



UNIDIR

UNIDIR Space Security Conference 2015

Underpinning Foundations of Space Security

UNIDIR RESOURCES

Acknowledgements

Financial support for the 2015 Conference was received from the Governments of the People's Republic of China and the United States of America, and The Simons Foundation.

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.

Note

The designations employed and the presentation of the material in this publication do not imply the expression of any opinion whatsoever on the part of the Secretariat of the United Nations concerning the legal status of any country, territory, city or area, or of its authorities, or concerning the delimitation of its frontiers or boundaries.

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

The report was drafted by Chris Johnson and Victoria Samson.

www.unidir.org

© UNIDIR 2015

UNIDIR Space Security Conference 2015

Underpinning Foundations of Space Security

Conference Report

24-25 August 2015, Geneva, Switzerland

Organized by the United Nations Institute for Disarmament Research, the Secure World Foundation and The Simons Foundation.

With support from the Governments of the People's Republic of China and the United States of America.

Introduction

Space Activities and their Security Context

UNIDIR's fourteenth annual Space Security Conference, entitled "Underpinning Foundations of Space Security", focused on foundational definitions needed for space security, and in-depth discussions were held on the necessities and the challenges involved in coming to understandings on definitional issues related to the safety and security of outer space activities.

The world is increasingly dependent on space-based services and the space domain, with wide-ranging applications including telecommunications, Earth observation, satellite navigation, and weather forecasting. As such, it is clear that any destabilization of the space environment and disruption of space-based services has the potential to cause far-reaching impacts in nearly all states around the world. Considering the conclusions of the 2013 Group of Governmental Experts (GGE) on Transparency and Confidence-Building Measures (TCBMs) in Outer Space Activities, the work of the Conference on Disarmament on the Prevention of an Arms Race in Outer Space (PAROS), and various United Nations General Assembly resolutions on the prevention of instability in outer space, it is evident that the international peace and security implications of space activities are of growing importance.

Space for economic development and general strategic stability

Space is not just the “other” domain. Space is linked to all other domains and to the national security strategy of many countries, playing a crucial role in how countries reflect on their strategic stability. Space is a part of many countries’ national security strategies, and also part of their economic development. Consequently, space is a part of many states’ concept of general strategic stability. Looking at various aspects of stability, and how space fits into that discussion, might bring light to discussions within the space domain and how states concern themselves with space.

The role of the conference

A specific aim of the Space Security Conference 2015 was to highlight the foundational underpinnings of space security, both security in space of space assets, and security on Earth as it is affected by space assets. The conference demonstrated that these issues, as well as their context and scope, are of primary importance to any cooperative or coordinated efforts in the international realm. Consequently, the conference provided a forum where established and emerging actors were able to share views in an open dialogue and to explore concerns and options for achieving greater understanding and consensus on the foundational underpinnings impacting further initiatives for space security and stability.

PROCEEDINGS¹

Panel 1

Conceptual Starting Points—National Approaches to Space Security

- **Mr Alexander Deyneko**, Deputy Permanent Representative, Permanent Mission of the Russian Federation, Geneva ([audio](#))
- **Ambassador Venkatesh Varma**, Permanent Representative, Permanent Mission of India to the Conference on Disarmament ([audio](#))
- **Ambassador Robert A. Wood**, Permanent Representative to the Conference on Disarmament, Permanent Mission of the United States of America ([audio](#))
- **Mr Muhammadou M.O. Kah**, Advisor to the President of The Gambia on STI Policy; Vice Rector for Technology & Innovations and Founding Dean, School of IT & Engineering, ADA University, Baku, Azerbaijan ([audio](#))
- **Ambassador FU Cong**, Deputy Permanent Representative (Disarmament), Permanent Mission of the People’s Republic of China to the United Nations, Geneva ([audio](#))

To provide the context of the current space security dialogue, the first panel began with representatives from established and emerging space states elaborating on their national security space strategies. Panellists considered the contributions of outer space security to disarmament, international security, and sustainable development. They also considered challenges to space sustainability and security, progress in implementing voluntary, non-legally binding transparency and confidence-building measures (TCBMs) to enhance stability

¹ 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 of supporting states.

in outer space, and the multilateral efforts in the progressive development of international law.

While the panellists held diverging views on a number of initiatives, and on their relative importance, they agreed that international efforts akin to the report of the GGE on TCBMs, the long-term sustainability guidelines pursued within COPUOS, the ongoing efforts to advance an international code of conduct on outer space activities, as well as the discussions and efforts underway within PAROS, as well as other possible initiatives, were the types of activities which may prove instrumental in the long-term stability and safety of space activities.

Looking to the past, panellists recalled over 50 years of international political and legal developments, beginning with UNGA Res. 1962 of 13 December 1963, and the 1967 Outer Space Treaty. The view was expressed that while Article IV of the Outer Space Treaty bans weapons of mass destruction, it does not completely eliminate the weaponization of outer space. The draft Treaty on the Prevention of the Placement of Weapons in Outer Space, the Threat or Use of Force against Outer Space Objects (PPWT) and the no first placement (NFP) of weapons in outer space initiative (as an interim political pledge) were also discussed as a means to close what might be perceived as a troublesome hole in international law. Others stressed the troubling trend of space debris as the most urgent threat to the long-term sustainability of space activities.

One effort addressed was a draft International Code of Conduct for outer space as a voluntary, non-binding, non-discriminatory, internationally acceptable measure, to be negotiated on the basis of consensus within the framework of the United Nations in an inclusive and transparent manner. Its objective is to enhance space security and sustainability for all actors. Addressing the need for multilateral efforts, the view was held that rather than resorting to national measures, or interim or partial steps, the goal of international consultations and negotiations is the progressive development of international law to ensure the continuing peaceful and sustainable uses of outer space. Whether these be binding international laws, or TCBMs, panellists posed that in any multilateral process, it is only by ensuring the right process and the right participation that the right product will result.

Panel 2 Foundational Concepts

- **Mr André João Rypł**, Office of Outer Space, Ocean and Antarctic Affairs, Brazilian Ministry of External Relations ([audio](#))
- **Ms Victoria Samson**, Washington Office Director, Secure World Foundation (SWF) ([audio](#))
- **Ms Jana Robinson**, Space Security Program Director, Prague Security Studies Institute (PSSI) ([audio](#)) ([text](#))

In considering the foundational concepts of space security, the panellists in the second session reflected that every new issue that is addressed tends to lead to new questions. Panellists posited that many of our everyday actions, such as using position, navigation, and timing (PNT) satellites for navigation on Earth, using space assets for communications, and related downstream benefits like weather forecasting, tele-medicine and precision agriculture, indicates that much of our modern, globalized, and interconnected lifestyle is contingent on space. Therefore the stakes are quite high, and the perils to the continuing

use of space are growing. As space technologies are inherently dual-use, with both civilian and military applications, it is especially challenging to configure an overarching architecture for the governance of space activities.

The issue of self-defence in space was raised. It brings up questions about the concept of an armed attack for outer space, proportional responses, the principle of distinction in outer space, and frequency interference. It was noted that the international community is divided between viewing self-defence in space as an inherent right stemming from the United Nations' Charter and worrying that discussing it will eventually lead to the weaponization of space. We do not have a clear definition, or much consensus on some important issues and concepts, including the definition of "peaceful purposes," enshrined in Article I of the Outer Space Treaty. Some believe that peaceful is the opposite of military, and that any internationally negotiated instrument that is limited to peaceful purposes therefore excludes all military activities. However, it is evident that there are certain related duties, such as the due regard obligations in Article IX of the Outer Space Treaty, along with prohibitions on weapons of mass destruction in Article IV, and the general prohibitions on the threat of force and the use of force, that also impact the space realm and that states must consider.

Panellists noted that space weapons do not only mean weapons in space, and that some space weapons can be based on existing weapon technology, including direct ascent kinetic energy missiles, particle beams, and ground-based lasers. Other weapons might be unique to space, such as hypervelocity rods, space-based lasers, and co-orbital "space-mines." Additionally, any system that can cause disruption or interference (such as jamming, spoofing, and cyber-attack) are certainly a growing and serious threat to operations in space. As such, it is no longer an option to believe that all is well in space, and it is useful to speak plainly about these matters before an actual crisis develops.

Keynote

The Underpinning of Space Security in General International Law

- **Mr Peter Hulsroj**, Director, European Space Policy Institute ([audio](#)) ([presentation](#))

Mr Hulsroj's keynote presentation considered the space security situation as it exists within a number of wider contexts, all necessary for clearly understanding the space security situation, and as a source for new ideas and solutions in the space security domain. Space security within an unstable system will always suffer repercussions stemming from beyond its particular normative system. This is so because a world that is perceived as unjust is inherently unstable. Therefore, we must strive for a world that is not only just, but also *perceived* as just. This will require recourse to contexts outside of space.

Because the rules of space law do not operate in isolation, general international law, and indeed the wider normative "universe," is a rich source for resolving space law and space security questions. More attention should be given to linking the space law and security domains with the general international law and security context, which both underpin these issues, and might supplement them in ways not fully acknowledged.

In looking to find normative solutions, we should consider not just the five major treaties on space, but also space law's substantive "neighbours" in the rules of war, international environmental law, general rules of responsibility between states, and by considering the general interconnectedness of international rules from across the "continent" of international law, including principles on "good-neighbourliness." Mr Hulsroj also stated that as outer

space is a realm where the actions of one state might concretely affect the actions or potential actions of others, the long-established principle of public international law, “that which is not explicitly prohibited is therefore permitted,” might need to be reconsidered and questioned for its continuing validity and appropriateness.

Considering the forms used to establish normative systems, Mr Hulsroj concluded that future generations will not be pleased with us if they see that all we could use were “soft law” instruments to deal with threats to peace in outer space, especially as space is more and more central to our everyday life. We should rather use all the options available to us, including the development of binding normative systems on both the international as well as the national levels.

Panel 3

Shared Stakes, Shared Space—Military and Civilian Perspectives

- **Mr Ajey Lele**, Gp. Capt. (Ret.), Assistant Director (Administration), Institute for Defence Studies and Analyses (IDSA), New Delhi ([audio](#)) ([presentation](#))
- **Mr Salem Humaid Al Marri**, Assistant Director General, Scientific and Technological Affairs, Mohammed Bin Rashid Space Centre ([audio](#)) ([presentation](#))

Panellists commented that stakeholders in space are both civilian and military in nature, so they have many different interests in and goals for their space capabilities. To understand stakeholders, one must look at the role, interests, potential impact, influence, and costs of space activities. Space is strategic in nature, as it provides global access and presence. Space power is the ability in peace, crisis, or war to exert, promote, and sustain influence in or from space; this differs from space superiority, which one panellist described as the degree of dominance in space that permits space operations without outside interference from space-based assets. Possible ways space can be used to aid militaries are to build real-time situational awareness, link radar and other communication networks, assist in ballistic missile defence, and jamming enemies’ space capabilities. In increasing the number of military uses of space, the question arises about whether space can be made a predictable, safe, and stable domain.

The next panellist discussed his country’s priorities for space. While they only recently created a government space agency, the commercial satellite sector has been active for nearly two decades. They have recently created a centre which is intended to create, use, and exploit space technologies and applications. Cubesats are, for this country and like many others, a way in which to develop domestic capabilities while also creating scientific progress. A Mars probe is planned to arrive in 2021. Space is generally seen as a key economic driver; as such, effort has been made to become involved in United Nations’ discussions and groups that focus on civil use of space. With the recognition that space capabilities bring with them responsibilities, the national space activities strive to meet norms of responsible behaviour. Finally, the role of this country in leading other new space actors in its region was emphasized greatly as an opportunity to enhance capabilities across the board.

Panel 4 Legal and Diplomatic Aspects of Space Security

- **Ambassador (Retired) Paul Meyer**, Senior Fellow in Space Security and Nuclear Disarmament, The Simons Foundation ([audio](#)) ([text](#))
- **Ms Olga A. Volynskaya**, Chief International Law Counsel, International Cooperation and Treaties Department, Russian Federal Space Agency (ROSCOSMOS) ([audio](#)) ([presentation](#))
- **Mr Laurent Gisel**, Legal Adviser, International Committee of the Red Cross (ICRC) ([audio](#))

The fourth panel concerned itself with the legal and diplomatic aspects of space security, and panellists reflected that despite the dynamic growth in the number and variety of actors, the range of services offered, the depth of societal dependence on access to space, and some regrettable weapons demonstrations, the legal-diplomatic situation has remained largely stagnant, and that moribund international forums have been tolerated for perhaps too long.

A number of diplomatic processes have begun to yield ideas responsive to unsettling trends in the space domain. These initiatives were included in the GGE on TCBMs in Outer Space Activities, which produced a substantive consensual final report in 2013, setting out a menu of possible measures and a useful set of criteria to evaluate those measures. However, this GGE report remains merely a set of recommendations and states have not yet displayed a commitment to adopt any of its recommendations.

China and Russia have worked towards the development of a draft PPWT, first presented to the UN Conference on Disarmament (CD) in 2008 and revised in 2014. While criticized by some for its narrow scope and lack of verification measures, the sponsors have continued to push for its consideration by the CD. A corollary to the PPWT has been the Russian-proposed UN General Assembly resolution calling upon states to unilaterally refrain from being the first state to place weapons in outer space, which was adopted by UNGA Res. 69/32.

To directly address the concept of self-defence in space, the point was made that unilateral or ambiguous interpretations by states is less preferable than a wide international discussion aimed at preventing conflict in space. While recourse may be had to existing legal instruments such as the Outer Space Treaty and the UN Charter, the Russian Federation has begun a conversation within COPUOS with a working paper aimed at a uniform interpretation of the right of self-defence, which *inter alia* discusses what the right of self-defence implies, what situations might arise which could lead to conflict, what mechanisms might be elaborated to prevent critical conflict situations, which aspects of space activities require further regulation, and even a proposal on how to react proportionally and adequately to such situations.²

Another development in the minds of the panellists and conference attendees has been the development of an International Code of Conduct for Outer Space Activities, which was

2 Working paper submitted by the Russian Federation, *Achievement of a uniform interpretation of the right of self-defence in conformity with the United Nations Charter as applied to outer space as a factor in maintaining outer space a safe and conflict-free environment and promoting the long-term sustainability of outer space activities*, A/AC.105/C.1/2015/CRP.22 (Feb. 2, 2015), available at http://www.unoosa.org/pdf/limited/c1/AC105_C1_2015_CRP22ER.pdf.

initiated by the European Union with a draft text in 2008. However, views were expressed that the code essentially repackages existing principles and commitments into a framework of confidence-building measures, and arguably does not enlarge the current normative framework. It does innovate by establishing institutional support and the provision for biennial meetings between states parties. While the process may develop into a more multilateral and representative phase, its ultimate acceptance is, like the PPWT, far from assured.

International Humanitarian Law (IHL), alternatively called the law of armed conflict or *ius in bello*, is likewise applicable to any hostile use of outer space during armed conflict, which must thus comply with the IHL principles and rules of distinction, proportionality and precautions in attack. However, this raises a number of challenges, especially regarding the implication of the characteristics of satellites—that often simultaneously execute military and civilian functions; the long-lasting consequences of space debris; and the notion of “attack” under the rules governing the conduct of hostilities, in particular if space systems would be disabled via non-kinetic means, an issue that has also been widely debated with regard to cyber warfare.

Panel 5

UN Machinery—The Challenging Quest for Synergies and Coordination

- **Mr Marco Kalbusch**, Senior Political Affairs Officer, United Nations Office for Disarmament Affairs (UNODA) ([audio](#))
- **Mr Niklas Hedman**, Chief, Committee, Policy and Legal Affairs Section, UN Office for Outer Space Affairs (UNOOSA) ([audio](#)) ([presentation](#))
- **Mr Attila Matas**, Head, Space Publications and Registration Division, Radiocommunication Bureau (BR), International Telecommunication Union (ITU) ([audio](#))

The fifth panel briefed the attendees on the machinery of the UN system related to space activities. The UN deals with space along two mutually reinforcing tracks: COPUOS, focused on fostering the peaceful uses of outer space, and the Conference on Disarmament (CD), focused on disarmament negotiations since the 1980s. Both share a common basis, which is the 1967 Outer Space Treaty. The UN Office for Disarmament Affairs (ODA) has recently serviced the meetings in New York on the development of the draft International Code of Conduct, which may result in further negotiations within the UN framework. Within COPUOS, the Working Group on the Long-term Sustainability of Outer Space Activities has led the development of guidelines also concerned with space.

Situated in Vienna, Austria, the United Nations Office for Outer Space Affairs (UNOOSA) acts as the Secretariat to COPUOS, as well as leads the interagency mechanisms for the coordination of space-related activities across the UN. UNOOSA also serves as the secretariat for the International Committee on Global Navigation Satellite Systems (ICG), implements the UN Platform for Space-based Information for Disaster Management and Emergency Response (UN-SPIDER), and maintains the register of objects launched into outer space on behalf of the UN Secretary-General.

A current initiative is the UNISPACE+50, which marks the 50th anniversary of UNISPACE I in 1968, and is aimed at reflecting on the global space governance. UNISPACE+50 themes will link topics such as governance, capacity building, resilience, interoperability, and space

for sustainable development. Within COPUOS, the Working Group on the Long-term Sustainability of Outer Space Activities has a work plan extending to 2016, and is linked with the report of the GGE (A/68/189). The GGE report also addresses topics of long-term sustainability, especially information on national space policies, military expenditures, notification on the status of space objects, visits, natural hazards, and the safety of space operations, and, in this manner, links security in space with the safety of space operations. Looking to the future, COPUOS might consider the broader perspectives of space security under its regular agenda item “*Ways and means of maintaining outer space for peaceful purposes*”. Within the UN, the 2015 COPUOS report suggests the regular exchange of information between OOSA, ODA, and other relevant UN entities.

Another important organ of the UN system concerned with space is the International Telecommunication Union (ITU). Headquartered in Geneva, the ITU is tasked with orchestrating the efficient use and equitable access to radiofrequency spectrum and orbital resources. While the ITU does not distinguish between deliberate, intentional, and unintentional harmful interference, ITU procedures for notification, coordination, and allocation within the Master International Frequency Register (MIFR) allow for the coordination of steps to resolve harmful interference between member states.

Panel 6 **Current Initiatives Under Discussion—Status Updates**

- **Mr LIU Wei**, Director, Arms Control Department, Ministry of Foreign Affairs, People’s Republic of China ([audio](#)) ([presentation](#))
- **Ambassador Victor Vasiliev**, Ministry of Foreign Affairs, Russian Federation ([audio](#)) ([text](#))
- **Mr Sergio Marchisio**, Full Professor of International Law, University Sapienza, Rome
- **Mr Peter Martinez**, Chairman, Working Group on the Long-Term Sustainability of Outer Space Activities, UN Committee on the Peaceful Uses of Outer Space (COPUOS) ([audio](#))

In discussing the Draft PPWT, one of the panellists posited that its creation indicated that many countries felt that the biggest threat to space security is the placement of weapons on orbit, and noted that the CD has had the prevention of an arms race in outer space (PAROS) as an issue since 1982. The PPWT was first released in 2008, with an updated version following in 2014. It aims to ban behaviour, rather than weapons. The speaker noted that disputes over the effectiveness of verification of the PPWT do not have to prevent the international community from moving ahead with negotiations on the treaty and building in stronger verification protocols later. The PPWT, due to its banning the use of force against objects in outer space, would eliminate the motive for anti-satellite weapons.

The next panellist discussed the results of the study on TCBMs in outer space activities that was undertaken by the Group of Governmental Experts in 2012-2013, with the final report being the product not just of the 15 experts of the GGE but also coming from inputs by many other States which presented their views both in response to the respective GA Resolutions on TCBMs and directly to the GGE, and the interaction by the Group with other international organizations. The GGE identified categories of and criteria for TCBMs, and noted that the proposed measures should be voluntary and non-legally binding. The GGE encouraged States to review and implement the proposed TCBMs through relevant

national mechanisms, as well as recommended universal participation in and adherence to the existing legal framework relating to outer space activities. The GGE suggested holding a joint meeting of the First and Fourth Committees, a historic event which will be happening in October 2015.

The draft International Code of Conduct for Outer Space Activities (CoC) was discussed in July 2015 as a European Union meeting convened at the United Nation headquarters in New York by UNODA. In general, many participants expressed support of the CoC, but there were some issues with the process of the discussions. There was a difference of opinion in regards to the scope of the CoC, with speakers either pushing for a comprehensive Code that applies to all activities in space (a conception that the European Union has long backed) or suggesting that the Code should focus only on peaceful actions in space. The CoC complements several other international initiatives intended to enhance the long-term sustainability of space. One major issue was whether the Code should include the concept of self-defence in space. The chair of the meeting suggested that the Code be given a mandate at the UN General Assembly, and noted that the question arises about what would be the most suitable forum for further negotiations. One possibility is a rotating group between Vienna, Geneva, and New York, in order to take advantage of the expertise in those locations, while another option is to adopt a resolution to continue the process.

Next came a discussion of the history and status of the Working Group on the Long-Term Sustainability of Outer Space Activities (LTS) of the UN Committee on the Peaceful Uses of Outer Space (COPUOS). The LTS working group was tasked to consider current practices and procedures contributing to LTS. The panellist noted that terminology is still an issue for some of the participants. An update on the LTS guidelines was given and there was a comparison of how actual state practice is or is not conducive to the LTS of space activities (registration practices, orbital data sharing and standards, space weather, conjunction assessment, space debris information sharing, and terrestrial infrastructure, among others). The LTS should not raise barriers to space-aspiring nations and therefore there is a capacity-building component to the LTS guidelines. There will be an intersessional meeting of the LTS working group in October 2015 in Vienna.



UNIDIR

UNIDIR Space Security Conference 2015

Underpinning Foundations of Space Security

UNIDIR held its 2015 Space Security Conference entitled “Underpinning Foundations of Space Security” on 24–25 August 2015 in Geneva, Switzerland. The conference was organized in collaboration with Secure World Foundation and The Simons Foundation with the support of the governments of the People’s Republic of China and the United States of America. This fourteenth annual Conference focused on foundational definitions needed for space security, and in-depth discussions were held on the necessities and the challenges involved in coming to understandings on definitional issues related to the safety and security of outer space activities.