ESPI
European Space Policy Institute

ESPI PERSPECTIVES 33

Ottawa in Space? – Reversing the Burden of Proof Regarding Space Weapons

Max M. MUTSCHLER, University of Tübingen, Visiting Researcher at ESPI

In order to provide new impetus to the debate concerning the prevention of an arms race in space, EU member states agreed upon a "Draft Code of Conduct For Outer Space Activities", whose goal is to set some rules for the responsible use of outer space. While such a Code of Conduct has its merits as a pragmatic first step towards a better regulation of space, it cannot substitute for an international treaty banning the use, deployment, testing, and development of space weapons. In order to arrive at such a treaty, "a space version of the Ottawa process" was proposed. This refers to the process that culminated in the signing of a ban on anti-personnel land mines in 1997 in the city of Ottawa which was preceded by a large anti-mine campaign by a coalition of civil society organizations. This paper argues that while the model of the "Ottawa process" cannot be transferred to the case of space weapons, important lessons can be learned from it. States and non-state actors interested in the banning of space weapons should work together and further the development of scientific evidence that questions the utility of space weapons in order to reverse the burden of proof from the opponents to the proponents of space weapons.

1. The Debate about the Weaponization of Space

Since the early phase of the space age mankind has begun to use space for military purposes. During the Cold War, the militaries of both superpowers began to make use of satellite technology for reconnaissance, communication, and navigation, among other purposes. Other states followed and today, space applications are essential to contemporary war fighting. However, while space is utilised to amplify the impact of weapons used on earth, it is not weaponized itself. This means, no fully developed technology is deployed on a large scale to project force from space to space, earth to space, or space to earth.[1] The debate on such "space weapons" is not new. Starting already in the 1960s, the U.S. as well as the Soviet Union developed and tested weapons for anti-satellite (ASAT) purpose. Despite the failure of bilateral talks on ASAT arms control, there was a tacit agreement that neither side had the intention to start an arms race in space by pressing ahead with the development of space weapons. That tacit agreement came under pressure with the plans of the Reagan administration for the Strategic Defense Initiative (SDI) that included plans to place interceptors with an anti-ballistic missile capability into space. However, resistance from U.S. Congress brought these plans to a stop and the end of the Cold War made an arms race in space seem like a rather remote scenario.

In recent years however, there have been some alarming developments. The U.S. is increasingly taking leave of the concept of space as a zone free of weapons. In various official documents, space is conceived as a medium that needs to be controlled in order to ensure one's own freedom in space and, if necessary, denying an adversary that freedom; a view that is referred to as "space control". This perspective gained momentum with the Bush administration taking office in 2001. From its dependence upon space capabilities, the U.S. concluded that it must have the capabilities for space control.[2] Within the U.S.,

[1] Webb, Dave. "Space Weapons: Dream, Nightmare, or Reality?" Securing Outer Space. Eds. Natalie Bormann and Michael Sheehan. London: Routledge, 2009.

[2] "Vision for 2020". United States Air Force Space Command 1997. Federation of American Scientists 5 May 2010 http://www.fas.org/spp/military/docops/usspac/visbook.pdf

some proponents of space weapons even intend to go a step further and recommend the use of space weapons to apply force towards terrestrial targets. They see space as the ultimate "high-ground" that provides the decisive advantage to prevail in a military conflict on earth. Proposals have been made, for example, to develop a space-based strike system with rods of heavy metal deployed in orbit that would be hurled earthwards at extremely high speed, creating an impact equivalent to a small nuclear weapon.[3] Another proposal that has its origins in the SDI plans of the 1980s is the idea of making use of space-based lasers for the purpose of missile defence.[4]

It is important to note that these last ideas are visions and not yet reality. However, it has not come as a surprise that other space powers such as Russia and China have not been very pleased by these proclamations and have voiced their fears that the U.S. might trigger an arms race in space. Unsettling developments are not confined to doctrinal development and some verbal sabre rattling. In January 2007, China used a ground-launched missile that successfully destroyed one of its old weather-satellites. This ASAT test was interpreted by some experts as an attempt to demonstrate the Chinese capability to counter U.S. space dominance.[5] The U.S. for its part shot down a proprietary spy satellite in 2008, using a modified version of its Aegis-LEAP system, originally developed for missile defence. The U.S., in contrast to China, announced this action and justified it with the threats that the out-of-control satellite might pose. Nevertheless, the two events show that work on the development of weapons that can project force into space is progressing. And this trend is probably not restricted to the established space powers. Just recently, in January 2010, the Director-General of India's Defence Research and Development Organization announced that India is working on an exoatmospheric kill vehicle that could be used to attack satellites in Low Earth Orbit (LEO).[6] These developments show that the danger of an arms race in space is a possible future scenario.

Negotiations on the prevention of an arms race in outer space need new impetus.

There is no international arms control agreement that bans the deployment, let alone the testing or development of space weapons and negotiations on such an agreement are stalled. The Outer Space Treaty (OST) of 1967 bans the deployment of weapons of mass destruction in space but not the deployment of conventional weapons. Already in the early 1980s, the Conference on Disarmament (CD) in Geneva discussed the issue of the prevention of an arms race in outer space (PAROS). A large majority of states in the CD would like to see the legal standards of the OST amended to include a ban on conventional space weapons. Among the latest initiatives, there has been a proposal from China and Russia for a Treaty that would ban the placement of weapons in space.[7] This approach found clear opposition from the U.S. which held the opinion that there is no danger of an arms race in space. Certainly, the fact that the Russian/Chinese proposal would not ban the testing and deployment of earth-based ASATs and that it avoids concrete suggestions for verification procedures does not cast a positive light on the intentions of both states. In any event, due to consensus decision-making and strongly varying preferences of the states regarding the agenda of the CD, this forum is stuck in quarrels over its work program.[8]

2. The EU Draft Code of Conduct

Is the European Union willing and able to provide new impetus to the debate on the prevention of an arms race in space? The EU has taken a different approach to both the U.S. position that there is no danger of an arms race and the Chinese-Russian approach that a legally binding treaty should have priority. The

"Counterspace Operations. Air Force Doctrinal Document 2-2.1" 2004. USAF 5 May 2010 http://www.dtic.mil/doctrine/jel/service_pubs/afdd2_2_1.pdf
"U.S. National Space Policy" 2006. Federation of American Scientists 5 May 2010 http://www.fas.org/irp/offdocs/nspd/space.pdf

3 "The U.S. Air Force Transformation Flight Plan". 2003. USAF 5 May 2010 http://www.au.af.mil/au/awc/awcgate/af/af_trans_flightplan_nov03.pdf
Preston, Bob et al. Space Weapons, Earth Wars. Santa Monica, CA: RAND, 2003.

4 Ibid.

5 Webb, Dave. "Space Weapons: Dream, Nightmare, or Reality?" Securing Outer Space. Eds. Natalie Bormann and Michael Sheehan. London: Routledge, 2009.

6 "India Developing Means to Destroy Satellites." Space News 11 Jan. 2010: 9.

7 United Nations Conference on Disarmament. Draft "Treaty on Prevention of the Placement of Weapons in Outer Space and of the Threat or Use of Force Against Outer Space Objects (PPWT)" Introduced by the Russian Federation and China. CD/1839 of 29 Feb. 2008. Geneva: United Nations.

8 For a detailed discussion of the work in the CD on PAROS see: Wolter, Detlev. "Common Security in Outer Space and International Law". Geneva: UNIDIR, 2006.

EU has proposed a Draft Code of Conduct For Outer Space Activities[9] (hereafter referred to as the EU Draft CoC). A code of conduct is not legally binding. States that agree to it voluntarily commit themselves to certain rules of the road. The EU Draft CoC lays down general principles such as the freedom of access to outer space, its exploration and use; the right of self-defence but also the responsibility of states to prevent space from becoming an area of conflict. From the viewpoint of this paper, the centrepiece of the EU Draft CoC is the obligation for states to "[…] refrain from any intentional action which will or might bring about, directly or indirectly, the damage or destruction of outer space objects […]" (4.2). In addition, the EU Draft CoC suggests particular measures on space debris control and mitigation, the notification of outer space activities, the registration of space objects, information sharing on space activities, and consultation. Further, the EU Draft CoC suggests biennial meetings of subscribing states, as well as the establishment of a central point of contact and an outer space activities database.[10]

An appraisal of the EU Draft CoC produces a mixed result. On one hand, it is easier to agree upon a voluntary commitment than upon a legally binding treaty since the consequences of breaking it are less severe for a state's reputation. In addition and maybe even more important, by confining itself to set standards of good behaviour in space, this approach avoids lengthy debates about definitions. It would be a central obstacle to any negotiation of a legally binding, comprehensive treaty to agree on a definition of "space weapon". Possibly the biggest plus of the EU Draft CoC is the prospect that in light of the new U.S. administration under President Obama, such an approach might now be acceptable to the United States.[11] On the other hand, the soft law character of the EU Draft CoC can be seen as a major shortcoming. A legally binding treaty would signal a much stronger commitment and would build more confidence among the parties to the treaty. In addition, an international treaty would present a higher barrier to the erosion of the central norms. Besides, the EU Draft CoC has some shortcomings with regard to its content, too. While it proscribes the intentional damaging of space objects, it does not restrict the development of the means to do so (although the measures on space debris control and mitigation would restrict certain ASAT tests – namely those generating long-lived space debris). Such a non-preventive approach would not stop the development of space weapons. In a potential future crisis, the technology would be available and could be used (violating "only" a voluntary commitment, not an international treaty).

The EU Draft CoC should be seen as a first step in a process that leads towards a comprehensive and legally binding treaty banning space weapons.

The pragmatic approach of the EU Draft CoC makes it a suitable starting point for discussion with other space-faring nations but the shortcomings mentioned here present a case for further considerations that go beyond the EU Draft CoC towards a comprehensive and legally binding treaty. The question is: How should such a process look like? The long-term process could be separated into a civilian and a military element. The civilian part could culminate in the establishment of a comprehensive space traffic management (STM), providing amongst other things a set of rules of the road that would increase space safety.[12] The military part would focus on reaching consensus on a legally binding ban of the use and development of space weapons in order to increase space security. The remainder of this paper focuses on the second, the "security" related part of such a long-term process.

3. Ottawa in Space?

In 2001, Rebecca Johnson from the Acronym Institute for Disarmament Diplomacy called for a treaty that would ban the deployment and use of all kinds of weapons in space, as well as the testing, deployment and use of ASAT weapons (whether earth-based or space-based). Similar proposals have been made before; the innovative part was that she proposed "a

[9] The Draft Code of Conduct was approved by the Council of the European Union in December 2008.

[10] For a more detailed discussion of the content, as well as the history of the EU Draft CoC see: Rathgeber, Wolfgang, Nina-Louisa Remuss and Kai-Uwe Schrogl. "Space Security and the European Code of Conduct for Outer Space Activities". UNIDIR Disarmament Forum, 10.4 (2009): 33-42.

[11] Black, Samuel. "Next Steps on a Code of Conduct for Responsible Space-Faring Nations". ESPI Perspectives 32 (2010). 1 June 2010 http://www.espi.or.at/images/stories/dokumente/Perspectives/espi%20perspectives_32.pdf

[12] For the original study on STM see Contant-Jorgenson, Corinne, Petr Lála and Kai-Uwe Schrogl, eds. "Cosmic Study on Space Traffic Management". Paris: International Academy of Astronautics (IAA), 2006.

space-focussed 'Ottawa process'"[13] as a means of arriving at such a treaty. The term "Ottawa process" refers to the developments during the 1990s that led to a comprehensive treaty banning anti-personnel land mines. It was signed in December 1997 in Ottawa.[14] This process was accompanied and driven by a large number of civil society organizations that actively promoted a ban on anti-personnel land mines. They convinced a group of pro-ban states to push for and finally agree on a ban outside of the designated negotiation forum at which no consensus could be found.[15]

The proposal of "Ottawa in Space" found the support of Lloyd Axworthy, who in his former position as Foreign Minister of Canada (1996-2000) provided crucial leadership in the Ottawa process. In 2002, he called for "a space version of the Ottawa process".[16] He admits that a complete reproduction of the Ottawa process is not possible. In particular, the role of the U.S. regarding space is different from that regarding landmines. Nonetheless Axworthy sees "Ottawa" as a role model for space inasmuch as the mobilization of developing countries and civil society would be a crucial factor in the success of the efforts to improve space security. "A treaty prohibiting space weaponization […] would have to be the consequence of global mobilization."[17] Because of the special role of the U.S. in space, it would be important to gather support of commercial actors from the U.S. as well. In order to get the support of those groups (developing countries, international civil society, and commercial actors), Axworthy suggests to link outer space and sustainable development, raising awareness of the benefits from space that are endangered by a weaponization of space.

Johnson and Axworthy are correct regarding their call for more awareness of the issue and the necessity for a stronger mobilization. These were relevant factors in the success of the Ottawa process. As shown in section 1 of this paper, negotiations on the prevention of an arms race in outer space need additional momentum. However, there are considerable differences between the case of anti-personnel land mines and space weapons. In the Ottawa process, the International Campaign to Ban Landmines (ICBL) successfully framed anti-personnel landmines as a humanitarian disaster; as weapons that violate the well established principles of humanitarian international law: Anti-personnel landmines do not discriminate between combatants and civilians and they cause unnecessary suffering.[18] It was this persuasive, easy to grasp argument, supported by moving pictures of the victims of anti-personnel landmines, that enabled the huge civil-society mobilization. A similar framing process is hardly possible in the case of space weapons. Presenting the placement of weapons in space as a threat to sustainable development or as a violation of central principle of the OST has its merits.[19] But it will probably not generate a similar level of mobilization as the anti-humanitarian framing of landmines produced in the Ottawa process.[20]

We cannot simply transfer the model of the Ottawa process to the case of space weapons, but we can learn some lessons.

There are two important lessons to be learned from the Ottawa process. The first lesson is of primary concern to the community of civil society organizations and think tanks working in the field of space policy whereas the second lesson is of relevance to both state and non-state actors. The first lesson is that if you want to achieve a ban on certain weapons, it is important to question the military utility of the weapons in order to reverse the burden of proof to weapon proponents. Challenging the military utility of landmines was an important factor to the success of the Ottawa process. The

13 Johnson, Rebecca. "Multilateral Approaches to Preventing the Weaponization of Space". UNIDIR Disarmament Diplomacy, 56 (April 2001).

14 The "Ottawa Treaty" is formally known as the "Convention on the Prohibition of the Use, Stockpiling, Production and Transfer of Anti-Personnel Mines and on their Destruction". 156 states are party to the treaty. The U.S. is not party to it. However, it imposed an export moratorium on anti-personnel landmines and announced that it would not use these mines outside of Korea.

15 In this case, the designated forum was the "Review Conference of the Convention on Certain Conventional Weapons".

16 Axworthy, Lloyed: "Prevention of an Arms Race in Outer Space". A Disarmament Agenda for the 21st Century. United Nations Office for Disarmament Affairs (UNODA) Occasional Paper No. 6 (2002): 104-126.

17 Ibid: 115.

18 Price, Richard. "Reversing the Gun Sights. Transnational Civil Society Targets Land Mines". International Organization 52.3 (1998): 613-644.

19 For the argument that the placement of weapons in space violates OST principles, see Wolter, Detlev. "Common Security in Outer Space and International Law". Geneva: UNIDIR, 2006.

20 One reason for this is that the principles of civilian discrimination and avoidance of unnecessary suffering are more "salient" to society than the – even literally – faraway concepts of sustainable and peaceful use of outer space. On the concept of "salience" in the process of framing and mobilization see: Benford, Robert D. and Snow, David A. "Framing Processes and Social Movements. An Overview and Assessment". Annual Review of Sociology 26.1 (2000): 611-639.

proponents of the mine ban did not want to be depicted as "dovish" peace activists, aiming at some noble tough unrealistic goal. Instead they took on the arguments of those who portrayed anti-personnel landmines as essential for national security and presented evidence that showed that mines were far from being as useful as assumed. The International Committee of the Red Cross (ICRC) played a leading role here when it commissioned a study on the "Military Use and Effectiveness of Anti-personnel Mines".[21] With such activities, ban supporters were successful in reversing the burden of proof from the opponents to the proponents of the weapons - a task the weapon proponents could not stand up to.

The second lesson is that civil society organizations cannot do it alone. They need to coordinate among themselves and gather the support of a core-group of states. In 1992, six NGOs formed a steering group to coordinate the early activities of anti-landmine action and since 1993 those actions were organized under the umbrella of the ICBL. The ICBL supported campaigns worldwide and successfully lobbied governments as well as the media. By this means the campaign managed to get a group of states to support their ideas on a landmine ban. This support was crucial since it were finally the states that had to agree to a ban and when it became clear that no consensus could be reached within the traditional negotiation forum, the core-group of states was prepared to carry on with the process outside of that forum. In 1997, the ICBL and its coordinator Jody Williams were awarded the Nobel Peace Prize.

4. Reversing the Burden of Proof Regarding Space Weapons

These lessons are applicable to space. There are good arguments against the military utility of space weapons, based on a scientific discussion of the physical laws in space.[22] Space weapons are not very well suited for many of the tasks that are associated with the ideas of "controlling" space or using it as the new "high-ground". They are not good at protecting one's own satellites from attacks of various forms. An active defence against an attack by microsatellites or hit-to-kill ASATs would pose many technical problems such as the question of how to avoid fatal debris resulting from the intercept. Besides, the estimated costs of such weapons would be so high that it makes more sense to decrease dependency upon single satellites by developing redundancy, e.g. by holding back-up satellites ready or by applying terrestrial alternatives such as Unmanned Aerial Vehicles (UAVs). Such redundancy would have the additional effect of making a satellite a less attractive target. Those who conceive space as "high-ground" would need to argue against similar reasoning. Attacking ground targets from space is much less reliable and much more expensive than using terrestrial means to do so. For example, a ballistic missile can reach a target within 20 000 kilometers (halfway around the earth) in 45 minutes. To achieve the same global coverage of possible targets from space would require at least 48 satellites.[23] This means 48 launches instead of one and thus a tremendous difference regarding the costs.

It is possible to question the military utility of space weapons in order to reverse the burden of proof to their proponents.

Probably the strongest argument against the weaponization of space is the fact that countries that develop space weapons cannot expect to have a monopoly on such weapons. As was indicated in the first section of this paper, it is not necessary for states that feel the need to have the ability to attack objects in space to have the same level of technology as the U.S. Every space-faring nation has the inherent capability to develop ASATs. Even countries that only have short- or medium-range missiles can reach satellites in LEO. If they do not have the capacity to develop homing interceptors to hit the target directly, they could release clouds of pellets in the path of the target satellite. In addition, as the Chinese example has shown, the process of testing ASATs that make use of the kinetic hit-to-kill technology produces a considerable amount of space debris that endangers satellites in the respective orbits. The U.S., being the country whose military is most dependent upon its satellites for

[21] Price, Richard. "Reversing the Gun Sights. Transnational Civil Society Targets Land Mines". International Organization 52.3 (1998): 613-644.

[22] DeBlois, Bruce M., Richard L. Garwin, Scott R. Kemp and Jeremy C. Marwell. "Space Weapons. Crossing the U.S. Rubicon". International Security 29.2 (2004): 50-84. Wright, David, Laura Grego and Lisbeth Gronlund. "The Physics of Space Security. A Reference Manual". Cambridge, Mass.: American Academy of Arts and Sciences, 2005.

[23] Wright, David, Laura Grego and Lisbeth Gronlund. "The Physics of Space Security. A Reference Manual". Cambridge, Mass.: American Academy of Arts and Sciences, 2005.

communication, reconnaissance and navigation, has the most to lose from such a development.

In sum, weaponizing space is a very costly strategy that would be detrimental to the security interests of a country that seeks to benefit from its advantage in space. Alternative means to improve one's security are available. It would be essential to further develop and promote these arguments in order to make them more prominent in the discourse on the weaponization of space. A first step in doing so could be the establishment of a dialogue between civil society organizations and leading scientists in the field. The reference to the knowledge developed by such a dialogue could help the opponents of space weapons to not be denounced as "idealistic space doves". Instead a ban on space weapons could be presented as the responsible option, from the military point of view. This would reverse the burden of proof on the proponents of space weapons.

In addition, such a dialogue could be the first step in establishing an organizational platform for the coordination of the activities of civil society organizations in the field. Finally, states are in demand, too. As the Ottawa process has shown, their support will be crucial. With the Draft Code of Conduct, EU member states hinted at their preparedness to take a more active role in the debate. They might find support from Canada which promotes its own ideas on space security.[24] In order not to leave the initiative completely to Russia and China or to Canada, the Europeans should further develop and promote the EU Draft CoC.[25] However, if they want to overcome its shortcomings listed above, EU member states should be ready to work together with non-state actors and support or even initiate a process that seeks to reverse the burden of proof regarding the utility of space weapons.

[24] United Nations Conference on Disarmament. Working Paper "On the Merits of Certain Draft Transparency and Confidence-Building Measures and Treaty Proposals for Space Security" submitted by Canada. CD/1865 of 5 June 2009.

[25] For example: Black, Samuel. "Next Steps on a Code of Conduct for Responsible Space-Faring Nations". ESPI Perspectives 32 (2010). 1 June 2010 http://www.espi.or.at/images/stories/dokumente/Perspectives/espi%20perspectives_32.pdf

European Space Policy Institute

Palais Fanto
Schwarzenbergplatz 6

(Entrance: Zaunergasse 1-3)

A-1030 Vienna, Austria

Tel +43 1 718 1118 -0 / Fax -99

www.espi.or.at

The mission of the European Space Policy Institute (ESPI) is to provide decision-makers with an independent view and analysis on mid- to long-term issues relevant to the use of space.

Through its activities, ESPI contributes to facilitate the decision-making process, increases awareness of space technologies and applications with the user communities, opinion leaders and the public at large, and supports researchers and students in their space-related work.

To fulfill these objectives, the Institute supports a network of experts and centres of excellence working with ESPI in-house analysts.

ESPI Perspectives are short and concise thought or position papers prepared by ESPI staff as well as external researchers.

Available for free download from the ESPI website
www.espi.or.at