

Conference Report

UNIDIR held its twelfth annual Space Security Conference, entitled “Enhancing confidence, ensuring space stability”, on 2 and 3 April 2013 in Geneva, Switzerland. The conference was organized in collaboration with Secure World Foundation, The Simons Foundation, and Chatham House, with support from the Governments of India, Japan, the People’s Republic of China, the Russian Federation, and the United States of America. The conference focused on the potential negative impacts of emerging security threats on all types of outer space activities. In-depth discussions were held on the roles that might be played by various stakeholders in efforts to enhance stability in outer space.

Introduction: The Evolution of Space Security

Much has changed in the space domain over the last 50 years. In the early days of space activity, the political landscape was dominated by the Cold War. As a result, multinational policymaking was, for all practical purposes, divided between the two major political blocs. Today’s world is vastly different. Space is no longer solely the domain of major military actors, but rather a critical component of modern infrastructure in which many parties, both public and private, operate on a daily basis. However, as the range of stakeholders in outer space grows, space activities, and resulting dependence, increase; so too does society’s vulnerability to emerging space security threats.

Emerging space security threats

Technology and operational business models have evolved drastically to meet the growing demand for space-based services with cheaper satellites, private multinational service providers, and more efficient launch capabilities. As a result, there are over one thousand satellites in outer space today, operated by over 60 states and entities.¹ The rise in the number of players and activities in space means that space is becoming increasingly congested, with the risk of collisions between satellites in orbit becoming ever greater. Not only is there a danger of impact between operational satellites, but also with the growing amount of space debris. The last five years alone have seen an alarming 50 per cent increase in the amount of debris in the most populated orbits.²

Outer space has also become increasingly contested, with geopolitical tensions threatening to spread into the space domain. At its most fundamental level, the space environment represents the high ground for modern militaries,

1 See Union of Concerned Scientists, “UCS Satellite Database”.

2 S. Cruddas, “ESA plans to clear up space junk”, *Sen*, 3 October 2012.

providing considerable strategic value that many are seeking to secure for their military programmes. The applications used by militaries range from the coordination of troop deployment to intelligence gathering. Outer space also enables crucial services for societal infrastructure, delivering critical data and information to all sectors of civilian life. For these reasons, space assets have become increasingly attractive targets for attack. Advances in technology have produced affordable tools that enable such attacks, whether through signal jamming, cyberattack, or the use of ground-to-space kinetic anti-satellite weapons. Given the physical characteristics of space, the use of such technology, by any actor, could lead to a significantly destabilized space domain.

Inclusion of non-traditional voices in space security dialogue

Until recently, the majority of space activities have been carried out by states due to the high costs involved. However, as already mentioned, technological advances have led to the proliferation of more affordable means to gain entry into space, resulting in the emergence of more types of actors conducting space activities. For example States with no prior history in this sector are entering into cooperative partnerships in order to gain access to important space benefits. The private sector has established itself as a key provider of space-based services, with extensive technical knowledge and practical experience of space operations. Non-governmental organizations (NGOs) are proving to be valuable sources of expertise on space issues, capable of bridging gaps between governments, industry, and other space actors. Each of these categories of actors are at different levels of development, with needs and interests that differ from those of established space actors. As they become increasingly active in space, their behaviour will likewise have an increasing impact on the space environment as a whole. As such, they are valuable players whose participation in the development of future rules and frameworks for space activities is indispensable.

Exploring options for achieving a more stable and secure space domain

In light of the ongoing changes in the space domain, some key stakeholders are considering whether the existing legal and political regime for outer space activities adequately addresses current geopolitical, economic, and technological realities. Little progress has been made in those forums where formal legal instruments for space activities have been discussed, which some attribute to the fact that, today, there are many more players than before, with diverse interests in the regulation of space. The positions and needs of these actors have, at times, proven difficult to reconcile. As an alternative to the development of formal legal instruments, policymakers have turned to political and voluntary measures to make progress on establishing parameters for acceptable space conduct. Norms of behaviour, frameworks, and guidelines are some of the voluntary tools that could help to establish “rules of the road” aimed at defining acceptable parameters for space activities among the international community.

At present, there are several significant multilateral initiatives that are underway in different forums seeking to establish such informal tools. They include, in particular, the United Nations Group of Governmental Experts (GGE) on transparency and confidence-building measures in outer space activities, the Working Group on the Long-Term Sustainability of Outer Space Activities of the Scientific and Technical Subcommittee of the United Nations Committee on the Peaceful Uses of Outer Space (LTSSA), and the

International Code of Conduct for Outer Space Activities (ICoC). These initiatives are seen as a part of a wider comprehensive effort to define responsible behaviour in space by developing independent but complementary tools.

The role of the conference

A specific aim of the Space Security Conference 2013 was to highlight emerging space actors within the context of multilateral initiatives and to examine how these actors could further contribute to the overall dialogue. The conference demonstrated that these actors are greatly invested in ensuring that the space environment remains as stable as possible and that they have a critical role to play in finding viable solutions for security issues in space. Thus, the conference provided a forum in which established and emerging actors were able to share views in open dialogue and to explore options for achieving safety and security in outer space for all.

Proceedings³

Panel I: Space security threats: exploring current vulnerabilities in outer space

Speakers: Amb. Wu Haitao, Ambassador for Disarmament Affairs and Deputy Permanent Representative to the United Nations Office at Geneva, People's Republic of China (audio available on our [website](#))

Mr. Vladimir Yermakov, Deputy Director, Department for Security Affairs and Disarmament, Ministry of Foreign Affairs, Russian Federation ([audio](#))

Mr. Amandeep Singh Gill, Minister, Permanent Mission of India to the Conference on Disarmament ([audio](#))

Mr. Frank Rose, Deputy Assistant Secretary of State for Space and Defense Policy, Department of State, United States of America ([audio](#))

To provide the context of current space security dialogue, the first panel featured representatives of established space powers. They welcomed the opportunity to engage with experts from diverse backgrounds, stressing the need for open dialogue between as many stakeholders as possible in the pursuit of comprehensive solutions to the problems and threats that are emerging in outer space.

In particular, the panellists drew attention to the threats of the risk of weaponization of outer space, space debris, frequency interference, and lack of space situational awareness. While the panellists held different views on the particular order of priority of these threats, there was consensus that a comprehensive approach should be taken by the international community to develop tools and frameworks that might ensure the long-term sustainability of space activities. Some of the panellists were in favour of pursuing a binding international treaty that would help to prevent the outbreak of armed conflict in outer space, which could have immeasurable consequences. Others debated

³ This report aims solely to reflect the content of the presentations and discussions and does not necessarily reflect the opinions and positions of UNIDIR, the United Nations, the sponsoring organizations, or supporting states.

the feasibility of achieving such an instrument, particularly in light of the wide range of socioeconomic interests of space actors, and suggested that voluntary political measures are more realistic goals.

Attention was drawn to the ongoing multilateral initiatives to bolster safety and security in outer space, particularly through the development of transparency and confidence-building measures (TCBMs). The panellists agreed that the work in these forums as distinct but could be harmonized to ensure complementarity. There was consensus that these efforts could serve as a solid basis for stability in the space environment.

Panel II: Multilateral non-binding initiatives: an update on international cooperative efforts on space security

Speakers: Mr. Victor Vasiliev, Chair, GGE ([audio](#))

Dr. Peter Martinez, Chair, LTSSA ([audio](#))

Amb. Jacek Bylica, Principal Adviser and Special Envoy, Non-Proliferation and Disarmament, European External Action Service, European Union ([audio](#))

The second panel provided updates on three of the multilateral initiatives to develop TCBMs and norms of behaviour—the GGE, the LTSSA, and the ICoC. Each is a cooperative effort to address growing security problems in outer space. The Chair of the GGE—a 15-member group of experts established by the United Nations Secretary-General at the request of the General Assembly at its sixty-fifth session—recalled that the aim of the group is to submit a comprehensive report to the General Assembly at its sixty-eighth session with recommendations on the development of TCBMs with a view towards preventing an arms race in outer space.⁴ The Chair of the LTSSA stated that the group had been formed to examine and propose measures for ensuring safe and sustainable use of space for peaceful purposes for the benefit of all countries. Its terms of reference call for recommendations and guidelines that take into account current best practices in space and existing legal frameworks. Finally, the EU’s special envoy presented the proposed ICoC, a voluntary code intended to promote safety and security in space by establishing baseline standards of conduct for civil and military space activities.

The panellists agreed that all three initiatives are fundamentally compatible, and it was felt that efforts should be made to ensure complementarity. Furthermore, the panellists supported the idea that widespread participation would be highly valuable to each of the processes. The Chair of the GGE noted that the group had issued a call to all non-participating states, as well as to the commercial space sector and to NGOs, to submit comments on the ongoing work. The EU Special Envoy also pointed out that as many states as possible would be invited to attend the first round of open-ended consultations on the ICoC.

⁴ General Assembly, *Transparency and Confidence-Building Measures in Outer Space Activities*, resolution A/RES/65/68, 13 January 2011, para. 2.

Keynote: Mr. Kassym-Jomart Tokayev, Director-General of UNOG; Secretary-General of the Conference on Disarmament and Personal Representative of the United Nations Secretary-General to the Conference ([audio](#))

The Director-General acknowledged the indispensable nature of space-based services to modern society, citing telecommunications, weather forecasting, disaster management, and resource protection applications as being just some of the services that people rely on every day. He also acknowledged that the utility of outer space is at risk from a number of security threats, many of which could be traced to basic human traits such as uncertainty, suspicion and mistrust. The Director-General suggested that TCBMs in the space domain could play a key role in mitigating the dangers of human misunderstandings and miscommunications. He recalled that the United Nations Secretary-General has stressed that the prevention of an arms race in outer space should remain a high priority for the international community, as such an arms race could undermine development globally. The Director-General reiterated the view that human development had become highly interconnected with outer space and that comprehensive mechanisms should be sought to ensure the preservation of space for future generations. He commended the annual UNIDIR Space Security Conference as an ideal forum to engage in open dialogue on how best to achieve the long-term sustainability of human activities in outer space.

Panel III: Emerging space security threats: anticipating the challenges of tomorrow for human space activities

Speakers: Prof. Frans von der Dunk, Space Law, University of Nebraska College of Law ([audio](#))

Mr. Dave Clemente, Research Associate, International Security, Chatham House ([audio](#))

Mr. Yvon Henri, Chief, Space Services Department, International Telecommunication Union ([audio](#))

Prof. Joan Johnson-Freese, National Security Affairs, US Naval War College ([audio](#))

The next panel focused on the growth of human dependence on space-based services and the increase in vulnerability to space security threats. The panellists discussed how man-made risks, in addition to the natural hazards of outer space, have emerged that could significantly reduce the capacity of space-based services that support valuable socioeconomic development. They analysed those threats that are seen as having particularly negative consequences for all space activities—space debris, cyberattack, interference harmful to space assets, and the potential weaponization of outer space.

This panel illustrated the destabilizing potential of space security threats and how they are all inherently linked together. In particular, one panellist pointed out that one of the principal problems with the intentional destruction of satellites is the creation of additional space debris, which could eventually render the assets of any space actor inoperable. This could also be the case with a cyberattack—for example, a malicious actor could take control of a satellite and steer it into a collision with another. Such threats also raise a number of definitional complexities, particularly as the dual-use nature of space assets makes it difficult to define a “weapon” in space. However, there was consensus

among the panellists that comprehensive solutions can be reached whereby the access to space and the utility of outer space could be preserved for all.

Panel IV: Taking account of non-traditional voices: emerging space actors, NGOs, and their impact on current efforts to make progress in finding solutions for space security challenges

Speakers: Amb. (retd.) Paul Meyer, Senior Fellow, The Simons Foundation ([audio](#))

Ms. Agnieszka Lukaszczyk, Brussels Office Director, Secure World Foundation ([audio](#))

Mr. Mohamed Hatem Elatawy, Officer in Charge of Disarmament, Mission of Egypt to the United Nations and other International Organizations in Geneva ([audio](#))

Dr. Sergio Camacho, Secretary-General, Centro Regional de Enseñanza de Ciencia y Tecnología del Espacio para América Latina y el Caribe – CRECTEALC ([audio](#))

This panel shed light on how interactions in space have changed significantly due to the expansion of the number, and broadening of the nature of space. The panellists explained that, as space technology has become more accessible, an increasing number of states have become important players in the domain. The panellists also pointed out that, in addition to state actors, NGOs have also sought to leverage their expertise in international policymaking in order to promote creative solutions for space sustainability. The contributions were seen as valuable by the panellists, particularly in light of the slow progress being made to address stability and security in outer space at the multilateral level.

There was some concern that, historically, the voices of many less central actors had not been incorporated into discussions on space security. It was felt that lack of awareness and expertise, particularly among developing countries, had led to disparate levels of participation by states within multilateral initiatives regarding space activities. Such disparity has created additional roadblocks for multilateral space security processes that require widespread participation and support to achieve their aims. It was agreed that affirmative steps should be taken to encourage broader participation in the space security dialogue by emerging actors and to increase awareness of space security issues in developing countries. In particular, it was thought that NGOs could play a critical role in reaching out to the developing world, providing expertise and information where it is most needed.

Panel V: Lessons from private actors: analysis of innovations by the commercial space sector on new methodologies for contributing to space security initiatives

Speakers: Mr. Jean-Francois Bureau, Director of Institutional and International Affairs, Eutelsat SA ([audio](#))

Mr. Stewart Sanders, Executive Director, Space Data Association ([audio](#))

Ms. Cécile Gaubert, Head of Contracts, Marsh SA ([audio](#))

Private entities have emerged as important actors in the space domain. Accounting for most current space activity, the commercial space sector has had to adapt to many of the space security threats in order to ensure their continued provision of services. From a commercial perspective, the biggest threats to the integrity of space assets are the threat of collision, either with operational assets or debris, and harmful interference. Commercial operators have voluntarily taken technical measures for many years to mitigate debris creation, such as decommissioning satellites in higher orbits. This is seen by many operators as a fundamental part of responsible fleet management. However, these measures are not sufficient to keep space debris from increasing, thus the space environment becomes increasingly dangerous, and therefore expensive, to operate in. This is illustrated by the growing concern of the space insurance community, whose rates may have to rise if the exposure of space assets to damage by debris continues to increase

One example given by participants of a voluntary measure taken by industry to address space security was the Space Data Association (SDA). Many experts have called for increased space situational awareness to address the growing threat of space debris and collision. SDA is a non-profit organization of commercial actors that seek safety and integrity of space operations through wider coordination and cooperation among operators. Members of SDA provide situational data, improving fleet management through secure, shared data resources and analysis. By providing a confidential forum for many operators to share data, SDA has significantly improved space situational awareness for satellite operators, reducing the dangers of collision and interference. Such a mechanism is seen as a useful template for a comprehensive multilateral approach to improving space situational awareness.

Special presentation: NGOs in space security—reasons for engagement

Speakers: Amb. (retd.), Paul Meyer, Senior Fellow, The Simons Foundation ([audio](#))

Dr. Michael Simpson, Executive Director, Secure World Foundation ([audio](#))

Mr. Dave Clemente, Research Associate, International Security, Chatham House ([audio](#))

The 2013 Space Security Conference was organized in collaboration with three NGOs: Secure World Foundation, The Simons Foundation, and Chatham House. A special presentation was held to illustrate how NGOs, as relative newcomers to discussions on space security, have already made a notable impact. The representatives of these NGOs recognized that the world is dependent on outer space and explained how NGOs are seeking to facilitate dialogue on issues where established and reliable patterns of

communication among stakeholders do not currently exist. They noted that NGOs are uniquely able to speak on behalf of civil society in space security discussions as they are not constrained by many of the diplomatic considerations facing governments. The representatives stated that this is particularly important as civil space activities are becoming increasingly widespread, and thus the need to reconcile the interests of all space actors is imperative.

Panel VI: Assessing the comprehensiveness of legal frameworks for outer space activities

Speakers: Prof. Setsuko Aoki, Faculty of Policy Management, Keio University ([audio](#))

Prof. Li Juqian, China University of Political Science and Law ([audio](#))

Dr. Xavier Pasco, Senior Research Fellow, Fondation pour la Recherche Stratégique ([audio](#))

The first panel of the second day of the conference analysed the existing regime for the regulation of outer space activities. As explained by the panellists, this regime is primarily founded on the United Nations outer space treaties and principles, but they noted that, as technology and space activities have rapidly evolved, the laws that apply in space have remained unchanged. It was noted that, in order to bolster the space law regime, policymakers have looked to cooperative measures to help mitigate threats such as the weaponization of space and the creation of space debris. The panellists discussed, in particular, the usefulness of TCBMs, as well as voluntary frameworks and guidelines in order to help define responsible behaviour and to avoid diplomatic and political issues that might make the pursuit of formal treaties impractical. They also felt that soft law has the potential to confirm international consensus on specific issues, serve as the basis for technical guidelines, stimulate relevant national policymaking, and potentially form the basis for future negotiations on possible treaties.

The potential of cooperative measures was seen in the example of the European Space Policy (ESP), a unified regional approach that seeks to promote pragmatic solutions to the needs of EU member states. As explained by one panellist, the impetus for this cooperative approach was a desire to share the enormous costs of developing a space programme, something which other space powers had dealt with by tapping into military and defence funds. He noted that, in the case of the ESP, the goal was to establish a space programme that focused on civil development across Europe but has now turned into a mechanism whereby all EU member states can coordinate their approach to space policy. One panellist proposed that the ICoC is a product of this approach, arising from the cooperative and multilateral traditions of the EU's cultural heritage.

Panel VII: Tomorrow's cooperative approaches: assessing next steps for collaborative efforts in space and the potential roles of emerging civil, and commercial actors

Speakers: Dr. John Sheldon, Senior Fellow in Security Studies, Canada Centre for Global Security Studies, University of Toronto ([audio](#))

Dr. Abdul-Hakim Elwaer, Director of Department of Human Resources, Science and Technology, African Union Commission ([audio](#))

Dr. Rajeswari Rajagopalan, Senior Fellow, Observer Research Foundation ([audio](#))

Dr. Yasushi Horikawa, Chair, COPUOS ([audio](#))

The final panel examined how space activities have evolved over the last few years and what these changes will mean for future growth. The panellists drew attention to changes in international politics, technological developments, and the emergence of state and private actors that has broadened the space security dialogue to include a much wider range of stakeholders. Organizations with little history in space, such as the African Union, are seeking to take full advantage of space-based services for their member states by incorporating space capacity-building into their development policies. In order to address growing space security concerns—such as weaponization of space and debris—the panellists suggested that it is crucial to encourage non-traditional actors to further participate in multilateral initiatives in order to take into account the full spectrum of interests in cross-cutting space issues.

The panellists agreed that agreeing on rules is significantly more complex now that there are so many parties with vital interests in space activities. This was seen as a welcome challenge because it signals that space is becoming more widely accessible, with a greater portion of the world deriving benefits from outer space. It was felt that international coordination mechanisms and established multilateral forums could serve as platforms to bring together the wide range of stakeholders, who should be involved in the development of new rules. In particular, it was agreed that the private sector, with many years of practical operating experience in space, could provide valuable input in the development of new norms of behaviour for space activities.

Concluding remarks: Ms. Theresa Hitchens, Director, UNIDIR

Theresa Hitchens concluded that realities in space warranted comprehensive approaches to security that brought non-traditional actors to the table. Their input has already yielded insight to existing security threats and how they might be mitigated. Valuable lessons can also be taken from the experience and expertise of non-state actors in space, in particular the private sector. Finally, international forums that offer an opportunity for constructive dialogue among key stakeholders from a wide variety of sectors, of which the Space Security Conference is a prime example, are valuable exercises in the development of comprehensive solutions to space security issues. These discussions are, in effect, transparency and confidence-building measures in themselves.

Conclusion

Throughout the conference, participants drew attention to three factors that make today's geopolitical climate distinct from that of a few years ago. First, there is an increasing number of state and private actors, with a wide array of interests and needs, engaging in outer space activities. Second, technology has evolved significantly, giving actors access to a broader range of affordable civil and military space capabilities. Third, the widespread use of space-based services has made outer space a critical element of modern economic and social infrastructures. The combination of these factors results in more space actors carrying out a wider range of activities with profound impacts in space and on Earth. This situation, while signalling an encouraging growth of space-derived benefits, has caused policymakers and key stakeholders to raise the priority of the space security dialogue.

During the discussions, the panellists referred to several multilateral initiatives as a means of addressing space security threats through cooperative measures as opposed to engaging in competitive conduct. A competitive space environment, it was felt, would result in the destabilization of the space domain and a drastic reduction in the socioeconomic value of space activities. On the other hand, establishing cooperative frameworks and guidelines that lay out responsible behaviour was seen as positive steps towards ensuring a safe and sustainable space environment for all.

Most importantly, participants stressed the role of non-traditional actors in the development of any tools aimed at enhancing security in space. In particular, the role of these actors was seen as one that will grow steadily in the coming years, representing a greater percentage of all space activities. As such, it is important to take into account the specific needs and interests of these actors, thereby increasing the possibility that future activities will be carried out in a safe and sustainable manner. These actors, particularly the commercial space sector, are a valuable source of expertise and technical knowledge that must help to establish new approaches to space security. Given the risks and threats in outer space, participants were in agreement that as many stakeholders as possible should be brought to the table as policymakers seek to enhance confidence and secure space sustainability.

The views expressed in this document are the sole responsibility of the author. They do not necessarily reflect the views or opinions of the United Nations or of UNIDIR's sponsors.

About UNIDIR

The United Nations Institute for Disarmament Research (UNIDIR)—an autonomous institute within the United Nations—conducts research on disarmament and security. UNIDIR is based in Geneva, Switzerland, the centre for bilateral and multilateral disarmament and non-proliferation negotiations, and home of the Conference on Disarmament. The Institute explores current issues pertaining to the variety of existing and future armaments, as well as global diplomacy and local tensions and conflicts. Working with researchers, diplomats, government officials, NGOs and other institutions since 1980, UNIDIR acts as a bridge between the research community and governments. UNIDIR's activities are funded by contributions from governments and donor foundations.