

Celebrating the Space Age

**50 Years of Space Technology,
40 Years of the Outer Space Treaty**

**Conference Report
2-3 April 2007**

CONFERENCE REPORT

INTRODUCTION

“Celebrating the Space Age: 50 Years of Space Technology, 40 Years of the Outer Space Treaty” is the latest in a series of annual conferences held by the United Nations Institute for Disarmament Research (UNIDIR) on the issue of space security, the peaceful uses of outer space and the prevention of an arms race in outer space (PAROS).

The purpose of this conference series is, in line with UNIDIR’s mandate, to promote informed participation by all states in disarmament efforts and to assist delegations to the Conference on Disarmament (CD) to prepare for possible substantive discussions under agenda item 3, PAROS. Since beginning in 2002, these conferences have received the financial and material support of a number of Member States, showing the broad political support for these discussions.

This year’s conference focused on three main issue areas:

- a historical overview of outer space diplomacy and possible future developments, including the Outer Space Treaty (OST) and PAROS within the CD;
- the status of and challenges to space security, including a discussion of approaches on how to improve space security; and
- the creation of an environment promoting space security through creative thinking and confidence-building measures.

The conference convened in Geneva on 2–3 April 2007, organized by UNIDIR, with the financial and material support of the Governments of Canada, the People’s Republic of China and the Russian Federation, and of the Secure World Foundation and The Simons Foundation. Representatives from UN Member States and Observers, from non-governmental organizations (NGOs) and civil society, as well as speakers from Canada, China, the Czech Republic, France, India, Russia, Sri Lanka, the United

Kingdom and the United States, brought the total number of conference participants to over 100.

Opening remarks were delivered by Sergei Ordzhonikidze, Director-General, United Nations Office at Geneva and Patricia Lewis, Director, UNIDIR.

The following is a summary report of the conference. The keynote speakers are identified along with summaries of their presentations. The Chatham House Rule applied in the ensuing discussions.

SESSION I

SPUTNIK, THE OUTER SPACE TREATY, TODAY: 1957, 1967, 2007

Sputnik and Russia's outer space activities Vladimir Putkov, Russian Space Agency

Activities in outer space are now part of everyday life. Space flight has contributed a number of extremely complex challenges to science and technology and thus has developed many new research methods. Russia was the pioneer in space exploration: on 4 October 1957 it was the first country in the world to place an artificial satellite into orbit—Sputnik I. The names of Konstantin E. Tsiolkovsky (founding father of theoretical astronautics), Sergey P. Korolev (chief designer of the first space launch vehicles) and Yuri A. Gagarin (the first man in outer space on 12 April 1961) are known the world over.

Beginning with a research programme of the upper atmospheric layers and outer space in the early 1960s, which included the first docking of spaceships of the two leading space nations, the Soviet Union and the United States in 1975, and continuing today with international crews aboard the international space station being commonplace, Russia remains one of the leading space nations.

Russia's continued expertise has been made possible through the effective development and utilization of its space potential, which includes a space system complex; a technological, industrial and experimental foundation; a system of specialist training; and branches of science and technology that ensure and support further exploration of outer space.

Following the rather negative trends in Russia's "space life" during the last decade, Russia today has stabilized its activities and is pressing forward. The years 2001–2005 have been critical in charting the future course of Russian astronautics, particularly vis-à-vis the development of Russia's space potential in terms of spacecraft and improvements in the quality of the Russian orbital groups used for scientific and socio-economic purposes.

The experience in space research and in the use of outer space accumulated by the space-faring nations is a valuable heritage of the world community. It is an asset that can solve global problems of sustainable development through better use of space assets. To address these problems, Russia stands ready to play its part in implementing global projects that include a unified space system to explore the Earth's natural resources and provide global monitoring of geophysical processes; international communication, broadcasting and retransmission systems; international integrated navigational systems; a system for forecasting and counteracting asteroid and comet threats; integrated systems for delivery of payloads to outer space; a project of building and operating an international space station for civil use; and fundamental space research with Moon and planet research sub-programmes.

Today outer space means are an indispensable component for the functioning of civilization and it is with this in mind that Russia sees an urgent need to solve the problems of the prevention of an arms race in outer space. Russia has put forward a series of initiatives aimed at preventing the weaponization of outer space, including a unilateral and unconditional statement at the First Committee of the Fifty-ninth United Nations General Assembly, whereby Russia would not be the first nation to place weapons of any kind in outer space.

Russia hopes that the approval of the international legal instrument proposed by China, Russia and other countries on the Prevention of the Placement of Weapons in Outer Space, the Threat or Use of Force Against Outer Space Objects will be the next benchmark towards a lasting solution to the problem of ensuring space security. Toward this end Russia has prepared a draft treaty which it intends to table in the CD.

Russia also takes note of the efforts aimed at mitigating the threat caused by space debris and sees a potential new stage in the development

of international space law to establish traffic rules and the use of space technologies in near-Earth outer space in the interest of space exploration.

For the sake of preserving civilization and its development, Russia sees an urgent need to avoid the weaponization of outer space and recognizes its own responsibility in this process.

The Outer Space Treaty—then and now

Sergey Batsanov, Director, Pugwash Conferences on Science and World Affairs, Geneva

The OST is and remains an outstanding and progressive treaty which laid the legal foundations for a wide range of activities in a new and limitless environment at a time when relatively little was known about it. The drafters of the treaty were able to foresee a number of things. The treaty addresses issues of general jurisdiction, states' responsibilities, addressing among other things issues of non-state participation in deliberations and states' responsibility in this regard. It also addresses regulation of economic activities, environmental law and liability for damage.

The OST embodies principles such as the exploration and use of outer space for the benefit and interest of all countries, and the freedom to use, explore and scientifically investigate outer space. It proclaims outer space as the province of all mankind and prohibits its appropriation by any state. The main theme of the treaty is that no country can claim monopoly over, or the right to govern, outer space.

The OST has an important security dimension but it is not solely a security treaty. The security dimension is represented by the prohibition to place in orbit or station in any other way weapons of mass destruction (WMD) and by the non-militarization of the Moon and other celestial bodies. The treaty also clearly discourages activities and experiments that could cause potentially harmful interference with the activities of other states parties. However, there is no specific reference in this regard to WMD. This may make the treaty much more relevant to the whole question of weaponization of outer space in a manner not limited to WMD. A number of principles stipulated in the treaty were later embodied in a series of follow-up understandings and also in the form of legally binding documents and a number of conventions, which is a useful process to note for future endeavours in ensuring space security.

While the OST was concluded four decades ago in a climate very different from what prevails today, the present combination of geopolitical and other factors makes states feel much less secure. While military force alone can no longer be a solution, there is a tendency, or rather a temptation, to solve these concerns in a simplistic way, which is to say through increased reliance on military force, particularly with the employment of the latest achievements in science and technology.

While there is an inherent risk of an arms race in outer space, it may perhaps not be correct to only refer to an arms race *in* outer space since warfare on the ground is increasingly connected to security in outer space. It is perhaps advisable to think about these issues in a more interconnected way and talk about the prevention of an arms race *in relation to* outer space.

Outer space has become indispensable in many aspects of daily life and any damage to space assets will deal a heavy blow to humankind. While space assets do act as a force multiplier for military forces, they are however very vulnerable and can become easy targets for less-sophisticated, but nevertheless powerful, countermeasures. The other risk is that these countermeasures will not discriminate between friend or foe or neutral countries. There might also be no discrimination between military and civilian space assets, leading to a highly destabilized situation overall. Furthermore, if an arms race in relation to outer space is allowed to develop, it will result in the emergence of asymmetrical capabilities that will not be a repetition of the action–reaction cycles typical of arms races of the twentieth century.

Forty years after the birth of the OST, there is an urgent need for a comprehensive reassessment of all aspects of space security. There is a need to look at issues from more than one security perspective of more than one group of countries. There are many proposals aimed at preventing a space-related arms race, including confidence-building measures, codes of conduct, transparency measures, cooperative risk reduction steps and comprehensive agreements. What should be stressed is that there is an urgent need to start the indispensable processes of general consultations and pre-negotiations, including multilateral and bilateral dialogue.

The OST can still be a part of the solution since its constructive potential has not been exhausted and a number of its basic principles can help to find correct approaches to the problems encountered.

China's space activities: present and future

Xu Yansong, Deputy Division Director, China National Space Administration

China's space activities can be best charted in three fundamental phases: its history and achievements, its future development, and satellite applications and international cooperation. China started its space activities in 1956 and launched its first satellite, the DFH-1, in April 1970, followed by the launch of its first geostationary telecommunication satellite in 1984. Over the past 50 years, China has established a comprehensive space research, design, production and testing system. It has also established a telemetry control and tracking system and has a family of over 12 launch vehicles to execute different missions, including manned missions. China's Long March series has a record of over 93 launches, with over 50 consecutive successful launches.

China has developed a comprehensive satellite system of civilian spacecraft, including meteorological satellites, recoverable satellites, scientific and remote-sensing satellites and telecommunication satellites. China has been actively involved in joint missions with France and Germany with telecommunication satellites and in remote sensing it has established, in partnership with Brazil, the China–Brazil Earth Resource Satellite (CBERS). China has also been cooperating actively with the World Meteorological Organization (WMO) vis-à-vis its meteorological satellites. China has also held joint scientific missions with the European Space Agency (ESA).

China is keen to apply space technology for peaceful purposes especially in urban areas, agriculture, in materials science and in other areas, and for future development it is focusing on space launch capacities and satellite platform capacities. China is developing a new generation of meteorological satellites and is studying the possibility of creating a constellation of satellites for disaster mitigation and monitoring. China has an active deep space exploration programme, including lunar missions. China's lunar mission is composed of a three phase programme: a lunar fly-by, a soft landing and a sample return.

China is currently building an integrated satellite application system to promote space technology and its applications in all fields. This includes remote-sensing, meteorological, telecommunication and navigational satellites among others. China is also actively involved in many bilateral cooperative agreements vis-à-vis space application technologies with

countries such as Brazil, Nigeria, Russia, Venezuela and those of the European Union. Most recently China has established the Asia–Pacific Space Cooperation Organization (APSCO) with headquarters in Beijing and has become a member of the Charter on Disaster Mitigation. It is working jointly with Canada and France on building an integrated global disaster mitigation system.

DISCUSSION

Following the presentations by the panellists, the ensuing discussion focused broadly on two issue areas:

- the role of the China National Space Administration; and
- the OST.

Referring to recent events, it was noted that the China National Space Administration is a civilian space organization that conducts activities only related to the peaceful use of outer space and that it was working very hard on the mitigation and the reduction of space debris, and that it has joined the effort of the international coordination committee on this front and is following very closely these activities, including an effort to provide guidance on the reduction of space debris.

Referring to the OST, questions were raised as to why provisions for a formal mechanism of consultation were left out of the OST, and how could Article 9 of the treaty, which requires consultations to be initiated under certain circumstances, be interpreted in that light. Furthermore, a question was raised on the adequacy of the OST in light of the experience of the last 40 years. The response from some participants was that the consultations were envisaged in certain cases and that they could be started by states parties that were either carrying out certain activities or by other states parties who believe another is carrying out such activities.

Regarding the state of the OST as a whole, it was suggested that these consultations were useful but not necessarily sufficient in the present circumstances for two reasons. Firstly, the pace of development has increased significantly and the international community would need to be more attentive individually and collectively to events and developments that may affect the status of the treaty. However, such a mechanism does not exist in the treaty as of now. Secondly, it was suggested that in principle states

could not conclude treaties without the possibility of alteration and that this fact had been recognized by the authors of the treaty in the way that was fashionable at the time, through the provision of an amendment procedure. However, in the light of experience, the international community had arrived at a point of view whereby it viewed an amendment, unless it were extremely clear in advance, as a rather risky exercise since it could mean reopening a number of issues and renegotiating the OST. This would mean that states would come to the table with their own agendas. It was suggested that an amendment may be too radical and that a softer mechanism was needed to “tune” the operation of the treaty as required. This tuning is particularly important in the current situation of flux, in contrast to the status quo that had existed when the treaty was created.

SESSION II

OUTER SPACE: LOOK BACK, LOOK FORWARD

Peace in space: building on the Outer Space Treaty

G rard Brachet, Chairman, UN Committee on the Peaceful Uses of Outer Space

The United Nations Committee on the Peaceful Uses of Outer Space (COPUOS), created in 1959 by the General Assembly, has developed most of the legal framework for international space activities, including the Outer Space Treaty of 1967 and the Convention on Registration of Objects Launched into Outer Space of 1975. In addition to these treaties, COPUOS has also elaborated and submitted for approval to the General Assembly a number of declarations on principles which, while not having the legal strength of treaties, provide an internationally recognized reference for certain space-based activities. These declarations include the Principles Relevant to the Use of Nuclear Power Sources in Outer Space of 1992 and the Declaration on International Cooperation in the Exploration and Use of Outer Space for the Benefit and in the Interest of All States, Taking into Particular Account the Needs of Developing Countries of 1996.

In addition, COPUOS has also elaborated for approval by the General Assembly a number of resolutions which are meant to reinforce and clarify aspects of the international legal framework for space activities. These resolutions include Resolution 1721 (XVI) B of December 1981 on the

registration of satellite launches and Resolution 59/115 of 10 December 2004 on the notion of “launching state”.

More recently, COPUOS has focused on the development of a consensus-based “rules of the road” approach aimed at minimizing the production of space debris and the risk of collisions in outer space. The adoption of the Space Debris Mitigation Guidelines in February 2007 by the Scientific and Technical Subcommittee of COPUOS is an important step in this direction. It is interesting to note that one of the space debris mitigation guidelines explicitly indicates that states should avoid intentional destruction of space objects and other harmful activities.

While there is no consensus within COPUOS to reopen the OST nor to develop new international conventions, there is however a shared feeling that bottom-up, technically-based guidelines and recommendations are a powerful means to develop rules-based behaviour and keep outer space as safe as possible. A possible path towards developing rules of the road for secure space operations could be through reliance on the existing operational experience of the principal actors, commercial operators and government agencies.

Current CD developments regarding PAROS

Paul Meyer, Permanent Representative of Canada to the CD and Coordinator for the PAROS Agenda Item

The 1967 Outer Space Treaty has provided the basic framework for international space law. However, the record of implementation, and new developments and technological capabilities, have demonstrated that the treaty does not offer a comprehensive solution to current and future challenges of space security and that additional measures may be required to ensure its goals. There are many avenues through which we can build on the existing space security architecture, one of which is the work of the CD.

PAROS has been on the CD agenda for sometime and during the mid-1980s to the mid-1990s had an Ad Hoc Committee devoted to the subject. However, the termination of the Ad Hoc Committee has not prevented some worthwhile discussion and proposals from being generated in the intervening years, both in formal plenary sessions and informal meetings.

In 2006, the promotion of Space Week during the CD was an important step in enabling it to resume some of its substantive work on space security. This year the CD has worked in coordinated effort to build upon the work of the previous year.

The objective of the informal meetings this year was to identify proposals relevant to PAROS that could have the potential to become multilateral agreements of the CD. The work of the CD during the informal sessions was divided along three main themes:

- consideration of the adequacy of the existing legal regime providing for security in outer space and possible means of enhancing this regime;
- transparency and confidence-building measures (TCBMs) regarding outer space activities relevant for international security; and
- elements of a treaty on the non-weaponization of outer space.

On the adequacy of the existing international legal regime there was broad support for the accords relevant to space security with the recognition that strengthening implementation and promoting universalization would lead to an overall improvement in space security. Additionally, there was an acknowledgement of some gaps in the existing space architecture that were not addressed by the existing mechanisms and would need new measures or agreements to ensure the unthreatened access to outer space for peaceful uses.

Under the theme of TCBMs, there was wide acknowledgement that these measures could make a contribution to space security and that there was scope for the CD to develop measures that would address the security/military side of our space environment and that such could help reduce threat perceptions and increase confidence among states. The ideas discussed included developing rules of conduct, a multilateral moratorium on anti-satellite (ASAT) tests, rules of the road and strengthening the implementation of existing accords such as the Hague Code of Conduct.

Under the theme of elements of a treaty on the non-weaponization of outer space, the meetings built on previous discussions in the CD regarding such. Discussions focused mainly on the Chinese–Russian draft text contained in CD/1679 of 2002 and allowed for further elaboration and clarification of key concepts such as definitions, verification and scope. It was felt that

the CD would be an appropriate place to negotiate a legally binding ban on space-based weapons as part of an effort to strengthen the multilateral architecture for space security.

The CD is best positioned to play a leading role in addressing the security dimension of outer space and what is needed is for the global community to work together to ensure that we all benefit from continued access to and use of outer space by all, free from threats of attack.

Space security—perspectives of developing countries

Hewa Palihakkara, former Foreign Secretary of Sri Lanka

When referring to developing countries' perspectives on space security, two questions come to mind. Firstly, is not space security a concern for space-capable and space-faring states rather than a worry for developing nations whose economic and social mobility on Earth leaves much to be desired? Secondly, are not developing countries wasting their time and energies on such issues, when instead they should be focusing on realities such as food security, sanitation, and so forth?

The answers to both these questions must necessarily be in the negative, more so at this historical juncture when the potentialities as well as dangers emanating from our intervention in outer space, irrespective of whether they are carried out in a competitive or a cooperative manner, have become so sharply pronounced. It has been almost 25 years since the PAROS item was put on the CD agenda. This is important as the CD remains the most representative multilateral arms control and disarmament treaty-making body in the world.

The developing countries have by their consistent and persistent words, as well as deeds, striven hard to agree on treaties and other barriers against weaponizing outer space at the CD, UN, peace research forums and civil society forums. They have advocated a number of constructive ways forward on space security that include strengthening the existing legal regime, developing TCBMs and developing and implementing rules of the road.

The reason for the consistent advocacy by developing nations is two-fold. Firstly, they would like to ensure the principle of free and unimpaired access to outer space. In its broadest sense this rationale has been most

succinctly encapsulated in the CD. Secondly, the developing nations are deeply concerned that they will be again called upon to carry the burden of nurturing and sustaining a non-proliferation regime.

As with terrestrial security, once outer space is weaponized, proliferation will follow. The developing countries would not want this burden on them and they therefore advocate and want to contribute to a less expensive and more equitably enforceable prevention regime to keep the last frontier environment free of weapons and debris. It is not too late to bring to fruition a multilateral process that was initiated 25 years ago to guarantee the non-weaponization of outer space.

DISCUSSION

Following the presentations by the panellists, the ensuing discussion focused broadly on three issue areas:

- the work of the CD and COPUOS;
- developing countries' perspectives; and
- definitional issues.

Referring to the work of the CD and COPUOS, it was suggested that it was very important for the CD to have updated information of developments at COPUOS. Furthermore, it was highlighted that COPUOS did not address military and weaponization issues and that they were really a part of the CD deliberations. Related to this discussion was the reference to the possible contents for a new resolution involving TCBMs and of the role that COPUOS could play in this regard. The response was that resolutions on TCBMs go through the First Committee of the General Assembly whereas COPUOS only reports to the Fourth Committee. Furthermore, it was suggested that COPUOS has a technically based approach relying on principles and resolutions because of the resistance of many nations on modifying the existing legal regime. It was highlighted that this had its own advantages as resolutions could be replaced easily by new ones and that this helped to keep a better grasp on technological developments. Additionally, it was highlighted that although COPUOS did not address weaponization issues, it addressed all peaceful space activities, that is, non-aggressive issues which could include military and civilian use of outer space, as well as addressing the issue of secure access to outer space.

Referring to the issue of developing countries' perspectives, it was highlighted that PAROS was very important for international peace and security and that it was essential for developing countries' voices to be heard vis-à-vis any developments in outer space. It was further indicated that progress in telecommunication, remote-sensing and meteorological satellites had important social and economic implications for developing countries. Peace and stability in outer space was closely related to development and peace in developing countries.

Referring to the question of definitions, particularly of space weapons and differences between military and civilian use of outer space, it was suggested that rules of the road or codes of conduct could circumvent these problems if the focus was on behaviour rather than on definitions. It was pointed out that to try to disconnect dual-use or multi-use technologies was a considerably harder endeavour. Moreover, it was suggested that operationally based or technically based rules of the road could circumvent the problem of definitions.

Related to the above issue areas, interesting points of view were expressed on the issue of liability for damage. It was suggested that there was a place for discussion in the OST under Article 9, but that it was limited only to planned activities. It was also pointed out that it was possible to find legal grounds to claim damages if evidence could be established. Additionally, it was suggested that currently all objects tracked in the US catalogue had a known origin but that there were concerns about using information provided by only one state party, thereby making a strong case for greater international participation and cooperation in tracking space debris.

SESSION III

APPROACHES TO SPACE SECURITY

Alternative approaches for ensuring space security

James B. Armor, Jr., Director, National Security Space Office

When it comes to national security space decision-making in the United States, things are far from monolithic. Actual decision-making is similar to the consensus-building structures in place at the CD and in the European Union. Traditionally US space policy has been grouped into three sectors—civil space, commercial space operators and developers, and national

security space which includes military and intelligence. However, with digital convergence and the increasing number of dual-use systems it has become difficult to draw clear lines between different sectors of space activities. Looking specifically at national security space, the United States is organized into 11 mission areas which are missile warning and defence; satellite communications; position, navigation and timing; intelligence, surveillance and reconnaissance; space control; space access; space command and control; environmental monitoring; force application; satellite operations and the industrial base.

Space capabilities have become a foundational component of the US and other space security organizations, however space capabilities have become even more important in the global economy. US President George Bush, in the recent update of US space policy, has recognized that outer space enables the US way of life and is thus of critical national interest. Space capabilities play a critical role in enabling modern warfare. Operation Desert Storm in 1991 was a benchmark in the emergence of space-enabled warfare. In today's US military, space capabilities have become seamlessly integrated into the total force.

The new US National Space Policy is very much similar to its predecessors and has great continuity with US space policy going back to the opening of the space age. It contains a fairly comprehensive approach to govern the conduct of US space activities and its principal motivation is to ensure free access to and use of outer space for all peaceful purposes. It mandates a protection of space assets commensurate with their planned use, and it more clearly and publicly articulates the long-standing US position that no new space arms control is needed beyond the OST.

There is broad consensus on which direction the international space community should take but, as in all important issues, the devil is in the details. The United States would like policies that encourage free access to and freedom of action in outer space for peaceful purposes and for all users, and would like to encourage TCBMs among all like-minded space-faring nations, specifically the sharing of data and the fostering of good housekeeping practices. The United States discourages outer space debris creation and practices likely to generate debris.

The National Security Space Office has already taken steps in trying to encourage cooperation among like-minded states and major space

actors through better sharing of space situational awareness (SSA) and good housekeeping practices in space. History suggests that there is an important role for militaries in both setting the stage for the emergence of international legal regimes and then enforcing the norms of those regimes once they emerge. Regarding the desired approach, it would be more productive to work toward universal adherence to the OST and subsidiary conventions along with non-treaty TCBMs. It would be advisable to build upon commercial best practices for safe and responsible operations. It is also important to encourage shared SSA since technical approaches are far more pragmatic and more likely to bear fruit.

Putting current space militarization and weaponization dynamics in perspective: an approach to space security

Kiran Nair, Indian Air Force

Military objectives and structures are extensions of the dynamics of human self-interest and in absolute terms ensure that humanity can never peacefully coexist. However, dynamics of common interest are instrumental in balancing objectives, and given that these compulsions of common interest are progressively increasing, there is reason to believe that they will enable compromises and solutions. It is within these prevailing dynamics of space militarization and weaponization that one must explore options. It is important to weigh the environmental and doctrinal factors before choosing a specific approach.

Regarding possible approaches to space security, the last five decades of no solutions show that there are no easy fixes. The allure of outer space for military advancement is increasing and will continue to do so. However, the allure of outer space for commercial gain and for civilian and commercial advancement is also increasing. The democratization of space affairs, interests and security issues is resulting in more and more stakeholders, which in turn encourages better solutions. It is imperative that we explore a middle path, a path that would enable the fulfilment of reasonable military, commercial and civil aspirations and not indiscriminately endanger the Earth and outer space. We must try to identify workable parameters of the middle path and push for realistic approaches to space security.

Space weaponization is largely an offshoot of military missions in counterspace operations and force application, and, ideally speaking, it would be positive if nations would relinquish this or were dissuaded from

this type of role for outer space. However, this appears to be unrealistic at present and, again, one must explore the middle path, that is, attempt to balance reasonable military aspirations with common interest. The declared military aspirations of counterspace operations are deception, disruption, denial, degradation and destruction. Of these, destruction is the most threatening to space security and most damaging to common interests, thus it makes less and less sense. This issue could be targeted for permanent elimination. It is imperative that approaches to the non-weaponization of outer space would need to factor in changing military dynamics of the present and foreseeable future.

Fundamental ways to ensure outer space security: negotiating and concluding a legally binding international instrument

Zhang Ju'nan, Deputy Division Director, Department of Arms Control and Disarmament, Ministry of Foreign Affairs of China

Over the past half century humankind has made great achievements in its exploration and use of outer space, thus helping to advance the evolution of civilization. Outer space has become an indispensable part of human life. The twenty-first century will witness a growing number of countries participating in and benefiting from the exploration and use of outer space.

Lasting peace in outer space is closely linked with the security, development and prosperity of every nation. The security of outer space bears on that of the whole world. What effective measures we can take to safeguard the peace and security of outer space is an important and urgent question for the international community. With the growing exploration and use of outer space the international community has been haunted with the increasing possibility of weaponization of and arms racing in outer space. More and more governments, NGOs and research institutes are very much concerned with this possibility and its consequences. Facing this threat what should we do?

We can simply neglect it and avoid any action, or we can amend the existing legal instruments and attempt to resolve the problem. A third way is to establish confidence-building measures and a code of conduct to increase transparency and guide our activities in outer space. A possible fourth path is to negotiate and conclude a new legally binding international instrument so as to completely avoid the danger of weaponization of and arms racing

in outer space. It goes without saying that no one can afford to bear the consequences of the first choice. Weapons and weapon systems placed in outer space will trigger an arms race threatening everything that we have achieved thus far.

Some governments insist that there is no danger of weaponization of or an arms race in outer space, and that therefore there is no need to negotiate a new legal instrument. However, history has shown that prevention is more effective and less costly than remedy. The OST and other related agreements have undoubtedly played a key role in promoting the peaceful uses of outer space. However, they all have limitations—some are targeted only at WMD and others are limited in scope to certain celestial bodies or areas. Amendments to those can hardly close the loopholes. Moreover it may create serious political, legal and technical problems by opening these treaties for discussion. So if amending the existing legal instruments is not feasible, let us turn to TCBMs. While these measures do facilitate trust and reduce conflict, thus playing an active role in disarmament and arms control, they are inherently limited as they are not legally binding. Such measures rely on voluntary implementation by governments and are thus unsatisfactory to keep outer space free from weapons. We need a legally binding international instrument.

The best choice is to conclude a new instrument through negotiation to prevent the weaponization of and an arms race in outer space. We already have a strong foundation for this approach as it enjoys extensive political support. For the past two decades, the General Assembly has adopted yearly resolutions by an overwhelming majority of votes regarding the prevention of the weaponization of outer space and has called for the negotiation and conclusion of an international legal instrument to prevent the weaponization of outer space.

The CD also has experience in negotiating and concluding such instruments. As part of the Ad Hoc Committee, in-depth discussions have been carried out on definitions, guidelines and other important issues. Document CD/1679, submitted in 2002 by China, Russia and a number of other nations, made concrete proposals for elements of a possible treaty which could serve as a blueprint for work. What we need now is political will and the resolution of all governments.

The Treaty on the Prevention of the Placement of Weapons in Outer Space, the Threat or Use of Force Against Outer Space Objects

Anton Vasiliev, Deputy Permanent Representative, Permanent Mission of the Russian Federation

In the course of recent debates, we have already reached a common understanding that all states are interested in keeping outer space from turning into an arena for military confrontation, and in guaranteeing security in outer space and the safe functioning of outer space assets. It is important that we all share this interest. The issue is how to realize this interest in practice.

Russia is open to all ideas and proposals in this respect. We do not rule out any possibility, but we believe the best way to meet these goals is to elaborate and adopt a new treaty on the Prevention of the Placement of Weapons in Outer Space, the Threat or Use of Force Against Outer Space Objects (PPW). Such a treaty is necessary because:

- new obligations, covering the identified gaps in international law, must enjoy the same status as existing norms and rules;
- new obligations will entail inevitable limitations on national military activities and on national business, which should be regulated by domestic legislation, including liability in case of violations; and
- such obligations should be reliable factors of national security for all states.

While an additional protocol to the OST or TCBMs could address these issues, they are no substitute for a legally binding PPW. Such protocols or measures should not deviate our efforts and attention from the PPW in the CD, although reaching an agreement on TCBMs could be a relatively easy and consolidating step towards achievement of the treaty.

Using weapons placed in outer space to assure outer space security is not an option, since it will result in less, not more, security. Although Russia, the United Kingdom and the United States have made specific political statements that they are not going to place weapons in outer space, the non-weaponization of outer space should nevertheless become a legally binding norm. The PPW is not a new idea. It is based on working document CD/1679 tabled by the delegations of China and Russia with a group of co-sponsors in June 2002. The PPW would further enhance security in

outer space by supplementing the non-weaponization obligation with an obligation not to use force or threat of force against outer space objects. Thus, in a sense, the PPW could be a solution to the PAROS issue. The main purpose of the PPW is to ensure that the safety and security of space assets is guaranteed; the PPW would serve the security interests of all states and contradict the interests of none.

DISCUSSION

Following the presentations by the panellists, the ensuing discussion focused broadly on three issue areas:

- US space policy;
- SSA; and
- rules of the road.

Questions were raised as to what would be the implications of the new US space policy, which aims at ensuring freedom of US space activities. Furthermore, a clarification was sought on what kind of capabilities the United States would like to develop in order to realize the desired “freedom of action”, and on the current and future focus of US space policy. The response was that since outer space had become an indispensable part of the US way of life, it was policy to ensure freedom of action in outer space. It was suggested that the space policy does not lay emphasis on denying access to others insofar as their activities do not encroach on US interests. Furthermore, it was suggested that the US space policy focus was on building SSA.

Referring to SSA, questions were raised about views on approaches to sharing it as well as on the best course of action to see this achieved. The response was that SSA was meant to start out as a cooperative effort among commercial practices that would also include governments and others. Alternatively, it was expressed that although conceptually good, SSA involved many complex factors. It was suggested that while SSA would increase information access, it would still not solve the problem of weaponization.

Referring to rules of the road, it was asked if such would constitute a new regime and if such were looked upon in preferential light. It was responded that while there is no need necessarily for a new regime, nevertheless there was support to be found for common approaches. Alternatively, it

was suggested that while rules of the road present a good approach, much needed to be done in terms of refinement, which would take a long time. Related to rules of the road, it was asked whether there was need for a treaty to limit the number of satellites. The response was that while there was broad support to account for debris in outer space and to know where all space objects are, limiting the number of satellites was a new approach and had not been considered yet.

SESSION IV **STATUS AND CHALLENGES TO SPACE SECURITY**

The Space Security Index: changing trends in space security and the Outer Space Treaty

Jessica West, Program Associate, Project Ploughshares

The OST is commonly described as a “non-armament” treaty. That term is inaccurate as the OST does not ban all weapons in outer space, just the most frightening ones. The OST is not about the armament of space; it is about the security of outer space.

The Space Security Index (SSI) was one of the first research and policy tools to use and promote the term “space security”. Taking its cue from the principles enshrined in the OST, which recognized “the common interest of all mankind in the progress of the exploration and use of outer space for peaceful purposes” and the belief that “the exploration and use of outer space should be carried on for the benefit of all peoples,” the SSI defines space security as the secure and sustainable access to and use of outer space, and freedom from space-based threats. This concept is increasingly used by the space community including a wide array of civil, military and commercial actors because it creates a framework in which competing interests in outer space can be brought together.

The SSI reflects a shift in how we conceptualize the goals of the OST, away from a narrow focus on weapons to a broader concern for security. It is also more than a concept—it is a process. By convening researchers and internationally respected space experts to develop an annual, comprehensive assessment of the status of space security according to eight different indicators, the SSI tracks the impact of our use of outer space, the regulation of those activities and the cumulative impact on the space

environment over time. In other words, the SSI allows the space community to reflect on how we are achieving the broad goals of the OST.

The changing trends captured by the SSI process indicate that the goals of the OST are more important than ever because the space environment is increasingly threatened. The increase of space actors and stakeholders, of space use and dependence, and the rapid technological advancements that have given rise to this increase, have made outer space a more precarious operating environment. Maintaining stability has become more complex as political and technological advancements have outpaced the international governance framework for outer space. In short, it has become more difficult to achieve the goals of the OST as today the space environment is more dangerous than ever. Added to this mix is the increasing geopolitical competition in civilian space programmes, the regional tensions driving the use of space for terrestrial military operations, the long-term military–commercial partnerships, the perils and possibilities of dual-use technologies and the international policy gap.

The role of the SSI is to provide a tool to inform policy. The analysis of changing trends in space security captured by the SSI does shed light on issues and actors that must be part of any attempt to revisit laws, institutions, norms or concepts. First, any efforts to preserve and enhance space security must include the relevant actors and stakeholders: governments, militaries, scientists, industry and civil society. Second, these efforts must not be too narrow—arms control issues cannot ignore concerns of space debris, peaceful exploration, commercial access and so forth. Third, these efforts must prioritize the security of outer space as an environment, which means the safe and sustainable access to and use of outer space, and freedom from space-based threats. This means taking issues and actors out of discrete contexts such as national security, scientific and technological advancement, revenues or convenience, and examining them in the broader context of space security.

Developments in ballistic missile defences

Peter Hays, Policy Analyst, Science Applications International Corporation

The interrelationship between missile defence and outer space does not get addressed as often as it should. In countries such as the United States they are often treated as conceptually and organizationally split apart. Outer space has become increasingly important to the US military, for example

space assets have been used increasingly over the past 15 years to guide precision munitions. Much of the efforts of the US Department of Defense are geared towards increasing the capacity available on dedicated US satellites.

There is a lot of continuity in the US Ballistic Missile Defense (BMD) programme. The total amount of spending on it, as part of the Department of Defense budget, has remained in a very narrow band. Boost-phase-intercept BMD is one of five potential paths to the use of space weapons. While basing such weapons in space gives the global coverage required, there are a few problems with this approach as it offers a very limited engagement window. This raises a number of issues on how the system is going to operate, such as will there be a need to pre-delegate launch authority? Will there be human command and control in the loop to make that happen? This latter scenario could lead to missing the limited engagement window.

The main objectives of the US BMD programme are:

- to maintain and sustain an initial capability to defend the United States, its allies and deployed forces against attack;
- to close the gaps and improve the initial capability; and
- to develop options for the future.

In terms of the biggest conceptual issues there is a desire on the part of the United States and many others, especially after 11 September 2001 and the end of the Anti-Ballistic Missile Treaty, to have some kind of constantly deployed boost-phase-intercept global BMD to protect against rogue actors. However, this creates problems in terms of undermining strategic stability with China and Russia, thereby creating a highly destabilized environment. The weaponization of outer space greatly increases the likelihood of creating space debris. Even a very limited BMD system will have significant ASAT capabilities. Thus there is significant overlap of BMD and space weaponization issues, which need to be seen as interlinked issues.

“Hit-to-kill” and the threat to space assets

Jeffrey Lewis, Harvard University

Rather than focus on ASAT weapons as a whole, there should be a focus on one particular technology—hit-to-kill systems. These should be thought

of as a technology in their own right because in focusing on many exotic ASAT-like technologies and space weapon programmes—that may or may not be going anywhere—we may be missing a fundamental change in the technological realities that influence the vulnerability of our satellites.

There are three arguments that one can be put forth on this issue. One is that exotic hit-to-kill technologies are now at the early stages of spreading around the world; second, that our broad focus on space weapons and ASAT technologies—many of which are unrealistic—may have distracted from the technological challenges posed by the proliferation of hit-to-kill technologies; and three, partial arms control measures such as a ban on the testing of such weapons may mitigate the most threatening aspects of this technology while avoiding some of the difficulties that have prevented us from reaching a more comprehensive agreement.

Besides China, Russia and the United States, there are other countries, such as India and Israel, who are interested in developing hit-to-kill technology. Given the widespread interest, it is important to understand that the interest in hit-to-kill may be not so much in the individual military missions as in the basic military desire to invest in an interesting and challenging technology that may be relevant in the future. Hit-to-kill has become a fundamental defence technology that many countries with advanced militaries will pursue, if only to know how to counteract the threat.

If we change the way we think about problems facing space technology and emphasize the threats they pose, rather than discuss the concepts of space weapons or ASAT weapons, the challenge becomes much clearer. There are generally two worries with ASAT weapons, one is the issue of international stability and the second is the issue that, if ASAT weapons become a normal part of the international system, it will be much harder to reach cooperative agreements on issues such as debris mitigation or space traffic management.

Partial solutions such as a ban on hit-to-kill ASAT tests would be very valuable. Even a partial agreement will initiate a process of dialogue from which we could work together to develop a more sustainable space environment, perhaps in the form of a code of conduct.

Orbital debris produced by kinetic-energy anti-satellite weapons

David Wright, Senior Scientist, Union of Concerned Scientists

The amount of debris caused by the destruction of a satellite with kinetic-energy ASAT weapons is much larger than what people assume. The reason why this issue is important is because space debris can pose a long-term threat to the future use of outer space. Due to their very high speeds in orbit, even relatively small pieces of debris can damage or destroy satellites. Since debris in high altitudes can stay in orbit for decades or longer, it accumulates with time as more is produced. As the amount grows, the risk of collisions with satellites also grows. If the amount of debris becomes sufficiently large, it can make regions of outer space unsuitable for use by satellites. Since there is currently no effective way to remove large amounts of debris from orbit, controlling its production is essential for preserving the long-term use of space.

The international community is attempting to address this issue in part by developing debris mitigation guidelines to limit the debris created during routine space activities. This includes efforts by the Inter-Agency Space Debris Coordination Committee (IADC), as well as guidelines developed by COPUOS.

However, a major potential source of orbital debris is the intentional destruction of satellites in orbit by kinetic-energy interceptors, which are intended to destroy satellites by colliding with them at high speed. While there is a general recognition that the debris created by such events is a problem for the space environment, the scale and severity of this problem appears to be largely underestimated. The destruction of one large satellite could create as much large debris as would be generated in 70 to 80 years of space activity under strict debris mitigation measures of the kind mentioned above.

The point is that preventing the production of space debris is crucial for preserving the space environment and allowing the sustainable use of outer space. That environment is uniquely suited for some important uses such as communications, Earth observation, navigation and so forth, and interfering with our ability to use outer space for these purposes is incredibly short-sighted. Moreover, attacks on satellites can have serious security implications. It is therefore crucial that the international community develop rules on the kinds of systems that can be put into outer space and

the rules of the road that guide how countries operate there. As an urgent and important first step, an international agreement to ban the testing and use of destructive ASAT weapons is very important and can only be achieved through international leadership.

DISCUSSION

Following the presentations by the panellists, the ensuing discussion focused broadly on two issues:

- missile defence; and
- ASAT development, testing and use.

Referring to the issue of missile defence, questions were raised regarding the amount of money that had been spent on the US programme and the future cost projection of such a system. The response was that the budget request for missile defence for fiscal year 2008 was around US\$ 8.9 billion and that, since its inception in 1983, the sum would total around US\$ 100 billion. Among the many comments on the issue of missile defence were that the United States' attempt to build missile defences in Poland and the Czech Republic were assumed by Russia to be unfriendly and that they would be viewed as a major challenge to Russian security interests as well as in the wider strategic perspective.

It was suggested that the big issues, in relation to Russia, with the basing of US missile defence architecture in Poland and the Czech Republic were, first, that there was an objective correlation between offensive and defensive weapons, and, second, while the basing of the architecture would not intrinsically threaten Russia, this could represent a first step in that direction. Moreover, the deployment could be viewed as an element in a chain of events whereby the United States was continuing its build-up of warning systems around Russia. It was suggested that, unlike the Cold War, Russia would not be dragged into an arms race and would instead look for the cheapest and most effective responses.

It was suggested that if the basing of a few interceptors in Poland could cause such a large effect on the Russian strategic deterrent, then there were probably larger issues at play. It was further suggested that the United States was trying hard to have a limited number of interceptors deployed precisely in order to minimize the strategic effects on others states.

A question was raised about the possible reasons for the failure of talks on the issue of ASAT weapons between the Soviet Union and the United States in the 1980s. It was responded that the ASAT negotiations, held between 1978 and 1979, came to no conclusions as there was no agreement even on fundamentals, that is, the scope or subjects of negotiations, and definition of what constituted a space weapon. Furthermore, it was suggested that the ASAT talks mirrored the collapse of the SALT II talks after the Soviet invasion of Afghanistan. A further impediment was that at the time adherence to the ASAT treaty was perceived by some to be unverifiable.

Still relating to the issue of ASAT weapons, and particularly with reference to debris creation and ASAT tests conducted by the Russian Federation, the United States and more recently China, a view was expressed that it was important to distinguish between the debris created by routine space activities—the kind which could be controlled by debris mitigation guidelines—and the debris created by the deliberate destruction of satellites. This distinction should be made to avoid the issue of routine debris creation being sidelined by the issue of deliberate debris creation. One suggestion was that an advantage of a partial arms control measure, such as a ban on kinetic-energy ASAT testing, is that it would be both easy to define and to verify, and would allow for a dialogue to begin without sidestepping any issues.

SESSION V

CONFIDENCE BUILDING MEASURES

A Code of Conduct for Responsible Space-Faring Nations Michael Krepon, Co-founder, the Henry L. Stimson Center

Satellites are indispensable but also happen to be very vulnerable. The responses to this dilemma have resulted in an improvement in SSA, as well as better intelligence capabilities, redundancy, terrestrial power projection, latent or residual offensive counterforce operations and hedging strategies. While the aforementioned responses share a general consensus, two other types of responses—flight testing and deployment of dedicated space weapons, and the negotiation of a new space treaty—are somewhat more problematic.

The near-term option would be to pursue a code of conduct for responsible space-faring nations. As long as we rule diplomacy out, ASAT tests and the basing of weapons in outer space will lead to greater insecurity. It has been argued that there is no need for diplomacy as there is really no arms race in outer space, that arms control is a vestige of the Cold War, that there are no agreed definitions of space weapons and, moreover, that self-defence is a right of every nation and that freedom of action must not be constrained. These arguments command no consensus within the international community. Moreover, it is important to develop rules, since without rules of the road there will be only less, not more, freedom of action. The absence of rules only makes it harder to prosecute, isolate and punish those who breach the rules.

When comparing the negotiation of a new treaty versus establishing a code of conduct, the latter emerge as less formal and quicker in outcome. Treaties take a long time and may not enter into force and more often than not involve lowest-common-denominator outcomes. This is where rules of the road come in. Establishing rules of the road can increase freedom of action overall by restricting harmful activities. Since rules of the road to prevent dangerous military activities do exist for navies, ground forces and air forces, establishing rules of the road for outer space can only contribute to international security.

Cooperative management of the space environment

Richard DalBello, Vice-President Government Affairs, Intelsat General

Given that our space environment is becoming increasingly congested there is an ever-increasing role for space environment management. Protecting high-value assets is a priority for government and commercial actors. While governments do play an important role in space traffic management, their role remains relatively small. Coordination of activities in outer space is mostly done through informal agreements that allow the routine exchange of orbital information and manoeuvre information among operators. They also rely on data provided by the US Air Force's Commercial and Foreign Entities (CFE) pilot programme.

While this process has been working effectively there are certain shortcomings. Not all operators participate fully and government operators are inconsistent in their participation. Furthermore, no common protocols exist for exchanging information and the data provided by the CFE is not

always sufficient. Government and commercial operators must improve their SSA and need to have access to more relevant and timely information.

It would make sense to have rules of the road that people understand and abide by. Having rules articulated and distributed can reduce potential confusions. There is a need for continued reinvestment in our ability to identify and predict the motion of objects in space—a broad sharing of space surveillance information. This is in everyone's common interest.

Study on space traffic management by the International Academy of Astronautics

Petr Lalá, Member, Czech Board for Space Activities, Co-Chair of the International Academy of Astronautics Study Group

Space traffic management concerns the set of technical and regulatory provisions for promoting safe access to outer space, operations in outer space and return from outer space to Earth, free from physical or radio-frequency interference. Existing space monitoring is presently limited to the:

- US Space Surveillance Network (SSN);
- Russian Space Surveillance System (SSS);
- limited systems for monitoring space assets are operated by the ESA, India, Japan, probably also China, and by private operators Intelsat, Inmarsat, Eumetsat, and others; and
- experimental monitoring sensors (optical and radio-electronic) in France, Germany, Japan, the United Kingdom and the United States.

While the aforementioned systems are effective, there are however some problems, such as the fact that there is no systematic cooperation among different systems, there are no common standards, there is limited geographic capability and there are different sensitivities and designs associated with sensors.

Five legal treaties form the international legal regime governing the space activities of nations. They include the UN Registration Convention, and were developed by COPUOS, established in 1959 by the UN. In addition to these treaties there exist five principles and declarations on more specific issues.

With reference to the UN Register, there are a number of possible steps to improve its functioning that include space debris mitigation guidelines, collision avoidance, enforcement and checking, and delineating a distinction between valuable spacecraft and worthless space debris. It is envisioned that an international agreement to reinforce the existing regime could contain three distinct parts: one, on securing information needs; two, a notification system; and three, traffic management. It is envisioned that the provisions of these agreements initially would be monitored by COPUOS and administered by UN Office for Outer Space Affairs (UNOOSA). Subsequently, post-2020, this new agreement, together with the existing space treaties, could be superseded or replaced by a comprehensive Outer Space Convention.

The security dimensions of space traffic management

Philip Baines, Expert, Department of Foreign Affairs and International Trade of Canada

Space traffic management exists primarily to ensure the safety of space operations. It applies to the three phases of spaceflight to ensure safety during the launch, operations in orbit and the return to Earth.

There are a number of security challenges associated with recent dual-use space technology developments, particularly those concerned with space debris creation, whether intentional or not, close-proximity-operations-capable satellites and on-board laser communications. Obviously, there is a need to prevent the creation of space debris through mechanisms that damage or destroy artificial satellites in order to make sure that the use of outer space remains sustainable. Satellites that can orbit near another in low-Earth orbit often will not possess sufficient fuel to approach satellites in more distant orbits. However, those that do will have forms that will be indicative of this function. Likewise, apertures used for communication will be significantly different from those capable of harming another satellite at range. Thus, space-based weapons capable of damaging or destroying other space objects will likely possess functionally related observable differences that can be used to distinguish them from more benign dual-use satellites.

It is therefore possible for us to think of a ranking system for satellites, or a "harm index", to determine whether they can cause harm to another satellite in orbit. In view of this there are certain additional declarations that we ought to consider, in addition to space traffic management systems,

in order to maximize our security gains. Many declarations would focus on the amount of fuel carried onboard a satellite, to determine whether it could reach another satellite. Other declarations would be associated with how much power a satellite could radiate at another space object. Many of these additional declarations could be verified by national technical means available for satellite observation, further increasing confidence in the declared functions of artificial satellites. Additionally, space traffic management systems can provide more position and manoeuvre behaviour information to allay fears of intentional damage or destruction by ordinary dual-use satellites.

However, there are both obstacles and opportunities in this as well. The obstacles include opposition from some governments to space traffic management on security grounds. These concerns, however, can be addressed with managed-access architectures for sensitive data, the natural proliferation of space surveillance systems and through the use of satellite constellations to collect information. Many of the institutions, instruments, infrastructures, proposals and forums already exist to solidify the foundations of space traffic management.

It is important to note that assured access to outer space must preclude violence or accidents that would result in long-lived space debris. All space actors and beneficiaries should support space traffic management for its safety gains. Modest improvements in state declarations for satellites could result in significant security gains. It is possible for all interested parties to participate in space traffic management, given the low-technology means necessary to build such a system.

DISCUSSION

Following the presentations by the panellists the ensuing discussion focused broadly on two issues:

- a code of conduct; and
- space traffic management.

Given the reticence of some states to cooperate within regimes premised on an exchange of information, questions were raised about the likelihood of a code of conduct being fully implemented. Furthermore, the issue of definitions that would be contained in a code of conduct was raised. The

likelihood that the United States would adopt such a code of conduct was also questioned. In response, it was argued that a number of such codes have been very successful in regulating activities, such as the Incidents at Sea Agreement. It was suggested that a proper consultative mechanism, including a performance review, was needed. Others stated that since a code of conduct would not be legally binding it could not patch up the loopholes in the existing outer space instruments, therefore such a code could merely act as a supplement to them.

As a response to that comment, it was stressed that, with respect to the United States, a code of conduct could have the force of law if it were an executive agreement. Referring to the issue of definitions to be contained in the code of conduct it was highlighted that the proposal was a draft in progress and therefore it could still be refined. Additionally, another view stated that both a code of conduct and a treaty were needed. In many instances in arms control and disarmament regime creation, a code of conduct indeed preceded the conclusion of a treaty. It was suggested that it would be wise to commence with securing some commitment from states while not discarding the possibility of an arrangement that would be legally binding. Concern was expressed that the proposed code of conduct might not be comprehensive enough, for example concerning certain weapon systems such as directed energy weapons or airborne ASAT weapons.

On the issue of space traffic management it was suggested that one should not forget that such was not limited to managing near-Earth orbits. It was highlighted that with the multiplication of missions to the Moon there was already a problem in the assignment of radio frequencies and that there was a real coordination problem. Furthermore, it was suggested that when talking about space traffic management it would be necessary to include not only geostationary orbits and near-Earth orbits, but also other regions of outer space that are becoming increasingly cluttered. Additionally it was suggested that with respect to liability for damage to satellites, the provisions in the OST were not sufficient as it referred mostly to states and not to commercial operators.

The session concluded with the suggestion that, provided a definition of a space weapon could be agreed upon, the desired behaviour for space security could be achieved with three simple rules: first, do not place weapons in outer space; second, do not test or use any device as a weapon

on artificial satellites; and three, do not test or use artificial satellites themselves as weapons.

SESSION VI

ENHANCING SPACE SECURITY: CREATIVE THINKING

A ban on destructive anti-satellite weapons: useful and feasible

Laura Grego, Staff Scientist, Union of Concerned Scientists

Space security can be thought of as being divided into two baskets. The first consists of the sustainable use of outer space for our future generations, that is to say our environmental concerns, and the second, of the strategic issues that can engender instability and exacerbate conflict on the ground. These two baskets are intertwined and it is likely that a regime of arms control measures, rules of the road and TCBMs will yield the greatest amount of collective security as well as preserve the many benefits of outer space for the long term.

However a much more complicated basket of issues is how to manage the likely and inevitable conflicts over the military usefulness of outer space. While conflict may be thought to be inevitable, weaponization of space is not. Among the issues to consider are, first, that space operations do not become dangerous or too expensive because of the threat or use of ASAT weapons, and, second, that when the use of outer space is contested the conflict is managed in the most graceful manner possible and does not lead to dangerous reactions on Earth.

It is important to consider a multilateral ban on all testing and use of debris-producing ASAT weapons. If such an agreement could be negotiated and respected the single biggest threat to a sustainable space environment could be mitigated. Another benefit would be making illegal the simple but most immediate threat to satellites—ASAT weapons. The specifics of such a ban should be straightforward and could be embodied in a ban on kinetic-energy attacks on satellites.

Even if such a ban is unlikely to mitigate all threats, given that it might not stop heirloom ASAT weapons from being used in a crisis and the barrier to a breakout capability is only modest, there is measurable value in such an

agreement, much like the Comprehensive Nuclear-Test-Ban Treaty (CTBT) in regards to nuclear weapons.

Overcoming institutional inertia

Rebecca Johnson, Director, Acronym Institute

Pragmatic procedural suggestions and creative ideas and strategies are not enough to overcome institutional inertia vis-à-vis a ban on space weaponization. Ultimately, it is the responsibility of countries to identify that there are sufficiently strong interests involved.

Some of the factors that need to be addressed in overcoming the blocks include:

- the different political objectives and perceptions of national security and interests;
- the diversion of attention from what institutions currently regard as their remits;
- concerns about incremental approaches and prohibitional or comprehensive approaches;
- the venue or the institution for negotiations on these issues; and
- questions of timing and how urgent is the need, or the perception of the need, to get something done.

US interests are already being reframed by facts on the ground but more has to be done to change the perception in the United States of security interests, and indeed to change the modes in which some countries deal with the United States in relation to their own security interests. We need to think of how to build an incentive structure into the space security regime, which has not been sufficiently dealt with.

Moving from dialogue to action

Colleen M. Driscoll, Director, Kurtz Institute of Peacemaking

We need to broaden our thinking to realize that we can create a security system that does not depend on newer and more sophisticated weapons but rather on shared actions and an understanding of and common dependence on what we need to do to protect and preserve our planet and resources. Since outer space surrounds us all, this plan must depend on a joint system for using technology to assure the national security of every country. A large

part of the problem has been that there is no clear delineation of what constitutes the positive use of outer space versus the negative use. Neither is there real clarity as to what national security means or what it requires; or what might be accomplished through global security.

We need to redefine and identify our goals for human use of outer space and we need to have a wider dialogue that involves all. There are many ways that one could promote dialogue and education, insistence on transparency and controls within states on budgetary expenditures are just two examples. Immediate actions that states can take include encouraging all states to ratify the OST, increasing the number of joint space projects, issuing declarations not to be the first to deploy weapons in outer space and continuing discussions in all UN bodies dealing with the issue. Among the long-term plans, further development of the principle of non-use of force to include non-use of force against space objects, the declaration of a space preserve with a treaty-based management plan, an international satellite monitoring agency and a treaty banning weapons from outer space are just a few of the possible and necessary steps.

DISCUSSION

The ensuing discussion focused mainly on preventative strategies regarding space weaponization. Referring to possible budget controls, questions were raised on the role of parliaments in controlling budget allocations as a way of helping direct activity on preventative steps against space weaponization. Additional questions were raised if space tourism, or other civilian and peaceful projects, could be an incentive towards promoting plans for the non-weaponization of outer space.

The response was that, at least in the United States, NGOs and civil society forums have access to the legislature and can or do exert pressure. Even though this process takes time, change does come in the long run. Furthermore, it was suggested that transparency in budgets is a step in the right direction and that commercial space actors are very much part of the community whose interests are at stake and will be taken into account. Additionally, it was suggested that there was a need to move forward on a PPW. Also mentioned was the need to concentrate on a strategy that would engage the United States through its commercial sector and civil society, suggesting that its national security interests lie somewhere other than in keeping open the potential for the weaponization of outer space.

The session concluded with the observation that rules of procedure were tools of institutions and those institutions were themselves a tool of the international community to manage decision-making and relations among states with different, even competing, interests.