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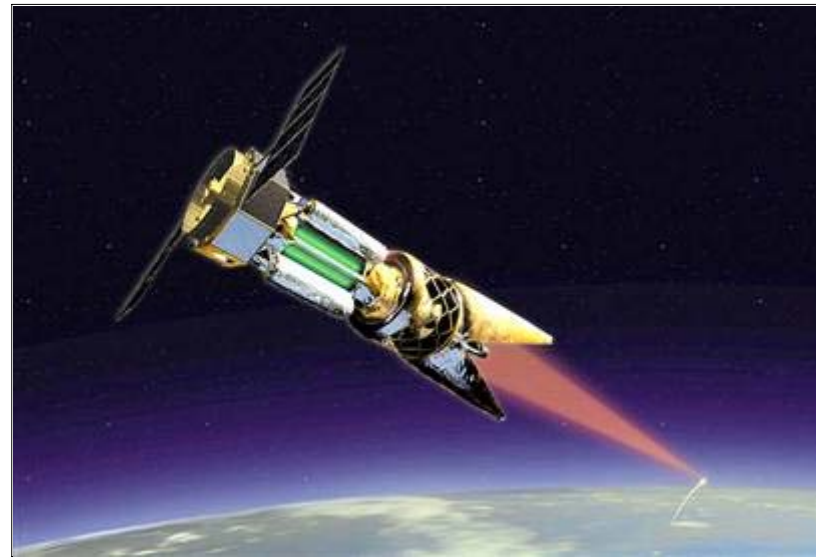
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Beam weapons almost ready for battle

Directed energy could revolutionize warfare, expert says



AFRL

A laser fires from space toward Earth in this artistic rendering. The Air Force Research Laboratory's Directed Energy Directorate is conducting research in a wide variety of laser weapons technologies.

By Leonard David

Senior space writer



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LOS ALAMOS, N.M. - There is a new breed of weaponry fast approaching — and at the speed of

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light, no less. They are labeled "directed-energy weapons," and they may well signal a revolution in military hardware — perhaps more so than the atomic bomb.

Directed-energy weapons take the form of lasers, high-powered microwaves and particle beams. Their adoption for ground, air, sea, and space warfare depends not only on using the electromagnetic spectrum, but also upon favorable political and budgetary wavelengths too.

That's the outlook of J. Douglas Beason, author of the recently published book "The E-Bomb: How America's New Directed Energy Weapons Will Change the Way Wars Will Be Fought in the Future." Beason previously served on the White House staff working for the president's science adviser under both the Bush and Clinton administrations.

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After more than two decades of research, the United States is on the verge of deploying a new generation of weapons that discharge beams of energy, such as the Airborne Laser and the Active Denial System, as

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"History has shown that, without investment in high technology, fighting the next war will be done using the 'last war' type of technique," Beason told Space.com. Putting money into basic and long-range research is critical, Beason said, adding: "You can't always schedule breakthroughs."

A leading expert in directed-energy research for 26 years, Beason is also director of threat reduction here at the Los Alamos National Laboratory. However, he noted that he was expressing his own views rather than the policy of the laboratory, the Defense Department or the Energy Department.

Ripe for transformation?

Though considerable work has been done in lasers, high-power microwaves and other directed-energy technologies, weaponization is still an ongoing process.

For example, work is continuing in the military's Airborne Laser program. It utilizes a megawatt-class, high-energy chemical oxygen iodine laser toted skyward aboard a modified Boeing 747-400 aircraft.



Boeing

An artist's conception shows a reddish beam emanating from an Airborne Laser system, with another beam being used against missiles in the background. In reality, the beam itself might be invisible.

Purpose of the program is to enable the detection, tracking and destruction of ballistic missiles in the boost phase, or powered part of their flight.

Similarly, testing of the U.S. Army's Tactical High Energy Laser in White Sands, N.M., has shown the ability of heating high-flying rocket warheads, blasting them with enough energy to make them self-detonate. THEL uses a high-energy, deuterium fluoride chemical laser. A mobile THEL also demonstrated the ability to kill multiple mortar rounds.

Then there's Active Denial Technology — a non-lethal way to use millimeter-wave electromagnetic energy to stop, deter and turn back an

uses a beam of millimeter waves to heat a foe's skin, causing severe pain without damage, and making the adversary flee the scene.

Beason also pointed to new exciting research areas underway at the Los Alamos National Laboratory: Free-electron laser work with the Navy and a new type of directed energy that operates in the terahertz region.

Niche for new technology

While progress in directed-energy is appreciable, Beason sees two upfront problems in moving the technology forward. One issue has to do with "convincing the warfighter that there's a niche for this new type of weapon," and the other relates to making sure these new systems are not viewed as a panacea to solve all problems. "They are only another tool," he said.

Looming even larger is the role of those who acquire new weapons. "The U.S. could put ourselves in a very disastrous position if we allow our acquisition officials to be non-technically competent," Beason explained.



Northrop Grumman

This is a conceptual look at putting a solid-state laser on an armored ground combat vehicle for potential use in the U.S. military's Future Combat Systems program.




Over the decades, Beason said that the field of directed-energy has had its share of "snake-oil salesmen", as well as those advocates who overpromised. "It wasn't ready for prime time."

At present, directed-energy systems "are barely limping along with enough money just to prove that they can work," Beason pointed out. Meanwhile, huge slugs of money are being put into legacy-type systems to keep them going.

"It's a matter of priority," Beason said. The time is now to identify high-payoff, directed-energy projects for the smallest amounts of

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