Space and Missile Defense

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For the past half century, beginning with the Eisenhower Administration, successive U.S. presidents have emphasized the crucial importance of space to national security as well as our economic well being. We have seen space control as a vital national interest. To quote from the 2006 U.S. National Space Policy:

> In this new century, those who effectively utilize space will enjoy added prosperity and security and will hold a substantial advantage over those who do not. Freedom of action in space is as important to the United States as air power and sea power. (p.1.)

Space provides the indispensable arena for such military activities as intelligence collection to provide what the military call situational awareness; secure communications; and strategic and tactical warning. Much of our surveillance, communications, and intelligence is performed by satellites and unmanned aircraft. Targets identified from space can be hit either with terrorist or commando strikes or with missiles that are more widely available than ever. Long-range or short-range missiles can be equipped with nuclear, biological, chemical or conventional warheads.

There is an understandable concern about the militarization and weaponization of space. However, space is already militarized and weaponized. Since the first German V2 rockets ascended to the outer edges of space in 1944 en route to targets in England, space has been used

for military purposes. When we discuss the weaponization of space, we usually think about the Outer Space Treaty of 1967, which banned the stationing of WMD in space or on celestial bodies such as the Moon.

Despite this treaty, the distinction between the militarization and weaponization of space is blurred. This the Chinese vividly demonstrated in their January 11, 2007 ASAT test. China launched a ballistic missile into space designed to destroy an aging Chinese satellite. The test was successful. A weapon launched from Earth against a target in space such as a satellite thus contributes to the weaponization of space. The weaponization of space need not take place in space, but instead from Earth, as the Chinese demonstrated in January. Designing an arms control agreement that would ban ASAT therefore becomes perhaps a fool's errand. Any weapon that can be fired into space becomes a potential space weapon. Furthermore, a ballistic missile could be launched with a nuclear warhead designed to detonate from 40-400 kilometers altitude, with EMP effects designed to disable satellites and destroy electronic systems here on Earth, as pointed out in the EMP Commission Report in 2004.

One set of threats that we face emanates from the proliferation of missiles. These include missiles having intercontinental range launched from distant locations or short-range missiles that could be deployed aboard submarines or surface ships near our coasts. What this all adds up to is uncertainty about the rate at which missile threats are increasing as well as uncertainty in predicting where and when missiles might be launched and what their targets might be.

If this strategic analysis is correct, it argues for the development and deployment of missile defenses that are ever present and capable of intercepting missiles launched from essentially anywhere at targets anywhere else, whether the launch point is several hundred miles away or several thousand miles away. In other words, the future missile defense that will be needed must be global in nature. Only space-based defenses inherently have a global, ever present capability that can be quickly moved where they are needed during or in advance of a crisis.

Prepositioning missile defense assets in space, including interceptors, could provide not only a truly global capability to defend against ballistic missiles, drastically reducing the time needed to

respond to a missile attack, but also a space-based missile defense could furnish the most effective basis for defense in the event of a surprise missile launch such as a missile designed to launch an EMP attack or to destroy a satellite. I would argue that it has been the politics of missile defense, more than technical obstacles, that have limited or reversed and eliminated the most promising missile defenses that would help us address such threats.

Among its advantages, a space-based missile defense could be in and of itself a layered defense or certainly a key part of a multi-tiered defense because it can be built with the capability to intercept attacking missiles in all their phases of flight – from boost-phase through midcourse and into the high endoatmospheric portion of the terminal phase. Such a defense could give us multiple shots at a missile and its warheads from boost to terminal phase.

Space-based missile defense would enable us to hit a ballistic missile in its boost phase, when the warhead has not yet separated from the missile and is most vulnerable but also designed to provide the opportunity for interception in subsequent phases of the trajectory as well. Interceptors would be placed in low-earth orbit, where they would remain until a hostile missile launch was detected. The interceptor would accelerate out of orbit toward the missile, which could be destroyed by direct impact. Such a concept is not new.

About 15 years ago, the United States had developed technology for lightweight propulsion units, sensors, computers, and other components of an advanced kill vehicle. This was the *Brilliant Pebbles* technology of the early 1990s. The *Brilliant Pebbles* design employed a global early-warning and tracking system in support of at least one thousand small, space-based kill vehicles, each capable of autonomous interception of enemy missiles. The *Pebbles* operated autonomously because each carried the equivalent of a *Cray*-1 computer on board and could do its own calculations for trajectory and targeting analysis. Because of the numbers of *Brilliant Pebbles* and their deployment in space, they would have had multiple opportunities for interception, thus increasing their potential for success either in boost-phase, midcourse, or even high in the earth's atmosphere during reentry or the terminal phase. In contrast, the deployment of ground-based interceptors in the limited numbers presently planned in the ongoing missile

defense programs may not provide more than one intercept opportunity. They will need to be placed within a more robust layered missile defense architecture if we are to keep ahead of the emerging missile threat.

Technology advances over the past decade furnish the basis for such an architecture for less mass, lower cost, and higher performance in space-based kinetic energy missile defense, provided necessary investments are made in *Brilliant Pebbles*-type technology for the twenty-first century. This should be high on the missile defense agenda for the way ahead. In sum, the key to moving forward would be, first, to identify programs that were under development more than a decade ago as a basis for reviving a viable space-based interceptor program and the technologies that undergird it.

A global missile defense that includes space should be open to other countries sharing an interest in global missile defense and willing to contribute. A global missile defense should be based on the assumption that space, like the high seas, is an arena for common security. The United States should reaffirm the recognition contained in the Outer Space treaty that there is a common interest in the use of outer space for peaceful purposes. Missile defense represents one of these peaceful purposes.

As we contemplate the future, it is useful to draw lessons from the past. The key lesson of the ABM Treaty era is that in the *absence* of the U.S. missile defense deployment that was prohibited by the treaty, other states were nevertheless developing missile programs without having to take into account a robust U.S. missile defense. In this sense, paradoxically, the ABM Treaty may have had the reverse of the effect intended by its proponents. With little or no need to penetrate a nonexistent U.S. missile defense, missiles offer a relatively cheap option for states seeking an asymmetrical advantage over the United States. The thirty-year experience of the ABM Treaty does not lend credence to replacing the ABM Treaty with new international legal prohibitions against space-based missile defense. To judge from past experience, such efforts are more likely to place onerous restrictions on the United States, as happened with the ABM Treaty, than to provide universally accepted norms to govern the peaceful use of space. In short, assured access to space, as well as space control exercised by the United States with allies who share our

security interests, is key to future disincentives to states and terrorist organizations seeking access to such weapons. Therefore, space control, including space-based missile defense, is crucial to U.S. national security in the twenty-first century.

Finally, we are entering a period in which additional countries are likely to acquire nuclear forces as well as their own space capabilities. We spend a great deal of time thinking and worrying about North Korea and Iran. If we cannot halt their respective nuclear programs, as appears to be the case, we will need to be able to counter them – to deter them from using such weapons or to defend ourselves if they are tempted to use them. Space not only affords the arena in which a missile defense could be deployed. It also provides the arena for essential reconnaissance, surveillance, communications, and other essential capabilities, as I have noted. Space will also be increasingly important as we update security assurances and guarantees to countries that may feel threatened by North Korea (especially Japan) or by Iran (Israel and NATO Europe). In other words, space-based missile defense offers a key component of a counterproliferation strategy. Therefore, the importance of space can only grow as we build new architectures to meet twenty-first-century security challenges.