

## OPENING REMARKS

**United Nations Under-Secretary-General Sergei Ordzhonikidze  
Director-General of the United Nations Office at Geneva  
Secretary-General of the Conference on Disarmament**

It is a pleasure to welcome you all to the Palais des Nations. I appreciate this opportunity to continue the tradition of being with you at this annual conference. I should like to thank the United Nations Institute for Disarmament Research (UNIDIR), the Governments of Canada, the People's Republic of China and the Russian Federation, as well as The Simons Foundation for organizing these two days of debates to highlight—again—the need for the international community to address the issue of space security.

The challenge of safeguarding space security is indeed pressing. We have arrived at a point where there are serious concerns about the preservation of outer space for “peaceful purposes”. Over the years, the international community has concluded a number of legal instruments that, among other things, regulated the protection of space vehicles, determined international liability for damage caused by space objects, advanced confidence-building measures (CBMs), prohibited the placement of nuclear weapons or other weapons of mass destruction (WMD) into orbit around the Earth or on celestial bodies, prohibited the militarization of the Moon and prohibited the development, testing and deployment of missile defence systems and their components in outer space. Together, all of these instruments have played a positive role in promoting the peaceful exploitation and use of outer space.

The current situation, however, cannot serve as a source of complacency. The scope of some of these instruments is limited, while others have actually suffered significant setbacks. For example, the 1967 Outer Space Treaty prohibits only the deployment of nuclear weapons and other WMD in outer space, while leaving other types of advanced conventional—or “new concept” destructive weapons—unchecked. The Anti-Ballistic Missile (ABM) Treaty has been abrogated, which has limited the application of international law concerning restriction of development

and deployment of space weapons. Some of the instruments have only a small number of signatories, such as the 1979 Moon Treaty, which has been ratified by only 11 countries. Moreover, these instruments do not address issues such as the threat or use of force from the Earth (either from land, sea or air) against space objects.

The use of space, at the same time, is undergoing significant change. An increasing number of civil and military actors are in the process of transforming space into a new focus of political, economic and military attention. Our dependence upon space-based assets has grown, as they have rapidly become an integral part of our critical national and international infrastructures and, as such, a crucial element in our daily lives. This growing and ever more diverse use of space has brought with it legitimate concerns about the security of space-based assets and generated a much-needed debate—including in the Conference on Disarmament (CD)—about the nature of space security and how to preserve it.

Several proposals have been tabled at the CD to encourage negotiations on a space weapons ban. In 1998, Canada submitted a “Working Paper Concerning CD Action on Outer Space”, proposing that a special coordinator be appointed to explore the possibilities for establishing an ad hoc committee with a mandate to commence negotiation of a convention. Canada reiterated this call in February. In 2000, China put forward a working paper specifying what should be included in a legal instrument preventing the weaponization of outer space. And in June 2002, China and the Russian Federation presented a joint working paper, supplemented in 2003 and again in 2006 by a “Compilation of Comments and Suggestions to the CD PAROS Working Paper CD/1679”.

These initiatives have yet to yield substantive results. As Secretary-General of the CD, I should like to stress the importance of starting consideration of the prevention of an arms race in outer space: PAROS. Also in this area, the CD has considerable knowledge and expertise to draw on for the benefit of the international community. As you may be aware, the issue of PAROS is scheduled to be actively debated under the Russian presidency of the CD in June 2006.

Strengthening the current international legal framework on outer space, including with a comprehensive international legal instrument on the prevention of weaponization of outer space, should be high on the agenda

of the international community. It is my hope that the discussions during the conference can make a contribution to building consensus in the CD to deal with this issue on a priority basis. I invite you all to take full advantage of this welcome opportunity to discuss—frankly and constructively—how we may address the urgent challenge of preserving the use of space for peaceful purposes.

**Ambassador Paul Meyer**  
**Permanent Representative of Canada to the Conference on Disarmament**

First, I would like to express my heartfelt appreciation, as well as that of the Government of Canada, to the United Nations Institute for Disarmament Research (UNIDIR) and its staff for organizing this conference on “Building the Architecture for Sustainable Space Security”. As you are aware, this is the fourth annual space conference to take place in Geneva, and they all have contributed immensely to an elevated exchange of views on space and how to safeguard its security. The UNIDIR conference has become a major event on the international calendar of public discussion on this theme; something that we look forward to each spring, like the first blossoms on the plum tree.

We are also appreciative of the contributions from other sponsors, in particular The Simons Foundation of Canada, which has provided financial support for all of the conferences that have taken place so far—a tribute to the prescience and perseverance of Jennifer Allen Simons, whom we are delighted to have with us this year. Given the importance of the subject matter, I do hope that more countries will be convinced to contribute both ideas and financial support to future conferences.

The topics to be addressed over the day and a half of the conference should further contribute to our joint understanding of the issue of space security and how best to sustain and preserve it.

Canada’s working definition of space security is “secure and sustainable access to and use of space, and freedom from space-based threats”. Canada believes that the ongoing evolution of space activities and benefits provides a strong rationale and incentive for the global community to work together to foster a politico-diplomatic environment conducive to maintaining the benefits that space provides.

Also, we believe that the identification and implementation of confidence-building measures (CBMs) will have an increasingly important role to play in maintaining peace in space. Some of these measures relate to areas of space activity that are outside of the normal Conference on Disarmament (CD) programme, but their potential effect on our work and the goal of prevention of an arms race in outer space (PAROS) may be substantial.

The architecture of sustaining space security in our view should be both beautiful and functional and so should the proceedings of this symposium under that banner. The individual sessions include presentations on the contribution that rules-based behaviour can give to space security, how best to leverage the existing instruments for the enhancement of space security, developing CBMs and an interactive debate on public awareness and advocacy in policy making. It promises to be an interesting and stimulating exchange of views.

This expanded agenda reflects the reality that we can no longer separate space activities into neat, discrete realms of military and civil/commercial space. The world has moved beyond these artificial borders. Furthermore, the benefits derived from space assets are increasingly provided by commercial entities. Many satellites and launchers are now owned by the private sector or international consortia rather than by nations. This new reality poses a number of challenges for the existing international legal framework governing outer space, which was negotiated on the basis of a very limited club of governmental space actors.

Ensuring access to the benefits of space has also become crucial to a growing number of developing countries as they become ever more active users of space. We recognize their concerns and encourage their engagement in the PAROS discussions. They have a lot at stake.

So, as we pursue this holistic concept of space security, I encourage all participants to ask questions and engage presenters in order to understand all of the dimensions of maintaining peace in space, and how this debate might affect our deliberations in the CD and in other relevant multilateral fora.

I wish you a fruitful and edifying conference.

**Ambassador Cheng Jingye**  
**Ambassador for Disarmament Affairs**  
**Head of Delegation of the People's Republic of China to the Conference on Disarmament**

At the outset, on behalf of the Chinese government, I would like to extend my congratulations to this conference on “Building the Architecture for Sustainable Space Security” and sincere gratitude to its organizer, the United Nations Institute for Disarmament Research (UNIDIR). It is our great pleasure to co-sponsor the conference with the Canadian and Russian governments as well as The Simons Foundation.

This is the second time that China has co-sponsored this conference, which has become an important annual event in Geneva since 2002. It surely provides a valuable forum for officials and experts from various countries and representatives of non-governmental organizations (NGOs) to explore and incubate constructive ideas on how to effectively enhance outer space security. Furthermore, it also serves as a good complement to relevant discussions in the Conference on Disarmament (CD).

The conference this year is of special significance. Under the 2006 six Presidents (P6) initiative, focused debate on the prevention of an arms race in outer space (PAROS) will be held at the CD during the Russian presidency in June 2006. I believe that our discussions here on “Building the Architecture for Sustainable Space Security” will definitely give an important impetus to the aforementioned debate in the CD.

Like many other countries, China is actively engaged in exploring and making peaceful use of outer space. Thanks to the continued advances of science and technology, the exploration and peaceful use of outer space has brought great benefit to humankind. Never before have people around the world depended so much on outer space and its related technology, and never before have there been such close and extensive links between our well-being and outer space. It is obvious that the guaranteed security of outer space serves the common interest of all countries. Unfortunately, the shadow of weaponization and a possible arms race in outer space always loom large over humanity. Therefore, it is the shared responsibility and urgent task of the international community to safeguard the security of and prevent an arms race in outer space.

China is committed to promoting outer space security and has spared no effort over the years in working to that end within the CD. We are of the view that the CD should negotiate an international legal agreement on the PAROS. In June 2002, China, together with the Russian Federation and several other countries, proposed possible key elements for such a legal instrument as contained in document CD/1679. The Chinese and Russian delegations later incorporated inputs from other countries into the two texts on “Compilation of Comments and Suggestions to the CD PAROS Working Paper CD/1679”. The latest one was submitted to the CD just a few weeks ago. China appreciates the constructive suggestions and propositions put forward by all countries, which we believe has enriched the document. It is our hope that, through the joint efforts of all parties concerned, the CD could start its substantive work on the PAROS at an early date.

In conclusion, I would like to take this opportunity to pay tribute to all of the participants, especially those experts and specialists coming from afar. Your participation testifies to the importance of outer space security. I wish the conference a complete success.

**Ambassador Valery Loshchinin  
Permanent Representative of the Russian Federation to the United Nations and other International Organizations in Geneva and to the Conference on Disarmament**

It is my honour and pleasure to welcome you to the traditional Geneva spring international conference on outer space security. Since 2002, these conferences have established themselves as one of the most representative, authoritative and influential forums on this subject matter.

I would like to pay tribute to the Government of Canada, The Simons Foundation and the United Nations Institute for Disarmament Research (UNIDIR), as well as the Government of the People’s Republic of China for their decisive contributions to organizing this year’s conference. We have a very impressive list of speakers, a large number of participants and a promising, well-structured agenda. I extend my gratitude to all participants who came to Geneva from all parts of the world.

The Russian Federation has been supporting and contributing to the Geneva outer space security conferences from the outset. We believe that

keeping outer space free from weapons of any kind, maintaining it as a common heritage of humankind, should be an obvious priority security issue for all. We have become increasingly dependent on outer space and space technologies. The stakes are rising constantly. We have more and more to lose if smooth functioning of space assets is in jeopardy. Although sometimes there are attempts to justify space weaponization for security reasons, in the final count, weapons in space will bring less—not more—security. I expect the discussions at the conference will clearly show why. Unfortunately, we have to do that again and again to reach the minds and common sense of some decision makers. But it is our hope that reason will prevail. It would be wasteful to prove in practice, and not by arguments, that an arms race in outer space is not a too distant, intangible possibility and then try to “undo” such development later on. We must avoid such scenarios.

There are many possible ways to assure sustainable space security. The Russian Federation remains open-minded to all relevant proposals and ideas. For our part, we think that a new treaty on the prevention of placement of weapons in outer space, threat or use of force against outer space objects is a simple, direct and feasible way to fill in the existing loopholes in the international outer space law through which outer space can be weaponized today without formal violation of anything whatsoever. The proposal of a new treaty, which we submitted together with China and a group of co-sponsors at the Conference on Disarmament (CD) in 2002, has substantially matured in discussions among all interested states and non-governmental organizations (NGOs). The major outcome of these discussions is reflected in a compilation prepared this February and which is now CD/1769. Realistically speaking, it seems to us that the CD member states are closer than ever to agreement on the issue of non-weaponization of outer space. So, as before, we hope that this conference, where all of our interested CD partners are present, will stimulate future deliberations at the CD and help us strike the long-awaited compromise on the CD programme of work.

This is a special year for the CD. For the first time all six CD presidents have agreed to act in concert to allow in-depth, detailed and focused thematic debates throughout 2006 on all items on the CD agenda. This idea has already brought some practical results and re-invigorated the CD. The Russian Federation has just informed its CD partners of its plans and intentions during the Russian presidency from 29 May to 25 June 2006. As

has been already announced by the 2006 Presidents (P6), we shall have a structured focused debate on the prevention of an arms race in outer space (PAROS) on 8–15 June 2006, and the Russian Federation proposed a specific calendar of activities for that week. From this standpoint, today's conference could not have been more timely for the CD delegations to broaden their vision on PAROS and to capture new ideas and arguments on the eve of that debate.

In addition to my colleagues from our delegation to the CD, the Russian Federation is also represented here by a group of experts from the Foreign Ministry, Ministry of Defence and the Russian Space Agency who came from Moscow for this occasion. We are open to contacts and we shall make a presentation and participate in the interactive discussion. Thus, the Russian Federation is ready to make its contribution to the success of this conference. And we are sure it will be a success.

**Jennifer Allen Simons**  
**President, The Simons Foundation**

On behalf of The Simons Foundation, I am very pleased to, again, co-sponsor the conference on outer space security. The Simons Foundation in partnership with Project Ploughshares initiated the first of these conferences in 2002. It is gratifying that the Governments of Canada, China and the Russian Federation and the United Nations Institute for Disarmament Research (UNIDIR) have ensured their continuity.

This is the fourth time that The Simons Foundation has co-sponsored and I would like to thank UNIDIR, the Governments of The People's Republic of China, the Russian Federation and Canada for organizing this conference, "Building the Architecture for Sustainable Space Security".

It is our hope that these conferences will continue to be held on an annual basis, and with others states participating as sponsors. These meetings are valuable because they further the development of the groundwork for a legally binding Outer Space Treaty which will prevent the weaponization of space and, through international law, decree space as a preserve for the common security of all nations and peoples.

Since 2002, which saw the introduction to the Conference on Disarmament (CD) of the Russia–China working paper on a new space treaty and the first of these conferences, there has been much discussion and activity on this issue at the United Nations and in government circles, universities and other non-governmental organizations.

There is greater awareness in civil society of the dangers of weapons in space and of related space security issues. However, despite the concerns and the activity on this issue, the crucial arena for negotiating a treaty remains paralysed, which is extremely worrying.

We believe that since the last conference, space has become less secure. At the UN First Committee in November 2005, for the first time in the history of the resolution on the prevention of an arms race in outer space (PAROS), one state—the United States—voted against this resolution. We fear that this act will ensure the continuing delay in an appropriate treaty process and is ultimately counter-productive to the United States' own interests.

Already, there have been acts of aggression—successful and unsuccessful attempts to jam satellites—and actions such as these will no doubt continue. Moreover, research and development of dual-use space technologies continues in many countries and these dual-use technologies are marketed internationally. This proliferation has the potential to create a new community of space users whose purposes may be predominantly militant.

One of the primary values of these conferences is the opportunity for participants to address ways to draw the United States into cooperative and collaborative multilateral processes to sustain space security and to prevent an arms race in space. Although this now holds less promise of success, it, nevertheless, needs to be accorded a high value.

The Russian Federation's initiative in 2004 to declare that it would not be the first state to put weapons in outer space is commendable and could be a valuable tool to encourage all states to make similar declarations. Last year, Patricia Lewis, Director of UNIDIR, expressed the hope that there will be some movement in this direction—perhaps a recommendation from this conference will encourage you to take this proposal back to your governments.

Perhaps it is also time to heed Rebecca Johnson's call at St. Petersburg in 2001, to reassess the feasibility of an outer space treaty-making process outside the CD—similar to the Ottawa Process to ban landmines.

On behalf of The Simons Foundation, I wish you every success during the conference in developing further the steps to the goal of a weapon-free outer space, preserved for peaceful use.

## CHAPTER 1

### CONFERENCE REPORT

#### INTRODUCTION

In March 2006, the United Nations Institute for Disarmament Research (UNIDIR) continued its commitment to holding an annual discussion to explore the issue of security in space in order to further the understanding by, and the debate among, governments, academics, non-governmental experts and industry experts.

The meeting focused on:

- The preconditions for a space regime that would provide sustainable and secure access to outer space for peaceful purposes;
- The creation of an environment that convinces space actors that it is safe not to base weapons in space; and
- Increasing awareness among governments and the public of the benefits of sustainable and secure access to and use of outer space.

The meeting was organized by UNIDIR and supported by the Governments of Canada, the People's Republic of China, the Russian Federation and The Simons Foundation and held in the Council Chamber of the Palais des Nations, Geneva. Representatives from member states and observer states of the Conference on Disarmament (CD) and experts from Canada, China, France, Germany, India, the Russian Federation, the United Kingdom and the United States brought the total number of conference participants to over 100 people. Opening remarks were delivered by Patricia Lewis, Director, UNIDIR; Sergei Ordzhonikidze, Director-General, United Nations Office at Geneva; Ambassador Paul Meyer, Permanent Representative of Canada to the CD; Ambassador Cheng Jingye, Ambassador for Disarmament Affairs, People's Republic of

China; Ambassador Valery Loshchinin, Permanent Representative of the Russian Federation to the CD; and Jennifer Allen Simons, President, The Simons Foundation.

The following constitutes a summary report of the conference. The keynote speakers are identified along with summaries of their presentations. Participants in the ensuing discussions remain unidentified.

## **SESSION I**

### **FUTURE AND CURRENT THREATS TO THE PEACEFUL USES OF OUTER SPACE**

#### **Threats to the security of outer space: emerging technologies** *Laurence Nardon, Institut français des relations internationales*

Emerging technologies can be defined as those technologies most actively researched at present, as opposed to technologies currently coming online. Research conducted in the United States could be the best indicator of such emerging technologies given that in 2005 the United States had a space budget of approximately US\$ 22.5 billion.

In terms of the possibilities for anti-satellite (ASATs) weapons, three considerations need to be taken into account: the target; the location of the weapon itself and the level of damage required. All three considerations combine to make many kinds of ASAT weapons imaginable and/or desirable, from electronic warfare equipment (“jamming” devices) and cyber warfare capabilities to weapons that attempt to directly target the satellite itself. However, in the past, attempts at developing the latter have run aground such as the “hit-to-kill” Kinetic Energy ASAT (KEASAT) programme during the Clinton Administration as well as the direct-ascent nuclear weapons tests that took place in the 1960s (known as the Starfish Series). Regarding directed energy weapons, ground-based lasers capable of attacking objects in low-Earth orbit (LEO) require a significant amount of power, making them difficult to mount on aircraft due to their size and difficult to place in space due to energy requirements. Although funding in the 2007 US budget for the Mid-Infrared Advanced Chemical Laser (MIRACL) programme has been cancelled, other ASAT programmes continue.

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### **Development and peaceful applications of outer space: the Indian experience**

*Balakrishnan Vasudevan, Indian Space Research Organisation (ISRO)*

India currently spends US\$ 650 million per year on its space endeavours, which employ a workforce of 16,500. During the past 40 years, India's remote sensing capabilities have gone from 1-kilometre resolution to 1-metre resolution and space launch vehicle capability has evolved so that India can now launch into geosynchronous orbits (GEOs).

For India, the most important peaceful applications of outer space include meteorological, surveillance, education, Earth observation and crisis management. The tsunami in December 2004 underlines the necessity of space for India's security—the value of remote imagery and space communication became clear to all. In addition to human security, space applications play an important role in the agricultural sector. Satellites identify potential fishing zones by measuring the temperature of the sea and then broadcast the information through radio transmissions to local fishermen. A number of other applications, such as remote education programmes, were also outlined. The speaker concluded by stating that enabling the peaceful application of outer space is as important for developing countries as for developed ones.

### **The private sector and the security of outer space** *Stephen Stott, New Skies Satellites*

Since the early days of space exploration two basic principles have governed the use of space: right of access and freedom of navigation. As of 2006, there are many new and independent operators and space has become a truly open environment, comparable to the high seas when they were of prime importance to public, private and governmental agencies for civil, commercial and military operations. This surge in space-based activity has been met with a matching surge in irresponsible use, debris, radio frequency contamination and commercial piracy. There is a need now for the commercial sector to come to agreement on criteria that would ensure the security of space for commercial operations, that is, mission assurance—the ability to provide a product when needed. Increasingly, the line dividing the military and civil sectors in the field of space exploration is blurring, as is the distinction between strategic and commercial interests. Given the reliance of the military and the civil sector on each other, true

space security requires collaboration in order to deter and protect against attacks on friendly space systems, be they military or commercial.

### **Terrorism in outer space**

*Jeffrey Lewis, Belfer Center, Harvard University*

The utility of the concept of terrorism in the field of space security was questioned. First, the term “terrorism” contains a normative connotation and is difficult to define, which poses a number of problems in and of itself. Second, the space element may not be absolutely necessary to disrupting outer space activities given that an attack by a non-state actor could be made against a ground station or a launch vehicle at time of launch. Whether such an act would be considered any different to attacking an embassy, for example, is generally considered doubtful.

Four challenges posed by non-state actors were examined. The threat to satellites or space stations was ruled out and the threat of an attack at the time of launch was deemed highly improbable. The real challenge seems to lie in physically protecting satellite ground stations or protecting operational systems from outside interference such as computer hacking. But such protection would not entail measures unique to the realm of space. A second challenge relates to the issue of signal jamming or communications interference, however Lewis questioned whether this was a challenge particular to dealing with non-state actors given that governments are also involved in this activity. The proliferation in commercial satellite use and the diffusion of technology are two further challenges, but they are not understood to be associated with malevolent non-state actor behaviour (that is, terrorism), but more as challenges posed by commercial entities.

### **Space weapons and proliferation**

*Michael Krepon, Henry L. Stimson Center*

The central dilemma is that satellites are both indispensable and highly vulnerable. This dilemma generates a number of potential responses such as improving space situational awareness (SSA) and intelligence, developing quick replacement parts/satellites, devising a code of conduct, drafting a new space treaty or developing space weapons. Space weapons are defined as those weapons designed to physically attack satellites; jamming devices are excluded as space weapons, as are weapons with residual ASAT capabilities. The vulnerability of satellites is tied to the problem of space

debris, which is a problem that space weapons are unable to counter and would only serve to make worse.

On the question of an arms race in outer space, the language of “arms racing” can be unhelpful in constructing arguments against the weaponization of space because such a scenario is viewed as being highly unlikely in a time of asymmetric threats to the United States. The vulnerability of satellites to a “cheap kill” attack on a ground station or even direct attacks in outer space could well make such competition unnecessary. The real problem lies in the proliferation of space weapons and is driven by such factors as perceptions of insecurity and weakened norms. Space weapons could also make the problems of satellite vulnerability and space debris worse, which, in turn, would likely have a negative impact on proliferation. A code of conduct as discussed in previous meetings was offered as a near-term solution.

#### DEBATE

Following the presentations, participants exchanged views on the following issues:

- Civil–military collaboration;
- The question of arms racing;
- ASAT technologies and Ballistic Missile Defense (BMD);
- The definition of space weapons; and
- Protection measures and commercial operations.

Referring to greater civil–military collaboration in defending space-based assets, the question was asked if members of the commercial sector advocate the placement of certain weapons in space. The response from representatives in this field was that, as is generally understood, offensive weapons are not advocated but that a line needs to be drawn between what is acceptable self-defence and what is unacceptable. This led to a debate on the distinction between offensive “weapons” and defensive “systems”. Regarding the notion of acceptable self-defence, another question arose as to whether this includes active defences such as “shoot-back” systems, which many regard as weapons. The argument, common in the BMD debate, that a system is not regarded as a weapon because its primary role was seen to be defensive was felt to be illegitimate. One strong view from the commercial sector—although not shared by all—is that shooting back

in any way is offensive, and the type of defences supported, and with which collaboration with the military is hoped for, are capabilities such as redundancy measures, radiation hardening and so forth.

The utility of the language of arms racing and the argument that space weapons deployment is unlikely to precipitate an arms race received considerable attention. On the relevance of symmetry in competition, a number of participants argued that symmetry of actors' capabilities in terms of resources and numbers was not necessary for an arms race as arms racing was not an end result, but a process. However, it was stated by one person that given the high vulnerability of satellites, any race to weaponize space was rendered unnecessary—significant capabilities are not necessary in order to compete in this area. As such, the kind of arms racing that was witnessed during the Cold War where the two superpowers developed thousands of weapons could not translate to the space arena; intelligent actors would not pursue such a course. But this was said to be a misunderstanding of what an arms race is: an arms race is not about numbers, but about perceptions of threat that lead another country to attempt similar capabilities, reinforcing perceptions, and so beginning a process of escalation. A view was expressed that arms racing is not solely a quantitative matter, but also a qualitative matter, meaning weapons development and research is just as important. However, one response to this point was that the language of arms racing is not useful from a political perspective as there are those who believe that an arms race in outer space could be won. Thus, the language could be unhelpful and many participants felt that it should be replaced with something more apt. The withdrawal from the Anti-Ballistic Missile (ABM) Treaty was cited as a case in point where, despite warnings to the contrary, an arms race has not yet ensued, thus supporting the argument that the terminology used in this debate should be made more accurate. However, as others pointed out, it could still be too early to tell what effects the ABM withdrawal might have. A closing comment on this issue was that it was unhelpful to focus on definitions of arms racing as this was not the only argument for prohibiting the weaponization of space—the existence of weapons in space is a danger in itself.

On the question of emerging ASAT technologies, questions were asked about research being conducted outside the United States in this area. The consensus among the experts was that very little research is being carried out in Western Europe or the Russian Federation, although it is difficult to

be sure in some instances. For example, there tends to be suspicions that governments are willing to develop ASAT capabilities when they are funding research on, or the development of, micro-satellites, as such systems are susceptible to being converted into ASAT weapons. A number of countries whose intentions related to ASAT capabilities development are not made public are actively researching micro-satellites. The issue as to whether space-based missile systems such as BMD fall under the auspices of ASAT weapons was debated. One view expressed was that BMD is primarily a nuclear policy issue and not a space policy one, meaning that BMD operates according to a different logic. However, this view was contested by the analysis that a weapon in space is a weapon in space, regardless of what its purpose is.

Concerning the definition of space weapons, one point of debate was whether a nation's nuclear-tipped intercontinental ballistic missiles (ICBMs) and space-based BMD should be considered as space weapons. Regarding weapons capable of targeting objects in outer space, such as ICBMs, it was argued that these should not be included in the definition of space weapons as only those weapons specifically designed to physically attack objects in space and weapons with latent or residual ASAT capabilities ought to be considered space weapons. However, space-based BMD should be considered as a space weapon because, as had already been expressed, a weapon in space is a weapon in space, regardless of its purpose there. It was noted that there is a difference between "objects in space" (for example, warheads) and "space objects" (for example, satellites), and that certain states are working toward a suitable definition on this front. It was generally thought that the definition needed more input from a variety of interested actors.

There was interest regarding what measures the ISRO has taken to protect its space assets and what the organization considers the chief concerns regarding vulnerability in the long term were, including steps that have already been taken such as redundancies or backups, for example. As far as ground systems are concerned, redundancy measures are in place. Regarding the actual satellites, studies are being conducted but nothing has been implemented yet. And on the commercial aspect of India's space programme, this is considered to be in its infancy and the issue of commercial satellites and their vulnerability still needs to be addressed.

## SESSION II

### A RULES-BASED BEHAVIOUR APPROACH TO ENSURE SPACE SECURITY

#### Creating rules-based behaviour to help space-faring nations avoid conflicts in space

*Douglas G. Aldworth, Foreign Affairs Canada*

The international community needs to adopt a broadened approach on the issue of space security to include all influencing factors of the space environment on space security, be they economic, technological, environmental or political. In this way, the development of rules-based behaviour could best be approached. Weapons-effects hardening, evasive manoeuvring, redundancy and electronic protection measures such as anti-jamming technologies are all alternative ways of protecting space-based assets. Concerning methods for advancing rules-based behaviour, proposed space debris mitigation guidelines of the United Nations Committee on the Peaceful Uses of Outer Space (COPUOS) are welcome. This approach to the development of rules-based behaviour might also be considered in the context of other space traffic management issues and as a means of building confidence and preventing conflict in space. Cooperation between the CD and other international forums that deal with various dimensions of space was also suggested, including with the First and Fourth Committees of the UN General Assembly and the International Telecommunications Union, as a way of fostering greater awareness of their respective activities relating to the peaceful uses of, and sustainable access to, outer space. For the commercial sector, voluntary guidelines for the commercial industry might not be very effective, but voluntary guidelines for states to apply, as appropriate, at the national level through national mechanisms could be a feasible alternative.

#### Ways to address the security of space assets

*Pan Jusheng, Defence Science and Technology Information Centre of China*

As an initial measure, states should strictly adhere to the current treaties and agreements governing the use of outer space such as the 1963 Partial Test-Ban Treaty, the 1967 Outer Space Treaty (OST), the 1968 Astronaut Rescue Agreement, the 1975 Registration Convention and the 1979 Moon Agreement. As a second measure, states should negotiate and conclude new treaties preventing the weaponization of space and an outer

space arms race. The fourth article of the OST, which intends to keep space free of weapons of mass destruction (WMD), but neither defines WMD nor prohibits the deployment of other weapons, has significant shortcomings. This is a strong reason to negotiate new agreements, as is the fact that the threat or use of force in outer space is not yet prohibited. As an interim measure until such agreements are formulated, a number of transitional phases or intermediate steps, including a code of conduct, confidence-building measures (CBMs) and unilateral measures such as the Russian no-first-deployment pledge could be made. Such initiatives, while serving as temporary measures to further secure the space environment, would also engender greater trust and cooperation and thus serve as a good foundation for a future agreement on a treaty on the prevention of an arms race in outer space (PAROS).

#### **Activities or types of space assets to be monitored and verified**

*Laura Grego, Union of Concerned Scientists*

The current threat is primarily from activities related to ASAT weapons, such as jamming devices, ground-based lasers and kinetic energy weapons. Regarding jamming devices, signal interference is easily monitored; the only real difficulty remains in finding the appropriate diplomatic and legal channels to resolve the problem. Laser technology, such as that for “dazzling” and “blinding” satellites, is prolific and difficult to monitor, although there is no great utility in using such weapons. Regarding ground-based lasers that physically damage satellite integrity, the technology is not widespread and such lasers are generally at fixed sites and very difficult to transport. However, as far as kinetic energy weapons are concerned, the only technology really needed for an effective capacity in this area is satellite manoeuvrability in orbit and the ability to conduct close-proximity operations with another object in orbit. In case of such an attack it would be unlikely that ground-based surveillance could detect the event happening in time to prevent it. Pre-launch inspections, though controversial, would have some value here. There are about 22 active launch sites at present, giving space launch a potential “bottleneck” advantage in terms of verifying and monitoring space-related activities. However, as satellites become smaller and technology improves, mobile space launch vehicles will become a greater possibility, thus making this task more difficult. There is also the possibility of using space launches in a fashion similar to the “atoms for peace” element of the Nuclear Non-Proliferation Treaty (NPT).

### Verification measures applicable to future outer space instruments

*Richard A. Bruneau and Scott G. Lofquist-Morgan, Canadian Centre for Treaty Compliance*

A verification framework or blueprint designed to apply to any potential treaty proposal on preventing the weaponization of space was outlined. Knowing which tools are technically available, financially feasible and credibly effective could force negotiators to be more specific about any proposed treaty's terms and scope, thereby helping to progress and shape negotiations. In designing the blueprint, four considerations need to be taken into account:

- Flexibility, in order to apply to multiple treaty designs;
- Details of intrusiveness levels and confidence issues to facilitate decision making;
- Reliable estimates of costs associated with each verification method; and
- Possible synergies between verification methods to increase cost-effectiveness.

With these considerations in mind, the optimal way to structure a verification system is a layered approach. Six layers were outlined: on-site verification; launch detection and post-launch confirmation; SSA; on-orbit inspection; detecting the use of laser and other directed energy weapons; and re-entry vehicle detection and characterization. The possibility of designing verification systems according to desired cost, whereby it is possible to demonstrate what a verification system might look like at US\$ 100 million, US\$ 150 million and so on, can provide a concrete tool for negotiators. In addition, outsourcing is always a possibility, for example, the Preparatory Commission for the Comprehensive Nuclear-Test-Ban Treaty Organization (CTBTO) has such potential.

### DEBATE

Following the presentations, participants exchanged views on the following issues:

- Verification;
- CD-COPUOS collaboration; and
- ASAT weapon use.

The central topic of discussion arising from the speakers' presentations in this session concerned verification issues following the presentation of the verification blueprint concept. Participants were quick to note the utility of the blueprint concept and felt that perhaps it would function better if it were designed as a "pick and mix" option, giving it even greater flexibility. However, the blueprint model was criticized for relying on more traditional verification measures when the current trend is moving away from such systems and their associated high management costs. An alternative is to think of verification as a system of collective sharing and information analysis.

How the commercial sector could be integrated into any proposed verification regime was raised as a potential obstacle that needed due consideration. The problem of commercial secrets being exposed to external bodies or personnel is a significant concern. This was tied to the issue of vulnerability—the more advanced a company, the more vulnerable it felt, making it less likely to concede vital areas of research and development to verification measures. This was compared to the age-old problem faced by governments concerned with questions of national security, which often has the effect of limiting a treaty's level of intrusiveness and thus effectiveness. This led to the question of who would carry out inspections for any proposed treaty. The general feeling among participants was that commercial actors needed to put more thought into the verification issue at both the research and policy levels.

An effective verification and compliance system would provide credibility to any chosen enforcement mechanisms. Disaggregating the issues of enforcement and compliance, as some states do, was said to constitute a misperception of how the two activities interact with each other.

With any proposed treaty, the capabilities under surveillance would all be dual use—this applies across the board, including space-based interceptors. The crux of the matter is in verifying acts of non-compliance, not capabilities that could be used to contravene a treaty. This points to the importance of SSA in monitoring activities and thus acting as a means of verifying events that had already occurred or were in the process of occurring. It was proposed that this should be the purpose of any proposed verification model given the problem of dual-use technologies. International space surveillance systems could be used to pool information.

How to promote more effective partnership between the CD and COPUOS on space-related issues was of considerable interest. The space environment is changing: the artificial barriers between civil and military activities in space are already dissolving and in turn will affect how the United Nations operates in this area. One idea is to see which activities of the CD and COPUOS are in concert and then cooperate on those. But simple factors, such as the fact that the Russian Federation will hold the presidency of the CD in June 2006, at the same time the CD is planning to discuss the PAROS agenda item, which also coincides with COPUOS's annual meeting, could act as a mechanism for examining common thinking and activities and deciding where to go from there.

Regarding ASAT technologies, debate centred on who would be in a position to use these devices. Signal jamming and communication disruption could be the key here, for example, the jamming of global positioning system (GPS) signals, which has a short-term impact. Such incidents are increasing and pose a significant threat. Incidents of television and Internet content signal jamming in certain countries in 2005 were noted.

### **SESSION III**

#### **LEVERAGING EXISTING INSTRUMENTS TO ENHANCE SPACE SECURITY**

##### **Framing the debate: the Space Security Index (SSI)**

*Sarah Estabrooks, Project Ploughshares Canada*

The annual SSI provides a comprehensive approach to the issue of space security in framing the debate for policy makers. The index incorporates eight indicators of space security that highlight current trends and developments: the space environment; laws, policies and doctrines; civil space and global utilities; commercial space; space support for terrestrial military operations; space systems protection; space systems negation; and space-based strike weapons. A brief summary of developments in 2005 was given using these eight indicators. The number of objects in the space environment increased by 195 in 2005, bringing the total number of identified trackable objects in space to 9,428; 24 civil spacecraft were launched and budgets increased everywhere except in Japan. The United States continued to be the single largest commercial space client, with 60% of the commercial satellite sector. There were

significant cutbacks to a number of US military space programmes in addition to the cancellation of the US Near Field Infrared Experiment (NFIRE) Kill Vehicle test, although the United States successfully tested its GPS “pseudolite”. A number of occurrences of jamming incidents have been reported. In the policy realm, 2005 also saw the first opposition to the PAROS resolution in the UN General Assembly.

### **Leveraging the existing UN space machinery for sustainable and secure access to outer space**

*G rard Brachet, incoming COPUOS chair, Sic Itur SARL*

COPUOS is a body composed of 67 states and 30 observer organizations. It could contribute to developing the architecture for sustainable space security by:

- Raising awareness among its members and community of observers that space security is a major issue;
- Building on the experience gained from the discussions on space debris mitigation: more work is needed beyond the guidelines and a report on space traffic management will be officially presented in June 2006 at the COPUOS plenary meeting;
- Contributing to confidence building via its current work on the application of the 1975 Registration Convention: in 2004, COPUOS established a working group on registration, reporting to the Legal Sub-Committee, whose work plan should lead to a set of recommendations in 2007; and
- Promoting open communications on PAROS issues with the CD; the incoming chair of COPUOS is committed to facilitating and encouraging such communication.

In February 2005, the COPUOS Scientific and Technical Sub-Committee proposed a set of guidelines on space debris mitigation. These guidelines will be officially submitted to COPUOS member states before the sub-committee’s next meeting in February 2007. If approved at the COPUOS plenary in June 2007, they will then be submitted to the UN General Assembly in the form of a resolution later that year.

### Outer Space Treaty review conference: progress and possibilities? *Joanne Irene Gabrynowicz, University of Mississippi*

In terms of international law, the OST is relatively rare because it created an interrelated framework with other space treaties. The OST is “quasi-constitutional” in that it functions like a constitution. This means that if the OST were to be opened for amendment of one particular article or to clarify a certain issue, the entire treaty would then be open for discussion. A thorough risk analysis of what could be lost as well as gained if an OST review conference was convened (with the intention of amending the treaty) is needed. This means asking some difficult questions regarding whether the provisions the OST presently contains could be achieved under current conditions. For example, an agreement banning nuclear weapons and WMD might not be possible to achieve in the current climate, nor perhaps an agreement on limiting military activity to peaceful or scientific purposes. The status of the OST during such negotiations would also be uncertain. There is a fear that some states could potentially move into the legal vacuum and create new types of practices. On the question of the treaty’s status in international law in the case of an outbreak in hostilities, the presumption is that the treaty would not be suspended. This presumption is based on the similarity of the OST principle of non-interference with the neutrality principle in the law of war that is maintained during conflict. Participants were warned to be careful about what they wished for in reviewing the treaty’s operation as this could increase the lack of clarity on certain issues.

#### DEBATE

Following the presentations, participants exchanged views on the following issues:

- Reframing the debate—the environmental aspect;
- The purpose of an OST review conference;
- Launch registration obligations; and
- The OST’s principle of non-interference and the neutrality principle.

The use of terminology commonly associated with environmental issues to apply to space, for example, “pollution” and “debris”, was postulated as a useful way of approaching the notion of outer space security

since such language could serve as an alternative paradigm for promoting objectives. The quality of the space environment is directly connected to the ability to operate in a secure manner. As of 2006, the problem or threat is not yet space weapons but rather space debris, which is primarily an environmental issue. In addition to the discussion in COPUOS, there are people already looking at how the environmental approach could complement the arms control approach. The concern, however, is that although space weaponization has not taken place, serious pollution already is having a major effect. Yet, the focus of the international community is still on the former and not on the existing problem.

A review conference of the OST could be convened to review the treaty's status without the intention of amending the treaty, similar to the review conference processes of other arms control treaties. It was generally felt that there could be a lot of utility in assessing the OST's performance at this stage. It was asked whether there would be value in negotiating a protocol to the treaty that could further the international community's understanding vis-à-vis Article IV, with the intention of extending its prohibition to the placement of all weapons in space. A review conference was suggested as a possible means of establishing a working group to look at such a possibility. In that regard, the very first UN General Assembly resolution (of 24 January 1946) defines WMD as all weapons adaptable to WMD. Had this definition been included in the OST, the Article IV problem would not exist. It was suggested that instead of a review conference an anniversary meeting could be held in 2007 timed to coincide with the OST's fortieth anniversary (noting too that 2007 was also the fiftieth anniversary of the first Sputnik mission). It was asked who would call for such a meeting. As the UN Secretary-General is the treaty's depositary, it was suggested that a meeting could be established via a UN General Assembly resolution.

Regarding the 1975 Registration Convention, concerns were expressed as to whether this is a voluntary or political commitment, whether it is a requirement for all UN Member States and whether it applies to both military and commercial satellites. One participant gave the example of the European Space Agency's (ESA) Ariane launch programme that launches from French Guiana. In this case it was asked whether the host country is responsible for registering launches or if this is the responsibility of the owners of the satellite. One problem is that some commercial satellite bodies that were once intergovernmental organizations have since been

privatized. At present, states in which a company's headquarters are located do not take responsibility for being the launching state. A COPUOS working group is currently reviewing this situation in relation to the Registration Convention and it was felt by a number of participants that both the owners of the satellite and the launch hosts should share responsibility in this matter.

In regard to the similarity between the OST's principle of non-interference and the neutrality principle in the laws of war, both are concerned with protecting peaceful activities in an area or region from non-belligerents. The OST codifies the right of all states to peacefully use and explore space. If two or more states were in conflict, it is presumed that this would not affect the rights of access of others. Thus, the treaty would be maintained during conflict, following the reasoning that the neutrality principle is not suspended in times of war.

#### **SESSION IV** **DEVELOPING CONFIDENCE-BUILDING MEASURES**

##### **The potential for outer space CBMs** *Phillip J. Baines, Foreign Affairs Canada*

CBMs are not designed to address the capabilities of others, rather they address perceptions of intent; thus, they succeed best when they lead to a transformation in perceptions. Some previous CBMs in outer space have worked well such as the 1975 Apollo Soyuz Test Project concerning the use of compatible docking systems that led to the first international handshake in space. Pre-launch notification is an area of space utilization in which CBMs could be effective today. A cooperative monitoring process referred to as "3D" (Declare, Do, Demonstrate) could be a suitable practice to apply to pre-launch CBMs. A 3D process would consist of three steps: declare what you will do, do what you had declared, and demonstrate that you did what you had declared. Such cooperative monitoring, which places the onus on compliance demonstration, could be less adversarial than challenge inspections or invitations to observers. Infrasound technology could well be an applicable technology—it is possible to detect Space Shuttle launches at the Kennedy Space Center from a distance of 1,200km. Applying the 3D cooperative monitoring system initially to pre-launch notifications and then to in-orbit satellite manoeuvres as well as to guided

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vehicle re-entry could take the international community to the next level of CBMs: a space traffic management system. Taking a “system of systems” approach, akin to air traffic control, is one way of achieving this system.

#### **Confidence building in outer space**

*Anton V. Vasiliev, Permanent Mission of the Russian Federation to the CD, and Alexander Klapovsky, Ministry of Foreign Affairs of the Russian Federation*

The Russian Federation’s resolution on transparency and confidence building in the sixtieth session of the UN General Assembly was a significant event. A simple first step in securing outer space and engendering confidence could be for interested parties to develop recommendations on possible CBMs together. In this way, CBMs could contribute to favourable conditions for a new agreement or treaty. Disagreements over verification measures could pose a considerable obstacle to agreement. These, however, could be prepared at a later stage and CBMs could compensate for a lack of verification measures in a new treaty for the time being. Transparency is the key for any specific CBM. A number of ways in which CBMs could be implemented were outlined including: information sharing; demonstration; notifications (of launches, satellite manoeuvres, re-entry of guided spacecraft, re-entry of nuclear powered craft); consultations; and thematic workshops. Such a proposal is not new, but builds on what has already been done to build confidence among space-faring nations. The Russian Federation’s no-first-space-weapon-deployment pledge is a good example of how states could take unilateral measures to build confidence. Such CBMs initially could be of a voluntary nature with the possibility that they might form part of a future treaty.

#### **The ESA Space Situational Awareness**

*Gerhard Brauer, ESA*

Space surveillance or Space Situational Awareness (SSA) systems need to be able to provide characteristics of satellites, in particular, orbit parameters and activity status of satellites; characteristics of potentially threatening debris, in particular trajectory data and physical parameters; and information related to space weather and near-Earth objects. Other data could be included to provide up-to-date SSA needed for threat assessments as well as alert cues to avoid collisions. From the European view, the cost-effectiveness of any system would depend on its use.

**CBMs: help or hindrance in achieving a space-based weapons ban?**  
*Theresa Hitchens, Center for Defense Information*

CBMs are a stepping stone to an eventual legal mechanism and as such they should not be skipped. As discussions on a PAROS treaty are currently at a standstill, states have a number of other options before them. One option is for dedicated nations to pursue a weapons ban treaty outside formal processes and structures, as was successfully done through the Ottawa Process used to achieve the Mine Ban Convention. Another alternative could be for interested nations and parties to continue to work to define a possible treaty approach, creating draft legal instruments, verification protocols, etc., until the time was ripe for negotiations to occur in the traditional setting of the CD. The crux of the situation is that some states remain unconvinced that a weapons-free space environment is either achievable or necessarily in their interests. In this regard, CBMs are of value. They are a way of dampening national threat perceptions and establishing consensus on mutual interests. Space debris is the most immediate area relevant to CBMs. COPUOS's proposed guidelines need development such as better data sharing across the gamut of space stakeholders, international practices and protocols for collision avoidance and joint research to combat problems such as ways to remove space debris. While CBMs are no substitute for a treaty, a combination of transparency regimes, CBMs, codes of conduct and strictures against debris-creating weapons, could, taken together, go almost as far as a total weapons ban.

**DEBATE**

Following the presentations, participants exchanged views on the following issues:

- Transparency issues;
- CBMs and BMD;
- The "dual-use" problem;
- The objective behind CBMs;
- Existing reporting requirements; and
- The view from the United States.

The need for greater transparency within existing transparency measures was expressed. None of the pre-launch notifications or reports of ballistic missile tests required in the existing arrangements and agreements

or submitted to the Hague Code of Conduct (HCOC) are made available to the public. This information is important and its lack of transparency could undermine the ability of the HCOC to further build confidence. The 3D concept could contribute to increasing transparency of those CBMs already in place.

On the question of BMD, it was suggested that states should think ahead as to what possible CBMs could be applied for the deployment of such systems. Some felt that when states begin testing in space, regardless of whether the system worked, it would erode the norm against weaponizing space and, therefore, needed to be addressed. The issue is not whether the system is effective, but rather what perceptions such deployment or potential employment engenders in others—which is precisely the point of CBMs: to build confidence in one state's perceptions of another state's intentions and activities. Another participant added that while BMD systems might not function as a whole, elements of BMD have latent ASAT capabilities that have been tested by directing missiles at particular targets in space; hence the relevance of the CBM question.

The dual-use problem related to SSA was raised in the sense of the same asset being used by both civilian and military enterprises. So far, there has not been sufficient discussion on how a system could be developed to serve both the civilian and military communities. It was thought that if the military contributed to any such system it could demand to own it at certain times, for example, in times of crisis. The space-faring community's discussion on this issue is still in its early stages and there is currently only one agreement in existence, the Turin Agreement between France and Italy. Legal research is being conducted on what a satellite-sharing agreement that satisfied both communities would look like.

Undue fixation on a treaty or on the necessity of agreeing to negotiate a treaty before other measures are discussed could be a mistake. It is important to remember the primary principles: the central issue is outer space security and how to establish it. Negotiating a treaty is a lengthy process—one the international community has yet to agree to. Interested actors now need to think about their goals and not become confined to the process. Some participants felt that a treaty might not be the best solution in any case. Often, people regard treaties as the optimum way to shape state behaviour, but the custom and practice that arises out of CBMs was proposed as another way. However, as one participant mentioned, it is

important to remember that CBMs would not prevent the weaponization of space, but should be understood as a transitional measure or part of a more realistic way to achieve this goal. Although CBMs are not a panacea, they would be worthwhile if they could command consensus and strengthen or create trust.

The prospects for consolidating the present reporting requirements under the various arrangements and agreements—for example, the HCOC and the 1975 Registration Convention—with a view to using these reports to monitor compliance with current obligations were discussed. Consolidation could develop transparency and build confidence on the basis of existing arrangements and agreements. A space traffic management system could serve this function. An important question is how the existing reporting requirements could best be interfaced and who should be responsible for coordinating this as well as which department at the national level should handle the information.

There was uncertainty expressed as to the United States' view of CBMs. The United States voted against a Russian-sponsored resolution in 2005 that concerned preliminary discussions on CBMs. The internal debate was said to be on transparency/CBMs versus what might be risked. The United States Air Force is interested in transparency, but apparently the intelligence agencies are not as keen. However, there are two areas where internal bureaucracies in the United States could move toward positions that could be expanded into CBMs. The first is regarding the protection of commercial satellites. There is increasing recognition that private companies are not national entities and so discussions concerning the protection of commercial satellites would need to include actors from outside government. A level of transparency would be needed to have these discussions. The second area concerns space debris, a problem that possesses no national allegiance. There is increasing recognition that mutual interests are apparent on these two issues. A way to start a dialogue that recognizes these mutual interests is now needed.

**SESSION V**  
**INTERACTIVE DEBATE ON PUBLIC AWARENESS AND**  
**ADVOCACY IN POLICY MAKING**

**Strategies for raising public awareness and influencing political decision making**  
*Rebecca Johnson, Acronym Institute for Disarmament Diplomacy*

Much has changed since the first Geneva seminar on space security was held in November 2002, with a main focus on educating, informing and raising awareness. A range of proposals and initiatives that have come to the fore since then, including the SSI, codes of conduct, guidelines for mitigating space debris, initiatives for reviewing and strengthening the OST in its fortieth year (2007) and treaty approaches such as the Russian–Chinese draft treaty tabled in the CD.

But, however good the ideas might be, without public awareness and effective strategies they remain in the realm of thought, not action. There are various drivers for raising public awareness, including fear of weapons or war in space, self-interest not to lose vital space applications on which we are now so dependent, commercial investments and interests, opposition to BMD and the romantic or moral appeals associated with space exploration and notions of keeping the heavens safe and peaceful.

Resolutions in both the UN First and Fourth Committees in 2007 could be tabled, calling for support for and universal adherence to the OST, and for a review conference to be held to commemorate and review its 40 years of operations and consider ways to strengthen implementation and progress toward universality. It could also be possible to bring the 1967 OST up to date (without opening it for amendment, which would not be desirable) by adopting a more space-relevant interpretation of the term “weapon of mass destruction” in the treaty: that in view of the particular circumstances of outer space, any weapon used in or from outer space would result in unpredictable and potentially mass destructive effects.

The discussion on this presentation returned to the proposed review conference of the OST, specifically linking it to the fiftieth anniversary of the launch of Sputnik (4 October 2007) and holding it at the United Nations in October 2007. It was proposed to invite commercially interested parties to the discussion table: Boeing, as a part owner of the pioneering Sea Launch

Company, was singled out as one such entity that could be worthwhile to include. The idea of convening a specific forum whereby those in the business and academic communities could come together to share their views was also suggested.

The possibility of creating an Internet network for exchanging ideas as a useful way of facilitating and developing ongoing discussions was raised. It was noted, however, that such a network already exists although it remains underutilized due to lack of awareness. Participants were informed of the Pugwash Internet Discussion and Information Sharing Forum, an initiative borne on the sidelines of the Pugwash conference “60 years after Hiroshima and Nagasaki” held in Hiroshima, Japan, in 2005. The forum was created to stimulate ideas and overcome the various existing boundaries to such interaction.

Rebecca Johnson concluded that:

- There is still a need to forge alliances and communicate better with commercial and military players, including in the United States, to ensure sustainable space security;
- We now need to engage parliamentarians much more effectively to raise the level of debate in different countries and regional institutions such as the European Union, and to provide legislators with the information and questions to ask governments, defence ministries and regional alliances such as North Atlantic Treaty Organisation;
- We need to do more to break down the institutional and political barriers so as to address both the civilian and military aspects of space security more coherently; and
- In order to adapt a principle of political strategy (think globally, but act locally), we need to think comprehensively, but build the space security architecture incrementally.

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