obsess over the past. They, the Americans, have a dream: they feel nostalgia about the promise of the future."[29] America is a forward-looking country, focusing on a positive future. Space has always been a part of America's future.

It is imperative that it remain so. If we approach it correctly, perhaps we can even convince those obsessed with the past that a balance between past and future can be achieved, to the benefit of all.

The United States has the opportunity to use space to its strategic advantage, as it did earlier with Apollo. Political will and public support are the keys to success. Both require reasoned and informed discussion and debate on all the issues. A clash of ambitions in space is no more inevitable than is the weaponization of space. There is still time to change direction and deescalate the security dilemma. Without a change in direction, however, the United States could increasingly find itself the odd man out in cooperative space projects or leading projects with minimal international commitment—relying on an increasingly strained aerospace industry and in a constant race with itself to create bigger, better, and always more expensive military space technology. Space is a frontier of seemingly unlimited horizons, yet one that has been parceled into the worst kind of policy stovepipes. It is time that the United States look at the big picture and, based on that, determine a best course of future action. Space security can be achieved in more than one way, and it is imperative that we explore them all.

Notes

Preface

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1. A Clash of Ambitions

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