Lt. General
Dan Leaf
Vice-Commander,
Air Force Space Command
Dr. Philip Coyle
Senior Advisor,
Center for Defense Information

Space Weapons or Space Arms Control?

Lt. Gen. Dan Leaf

I must admit it is pretty heady for a small town boy like me to appear in front of this august and large group. I'm reminded of a question once posed to Winston Churchill by an admirer. She asked, "Doesn't it thrill you, Mr. Churchill, to know that every time you make a speech the hall is packed to overflowing?" "It's quite flattering," Churchill replied, " but whenever I feel this way I always remember that if, instead of making a political speech, I was being hanged, the crowd would be twice as big." So, I'm happy to see this reasonably sized audience today.

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It is my honor to share the stage with Dr. Coyle. His credentials speak volumes about his expertise, dedication, and service to the nation. I am not certain that the term "debate" fits this exchange of ideas. As I prepared for today's event, I came to believe that we agree in principle. We seem to agree that there is a critical necessity to find a balance between preserving the peace and being prepared for war as it applies to military, civil, scientific and commercial space systems.

I would like you all to know me a little bit before we begin, because that may help you understand that I take finding that balance as seriously as Dr. Coyle does. "Military brass" like me are sometimes seen as those anointed to positions of power by birthright or grandiose self-image, but that is seldom if ever the case. I grew up in a small town in rural Wisconsin, and graduated from the University of Wisconsin. As a political science major and ROTC cadet there during the Vietnam War, my views were challenged and formed, and I came to believe very strongly in the path of service that I chose and have walked down for over 30 years. Writings about space and weapons in space often portray leaders like me as a bit wild-eyed and hell-bent to create, not prevent, conflict. That is simply not an accurate depiction.

Professionally, I am relatively new to the space side of our Air Force, but I have seen war from the air and on the ground. I know the tragedy of war, and therefore appreciate the magnitude of decisions that might determine the likelihood of conflict, or impact how war may be waged. My combat experiences have taught me not to take the subject of war lightly. I would like to see the end of such strife, but think that very unlikely, and know that we must be prepared for whatever circumstances require us to defend our nation. Therefore, when I argue for the capabilities to assure space superiority, I do so with a deep appreciation for the enormity of the issues. I also have an equal appreciation for the importance of military and civilian space systems to an extraordinary variety of beneficiaries.

I am very well aware that even "military" space systems are critical to the civilian population, and not just within the United States. The Global Positioning System (GPS), for example, was envisioned as a constellation of satellites to provide precision navigation to military users. The Department of Defense has spent $9.7 billion developing, fielding and sustaining that capability, and I've benefited from it in combat. However, GPS is now much, much more than a military system. Electronic commerce relies very heavily on the GPS precision timing signal to synchronize transactions. Roads are cleared of snow, crops are raised and cultivated, airliners and ocean-going freighters are steered—all with GPS. Civilian space systems contribute much more than science. They, too, enable food production. They provide communications capabilities to the remotest regions of our planet, monitor the environment, and help predict the weather. Space systems sustain life,

enable life, and enrich life around the globe.

As a military officer, my principal responsibilities are helping ensure that our space capabilities are there to benefit the U.S. Armed Forces and those of our allies. In explaining those duties to the public, we often use examples that demonstrate the importance of space to military operations. I think those examples may sometimes contribute to the misperception of some that we are focused on destruction. When some military officials talk about space they show a bridge in Serbia that was destroyed by a single B-2 on one flight with GPS-aided joint direct attack munitions. "Gee, isn't that impressive? We destroyed that bridge on a single mission and with only five bombs." In the past, that would have taken tens or hundreds of flights and many, many more bombs. I imagine many, in uniform and out, look at those before and after photos thinking they represent the destructive power of military space capabilities. I see it differently. I think of the bombs that were not dropped, the broader destruction that did not have to occur, because of our precision that is based very heavily on military space.

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I believe that because of military space capabilities we know more about potential conflict and potential adversaries; that when we fight, we are more likely to complete our mission rapidly, able to risk and lose less of our forces, and required to kill less and destroy less on the enemy side of the lines. When one looks at the reduction in the number of casualties from the World Wars to the present, one should think of the role that precision, and therefore space, has played in that reduction.

We have all seen the price of unpreparedness. Like many of you, I watched the attacks on the World Trade Center on September 11, 2001 with horror, and disbelief that we could be attacked in our homeland. A few minutes later, the Pentagon where I was, and suspect Dr. Coyle was too, came under attack, and I experienced combat and smelled death again, in the most unlikely of places, our nation's capital.

If space capabilities are used by our adversaries for the purposes of an attack on the United States, the military will face questions on why we had not done more to prevent such an attack, just as we were asked about preparations to defend against air attacks following 9/11. We cannot be unprepared for attacks on our space systems, or for the efforts of others to deny access to space capabilities through other means. In Air Force terms, that means we must maintain space superiority.

Some see space superiority as fighting words that indicate an intent to destroy. We will address that in much greater detail over the next several minutes, but more than anything else, I would like you to understand our priorities for maintaining space superiority: first, space situation awareness, second, defensive counter-space, third, and finally, offensive counter-space. Offensive counter-space is at the center of the controversy regarding the weaponization of space.

Because that is where the controversy lies, I will address those priorities in reverse order, starting with offensive counter-space. Some have cited our offensive counter-space doctrine as an indication that we, the U.S. Air Force, seek to weaponize space. One author specifically noted a passage from our counter-space doctrine, which states "Denying an adversary access to space capability may require taking the initiative to preempt or otherwise impede an adversary." The author called this a bait-and-switch argument of space weapons proponents, claiming it does not properly address questions of how the military can maintain security in

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space for all its assets, civil and military. Such a conclusion assumes that denial means destruction of assets that might be used for both civil and military (or other adversary) purposes. That is not the case.

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U.S. DoD Space Control Policy states that the preferred U.S. approach to negating space systems or services hostile to U.S. national security interests is through localized, reversible and temporary effects. There are many different ways to negate adversary use of space systems. We might attack a ground station, but that might not always be prudent or possible. Denying the information link from a satellite through temporary, reversible means may be the best option. Those reversible effects have the added benefit of not destroying existing infrastructure. There are many ways to deny an adversary use of satellites, and most of them do not entail physical damage or destruction of satellites. That said, while it is not currently in the best interests of U.S. national security and global use of space, we must retain the option of creating such a system if national security dictates.

Debate on offensive counter-space often focuses on concern over the space debris that such an attack on satellites would generate. That concern is certainly valid and the nation that would stand to lose the most from such debris is the United States. In fact, it is established U.S. policy to minimize space debris.

Our second priority, defensive counter-space, is exactly what the name states—defensive. We protect our space systems through appropriate design, building in characteristics that protect against an enemy's ability to attack those systems. We must defend our assets in orbit against any kind of threat. In the past years we have seen several attacks on satellites or their capabilities by nations and non-state actors. Some of the reports of attacks on U.S. and other countries' use of space include that Iran jammed satellite broadcasts of an opposition movement in August 1997, that Turkey overrode a Kurdish television channel in November 1998, that Russia admitted jamming satellite telephone communications in Chechnya in November 1999, and that the Falun Gong hijacked Chinese television broadcasts in September 2002. Finally, from our own experience during Operation Iraqi Freedom, Saddam Hussein's forces deployed GPS jammers in an attempt to reduce the utility of GPS for coalition forces. Our response was to destroy the ground-based jammers with 2000-pound GPS-aided bombs—that was a defensive counter-space mission because it protected our access to space capabilities.

Because of these events and others, in Air Force Space Command we have consciously taken another important step in defensive counter-space, assuming what we call a defensive counter-space mindset. That approach is simple: when something happens to one of our satellites, a related ground segment of the system, or the link between the ground and satellite, we do not assume the best and look for a technical problem or glitch, we also look closely to see if the problem may have been caused by enemy action. I think that is a prudent approach! If we find the latter to be the case—a hostile act—our response will be carefully considered and consistent with U.S. policy and international law.

The third and top priority in space superiority is space situation awareness. It is, in fact, the foundation of space superiority and it entails ensuring we know what is happening in space, both with respect to man-made objects and natural phenomenon, such as space weather. Just as we monitor the airspace, waterways and borders around our nation and deployed forces, it is prudent to monitor space in the same manner, and perhaps more so because there are no overflight restrictions or other protective borders or boundaries in space like we have on earth and in the atmosphere.

Nothing I have said ignores the roles of law or treaty. In fact, space weapons, whether ground- or space-based, do not necessarily violate any laws or treaties. The Outer Space Treaty only provides that: one, nuclear or other weapons of mass destruction will not be placed in orbit around the Earth, on the moon or any other celestial body, or in outer space; and two, any use of space must be for peaceful purposes.

Current and proposed U.S. uses of outer space comply with the "Peaceful Purposes" requirement. It is widely accepted that defensive purposes are peaceful and that any military use of outer space is lawful so long as it does not violate the other international laws, including the U.N. Charter and the inherent right of self-defense.

In addition to the right of self-defense, the U.S. believes recent routine and overt use of satellites and space systems in direct support of

military operations is "peaceful" and there have been no formal protests against such uses.

Of course, the United States is not alone in its use of space for military support. China, Russia, France and Canada and others use space for military purposes. Indeed, even countries that do not own satellites use satellite support from third parties for military purposes, including communications, navigation, intelligence gathering and weather data.

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Current treaties, laws and the existing multilateral arms control regimes adequately protect states' interests in outer space. Proposals to restrict weapons in space all but ignore existing behavioral constraints, both legal and practical, affecting use of space weapons. Any new agreement is likely to require concessions from the United States without any other nation, or transnational actor, giving up current or near-term potential capability. Such a concession would pull the United States backward and erode the advantage we have worked very hard to build with very little affect on any other nation.

It is difficult to create useful, effective arms control agreements in any medium. In the case of space, we have difficulty even reaching agreement on what constitutes a space weapon. Treaties work only if all affected parties are signatories to the treaty. Even if every recognized nation in the world were to agree to a treaty, it would not limit the actions of non-state actors such as terrorists.

I want to stress that the United States has continued to actively participate with the various international organizations that deal with space issues, including the Conference on Disarmament, United Nations General Assembly, the General Assembly First Committee for Disarmament and International Security, the U.N. Committee on the Peaceful Uses of Outer Space, and the Inter-Agency Space Debris Coordination Committee.

The United States is committed to maintaining free use of space, but we don't believe new treaties and space arms control are the appropriate means of doing so. We must be prepared to prevent use of space by others if it threatens our national security. Just as we developed means to use, defend and, if required, attack aircraft in the early days of air power, we must follow suit in space to defend our national interests. We will continue to pursue those capabilities required for defense of national interests. The United States is and intends to remain a responsible steward of space.

Thank you.

Dr. Coyle

From the outset I want to say that my son is serving in the U.S. military in Iraq, that I support our military, and that I have worked in defense research for most of my professional life, and in the Pentagon for several years also. But this debate is about weapons in space, even nuclear weapons in space.

In late February, just three weeks ago, Canadian Prime Minister Paul Martin announced that Canada would *not* participate in the U.S. missile defense program. While expressing its continuing commitment to North American Aerospace Defense Command (NORAD), the Canadian government said it would not join the Pentagon's missile defense program.

Why did one of our closest partners, and neighbors, take this strong step? In part it was because Canadian citizens are skeptical of U.S. missile defense plans. Canadian citizens question that the United States can develop missile defenses that will be effective against enemy missiles under realistic operational conditions. And Canadians also question the costs, both the money and the consequences.

But that was only part of their concern. Canada also did not want to be part of creating a new arms race in space. They understand that U.S. missile defense is the first wave in which the United States could introduce attack weapons into space, that is, weapons with strike capability—shooters, if you will—and Canada did not want to contribute to that.

The Pentagon wants a layered missile defense system, with interceptors launched from land, sea, from aircraft, and from space—all capable of shooting down enemy missiles in any phase of their flight: the boost-phase lineup, the mid-course, and in the terminal phase—coming back down. The idea is that if one layer misses, the next layer won't, and so forth. Pentagon briefings picture giant glass domes covering the United States, and we are to imagine that enemy missiles will bounce off these glass domes like hail off a windshield.

And one of those glass domes is to be in space.

But this debate today is not just about missile defenses in space, it is also about deploying new strike weapons in space to attack the space assets of other countries. The terms the Pentagon and the Air Force use for this are *space control* and *counter-space* - that is, like "Star Wars," the movie.

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Some of you may wish that space was pure and pristine with no military systems poised there for war—like Antarctica. But the militarization of space is already a fact of life. As Gen. Leaf said, our military relies on space satellites for military communications, for reconnaissance and sensing, for weather, and for precision targeting.

However, the weaponization of space hasn't happened. There are no strike weapons deployed in space. So deciding not to deploy strike weapons in space is a practical place to draw the line, exactly what Canada has just done.

In the United Nations, Russia and China have been urging this for years. But the United States has blocked these efforts.

Reportedly, President Bush is considering whether or not the U.S. should continue to participate in the 1967 United Nations Treaty on the Peaceful Uses of Outer Space—the Outer Space Treaty. That treaty bans nuclear weapons from space, stating that space should be maintained for peaceful purposes.

Why is the United States blocking arms control in space? And why would the president consider abandoning an existing space treaty? The United States has much more to lose from war in space than any other country. As Gen. Leaf said, we depend on space for both military and civil commercial applications of all kinds.

As a result, not since the development of the atomic bomb has the United States had an equivalent opportunity and special incentive to show leadership for restraint in the development of a new class of weapons, namely strike weapons in space.

The path to devoting significant U.S. military resources to space control was established in early 2001 by the first Rumsfeld Commission Report with its apocalyptic warnings of a "Space Pearl Harbor."

Kahlil Gibran said that the fear of need is greater than the need itself, and today, Pentagon planners take this type of hand-waving threat for granted, as though it already exists—this "space Pearl Harbor"—and that war in space is just as "inevitable" as war on land, sea, and in the skies.

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Senior Advisor,
Center for Defense Information

Here's what Robert Dickman, Air Force Deputy Under Secretary for Military Space said: "If we are attacked in space, and if it turns out that we don't have space superiority, the American public is going to have every right to be very upset." General Leaf said just about the same thing.

Never mind that no other country is threatening to deploy attack weapons in space. And never mind that missile defense and space weapons don't work against car bombs, improvised explosive devices, and rocket-propelled grenades, the tragically real threats in the hands of terrorists today. Nevertheless, the Air Force has requested hundreds of millions of dollars over the next several years to develop a new satellite constellation to look for enemy attack satellites in space—that is, to search deep space as well as low earth orbits for enemy attackers.

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Where exactly from deep space we expect a threat to develop is not explained, unless Martians would become annoyed with our Rovers crawling across their landscape.

There is no threat in space to justify a new arms race in space. And exaggerated future threats are being hyped out all of proportion. For example, last July, a commission largely appointed by Secretary Rumsfeld warned of another threat, the threat from high altitude nuclear electromagnetic pulse (EMP), saying that rogue nations and terrorists could threaten "the continued existence of today's U.S. civil society," and "our ability to project military power," and further puffing up rogue nations and terrorists with the capabilities of giants.

There are no so-called "states of concern" to the United States with both the capability and the need to deploy attack weapons in space. While the Pentagon seems to be thoroughly committed to both the weaponization of space and missile defense, there simply is not the threat required to justify the current rate of expenditure and planned deployments for either one. If the United States deploys attack weapons in space first, it would be doing so on the basis of a hypothetical threat that does not exist today and for which there are better solutions, if it did.

Last October the Federation of American Scientists (FAS) put out the report, *Ensuring America's Space Security*—and you can get it on the Web or through them as a book—which described more effective ways of dealing with potential threats to U.S. space assets than space strike weapons. This study showed that even if new threats emerge, for the foreseeable future those threats are better dealt with from land than from space.

What has been surprising to me is that U.S. defense policy makers have not challenged the justification for space strike weapons with other options and alternatives, such as the relatively simple and conventional options described in the FAS report.

Yet the United States is spending millions of dollars on space attack weapons, money that would be better spent on other, higher, priorities, such as body armor and armored Humvees for our soldiers in Iraq, for lowering the deficit, for health and education, for Homeland Security and Social Security, not to mention relief for poor and distressed people around the world.

The management of U.S. military space programs has become an embarrassment to the Pentagon. The U.S. Government Accountability Office (GAO) has reported time and again multi-billion-dollar cost overruns in Department of Defense (DOD) military space programs, and at a time when the United States is experiencing record budget deficits that threaten the American economy in the eyes of the international marketplace.

For example, a satellite program called SBIRS-High (Space-Based Infrared Systems High) has just released a new cost estimate of $31.4 billion, which is about eight times what it was when I was in the Pentagon just a few years ago and this is with no satellites as yet launched!

Together, the massive budgets for U.S. military space and missile defense activities represent the beginning stages of a new arms race in space, even though there is no threat in space to justify it.

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And this spending shows the commitment of the U.S. Air Force, U.S. Space Command, and the Pentagon to prepare space as the next strategic battleground.

As taxpayers and citizens we ought to be worried about this. We won the Cold War by outspending the Soviet Union. We spent so much on our defense that the Soviet Union

couldn't keep up. But today we are spending ourselves into bankruptcy, conducting a "Cold War" on ourselves by spending billions on defense for which there is no threat. And we're not spending enough on the ordinary threats we face today, such as car bombs, improvised explosive devices,

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and rocket-propelled grenades, against which strike weapons in space are useless.

Ladies and gentlemen, the United States is much more dependent on space for commerce, for banking, for civil communications and for our military than any other country, and accordingly has much more to lose from war in space. Much, much more to lose. We don't need strike weapons in space, we have better things on which to spend our money, and at this time in our economy we certainly don't need billions of dollars of cost overruns for military systems in space that aren't effective.

Thank you very much.

Question and Answer

Mr. Mack: Since General Leaf started the program today, let me turn to Dr. Coyle for the first question to General Leaf.

Dr. Coyle to General Leaf: General Leaf, you mentioned the attempts by the Iraqis to jam our Global Positioning Satellite (GPS). Would strike weapons in space help? If we had them in space and somebody tried to jam our GPS satellites, would it be any good to have strike weapons in space?

General Leaf: I have to answer your question with kind of another question and then I'll seek to answer. In my remarks, or in our Air Force budget priorities in spending, do you really see a focus on these space strike weapons you're talking about? I don't. As I said, our first priority is space situation awareness, and I'll give an example. You may be familiar with the space surveillance system known as "Navy Fence" that belonged to the Navy while Dr. Coyle was in the Pentagon. The Navy found its funding priorities did not allow maintaining the Navy Fence, and the Air Force has taken that over because situational awareness, in lower earth orbit in particular, as Dr. Coyle said, is our first priority. If we look at the counter-space weapons systems, there were two—the counter-space surveillance system and reconnaissance and a counter-communications system—one of those two was cut because it didn't meet our funding priorities and yet space situation awareness did. Dr. Coyle, I don't intend to say that space strike weapons—the shooters you described—are counter-GPS jamming. I do say that a GPS jammer, wherever you put it, in orbit or not, is an attack on our space capabilities and we have to be prepared to both recognize that attack and respond to it, and that has a lot to do with what was said about "space Pearl Harbor" by the Rumsfeld Commission.

A space Pearl Harbor is a real threat, but not necessarily from an attack in kind—directly from space-to-space assets. It could be an attack on our ground segments, it could be an attack on the links we have, anything that denied our space capabilities. Now, there was plenty of warning about Pearl Harbor. I know that if we had been able to put together the information contained in the Japanese diplomatic communications, what was seen on the radar on Oahu and what we knew about the Japanese navy submarines, somebody could have recognized that an attack was occurring. Well, that didn't happen. That's why space situation awareness is such a priority. We want to recognize what's happening and ideally prevent it from happening or mitigate the effects. I said that without mentioning anything about space-based weapons.

General Leaf to Dr. Coyle: I found it interesting, Dr. Coyle, that you speak of the Pentagon, since we served there together, as if it's some monolithic decision-making body where there's universal agreement on all issues. You spoke of the SBIRS system, SBIRS-cost overruns in particular, , which are a problem, an embarrassment and cost the taxpayers money, and that we are working very hard to remedy. But the SBIRS System is a fundamentally defensive system that is replacing capabilities that were designed in the '60s and early '70s. They were designed in the Cold War for Cold War threats and not to meet the lower IR signature current threats. I was in Coalition land forces headquarters for seven test missile attacks, and our current system could not see the lower signature, pinpoint it and report it to the defensive organizations in time to be of any value. SBIRS will be a much more capable system. If we had had it we would have been able to pinpoint the launching location, and we would have been able to strike the launcher after the first or second attack, and not have endured seven. Would you choose not to field the SBIRS-High

system and lose the situation awareness, the missile warning, or would you simply rely on the defense support programs satellites that are ageing out in the belief that everything will be fine?

Dr. Coyle: No, I wouldn't not deploy the SBIRS system. I agree that it's a defensive system. I brought it up because it's an example. If you read defense trade journals, practically every satellite development program is having huge cost overruns and I brought it up as an example. My point is, if these defensive systems, which are, in essence, passive, are having these kinds of huge multi-billion dollar cost overruns, what kind of cost overruns are we going to see once we start putting offensive systems in space? That's the reason I brought it up, not because it is an offensive system but because the kind of cost overruns we're seeing in the defensive system are nothing compared to what we could see with an offensive system.

Dr. Coyle to General Leaf: General Leaf made the point that the amount of money we're spending on space weapons is relatively small. General Leaf, can you tell us what the DOD top line is for space weapons of all kinds, defensive, and offensive, and how much is for space strike weapons?

General Leaf: I'll give you a concise answer because Mr. Mack asked for one and the answer is no—it's not "no" because I don't want to, but because your question doesn't fit what we're doing. You're labeling things that are counter-measures. You're describing programs that aren't in effect and frankly as a political science major, I couldn't do the math if I had the numbers.

General Leaf to Dr. Coyle: Dr. Coyle, you cited the budget overruns and they are troubling and we worry about that—we more than worry about it, we work at it every day. It is clear to me, as a newcomer to the space business, that most of the problems that are not the normal growth in any industrial production come from a reduction in the government oversight of industry which was taken during the time you were at the Pentagon during the '90s. Why was that taken, and how did you feel about it at the time, how do you feel now about the reduction and government oversight of development programs?

Dr Coyle: I don't really understand why anybody thought it was a good idea. What General Leaf is referring to is that most programs have sort of standard DOD procurement rules, but there are two exceptions: the space programs and missile defense programs. Both are exempted from these standard DOD procurement rules and those two programs are the ones that are having the biggest cost overruns. So, even though I believe these changes were made in the interest of streamlining those programs and helping to get systems into the field faster, the effect has been sort of the opposite of what was intended. They're having huge cost and schedule overruns. They're not streamlined at all.

Dr. Coyle to General Leaf: General Leaf, when people like me say that we should pause and think about arms control in space, some people will say on the other side that it's too late – war in space has already begun. For example, Air Force Secretary James Roach, using the jammer example that you used from the Warner Act has said, "War in space has already begun." Do you think that war in space has already begun?

General Leaf: I don't think that I would use that description. I think that attacks on our space capabilities have already occurred but that does not mean war in the environment of space. I agree wholeheartedly and I think the government's position shows that that is not just my view. We have to show restraint and give very deliberate consideration to cause and effect of pursuing strategies, programs, and weapons, and we are doing this. As I said, our priorities demonstrate that and our budget expenditures demonstrate that. But, no, I would not characterize it as war in space. I would categorize it as a tax on our space capabilities.

Summaries

General Leaf: In our DOD priorities and especially our Air Force Space Command priorities, for ensuring space superiority for your space capabilities are to put space situation awareness first—knowing what's up there—and that's what our budget shows. Defending our space against attacks is the next priority, and then, finally and with limited expenditure but with full consideration to what might develop in the future, offense gunner space. Those are reasonable and prudent priorities. The other point I would hope you'd take away from this is that, unlike some of the depictions in the press that do show us as wild-eyed advocates of state space weaponry seeking to cause conflict, that's not the case. We're aware of the enormous issues; we consider them, we wrestle with them, we're struggling to find that balance between preserving the peace and defending our nation in times of war. Thank you very much.

Dr. Coyle: Ladies and gentlemen, new funding and priority for space weapons and missile defense from the United States is creating a pressing need for arms control in space.

Considering the lack of a justifying threat, the technical difficulty and the cost of placing strike weapons in space, and considering the dependence of American society on space, we ought to ask ourselves, "Where is America going with space weapons?"

Just because we have military reconnaissance and other military needs for space, which I support, does not mean that we need attack weapons, that is, strike weapons in space. Even if new threats emerge, for the foreseeable future those threats are better dealt with from land than from space.

War in space is *not* inevitable. War in space is only inevitable if the U.S. puts nearly all its focus on preparing for war in space and virtually none into preventing war in space. Potential enemies of the United Sates have legitimate peaceful, civil, reasons to want space capabilities, just as we do.

Space is militarized to be sure, but it is not yet weaponized. We can draw the line at putting strike weapons in space. War in space has not begun, and attributing feeble efforts by Iraqi soldiers to jam our GPS satellites from the ground does not constitute war in space.

The cost of U.S. space weapons is too high, has not been shown to be effective anyway, and for the foreseeable future any threat that may emerge is better and more effectively dealt with from the ground, not from space.

Arms control can be remarkably effective, and can have enduring benefits for decades, and during those decades the basic relationships between the United States and other countries can change for the better.

With the United States facing record budget deficits and record defense spending, and with our international friends and partners expressing increasing concerns about the weaponization of space, it's time to examine our priorities and ask whether we want to go down a path towards war in space.

Thank you.