

# Space Assurance or Space Weapons?

Michael Krepon

The United States has an important choice to make on whether to pursue space assurance or space weapons. Space weapons are defined here as devices designed and flight-tested to disrupt, impair, or destroy objects in or from space. Flight-testing and deployment of these weapons would surely prompt low-cost, low-tech countermeasures in the form of space mines and other anti-satellite (ASAT) devices. A situation in which satellites orbiting the earth are interspersed with objects designed to destroy or disable them is inherently destabilizing, given the vulnerability of satellites and the ease with which they could be harmed. Potential adversaries in space would be faced with the dilemma of shooting first or risking the loss of critical satellites.

The quest to secure dominion over space could therefore elevate into the heavens the hair-trigger postures that plagued U.S. and Soviet officials during the Cold War. The use of space weapons would be an historic first, and could have catalytic effects in space as well as on the ground. Satellites now provide essential operational support, communications, early warning, and intelligence functions to the U.S. government and military. These assets would be placed at risk if other states develop and deploy space weaponry. Space warfare would therefore complicate, rather than reinforce, U.S. military operations. Consequently, if space were weaponized, U.S. armed forces would likely suffer greater casualties and the con-

**Michael Krepon** is Founding President of the Henry L. Stimson Center and author of *Cooperative Threat Reduction, Missile Defense and the Nuclear Future* (New York and London: Palgrave Macmillan, 2003) and *Space Assurance or Space Dominance? The Case Against Weaponizing Space* (Washington, D.C.: The Henry L. Stimson Center, 2003).

duct of war would become less precise and more punishing for noncombatants as well as combatants.

The potential debris and disruption caused by space warfare would impair global commerce that depends on space, produce environmental damage, and create hazards to space exploration. Companies that depend on space-aided commerce would be particularly hard-hit by the flight-testing, deployment, or use of space weapons. Insurance companies that backstop space-related activities would look for less risky investments, or raise their rates appreciably.

The avid pursuit of flight-testing and the deployment of space weaponry by the United States would also be likely to create deeper fissures in alliance ties and relations between major powers, whose assistance is most needed to form "coalitions of the willing" to stop and reverse proliferation.

Washington's choice is therefore stark and clear: The United States and other countries would not be reassured by the flight-testing and deployment of weapons based in space or weapons on Earth designed for space warfare. The pursuit of space weapons would come at the direct expense of space assurance. Space assurance is defined here as a mutually supporting network of agreements, cooperative measures, international norms, codes of conduct and military hedges designed to prevent dangerous military activities in space, especially the flight testing, deployment and use of space weapons.

The United States either can take the initiative to flight-test and deploy instruments designed for space warfare on the assumption that conflict in space is inevitable or useful, or it can seek to reinforce an interlocking network of

restraints designed to avoid the crossing of these key thresholds. The choice between space assurance and space weapons is fundamentally important since it will shape the contours of international security, global commerce, alliance ties, and relations between major powers for years to come. The United States cannot have it both ways: The pursuit of space weapons will come at the expense of space assurance, and space assurance is undermined by the pursuit of space weapons.

Given the significant costs and risks associated with the weaponization of space, particularly the costs this course of action would add to U.S. military operations, the United States would be well advised to pursue multiple initiatives to promote space assurance. Space assurance, unlike space weapons, promises the continued benefits to the United States of military security and space-aided commerce.

**The Choice.** Space assurance will not find favor with those in the United States who seek maximum freedom of military maneuver in space. In this view, space provides the means for quick, lethal strikes in regions that are currently remote to U.S. power projection. U.S. advocates of "capturing the high ground" view space as a medium in which adversaries' weapons of mass destruction could be neutralized, where information warfare could be waged, and where U.S. military dominance could be reinforced into the indefinite future. An essential corollary to this view is that weaker adversaries would seek to nullify U.S. military superiority by attacking or disabling U.S. space assets that have become essential for the conduct of military operations. Supporters of a space dominance posture argue that, precisely because potential

adversaries are so disadvantaged in terrestrial confrontations with the United States, they will engage, perhaps covertly, in the flight-testing and deployment of space weaponry. In this view, a surprise attack in space by a far weaker foe could have significant adverse impacts for the United States. Moreover, because the first use of space weaponry could have such deleterious impacts, weaker adversaries would not follow the U.S. example of restraint. The Rumsfeld Commission report on space reflects this perspective.

By definition, any military or terrorist actions against the United States would constitute asymmetric warfare, given the overwhelming military superiority the United States now enjoys. Concerns over asymmetric warfare are completely war-

the severity of the U.S. response. Adversaries would be far more likely to carry out sneak attacks against the United States in cities, ports, and wherever the American flag is flown abroad, than to engage in space warfare.

The weaponization of space is an environmental as well as a national security issue. The environmental degradation of space created by space-faring nations constitutes a danger to space exploration, the space shuttle and other peaceful uses of space. Space litter also poses difficulties for the military uses of space. The weaponization of space, particularly with respect to the flight-testing of ASAT weapons, would greatly compound existing concerns over safe passage. In the event of a resumption of ASAT tests, the

## The quest to secure dominion over space would therefore elevate into the heavens the hair-trigger postures that plagued U.S. and Soviet officials during the Cold War.

ranted and steps need to be taken to reduce U.S. vulnerabilities on the ground as well as in space. For example, surprise attacks are more likely to come about by a computer hacker than by a space mine or an ASAT. Attacks to critical infrastructure—including ground stations that control satellites—offer relatively low barriers to entry, multiple paths of disruption and greater potential difficulty in assessing responsibility for the crime. Moreover, if the weaker party were to carry out a surprise attack in space, it would not alter the outcome of a military contest with the United States, but it would, in all likelihood, increase

Pentagon would attempt to mitigate space debris, as it does with respect to missile defense tests. Other states that test ASATs might not be as conscientious about debris mitigation. The actual use of ASATs would compound these dangers exponentially.

Space warfare would therefore not only constitute a threat to targeted satellites, it would also create debris fields that would threaten satellites operating in low earth orbit, the space shuttle, and the International Space Station. Debris fields in the upper reaches of space could be longer lasting than environmental degradation on earth. Traffic manage-

ment and debris mitigation efforts are essential components of space assurance.

Dire predictions to the contrary, the weaponization of space, or a “space Pearl Harbor” is not inevitable.<sup>1</sup> If the weaponization of space were inevitable, it would surely have occurred during the Cold War. While many countries have used space to support military operations, no weapons are deployed in space, interactive ASAT testing during the Cold War ended two decades ago, and no satellites have been destroyed in warfare. Thus, the weaponization of space is certainly not inevitable, unless this mindset holds sway.

The potential for space warfare has long existed in the form of long-range missiles carrying nuclear weapons, as well as additional weapon systems designed for other missions, such as missile defense interceptors. These latent or residual capabilities have not led inexorably to an arms race in space. To the contrary, these residual capabilities serve as hedges against unwelcome and unwise decisions by potential adversaries. Residual capabilities to engage in space warfare will continue to exist and serve as a necessary hedge against unwelcome surprises as well as an alternative to dedicated platforms designed for space warfare. Existing military capabilities designed for other missions that could be used for space warfare do not impair space assurance, as long as they are not tested in ways that mimic space warfare.

By virtue of its leadership position in space commerce and military power, the United States has unprecedented leverage to shape whether the peaceful conditions that now exist in space are maintained or whether space becomes weaponized. If the United States exercises restraint in the flight-testing and deployment of

space weaponry, while maintaining readiness to respond if others do so first, there is a reasonable chance that these thresholds will not be crossed. If, however, the United States takes the lead in flight-testing and deploying space weaponry in the vain pursuit of still greater military supremacy, Washington will find little diplomatic support and much low-tech competition. As a consequence, by initiating the weaponization of space, Washington will find itself isolated diplomatically while placing ever greater burdens on U.S. armed forces.

The salience of space warfare will remain low if such techniques are not flight-tested or deployed. Given the extraordinary and growing differential in power that the United States enjoys in ground warfare, sea power and air power, it is hard to find compelling arguments for seeking to supplement these advantages by weaponizing space. The current U.S. lead in the military utilization of space has never been greater and is unchallenged.<sup>2</sup> If the United States pushes to extend its pronounced military dominance into space, others are likely to view this pursuit through the prism of the Bush administration’s national security strategy, which places emphasis on preventive war and preemption.

### **Implementing Space Assurance.**

Key elements of a space assurance posture include unilateral initiatives that enhance situational awareness in space and reduce satellite vulnerability; research and development programs that deter others from crossing key thresholds and hedge against adverse developments by potential adversaries; and cooperative measures, international agreements, and codes of conduct for responsible space-fairing nations. Cooperative mea-

asures, including information exchanges and greater transparency regarding space launches and payloads, could lend credence to declaratory statements of peaceful intent, while also serving to clarify threatening and destabilizing activities in space. Transparency measures must be sufficient to alleviate concerns over worrisome activities, particularly that military capabilities designed for other purposes are not being tested in ways that are virtually indistinguishable from preparations for space warfare. If states are sufficiently concerned about the weaponization of space, they will agree to significant, intrusive, and broad-ranging cooperative and transparency measures.

Cooperative behavior could be codified in bilateral or multilateral executive agreements as well as in treaty form. Alternatively, cooperative behavior might result from quiet consultations that do not yield written accords of any kind. It makes sense to accomplish what is politically feasible and useful first, while still pursuing other avenues of cooperation in space that are not yet ripe for accomplishment. The pursuit of initiatives that are unlikely in the short term—such as an international convention banning certain destabilizing activities in space—could still have utility, as this effort would demonstrate global sentiment in favor of space assurance and against the flight-testing, deployment, and use of space weaponry. If a bipartisan consensus in Washington in favor of space assurance and against space weapons is not forthcoming, the clarification of this choice elsewhere—particularly among U.S. allies, friends, and major powers—would have particular value.

Existing accords, regulatory regimes, and treaties provide the building blocks for a space assurance regime. The cor-

nerstone of space assurance remains the 1967 Outer Space Treaty, which provides the basic framework on international space law, including the strictures that the exploration and use of outer space shall be carried out for the benefit and in the interests of all countries and shall be the province of all mankind; that outer space shall be free for exploration and use by all states; that nations shall not place nuclear weapons or other weapons of mass destruction in orbit or on celestial bodies or station them in outer space in any other manner; that the Moon and other celestial bodies shall be used exclusively for peaceful purposes; that nations shall be liable for damage caused by their space objects; and that nations shall avoid harmful contamination of space and celestial bodies. The Outer Space Treaty also establishes the principle that governments are responsible for space-related activities carried out within national borders and for assuring treaty compliance “whether such activities are carried on by government agencies or by non-governmental entities.” When space activities are undertaken by international consortia, responsibility for compliance “shall be borne both by the international organization and by the States Parties to the Treaty participating in such organization.”<sup>3</sup> Several other treaties banning nuclear weapons testing, agreements on rules of the road for astronauts and space and objects, and accords on behavior on the Moon provide further building blocks.<sup>4</sup>

Adding to the treaty-based prohibitions on space warfare would strengthen international norms defining unacceptable behavior in space. Treaty regimes, when combined with military capabilities to deny gains or to punish violators, have more of a salutary deterrent effect than either in isolation. Deterrence is further

enhanced when treaties contain intrusive monitoring provisions and complementary transparency measures. When deterrence by means of treaty constraints and supplementary military capabilities fails, treaty signatories are on much firmer ground in taking compensatory military steps than in the absence of treaty norms.

Negotiating a multilateral treaty prohibiting space warfare in general and ASAT tests in particular will not be easy. The forum in Geneva established for this purpose, the Conference on Disarmament, now has sixty-six members and operates by consensus. The United States has been very reluctant to accept a negotiating mandate for space arms control. The People's Republic of China would like a negotiating mandate, but is leery (along with the United States and other nations) of accepting transparency measures necessary to provide assurance of compliance and early warning of troubling activities. Nor will it be simple to construct a widely acceptable, common-sense definition of what constitutes the acts of space warfare to be prohibited. The mix of monitoring arrangements and transparency measures sufficient to verify that prohibited activities are not being carried out also poses a significant challenge.

If the Conference on Disarmament remains deadlocked over space arms control, a single state or a grouping of states might decide to take the lead in tackling these difficult questions. The model here would be the Government of Canada's role in promoting an international convention banning the use of landmines. The "Ottawa process" was given a significant boost by the technical inputs and energy provided by non-governmental organizations that convened alongside governmental experts. The advantage of this approach is that a coalition of the

willing would not be constrained by the requirement for a diplomatic consensus.<sup>5</sup> The disadvantage is that some key states could be absent from the drafting process and would feel no compulsion to join the draft agreement.

An alternative or complementary approach would be to pursue a code of conduct or agreed "rules of the road" for responsible space-faring nations. The resulting accords could take the form of bilateral or multilateral executive agreements. During the Cold War, the United States entered into executive agreements with the Soviet Union to prevent dangerous military practices at sea, on the ground, and in the air. Comparable cooperative measures could also provide useful building blocks for a space assurance regime.

A model code of conduct for responsible sea-faring nations was negotiated in 1972 after a series of highly dangerous military maneuvers between U.S. and Soviet combatants and naval aircraft. The 1972 Agreement on the Prevention of Incidents On and Over the High Seas (the "Incidents at Sea" agreement) established important rules of the road. These include avoiding collisions at sea; not interfering in the formations of the other party; avoiding "maneuvers through areas of heavy sea traffic where internationally recognized traffic separation schemes are in effect;" requiring that "ships engaged in surveillance of other ships shall stay at a distance which avoids the risk of collision and also shall avoid executing maneuvers embarrassing or endangering the ships under surveillance;" using mutually agreed signals when ships maneuver near one another; not simulating attacks at, launching objects toward, or illuminating the bridges of the other party's ships;

informing vessels when submarines are exercising near them; requiring the greatest caution and prudence in approaching aircraft and ships of the other party; and not permitting simulated attacks against aircraft or ships, performing aerobatics over ships, or dropping hazardous objects near them.<sup>6</sup> The Incidents at Sea accord has served as a model for comparable agreements signed by more than thirty other navies.

Another bilateral accord of particular relevance to the establishment of a space assurance regime is the 1989 Prevention of Dangerous Military Activities Agreement (PDMA). The PDMA focused on four specific categories of "dangerous military activity," including "interfering with command and control networks in a manner which could cause harm to personnel or damage to equipment of the armed forces of the other Party," as well as the use of lasers "in such a manner that its radiation could cause harm to personnel or damage to equipment of the armed forces of the other Party." It established procedures to deal with border or boundary incursions, including the provision of designating "special caution areas."<sup>7</sup>

The pursuit of a code of conduct or rules of the road for responsible space-faring nations might draw and expand upon these sensible provisions. This effort would need to surmount many challenges, including how to define what constitutes dangerous military practices in space and how to devise suitable transparency measures to provide assurance of compliance or to warn of possible non-compliance. While executive agreements have the same standing as treaties in international law, this approach, even if widely replicated, is unlikely to be as inclusive as a multilateral treaty negotiated at the Conference on Disarmament.

As with efforts to negotiate an international convention, important space-faring nations might not choose to join. The choice between rules of the road and an international convention is not mutually exclusive. To the contrary, executive agreements establishing a code of conduct to prevent dangerous military practices in space could facilitate the eventual negotiation of a multilateral treaty that is more ambitious in scope.

**Conclusion.** The United States and the international community face a fundamental choice in the years ahead. That choice is between space assurance or space weapons. If space becomes another medium for deploying weapons of any kind, hair-trigger postures that plagued policy makers during the Cold War will be elevated into the heavens. The weaponization of space would complicate rather than enhance U.S. military capabilities. It would also impair global commerce and weaken the U.S. relationships with major powers that are essential for counterproliferation. Without question, the United States and the international community have more to lose than to gain by flight-testing and deploying space weapons.

The weaponization of space was avoided during the Cold War, even though both superpowers jockeyed for military advantage on virtually every other front. Space weaponry can also be avoided in an era of U.S. military supremacy—if Washington exercises restraint, adopts prudent hedges and joins others in diplomatic efforts to pursue space assurance. By advancing the peaceful uses of space rather than weaponizing this realm in previous decades, the United States and other countries have reaped extraordinary rewards. By initiating the weaponization of space, the United States



would jeopardize the twin revolutions in military affairs and space-aided commerce, as well as generate severe environmental hazards for space exploration and satellites in low earth orbit.

Among the extraordinary powers that the United States now enjoys is the power to shape the agenda for the use of space in the twenty-first century. If Washington seeks to extend its military dominance by flight-testing and deploying space weaponry, other capitals would surely follow suit. They would not do so in as sophisticated or as expensive a manner, but they would compete as best they can. If, on the other hand, the United States refrains from embarking on a course to weaponize space, there are no guarantees that others will exercise similar restraint. Potential adversaries would, however, have less incentive to do so since Washington can compete effectively in space warfare. Neither would weaker states benefit from surprise attacks in space, since the use of ASATs would complicate, but not alter, U.S. terrestrial military dominance.

Space weapons would beget space

mines; ASATs would beget more ASATs. The side that shoots first in space would cross a critical threshold in the history of combat, without realizing significant or long-lasting benefits. A far wiser course would be to reinforce and not cross two critical and verifiable thresholds—that of flight-testing and deploying space weaponry. A restraint regime of this kind would require transparency measures and cooperative monitoring by the United States, China, Russia, Japan, India, and other space-faring nations.

There is much to do here on Earth to deal with the challenges of environmental degradation, terrorism, and proliferation. New initiatives are needed to widen the benefits of economic security, pursue cooperative threat reduction, enhance regional security, repair alliances, and improve relations among major powers. The flight-testing and deployment of space weapons adds nothing to and subtracts much from this far-reaching agenda. The time is ripe to think creatively and to act energetically to build barriers against the weaponization of space.

#### NOTES

<sup>1</sup> This argument is propounded in: the Report of the Commission to Assess United States National Security Space Management and Organization (Washington, DC: Commission to Assess United States National Security Space Management and Organization, 11 January 2001).

<sup>2</sup> See DeBlois, Bruce. "Space Sanctuary: A Viable National Strategy." *Airpower Journal* 12, no. 4 (Winter 1998): 47.

<sup>3</sup> These principles were largely drawn from prior deliberation in the United Nations General Assembly, particularly the General Assembly's Declaration of Legal Principles Governing the Activities of States in the Exploration and Use of Outer Space, 1962 (XVI-II).

<sup>4</sup> See the Treaty Banning Nuclear Weapons Tests in the Atmosphere, in Outer Space, and Under Water (1963); the Agreement on the Rescue of Astronauts,

the Return of Astronauts, and the Return of Objects Launched into Outer Space (1968); the Convention on International Liability for Damage Caused by Space Objects (1972); the Convention on the Registration of Objects Launched into Outer Space (1975); and the Agreement Governing the Activities of States on the Moon and other Celestial Bodies (1979).

<sup>5</sup> This view is advocated by Rebecca Johnson in "Multilateral Approaches to Preventing the Weaponization of Space," *Disarmament Diplomacy* 56 (April 2001).

<sup>6</sup> This characterization of the "INCSEA" Agreement is drawn verbatim from the U.S. Government's summary of the accord, available at <http://dosfan.lib.uic.edu/acda/treaties/sea1.htm>.

<sup>7</sup> The text of the agreement can be found in *International Legal Materials* 28, no. 2. (Washington DC: American Society of International Law, 1989): 877–895.