

## Lost in Space

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Consider the implications of North Korea's July 4 missile tests. While the Taepondong-2 failed, Pyongyang has already demonstrated (in 1998) that it can launch long-range rockets. Meanwhile, the six short- and medium-range missiles it successfully tested can be sold to other rogue states and terrorists -- who could launch them at us from ships off our coasts.

When North Korea launched its missiles in July, what President Bush has properly termed our "modest" missile-defense system was activated -- but it included no protection against this short-range threat to the three-quarters of all Americans living within 200 miles of our coasts. Indeed, if a nuclear warhead on just one missile, launched from a ship off our coast, was detonated at an altitude of 100 kilometers, the electromagnetic pulse would have devastating consequences for critical infrastructures such as telecommunications, finance, fuel/energy, transportation, food and water supply, energy resources and space systems.

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The blunt truth is that, since withdrawing from the ABM Treaty in 2002, the U.S. has not done enough to protect the nation from the threat of missiles. The Pentagon is improving ground-based interceptor systems, but it is not fully exploiting other interceptor-basing modes. Sea-based defenses, for example, remain focused on defending our overseas troops, allies and friends against short- and medium-range ballistic missiles -- without using their inherent potential also to shoot down ballistic missiles aimed at the U.S. homeland.

Nevertheless, our continuing vulnerability to missile attack is the result of easily reversible past choices. Japan and the U.S., for example, are jointly developing sea-based missile defenses against short- and medium-range missiles; three U.S. ships equipped to shoot down these missiles will be operating in or near the Sea of Japan later this year. With a \$25 million software improvement, these same ships can shoot down North Korean intercontinental-range missiles early in their ascent phase -- long before ground-based interceptors in Alaska or California. And if ships operating near our coasts are similarly equipped, they could shoot down short- and medium-range missiles launched by terrorists from ships off our coasts.

We have already made an \$80 billion investment in over 80 Aegis ships now at sea around the world that have the ability to shoot down cruise missiles. A minimal additional investment can enable them to shoot down ballistic missiles: Outfitting a single ship costs \$100 million (\$20 million for support systems and \$80 million for eight interceptors). There is no better investment in near-term missile-defense capability.

As the administration has acknowledged, current missile defenses represent only a "starting point" for building improved capabilities. But rather than just marginally improving systems that evolved from the ABM Treaty era, missile-defense designers should start from the basics.

The authors participated in an Independent Working Group that for the last five years considered these issues in depth. Our full report, "Missile Defense, the Space Relationship and the 21st Century," is available at [www.ifpa.org/pdf/IWGREport.pdf](http://www.ifpa.org/pdf/IWGREport.pdf).

Here, we emphasize several points:

- Missile-defense systems should protect us against more than just small rogue states. We should make it virtually impossible for any adversary -- rogue states, non-state actors and larger strategic competitors -- to influence U.S. decisions, or the course of regional conflicts, by threatening to launch missiles with nuclear weapons against the U.S., its deployed forces or its allies.

Since we cannot be certain where or when a missile will be launched against us, we need a continuously ready, global, multilayered system to provide multiple shots at attacking missiles and their warheads in all their phases of flight -- boost, midcourse and terminal. Such defenses make an attack more expensive, and therefore less attractive for enemies to buy the technologies to overcome them. The ABM Treaty era showed that it is the absence of defenses, rather than their presence, that encourages the development of offensive technologies.

- Ground-based defenses can protect specific territory; sea-based defenses can more flexibly defend larger areas for less money. Neither provides global protection. Only space-based systems can provide a truly global defense. The U.S. needs a streamlined development program to build space-based interceptors for boost-, midcourse- and terminal-phase interdiction -- and to begin deployment of these interceptors by 2010.

Political factors have dictated technical behavior, subordinating the development of the most technically sound and cost-effective defenses. The problem transcends administrations and political parties; it reflects the unprecedented political opposition that has been mounted against effective missile defenses over the past five decades. The most technologically feasible global defense -- space-based -- has not been politically acceptable, because of concerns about the "weaponization of space." This is a dubious argument that ignores history, and the current efforts of other states to weaponize space. But the result is to leave us with a ground-based defense that is politically the most acceptable but technologically the least effective.

Because of Ronald Reagan's interest in research on all ballistic missile-defense concepts, his Strategic Defense Initiative (SDI) explored all possible concepts and pursued major technology initiatives, in order to underwrite those most effective. By the end of his administration, it was clear that a space-based interceptor system, "Brilliant Pebbles," could meet even the strict so-called Nitze criteria (survivability under direct attack and cost-effectiveness at the margin as compared to investments in attacking missiles).

This interceptor system consisted of a constellation of very lightweight satellites (each about the size of a watermelon) that would continuously monitor the Earth below and detect any missile launch within its field of view. The satellite with the best intercept opportunity would release a Brilliant Pebble (weighing a few pounds) that maneuvers into the path of the oncoming missile

or its payload and destroys it by impact. All key technologies were proven by the mid-1990s; today's technology is more advanced and could intercept even short-range Scuds in their boost phase.

Brilliant Pebbles was approved in 1990; the Pentagon's independent costing agency estimated acquisition and 20-year operations costs at \$11 billion in 1990 dollars, or about \$16 billion in inflation-adjusted dollars. It would have been far more capable than all other missile-defense concepts pursued since then -- at many times that cost -- but political considerations killed Brilliant Pebbles in 1993. Even the supporting technology programs were cancelled and the technologists dispersed -- so those most important products from the \$30-billion SDI investment were lost.

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Today the U.S. should make deployment of a multilayered missile defense, including space-based systems, an urgent priority. We should complete the ground-based sites in Alaska and California -- but build no additional ground-based sites. Limited resources are better spent to meet emerging threats by building the more cost-effective (sea- and space-based) missile components.

Great advances in technology have resulted when visionary and persistent leaders, supported by competent scientists and engineers and set apart from the normal acquisition bureaucracy, are given the necessary resources to prove new ideas can and will work. This recipe should again be employed to revive cutting-edge technologies demonstrated over a decade ago -- and to build the defenses we need in the 21st century.

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