

# PREVENTING THE WEAPONIZATION OF SPACE

**Report on a Joint Forum of  
Canadian Pugwash Group and  
Science for Peace  
held at the University of Toronto,  
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## **Introduction: The Challenge**

The beauty and wonder of the night sky could soon be spoiled if the US government moves ahead with plans to place weapons in space. Celestial points of light, viewed by the naked eye or by telescope, may no longer be pristine awe-inspiring heavenly bodies, but kinetic kill vehicles passing only 100-200 km above the heads of the people of the earth or, worse still, explosions caused during testing or by accident.

Such frightful scenarios were considered at the Joint Forum of the Canadian Pugwash Group and Science for Peace, which sought to evaluate the threat of the weaponization of outer space and to explore ways to prevent it. The challenge was found to be considerable, given the position and activities of the US government.

Despite a broad and long-standing international consensus that space should be used for peaceful purposes only, the Bush administration openly affirms that "space dominance" is a part of its war-fighting strategy, while resisting any international efforts to control space weapons. US plans and actions in recent years have included a long list of threatening developments:

- pushing aside the major obstacle to the space-weapons and missile defence by withdrawing from (and thus nullifying) the Anti-Ballistic Missile Treaty in June 2002
- accelerating research and development on ballistic missile defence (BMD) systems, including work on plans for a constellation of orbiting kinetic kill vehicles designed to knock out enemy ICBMs in their boost phase (similar to the previous plan called "Brilliant Pebbles")<sup>1</sup>
- testing of laser weapons (though not yet placed in space), in accordance with a plan to deploy at least 20 of them in outer space. While the old Star Wars concept for an H-bomb-fuelled X-ray laser in space is dead, the space-based laser program continues in various forms.
- shooting a 2-metre wide laser beam at a satellite using the earth-based laser named MIRACL (Mid-InfraRed Advanced Chemical Laser), in order to test whether the beam could disable the electronics of the dying US satellite. MIRACL is the "designated emergency ASAT [anti-satellite] weapon."<sup>2</sup>
- the convergence of the previously declared goal of "full-spectrum dominance" (including space) and Bush's more recent policy of "pre-emptive defence" which has added an element of unpredictability to international affairs

- continuing large expenditures on national missile defence (totalling more than \$70 billion since Reagan's 1983 Star Wars proposal) in which space-weapons enthusiasts are calling for a return on the "investment."
- the suggestion by Secretary of Defence Donald Rumsfeld, among others, that nuclear warheads could be used on interceptors for missile-defence.
- circular arguments on the need to put weapons in space because of the inevitability of such action. Secretary of Defence Rumsfeld states, "we know from history that every medium -- air, land, and sea -- has seen conflict. Reality indicates that space will be no different."
- the US goal, stated in the 2001 Quadrennial Defense Review (QDR), "not only to ensure US ability to exploit space for military purposes, but also as required to deny an adversary's ability to do so."<sup>3</sup>
- a warning, absurd as it is, that the US is vulnerable to a "space Pearl Harbour", made by the Commission to Assess United States National Security Space Management and Organization chaired by Donald Rumsfeld (prior to his appointment as Secretary of Defense).<sup>4</sup>
- continued support within conservative ranks for national missile defence and a deployment of a system to justify, if not vindicate, Ronald Reagan's 1983 "Star Wars" proposal.

What can be done? To find ways to counter this threat, the Forum was organized. The panelists and participants described a great many suggestions, many of which are described in this report.

### **Procedure of the Meeting**

The annual joint forum of the Canadian Pugwash Group and Science for Peace was held at Hart House, University of Toronto, on 22 March 2003. The co-chairs, Senator Douglas Roche and Professor Paul Hamel, welcomed the presence of the Secretary-General of International Pugwash, Paulo Cotta-Ramusino and the Executive Director, Jeffrey Boutwell. The Department of Foreign Affairs and International Trade Canada (DFAIT) was represented by Mr. Bob Lawson, whose knowledgeable presence was welcomed in its own right, as well as seen as a means to provide NGO input to the government.

The three invited speakers were: Loring Wirbel of the Global Network Against Weapons and Nuclear Power in Space, as well as Citizens for Peace in Space; Sarah Estabrooks of Project Ploughshares; and Bob Lawson of DFAIT. Wirbel painted an alarming picture of the US plans and activities to weaponize space and give the long history of US initiatives for "space dominance." Estabrooks provided an overview of many proposals for space weapons control. Lawson described DFAIT's current efforts and future possibilities on this subject. There followed an open discussion, with questions and comments about the speeches and on the issues in general.

## The Speakers

Loring Wirbel, board member of the Global Network Against Weapons and Nuclear Power in Space, described how US space-based military hardware was already well integrated into the US war-fighting capability (including forces deployed to Iraq). For instance satellites have major roles in the areas of communications, surveillance, broadcasting and positioning. In the course of history, it can be shown that certain space systems have positive, stabilizing effects, such as surveillance satellites for national technical means (NTM) of verification. For instance, spy satellites were used for verification of the SALT treaties, and were instrumental in disproving the alleged missile gap the late 1950s and 1960s. Still, with the brash unilateralism of the current US administration, there is the potential for a dramatic escalation in the militarization of space. So far, weapons have not yet been launched into earth orbit, but this could come. Efforts should be made to prevent the "weaponization" of space, as opposed to its "militarization" (which has already occurred). There is the danger of "technological creep" as advances in science and technology outpace rational controls. As well, some projects are ideologically pushed, even when the science to back them up is lacking. Furthermore, ballistic missile defence (BMD), space intelligence and space war-fighting are difficult, if not impossible, issues to disentangle. The new emphasis on pre-emption reinforces a long-standing US position that it should be the "sole decision-making power when other nation's space capacity could threaten US."

Opposition to space weapons is, fortunately, to be found within the US as well as in the international community. Wirbel advocated the isolation of the United States among its traditional allies, especially in NATO. He said that Canada should withdraw from NORAD, given that there is no longer the Soviet menace that had motivated its creation. He expressed his concern that Canada would have no say in the new NORCOM (Northern Command) that would take upon itself the responsibility of "protecting" North America. He advocated a strong and independent Canadian voice on space arms control.

Bob Lawson, senior policy adviser in the Non-Proliferation and Disarmament Division of DFAIT, described Canada as a space-faring nation. It was the first country to place a commercial satellite into geostationary orbit. It currently has large investments in communications and remote sensing technologies, and leads the world in certain areas. Space is recognized as a "centre of gravity" for national transportation and the environment.

Canada has also recognized that space is vulnerable. Prime Minister Pierre Trudeau spoke in favour of a treaty to prohibit the development and deployment of space weapons. Unfortunately, in recent years the efforts to achieve this end have foundered. The consensus-based Conference on Disarmament was unable to agree on the establishment of an ad hoc committee to discuss the matter. There remain problems even with the accepted definition of space weapons. While China, Russia and Canada had pushed for a space weapons treaty, the US has resisted even holding discussions about it.

In addition, there is a resurfacing of the old Star Wars concepts for a space-based national missile defence (NMD). This includes revived proposals for kinetic kill weapons (similar to the previous scheme "Brilliant Pebbles") and ongoing work on laser technology (but which is still decades from maturity). Despite RAND Corp.'s technical

arguments not to place kinetic and laser weapons in space, the US administration has been developing plans to do so anyways.

Lawson described the broader concerns that the US might break normative barriers on space weapons, given that the Bush administration has taken an aggressive stance in other areas of international affairs and has considered multilateral constraints an inconvenience that could be readily ignored.

Given this intransigence on arms control, Canada was looking at new ways to tackle the problem of space weapons. It was considering the possibility of moving the issue from the Conference on Disarmament (CD) to an independent conference. Although not exactly the same, there are *some* lessons that could be applied from the "Ottawa process" that resulted in the treaty to ban on anti-personnel mines.

Lawson said that it was necessary, at this stage, to create a broader "movement" for a ban on space weapons, analogous to the one that had so effectively advocated a landmines ban. This was essential before it would be possible to repeat the "18 month dash to glory" of the Ottawa landmines process in 1996-97. There was a need for thorough research, field studies, science-intensive studies and an international network. In the landmines campaign, organizations such as the ICRC had supplied excellent research and publicity on the threat to civilians, and on how landmines impacted on diverse communities, human rights, and humanitarian law.

There were some promising beginnings in the space field. As there was support from Senator Leahy on a landmines ban, so too there are US politicians willing to work for a space-weapons ban. It should be possible to reach out to space industry and other space stakeholders who have a vital interest in keeping space peaceful. The indicators of space debris (models giving a 5% increase per year) are alarming and anti-satellite testing would likely cause huge increases. In addition, the US military recognizes that the costs to protect ("harden") satellites are very large, indeed. They also recognize that the countermeasures could be effective (also cost-effective) and easy to deploy. Ground links, as well as space-based assets, are vulnerable to attack. The number of available and desirable orbital swaths is diminishing and any explosions in space could cause havoc for satellite users. Space enthusiasts, who support civil space programs could see the advantages of preserving space for peaceful exploration alone. Even the small debris, such a paint fleck that had penetrated deep into the window of the Space Shuttle Challenger, can cause a potential threat the safety of space travellers, such as of Sally Ride and other members of the crew in 1993.

Unfortunately, the coalition required for an international, multidimensional campaign does not yet exist. The Canadian government needs help on the space weapons and missile defence issues. It needs to hear from both experts and ordinary citizens of their concerns. Then the political decision making process can be galvanized to the goal. The citizens of the world have to be clear about the normative line that might be crossed by the US if it goes ahead with its space plans. Only then can we be successful in a effort to prevent the weaponization of space.

Sarah Estabrooks, Program Associate at Project Ploughshares, examined suggestions by governments and NGOs to prevent the weaponization of space. She reviewed the progress made with the 1967 Outer Space Treaty (OST), the 1963 Partial Test Ban Treaty, the Moon Treaty, Astronaut Safety Treaty, Liability Convention, etc., but noted

that a treaty to ban the placement of all weapons in outer space had not yet been developed. The CD had tried to have focused discussions on the issue of "preventing an arms race in outer space" (PAROS) but disagreement, especially between the US and other countries such as China, had held up the process. Despite the efforts of Ambassador Celso Amorim (Brazil) in 2001 to create an ad hoc committee on PAROS, the stalemate was not broken. It was now hoped that an incremental approach would address threats to peaceful space activity until a comprehensive weapons ban could be achieved.

Estabrooks spoke about NGO efforts to inform governments on space weapons issues, such as the recent conference by Project Ploughshares/UNIDIR/Simons Centre for Peace and Disarmament Studies conference that examined the current civilian and military uses of space, highlighting the great setback that would occur if the norm of no weapons in space. Another NGO initiative in the US has seen Congressman Dennis Kucinich (D-Ohio) introduce the Space Preservation Act of 2002, as a companion to the Space Preservation Treaty, which would prohibit the placement of weapons in space. (Although the bill is unlikely to be adopted by the Congress, it was valuable as a consciousness-raising effort.)

Arms controllers have to continually emphasize that space is one of the shared commons of humanity. They also have to prevent the blurring of the norm of no weapons in space through activities that might be considered borderline. Estabrooks described many of the proposed approaches for space arms control (reviewed below in connection with the discussion). She pointed out that these approaches were, for the most part, complementary and not exclusive.

## **Discussion**

In addition to discussing specific proposals (listed below), participants raised other issues, such as the desirability of having space industries on-side with arms control efforts, much as they were for chemical weapons control (where the US Chemical Manufacturers Association took a lead). Concerns were raised that commercial aerospace industries are heavily dependent on the US military for funding, though they are trying to find other sources. One participant said that US domestic courts ought to be used to put a halt to many US space weapon activities, given the international treaties that were violated in spirit if not in letter. Another participant lamented that the "space [arms] race had robbed people" by investing money unnecessarily in space when the needs on the earth were so great. Vital resources are needed to deal with real threats such as environmental degradation (e.g, deforestation and desertification) and the health of humanity. Several participants spoke of the need for more peace education, more knowledge and wisdom regarding the dangers of space weapons and on the necessity of inculcating a culture for peace.

On the ABM treaty, participants sadly noted the US assumption that once the ABM norm was broken, there would be no outcry. This was a fault of the international community, as well as of NGOs who have not continually criticized the US for its abrogation, a decision that affects the security of the world. Many participants expressed regret that Canada was not more outspoken on the US plans to develop a national missile defence program.

There was considerable interest in the possibility of an Ottawa process for space weapons, in the pattern of the Landmines Treaty negotiations. The similarities and differences, the pros and cons were discussed. The Ottawa process was generally seen as a good option given the deadlock that has occurred in the consensus-based CD.

The forum also heard alarming scientific reports about the potential threat to life of accumulated space debris, not only from new debris but also from the collision of existing objects. As "space junk" becomes finer and finer through collision and break-up, there is the possibility of the generation of a lethal "halo of debris" around the Earth. This could not only make space travel hazardous but it could even block sunlight and affect life on earth.

### **Proposals and actions**

The following proposals were made in the forum.

#### *Proposals relating to the Outer Space Treaty (OST):*

- Invoke Article 9 of the Outer Space Treaty to hold **consultations** on US activities that could "cause potentially harmful interference with activities in the peaceful exploration and use of outer space." The US could also be reminded of Article 7, which holds space-faring nations **liable** for damages they cause.

- Hold an **amendment** conference of the OST, possibly to broaden the list of prohibitions from weapons of mass destruction to **all** weapons in space. Even if the US prevents the adoption of such amendments, the holding of the conference will be a significant political signal. Lessons could be learned from experience with the 1991 Amendment Conference for the Partial Nuclear Test Ban Treaty to make it a Comprehensive Nuclear Test Ban Treaty.

- At the very least, convoke a **meeting** of parties of the Outer Space Treaty to discuss (and criticize) US plans.

- Agree on an OST **interpretation** that would extend the definition of weapons of mass destruction to include the high-power weapons being developed and tested by the United States.

- Create a **protocol** to the OST what would allow forward-minded nations to lead the way in space arms control.

- Create more **transparency and verification** measures for the treaty, so that space activities must be demonstrated to be in accordance with the treaty

- Nations should point out that US weapons programmes are **contrary** to the spirit, if not the letter of the OST, which provides that the "use of outer space ... shall be carried out for the benefit and in the interests of all countries."

- Nations could call for an **Advisory Opinion** from the International Court of Justice on specific US activities in space in relation to the OST obligations (similar to the advisory opinion on nuclear weapons).

#### *Registry Convention:*

- Demand more **specific** (and accurate) **information** from contributors to the UN registry of space launches. This would include more details of the objects sent into space

so that precise purposes and descriptions of hardware are clear (e.g., and useful for spotting weapons delivery).

- More ambitiously, set up a **monitoring** and/or **verification** system to check the information governments supply to the UN.
- Require that notifications be made **pre-launch**, with confirmation to follow.
- **Analyse** the registration data and spot errors and omissions, as is being done by some NGOs.<sup>5</sup>

#### *Developing a new treaty:*

- Continue to advocate multilateral negotiations to develop a space treaty by creating an **Ad Hoc Committee on Outer Space** at the Conference on Disarmament. If not in the CD, then create it by the General Assembly or another forum.
- NGOs could develop **draft conventions**, that could be used as models during negotiations for an agreed treaty.

#### *Ballistic Missile Defence:*

- Some researchers had advocated compromise on the BMD issue, accepting that the US could deploy some measures of ground-based systems but not space-based ones.
- Develop a multilateral agreement to prohibit interference with peaceful **assets in orbit**, a treaty that might be appealing to many in the US, whose reliance on space is the greatest.

#### *Dealing with space debris:*

- Create a space **debris management regime** that would prohibit weapons testing in space that would increase debris. Space debris is a recognized threat to satellites and space travel that all nations, especially the US, should seek to avoid.
- Request that more **information** on debris tracking (e.g., gained by NORAD) be made available publicly.

#### *US domestic legal action*

- With a US administration that fears law suits in domestic courts, remind government officials that, under the OST and the Liability Convention of 1972, nations are **liable** for damage to the property of another treaty party. Given the danger of fast orbiting debris, a weapons test may have unintended consequences months or years "down the road".

#### *Bilateral schemes with US:*

- In parallel with the multilateral (UN/CD) approach, there could be another track, involving regulatory agreements in the form of **executive agreements** between national authorities (space agencies) to avoid lengthy treaty negotiations and ratification. Especially nations cooperating with the US on peaceful projects could request such agreements so that peaceful uses would be completely separate from weapons programs (much as Canada requests that fuel processed in Canada not be used for nuclear weapons in the US).
- Continually point out the **unrealism** (scare-mongering) of a "Space Pearl Harbour"
- Relentlessly argue that US plans to develop space weapons are **self-defeating**, as the US is the nation most dependent on peace in space.

- Praise and support the US for its continuation of a **moratorium** on anti-satellite weapons

*General/miscellaneous:*

- Highlight the weaponization of space as a **threat** to use of force, in contravention of the UN Charter. Given the proximity of such weapons system to earth this could be considered a grave and perhaps imminent threat.
- Stigmatize the practice of placing weapons in space as an **offence** against humanity's sense of its shared commons.

*Canada specific proposals:*

- Declare Canada's **non-participation** in national missile defence, even if it is renamed ballistic missile defence (BMD) that employs space-weapons. The Canadian government, under a Conservative Prime Minister, declined the US invitation to participate in Ronald Reagan's Star Wars programme. Current and future Canadian governments should do the same for current and future US projects. The present "fence-sitting" will weaken the moral argument when later it comes time to declare opposition to actual deployment.

- Declare **non-participation** in any space weapons programs of any kind.
- Resist the **blurring** by the US administration of ballistic, theatre and national missile defences. Canada must consciously and constantly be aware of the strong link between national missile defence and the introduction of weapons into space.
- Develop a **declaration** with like-minded states on non-weaponization
- Support scientific **expertise** in arms control in space.
- Move forward with a **PAXSAT** system for monitoring weapons in space.
- Pursue options for an **Ottawa process** for the ban of weapons in Space.
- Restart DFAIT's Verification **Research** programme, to include research on space issues.
- The "Foreign Policy **Dialogue**" should include space weapons issues.

*Comments on the United States*

The central dilemma of arms control in space is how to proceed when the most important nation will not cooperate. In the landmines initiative, it was valuable to have many countries sign the Convention, so as to make a significant contribution to landmines control in the world. In space weapons, by contrast, the US was by far the largest offender. Still, the moral value of a widely-adopted convention was highlighted. Though the US has not ratified the Comprehensive Test Ban Treaty, it still complied with it. The CTBT creates an impediment to resumed nuclear testing. So also a Space Weapons Convention would greatly strengthen the norm of non-weaponization and significantly influence US behaviour. Smaller steps, such as immediate national declarations on non-weaponization and non-participation, would also have a positive effect.

Finally, some encouraging signs and thoughts:



- the final decisions have not yet been made to go ahead with testing and deployment of space weapons;
- if the US government boycotts an arms control process and refuses to sign any Treaty, it would have to deal with the resulting public relations problem;
- the current administration might soon be replaced by a more arms control friendly one;
- the US has shown leadership in arms control in the past (in fact, it was President Eisenhower who first proposed in 1958 to preserve the use of space for exclusively peaceful purposes). A return to leadership in the near future is not impossible;
- there are many battles going on in Washington (such as funding for various military projects, decisions on homeland (ground) security, as well as turf wars between the services) which affect the decisions on expensive space weaponry;
- above all, the US has the most to gain from space arms control and the most to lose from accidents, countermeasures and an arms race in outer space, since it depends the most on space.

## Conclusions

There are no easy solutions to the challenge of engaging the US government in space arms control but there are many possible initiatives. The above list shows that many can be considered, some tested and a several could possibly achieve the goal. There is no room for complacency.

There is a strong international will to prevent the weaponization of outer space. The participants were encouraged to learn of the strong commitment from Canada to attain this goal and of its desire to find willing partners in civil society, as well as like-minded nations. Canadian partnership and leadership on this question would be welcomed not only by Canadian civil society but by virtually the rest of the world. As civil society traditionally plays the role of pushing governments to action, the Canadian Pugwash Group and Science for Peace are happy to do their part. The organizations seek pro-active Canadian involvement in the cause of peace.

The groups welcomed the new civil society activism in Canada on the space weapons issue and applauded the creation by some its members of a new Canadian campaign under the banner of "No Weapons in Space!". NOWIS in Canada has already received a substantial grant from a US foundation, hired a full-time organizer, opened offices in Toronto and Vancouver, and partnered with the Institute for Cooperation in Space (ICIS) in the US<sup>6</sup>.

No doubt, a combination of approaches, organizations, governmental and civil society initiatives, will be required to achieve a space weapons ban. It will be necessary to continue multilateral negotiations, elevate public awareness of the dangers of space weapons, engage commercial, industrial, and scientific actors, and to work together in partnership in a campaign.

The issue of weapons in space challenges us to ask basic questions about our relationship with nature and our position in the physical universe. If we, collectively, as a human race decide to prevent this dangerous military step, then we will have a celestial

reward. Humanity may claim back the night sky so that future generations can continue to marvel at it, just as human beings have done for millennia.

W. Dorn, 31 May 2003

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*ENDNOTES*

<sup>1</sup> See Theresa Hitchens, "US Space Policy: Time to Stop and Think", Disarmament Diplomacy Issue No. 67, October-November 2002, found at <http://www.acronym.org.uk/dd/dd67/67op2.htm>.

<sup>2</sup> Sami Fournier, " U.S. Test-Fires 'MIRACL' at Satellite Reigniting ASAT Weapons Debate ", Arms Control Today, October 1997, found at [http://www.armscontrol.org/act/1997\\_10/miraclact.asp](http://www.armscontrol.org/act/1997_10/miraclact.asp).

<sup>3</sup> quoted in Hitchens, op. cit., 2002. The QDR is available at [www.defenselink.mil/pubs/qdr2001.pdf](http://www.defenselink.mil/pubs/qdr2001.pdf).

<sup>4</sup> Report of the Commission to Assess United States National Security Space Management and Organization, January 2001, available at <http://www.defenselink.mil/pubs/space20010111.html>.

<sup>5</sup> a start has been made by Jonathan McDowelsee, see "The United Nations Registry of Space Objects", found at [http://hea-www.harvard.edu/QEDT/jcm/space/un/un\\_desc.html](http://hea-www.harvard.edu/QEDT/jcm/space/un/un_desc.html).

<sup>6</sup> Information on NOWIS (Canada) can be found at <http://www.nowis.org>. The US equivalent (NWIS) web site is <http://www.no-weapons-in-space.org>. The ICIS web site is found at <http://www.peaceinspace.com>.