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The New York Times

Physics Body Concedes Mistakes in Study of Missile Defense

Two scientists said the American Physical Society had erred in evaluating their plan to use drones to shoot down North Korean long-range missiles.



An image released by North Korea's state-run Korean Central News Agency showed the test launch of an intercontinental ballistic missile. Credit...KCNA, via Agence France-Presse — Getty Images

By [William J. Broad](#)

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The world's largest body of physicists [admitted](#) on Monday that a report it had issued seven months ago contained errors that downplayed the effectiveness of a novel plan for shooting down missiles.

The American Physical Society published the 54-page [report](#) in February. It assessed the overall feasibility of thwarting missile strikes and [concluded](#) that a proposal that the United States use drones to shoot down North Korean missiles faced “very difficult challenges.” The group sent the report to Congress and officials in the Biden administration as part of the society's long history of providing guidance on cutting-edge weapons to defense policy decision makers.

Three months later, in May, the group pulled the document from its website, saying in an online [note](#) that the report was under review by its authors and would be “re-posted when available.” The note gave no reason for the withdrawal.

But the scientists who proposed the drone idea say the reason was errors in the society's technical analysis of the concept, which the society [acknowledged on its website Monday](#) but has yet to detail or explain.

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"The whole thing is outrageous," said [Richard L. Garwin](#), the lead scientist behind the proposal. Dr. Garwin, 94, has [advised](#) the U.S. government on issues of national security for more than a half century. He also wields outsize influence in the scientific community because he's [credited](#) with designing — at [age 23](#) in 1951 — the world's first hydrogen bomb.

He and the other proponent of the drone idea say they want Washington officials to have an impartial assessment of the plan as they consider how to improve the nation's defenses against enemy missiles.



Richard L. Garwin in 2016 upon receiving the Presidential Medal of Freedom at a ceremony in the East Room of the White House. Credit...Andrew Harnik/Associated Press

"It's a potential system for the defense of the United States, and these people are trying to stop it," said [Theodore A. Postol](#), the other scientist and an emeritus professor of science and national security at the Massachusetts Institute of Technology.

A [group](#) of 13 physicists and engineers wrote the February report. Its chairman was [Frederick K. Lamb](#) of the University of Illinois. The co-chairs were [James D. Wells](#) of the University of Michigan and [Laura Grego](#) of M.I.T. and the Union of Concerned Scientists. The [private group](#), based in Cambridge, Mass., has often [faulted](#) antimissile defense as futile and destabilizing.

Academic and private groups have long vetted claims of breakthroughs in destroying enemy warheads fired from the earth's far side. The task, one of the hardest in modern warfare, is likened to hitting a bullet with a bullet. Members of the American Physical Society have repeatedly [caught](#) the Pentagon in errors, exaggerations and what appear to be outright deceptions.

Now, the physical society has been caught in its own error. It says the episode is a first in its [123-year history](#).

Dr. Garwin and Dr. Postol's antimissile plan zeros in on destroying North Korean missiles fired at the United States. After Pyongyang achieved a [run](#) of successful flight tests in 2017, American intelligence agencies [described](#) its intercontinental ballistic missiles and their nuclear warheads as an emerging threat.

According to the plan, American drones would loiter over the Sea of Japan. If North Korea began a nuclear attack, the drones would fire rocket interceptors that would track the fiery exhaust of the rising missiles and annihilate them.

If feasible, the idea is seen as superior to the traditional missile defense method — shattering a missile's incoming warheads as they race toward their targets. Experts agree that rising missiles are slower, easier to track and far more vulnerable to attack.

In 2004, the Bush administration began [deploying](#), in Alaska and California, a system of interceptor missiles that has about a half-hour to track long-range warheads fired from North Korea. Even so, top experts [say](#) it has major shortcomings.

By contrast, the drone interceptors would linger relatively close to enemy launchers. Dr. Garwin and Dr. Postol detailed their plan in [2017](#) and [2018](#) studies, prompting the Trump administration to [examine](#) the idea as a possible way to thwart the new generation of more threatening North Korean missiles.

In 2020, the physical society [began](#) its own antimissile study. It looked at the feasibility over the next 15 years of both the old and new approaches, including Dr. Garwin and Dr. Postol's. It released its report in February.

The main error uncovered by Dr. Garwin and Dr. Postol in the society's report centers on the speed of their proposed interceptor rockets and thus how far they would have to fly. The report's diagram shows the carrier drones as having to loiter over North Korea's mainland or a narrow strip of its coastal waters in order to knock out missiles fired at Boston, New York or Washington. In such locations, the drones could be shot down.

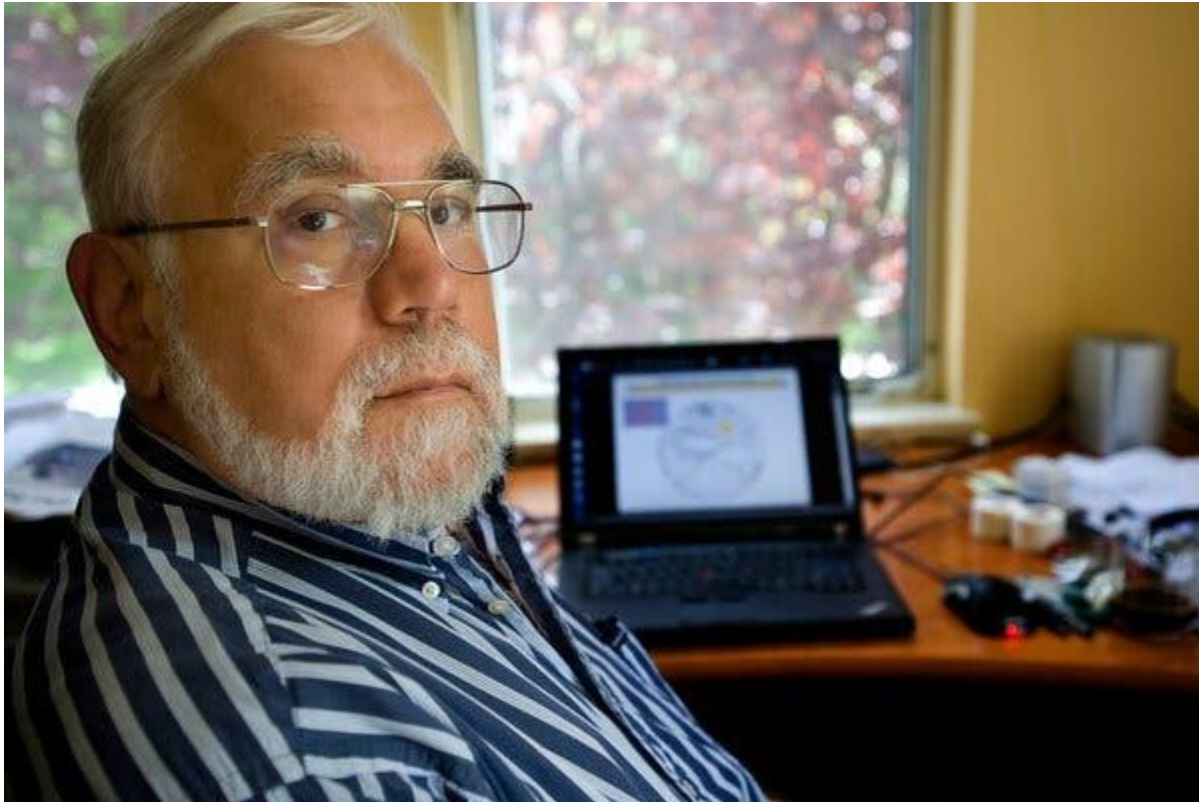
But the two scientists found that the study group had used the wrong interceptor speed — less than 2.5 miles per second instead of the faster pace of more than 3.1 miles per second. That error might seem small, but the military upshot was not. For an interceptor flight of 195 seconds, the baseline, the correct number was seen as moving the drones more than 100 miles farther out to sea.

"It puts you deep inside the Sea of Japan, where you can loiter and take aim at your leisure," Dr. Postol said. "Theirs puts you into an area where you can't operate."

Soon after the report's February release, Dr. Garwin and Dr. Postol began exchanging emails with the report's authors, which The Times has reviewed. In them, the authors admit to mistakes and suggest corrections.

[Frances Hellman](#), a physicist at the University of California, Berkeley, who is [president](#) of [the physical society](#), said that in late May and early June, it had privately notified key recipients about problems with the report, including staff members at the National Security Council and the Department of Defense, as well as House and Senate armed services subcommittees.

But making public a corrected version of the report, she added, "may take a year" from the time of its publication.



Theodore A. Postol in 2010. Credit...Darcy Padilla for The New York Times

“We take the integrity of our reports extremely seriously,” Dr. Hellman said in an interview. But removing the errors, she said, is inevitably a slow process because it involves dozens of experts and society officials. “They want it to happen overnight,” she said of Dr. Garwin and Dr. Postol.

Dr. Lamb, the report committee’s chairman, said one snag in the revision was that the study group’s members are busy people who “committed time” to the report. “Now we’re in overtime,” he said. Dr. Lamb added that the job required enormous care. “The worst possible thing,” he said, “is to try to correct something and make another mistake.”

Dr. Hellman, the society’s president, said that the group was seeking ways to better handle such situations in the future.

The long current delay “is not dissimilar to the time it takes to correct a scientific paper,” Dr. Hellman added. “We need to be sure we have the science correct. This argues for more care, not less.”

William J. Broad is a science journalist and senior writer. He joined The Times in 1983, and has shared two Pulitzer Prizes with his colleagues, as well as an Emmy Award and a DuPont Award.

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