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International Commons - Outer Space

Space debris and security in space on our way to UNISPACE + 50

1. *Introduction*

As announced in our latest contribution to the Yearbook (Volume 26, p.111 et seq.) the Fiftieth Anniversary of the United Nations first Conference on the Exploration and Peaceful Uses of Outer Space UNISPACE + 50) will be commemorated in Vienna in 2018. Special attention will be drawn to questions surrounding the global governance of outer space activities. As noted in UNGA Doc A/AC.105/1137 of 20 September 2016 -reissued for technical reasons on 23 November 2016- outer space has been depicted as humanity's most expansive global commons and its governance is today an increasingly complex challenge given the growing number of governmental and non-governmental actors in those regions and the emergence of new technologies. In this document, the United Nations Committee on the Peaceful Uses of Outer Space (COPUOS) -undoubtedly the 'primary' UN body for coordinating and facilitating international cooperation in space activities- is given full recognition for its work, since it was founded, in expanding international cooperation in the use of outer space for peaceful purposes.

UNISPACE +50 is to be the fourth Conference of the kind. In this sequence UNISPACE I (1968) focused on the benefits of space applications for developing countries. UNISPACE II (1982) addressed, among others, the building capacities in developing countries and ways and means of protecting the environment for the prevention of an arms race in outer space. UNISPACE III (1999) examined the use of space technology for global development challenges and stands out for having invited the space industry to take an active part in these objectives on both the regional and global levels, with particular reference to developing countries in their access to new space technologies.

At its fifty-ninth session, in June 2016, the Committee on the Peaceful Uses of Outer Space endorsed the thematic priorities of UNISPACE+50, its objectives and mechanisms. It also endorsed the creation of an Action Team on Exploration and Innovation to be led by States members of the Committee on a voluntary basis, with the Office for Outer Space Affairs to provide substantive and secretariat support. This Action Team will develop a plan of activities to be approved at UNISPACE+50 and will also identify mechanisms for coordinating global space exploration efforts (A/71/20, paragraph 296).

The agenda for UNISPACE +50 -now in the hands of the UN Action Team on Exploration and Innovation whose objective is to provide recommendations towards UNISPACE + 50- should envisage the necessary means to provide realistic proposals in

answer to the challenges brought about by space debris, space security and cyber security in today's international and regional scenarios.

In this framework UNGA Resolution A/RES/71/90 -adopted on 6 December 2016- is encouraging. It emphasizes, inter alia, the importance of UNISPACE + 50 being organised at a unique moment in history to consider and evaluate the contributions of COPUOS and its subsidiary bodies to the global governance of outer space activities. This Resolution further points out that these bodies made good progress during 2016 in pursuance of their objectives and, at the same time, it shows deep concern on the fragility of the space environment and, particularly, the impact of space debris and other security related threats in space which have become a serious preoccupation to the international community as a whole.

Moreover, the Resolution of reference reveals strong concern on the possibility of an arms race in space in light of Article IV of the 1967 Treaty on the Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies urging all States, particularly those with major space capabilities, to actively contribute to the prevention of a race of the kind in those regions.

In fact, as noted by the present writer in a presentation to the 55th annual Session of the Legal Subcommittee of COPUOS (2016), a major threat to environmental security -detected from the early days of space activities- is the gap left by article IV of the above mentioned Outer Space Treaty which, to follow Bin Cheng's wording, fails to go beyond a limited denuclearisation of outer space and a non-militarisation of celestial bodies.

It is useful to recall that the drafting of the article in question was the result of a compromise between the USA and the then USSR and has been a matter of concern to space security experts over the years. It is certainly inconsistent with the contemporary international settings.

2. Environmental aspects of space security, cyber security and related topics (2015-2016)

Interesting, for its implications, is the development of the doctrine on space debris and space security in recent times within institutions to which the present writer has been contributing. Reference shall be made next, inter alia, to the work and proposals of the International Law Association (ILA) and its Space Law Committee, the Royal Institute of International Affairs (Chatham House, London) and its Security Department in London, the International Institute of Space Law (IISL) and its Board of Directors, which has recently added these topics to its agenda, and the Ibero-American Institute of Aeronautic and Space Law (Madrid). On the governmental level, the United Nations Committee on the Peaceful Uses of Outer Space (COPUOS) and both its Subcommittees (STSC) and (LSC) and the Permanent Court of Arbitration of the United Nations have a major part to play in these fields. On the national level, the National Council for Scientific and Technical Research of Argentina (CONICET/UBA) and the Argentine Space Agency, the University of *Belgrano* and the Institute of Environmental Policy (National Academy of Political and Moral Sciences) and the *City of Buenos Bar Association (Colegio de Abogados de la Ciudad de Buenos Aires*) should be added to the list.

2.1 In the first place it should be noted that environmental space security questions are

topping the international and national agendas of today and prompting, in turn, intensive discussion and proposals. The next lines will summarise the positions held in recent times with the objective of creating awareness on security matters recurrent in the international fields. The focal point is the work of the ILA Space Law Committee during 2015-2016 and early 2017 in its Reports to the Legal Subcommittee of COPUOS as well as the work of the above mentioned institutions, with which we have liaised to discuss and design strategies in response to the serious current risks to the environment -nowadays seen by the literature as the 'Global Security Threat' (GST). A few examples may serve as illustration.

2.2 Not so long ago, the general consensus was that space debris, the possibility of an arms race in space and the proximity of natural near-Earth objects likely to impact on planet Earth were the major threats to space security and the environment, in no hierarchical order. This was a permanent note at the 'Security in space: the next generation' conference organised by the United Nations Institute for Disarmament Research in Geneva on 31 March-1 April 2008. However so, in the current scenarios the threat of a cybernetic attack should definitely enter this list, and perhaps top it.

The importance of looking into security matters is due to the fact that we are living in an extremely unsafe context in need of sound and prompt solutions. The risk of a cybernetic attack of dire consequences is no longer science fiction. Communication networks and Earth observation satellites, among others, have become attractive targets for a terrorist attack by means of cyber technologies.

2.3 The Report of the International Law Association (ILA) to the UN Legal Subcommittee of COPUOS, submitted in 2015 to its 54th Session (see Doc. A/AC.105/C.2/106, section C.3 (b) of the ILA Report), drew attention to issues of space crises management as being discussed during a seminar at the Royal Institute of International Affairs on 22 July 2014. A second seminar, entitled 'Space security and cyber security', was organised on 16 and 17 July 2015 and further meetings followed during 2016, some in the form of international conferences.

This modality enables participants to compare experiences and is therefore producing fruitful results. The agenda includes, for example, the international perspectives arising from the intersection of cyber security and space security. The standpoints and national legislations of China, France, India, Italy, Japan, Russian Federation, the United Kingdom and the United States are being exhaustively analysed and compared as a starting point. It is clear that modern technologies are gradually and steadily becoming more accessible to the civilian sector and represent a high level of threat if used as an element of terror. This is a cause for general concern. A central topic is represented by the security challenges to the environment, common to both the cybernetic and space domains. It has been noted, inter alia, that there is an absence of national policy documents in the cybernetic and space spheres and a lack of agreed definitions of key terminology in both domains.

Moreover, a 'blurring' line has been detected, at these meetings, between 'defensive' and 'offensive' actions in the cyber and space fields as well as certain confusion on the military and non-military roles in the cybernetic and space sectors.

Other elements have also been singled out at the Chatham House seminars, such as the clearly defined infrastructure of the Office for Outer Space Affairs (UNOOSA) in Vienna, in contrast with the lack of clear facilities for the cybernetic sector which is going through a rather troubled infancy. This situation appears to be an obstacle to the development of cybernetic policies, especially at security level. The view was expressed

that in today's space environment many of the key issues cut across the civil-military spectrum, thus interfering with the effectiveness of future space policies.

The predominant opinion today in the institutions of reference is that the United Nations are the natural forum for the development of global cybernetic policies. It would be desirable for policies on both space and cyber security to be designed within the United Nations framework given the high interdependency of latest generation technologies in both these areas.

2.4 ***The Cyberspace Conference (University of Sheffield 2015)***

Interesting, for its similarities with recent space law issues and technologies, was the Cyberspace Conference organised by the University of Sheffield on 18 September 2015 to discuss '*Non-State Actors and Responsibility in International law'*. Under this heading state responsibility, individual criminal responsibility and the question of evidence were included. The objective was to assess the effectiveness of international law in ensuring responsibility for the injurious cyber activities of non-state actors and it addressed critical international legal questions, such as the following.

- Can states be held responsible for injurious acts committed by non-state actors in or through cyberspace?
- Can individuals be held criminally responsible for malicious cyber operations and how is jurisdiction established in cyberspace?
- What challenges do international courts face when conducting cyber investigations and how do international courts assess the probity of cyber evidence?

2.5 ***Security issues and other threats to the environment (ILA 2016)***

These topics continued to be addressed by the International Law Association (ILA) on 7-11 August 2016 in Johannesburg, at its Seventy-seventh international Conference, as a subchapter of the Report submitted thereto by the present writer.

(a) Space Debris: ILA Johannesburg Conference (2016)

This is an area under permanent review by the Space Law Committee since the adoption, by the ILA Sixty-Sixth international Conference (Buenos Aires 1994), of the 'International Instrument on the Protection of the Environment from Damage Caused by Space Debris'. In line with the views provided by the scientists, its clauses continue consistent with the present landscapes.

The underlying objective now is to continue opening a new chapter in the field of space debris, not only considering mitigation measures but moving on, as well, towards space debris removal possibilities in the framework of international law. Special attention is being given to state practice and compliance with the *2007 COPUOS Guidelines on the Mitigation of Space Debris*, as also to the domestic measures taken by states to this end.

The ILA Space Law Committee continues to recommend a closer cooperation between the Scientific and Technical (STSC) and Legal (LSC) Subcommittees of COPUOS. Moreover, given the importance of the STSC Working Group Report on 'Long term sustainability of outer space activities', it should be viewed from a legal perspective as well. In this quest it is recommendable to have in mind, among others, the treatment of this matter by the Sofia (2012), Washington (2014) and Johannesburg (2016) ILA Conferences.

As pointed out by this writer in previous Reports to the Yearbook (Vol. 26, for example), a realistic step forward -registered in 2015 and followed up in 2016- , is the addressing of this topic by the Legal Subcommittee of COPUOS from an intergovernmental perspective. This action was published in a Conference Room Paper (A/AC.105/C.2/2016/CRP.16) on 5 April 2016 entitled 'Compendium of space debris mitigation standards adopted by states and international organizations' and to carry forward these objectives the Secretariat maintains a page on the UN OOSA website. At the fifty-eighth Session of COPUOS, in June 2015, it was agreed that states members of COPUOS and international intergovernmental organisations having permanent observer status with COPUOS should be invited to contribute to the updating of the Compendium (A/7020, paragraphs 247-248).

(b) Space security and cyber security: ILA Johannesburg Conference 2016

The Space Law Report to this Conference continued calling attention to these questions and the ideas and courses of action -as previously described in this report when referring to different occasions and institutions addressing space security and cyber security- were strongly supported by Committee members. Views were expressed indicating, for instance, the need for more profound research when considering the impact of cyber security issues on the space domain. Other experts highlighted the fact that both domains tend to apply dual capabilities and that confidence-building measures and terminology issues should be considered as a way of eradicating misunderstandings. It was noted, once again, that space technologies are turning into most attractive targets which can be greatly damaged by a simple laptop and that the increasing number of private actors in the field appears more vulnerable to cyber-attacks than governmental actors.

Other views voiced in Johannesburg pointed to the fact that, in the field of space security and the protection of the environment, risks were aggravated as many ground assets for tracking and receiving information were highly dependent on information transfer and reliable communication systems. These assets are most vulnerable to cyber-attacks, particularly from non-state actors, and especially considering that disruption and disability of untold consequences may be caused even by signals or radiation.

Finally, the ILA Space Law Committee as a whole was in disagreement with the wording of article IV of the OST as it stands today and believed it should go further than a mere ban of weapons of mass destruction in orbit around the Earth. In this framework the Committee supported the initiative of the ITU for the development of an international registry of interference to space services caused by cyber means dependent on space-based and ground infrastructure.

(c) ***Legal aspects of natural resources from space and asteroid mining at the ILA Johannesburg working session (2016)***

A discussion was held in this context on the -yet unresolved- questions surrounding the legal nature of natural resources from outer space which the Space Treaty and the Moon Agreement have so far failed to clarify. The question of space mining was included in light of a recent major development, notably the 2015 US Commercial Space Launch Competitiveness Act (H.R. 2262) and the subsequent response by the IISL Board of Directors Statement of 20 December 2015. These documents, both on the IISL website, stand out as one of the possible interpretations of the applicable law favouring the freedom of space mining in outer space for exploration purposes.

This train of thought by no means implies discarding any other interpretations -always welcome- brought about by states and/or international organisations, intergovernmental or non-governmental, nor initiatives for drafting some sort of non-binding international instrument on these matters. The members' views and positions discussed at the Johannesburg working session of the 2016 ILA Conference were described in early 2017 at the 56th Session of the Legal Subcommittee of COPUOS (see ILA's Report to the Fifty-sixth Session, UN Doc. A/AC.105/C.2/L.299).

In all these landscapes it was noted with concern that the international community appeared sharply divided on the question of the magnitude of space mining and the status of natural resources from outer space. This is the case, among others, of the Russian Federation and a number of Latin American countries which objected to unilateral solutions of the kind in the 2016 COPUOS sessions and other circles. For these reasons the ILA Space Law Committee remains open to further talk on these issues.

Nevertheless, it was pointed out that the US Act, as it stands today, makes clear reference to the priority of US commitments under international law as provided in article 46 of the Vienna Convention on the Law of Treaties.

The predominant position at the 2016 ILA working session was that the utilisation of space resources did not necessarily mean an appropriation of a celestial body. Indeed, a case by case study is possibly a more appropriate means to reach the right answer. The activity in question, however, may be in breach of Article 11 of the Moon Agreement which considers the moon and its resources as the 'common heritage of mankind' Be that as it may, it should be recalled that Article 11 of the Moon Agreement is by no means a rule of customary international law today and is therefore only binding on the sixteen States Parties to this Agreement.

Article II, on the principle of non-appropriation of the moon and other celestial bodies, makes no clear reference to the legal status of natural resources from outer space. It therefore follows that in the US Act of 2015, the ban on claims of sovereignty over outer space, the moon and other celestial bodies remains intact.

To sum up, the way opinion was moving in Johannesburg 2016 and other above-mentioned institutions indicates the need for further study of some major aspects involved, such as state practice developments, the COPUOS debates, reactions from the doctrine and the advantages and disadvantages of a code of conduct to shed light on the scope and implications of the state-of-the-art.

To close this Report, a word on the work and contributions to the above-addressed topics by the Ibero-American Institute of Aeronautic and Space Law -an academic institution founded in Madrid in 1964 which has been working without interruption ever since. On 18-21 October 2016 the annual meeting of the Institute dedicated one of its sessions to '*The eve of the fiftieth anniversary of the 1967 Treaty on Outer Space*', including on its agenda most challenging issues of today's world. Noteworthy, among the main threats to the space environment were space debris and security questions, followed by presentations on cybernetic threats and risks to the environment and a neat analysis of the nature of natural resources from outer space and their utilisation possibilities. The 2016 Madrid meeting led to various solid conclusions, currently being published by this Institute in Madrid in book format together with the articles submitted to the meeting and its proceedings.

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