

TESTIMONY OF MICHAEL KREPON  
CO-FOUNDER, THE HENRY L. STIMSON CENTER  
BEFORE THE HOUSE COMMITTEE ON ARMED SERVICES  
SUBCOMMITTEE ON STRATEGIC FORCES

SPACE SECURITY  
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Dear Madame Chair, and members of this Subcommittee,

Thank you for asking me to express my views about how to strengthen U.S. national security. You have asked me whether the United States has had the “right national policy to ensure the security of our space assets.” I regret to say that, in my view, we have not had a sound strategy to assure the use of these vital national assets when needed. I do not feel qualified to answer your second question about a proper investment strategy to improve matters – except in the most general terms. I do propose to focus on your third question – on the role that diplomacy might play in improving U.S. space security.

It’s clear that U.S. security requires assured access to space and the proper functioning of satellites that save lives, strengthen our economy, and support national security. Without the assured use of satellites, police, fire fighters, and first responders would be hampered; satellite phones would not work during emergencies; global financial transactions would be disrupted; and U.S. troops in harm’s way would be less able to defend themselves.

Satellites are as vulnerable as they are invaluable. Nations that depend heavily upon satellites also have the means to damage them. No nation benefits more from space or has more to lose if space becomes a shooting gallery than the United States. What, then, is the most appropriate strategy to ensure that essential satellites will be available for use when needed?

Because of America’s great dependency on satellites, some have advocated the testing of anti-satellite (ASAT) weapons and their use during crises or warfare. In this view, the United States needs to dominate space to deter the use of space weapons by potential foes and to win wars decisively on the ground. Advocates of this view believe in two underlying assumptions: that warfare in the heavens is inevitable and that the United States can succeed in dominating space with ASAT weapons.

The desire by some to “take the high ground of space” by testing and deploying weapons in space has outlasted the Cold War. But conditions have changed radically since the Soviet Union dissolved. Old-fashioned arms races have been

replaced by asymmetric warfare. Washington's space budgets will continue to dwarf those of Beijing and Moscow, but China and Russia do not have to be America's equal to nullify U.S. attempts to dominate space. Even a few ASAT weapons can do great damage to essential satellites, as was evident when China tested an ASAT weapon in January, 2007. This irresponsible test created a large, mutating debris field that will last for perhaps a century in low-earth orbit, placing human space flight and hundreds of satellites at risk – including those belonging to China.

Space debris poses a common threat to all space-faring nations. Space debris travels at ten times the speed of a rifle bullet in low-earth orbit. A piece of debris the size of a child's marble could strike a satellite with approximately the same energy as a one-ton safe dropped from a five-story building. The worst debris fields in space can be caused by actions that pulverize satellites – whether by ASAT tests or satellite collisions, such as the one that occurred last month. The three worst man-made debris fields in the history of the space age all occurred in the last two years. (In addition to the Chinese ASAT test and the U.S.-Russian satellite collision, the upper stage of a Russian Proton rocket broke up in 2007.)

The Reagan administration carried out a destructive ASAT test in 1985 that generated 300 pieces of trackable debris, one of which came within one mile of the newly launched International Space Station – fourteen years later. It took nineteen years for the last piece of debris from the 1985 ASAT test to burn up in the earth's atmosphere. China's 2007 ASAT test created the worst-ever man-made debris field in space, generating approximately 40,000 pieces of lethal debris, and an estimated two million debris fragments overall. Because the Chinese ASAT test was conducted at such a high altitude – half again as high as the 1985 U.S. test – its lethal debris field may remain in low-earth orbit for over a century. Even very small pieces of debris can be worrisome because they can't be tracked but can still penetrate the thin outer skin that protects satellites. The windows on the U.S. Space Shuttle have needed to be changed more than 70 times because of tiny debris hits. The United States now tracks more than 17,000 pieces of space debris.

Space dominance is extremely hard to achieve in a debris-strewn environment, and it is not difficult for weaker adversaries to create debris fields in space. The Bush administration's space policy refused to consider diplomatic initiatives that might limit the U.S. military's freedom of action in space – including any limitations on ASAT testing. Has U.S. space security improved as a result of this stance? The evidence strongly suggests otherwise: We have much less assurance today that our vital satellites will be available for use when needed than we did eight years ago. The continued testing or use of destructive ASAT weapons is likely to result in even worse space assurance.

An alternative approach to space security holds that the uniquely hostile and fragile nature of outer space makes cooperation not only possible but mandatory. This view rests on the assumptions that no major power will accept actions to achieve space dominance by another major power, and that a war in space between them cannot be won and must not be fought. Presidents Ronald Reagan and Mikhail Gorbachev reached exactly the same conclusion about nuclear warfare, and then reached path-breaking threat reduction agreements. Throughout the Cold War, the United States and the Soviet Union reached tacit agreements and signed treaties protective of satellites. This track record of restraint can be extended because satellites are more essential than ever before, and because major powers have less to fight about than in previous decades.

In my view, U.S. advantages in space and U.S. national security can best be advanced by seeking to stop destructive ASAT tests and, more broadly, by establishing stronger protections against acts of purposeful, harmful interference against satellites. The most clear-cut way to establish agreed protections of satellites is by means of a treaty – and the most verifiable treaty is one that bans the testing and use of destructive methods against man-made space objects. But treaties can entail lengthy and difficult negotiations. In addition, the consent of two-thirds of the United States Senate is required for treaty ratification. This will be a difficult hurdle unless the Pentagon reassesses the Bush administration’s position that, on balance, the right to conduct additional destructive ASAT tests overrides the consequences of additional testing of this kind by others.

Another approach to increase space security would be for the United States to join with our European allies and other countries with significant space capabilities to negotiate a Code of Conduct affirming norms for responsible space-faring nations. “Rules of the road” exist for ships, planes, and many military activities. A Code of Conduct could also be negotiated for activities in space, clarifying irresponsible actions and facilitating appropriate responses against rule-breakers. In my view, a key element in a Code of Conduct would be a pledge not to engage in harmful interference against satellites. Low-earth orbit is now a far less hospitable environment for satellites that are essential for our personal, economic and national security. The magnitude of the debris problem requires our attention. The collision last month between a revenue-producing Iridium satellite and a dead Cosmos satellite constitutes another wake-up call to strengthen space security. The Stimson Center’s proposed “rules of the road” for a space Code of Conduct seek to address this problem. We propose that all responsible space-faring nations accept “the responsibility to share information related to safe space operations and traffic management and to enhance cooperation on space situational awareness.”

The timing is right for Washington, Beijing and Moscow to reconsider their approaches to ASAT tests and space security. The United States has more agenda-setting powers than any other country, but no single nation can create conditions for successful space diplomacy. The United States, China and Russia have many competitive pursuits, but we all need to utilize space. The challenge facing major space-faring nations is how to align their space diplomacy with their common interests.

I urge members of this Committee to consider diplomatic initiatives that are protective of satellites and that advance our personal, economic and national security. A draft of one such initiative – Stimson’s Code of Conduct – is attached to my testimony for your review.

## MICHAEL KREPON

Michael Krepon is the co-founder of the Henry L. Stimson Center, a Washington-based non-governmental organization that focuses on security issues. He is also a Diplomat Scholar at The University of Virginia, where he teaches in the Politics Department. He served as founding president and CEO of the Stimson Center for eleven years before stepping down in 2000 to focus on programming interests, teaching and writing. Krepon worked in the Arms Control and Disarmament Agency at the State Department during the Carter administration. Before that, he worked for two Members of Congress: Norm Dicks (D-WA., Defense Appropriations) and Congressman Floyd Hicks (D-WA., Armed Services). Krepon is the author or editor of three books on space-related topics: *Space Assurance or Space Dominance, The Case Against Weaponizing Space* (The Henry L. Stimson Center, 2003); *Open Skies, Arms Control and Cooperative Security* (St. Martin’s Press, 1992); and *Commercial Observation Satellites and International Security* (Palgrave Macmillan, 1990). Krepon’s newest book, *Better Safe than Sorry, The Ironies of Living with the Bomb*, was published by Stanford University Press in January, 2009. He serves as a consultant to Sandia National Laboratories.

## Model Code of Conduct for Responsible Space-Faring Nations

*[Released by the Stimson Center October 24, 2007](#)*

### **Central Objective of this Code of Conduct:**

To preserve and advance the peaceful exploration and use of outer space.

### **Preamble:**

We the undersigned;

Recognizing the common interest of all humankind in achieving progress in the exploration and use of outer space for peaceful purposes;

Reaffirming the crucial importance of outer space for global economic progress, commercial advancement, scientific research, sustainable development, as well as national, regional and international security;

Desiring to prevent conflict in outer space;

Reaffirming our commitment to the United Nations Charter;

Taking into consideration the salience of Article 2(4) of the Charter, which obliges all members to refrain in their international relations from the threat or use of force against the territorial integrity or political independence of any state, or in any other manner inconsistent with the purposes of the United Nations;

Taking special account of Article 42 of the Charter, under which the United Nations Security Council may mandate action by air, sea, or land forces as may be necessary to maintain or restore international peace and security;

Recognizing the inherent right of self-defense of all states under Article 51 of the Charter;

Reinforcing the principles of the Outer Space Treaty of 1967, including:

- the exploration and use of outer space, including the moon and other celestial bodies, shall be carried out for the benefit and in the interests of all countries,

- outer space, including the moon and other celestial bodies, shall be free for exploration and use by all States without discrimination of any kind, on a basis of equality and in accordance with international law,
- outer space, including the moon and other celestial bodies, is not subject to national appropriation by claim of sovereignty, by means of use or occupation, or by any other means, in the exploration and use of outer space, States Parties to the Treaty shall be guided by the principle of co-operation and mutual assistance and shall conduct all their activities in outer space with due regard to the corresponding interests of all other States Parties to the Treaty;
- State Parties to the Treaty undertake not to place in orbit around the Earth any objects carrying weapons of mass destruction;
- the moon and other celestial bodies shall be used by all States Parties to the Treaty exclusively for peaceful purposes.

Recalling the importance of space assets for non-proliferation, disarmament and arms control treaties, conventions and regimes;

Recognizing that harmful actions against space objects would have injurious consequences for international peace, security and stability;

Encouraging signature, ratification, accession, and adherence to all legal instruments governing outer space, including:

- 1967 Outer Space Treaty
- 1968 Rescue Agreement
- 1972 Liability Convention
- 1976 Registration Convention
- 1984 Moon Agreement

Recognizing the value of mechanisms currently in place related to outer space, including the 1994 Constitution of International Telecommunications Union; the 1963 Partial Test Ban Treaty; the 1988 Intermediate-Range Nuclear Forces Treaty; the 1994 Strategic Arms Reduction Treaty; and the 2003 Treaty on Strategic Offensive Reductions.

Recognizing the dangers posed by space debris for safe space operations and recognizing the importance of the 2007 Space Debris Mitigation Guidelines of the Scientific and Technical Subcommittee of the Committee on the Peaceful Uses of Outer Space;

Recognizing the importance of a space traffic management system to assist in the safe and orderly operation of outer space activities;

Believing that universal adherence to this Code of Conduct does not in any way diminish the need for additional international legal instruments that preserve, advance and guarantee the exploration and use of outer space for peaceful purposes;

Declare the following rights and responsibilities:

### **Rights of Space-Faring States:**

1. The right of access to space for exploration or other peaceful purposes.
2. The right of safe and interference-free space operations, including military support functions.
3. The right of self-defense as enumerated in the Charter of the United Nations.
4. The right to be informed on matters pertaining to the objectives and purposes of this Code of Conduct.
5. The right of consultation on matters of concern and the proper implementation of this Code of Conduct.

### **Responsibilities of Space-Faring States:**

1. The responsibility to respect the rights of other space-faring states and legitimate stakeholders.
2. The responsibility to regulate stakeholders that operate within their territory or that use their space launch services in conformity with the objectives and purposes of this Code of Conduct.
3. Each state has the responsibility to regulate the behavior of its nationals in conformity with the objectives and purposes of this Code of Conduct, wherever those actions occur.
4. The responsibility to develop and abide by rules of safe space operation and traffic management.
5. The responsibility to share information related to safe space operations and traffic management and to enhance cooperation on space situational awareness.
6. The responsibility to mitigate and minimize space debris in accordance with the best practices established by the international community in such agreements as the Inter-Agency Debris Coordination Committee guidelines and guidelines of the Scientific and Technical Subcommittee of the United Nations Committee on the Peaceful Uses of Outer Space.
7. The responsibility to refrain from harmful interference against space objects.
8. The responsibility to consult with other space-faring states regarding activities of concern in space and to enhance cooperation to advance the objectives and purposes of this Code of Conduct.
9. The responsibility to establish consultative procedures to address and resolve questions relating to compliance with this Code of Conduct, and to agree upon such additional measures as may be necessary to improve the viability and effectiveness of this Code of Conduct.

*The Model Code of Conduct was completed by experts from NGOs in Canada, France, Japan, Russia and the United States in October 2007. The group included Setsuko Aoki of Keio University, Alexei Arbatov of the Carnegie Moscow Center, Vladimir Dvorkin of the Center for Policy Studies in Russia, Trevor Findlay of the Canadian Centre for Treaty Compliance, Katsuhisa Furukawa of the Japan Science and Technology Agency, Scott Lofquist-Morgan of the Canadian Centre for Treaty Compliance, Laurence Nardon of the French Institute of International Relations, and Sergei Oznobistchev of the Institute of*

*Strategic Studies and Analysis. NGO participants worked on this project in a personal capacity. Their support for the model Code of Conduct therefore does not reflect endorsements by their institutions or governments*