GLOBAL SPACE GOVERNANCE: THE CRISIS AND THE SEARCH FOR INNOVATIVE GOVERNANCE MODELS

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Abstract

In this speech I will introduce global space governance, the current challenges it faces and the search for new paths. I will start by explicating the meaning of the notion "global space governance" and portraying how it is currently structured. I will proceed with a review of the main current challenges facing global space governance: the structural challenges of fragmentation and stagnation and the specific challenges of space debris, weaponization of space and asteroid mining. The review will demonstrate how the ongoing structural deficiencies result in the failure to properly and effectively address even the most pressing specific challenges. This review sets the scene to the last part of the speech, in which I discuss the need to search for innovative governance models, and the current work done under the leadership of McGill's Institute of Air and Space Law. I will conclude with a short presentation of my own study in search for a feasible and effective governance model and its interim conclusions and suggestions. I will then open the floor for questions.

KEYWORDS: global space governance; space law; global governance; polycentric governance; regime complex

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* This paper is a revised version of the speech delivered at the IV National Conference of Aviation and Cosmic Law and Technology, Rzeszow, Poland, April 21st-22nd, 2016.

Published in Global Space Governance: The Crisis and the Search for Innovative Governance Models, in Elżbieta Dynia and Lidia Brodowski (eds), Aviation and Space Law and Technology (Poland, Rzeszów University Publishing 2017), 172-183.

1. What is Global Space Governance?

I will open with an attempt to define the notion of "global space governance", and an introduction to its two main pillars - space law and international fora on space affairs.

1.1 The notion of "Global Space Governance"

1.1.1 Governance

Governance is not government. It does not refer to a specific, distinct, clearly labelled and easily identified body with at least a certain degree of legal and practical capacity to govern. Oxford dictionary defines "governance" as "the action or manner of governing a state, organization, etc." We may define governance as the act of navigating or directing the actions of a legal entity or group of people. Governance is not any single entity but rather a myriad of various different elements that come to play and the equilibrium thereof directs behavior of actors. It is the aggregate of the rules, institutions and established practices that direct the behavior of actors that can be individuals or states. I will elaborate on this.

1.1.2 Global governance

Global governance is governance in the global level, and it captures far more than the UN and international treaties. In the absence of a world government, the subjects of the international society (primarily but not only States) participate in their own governance. This is the reality of global governance and this amount to 'governance without government'.[1]

There are several often-quoted definitions of the term, one of them is that of the Commission on Global Governance[2]:

> *"Governance is the sum of many ways individuals and institutions, public and private, manage their common affairs. It is a continuing process through which conflicting or diverse interests may be accommodated and co-operative action taken. It includes formal institutions and regimes empowered to enforce compliance, as well as informal arrangements that*

[1] See James N. Rosenau and Ernst Otto-Czempiel, eds, Governance without Government: Order and Change in World Politics (Cambridge 1992).

[2] The Commission on Global Governance was a policy-oriented committee, headed by former west-European statesmen, established with the support of the UN and the Swedish government, though with the support of the General Secretary of the UN.

people and institutions either have agreed to or perceive to be in their interest".[3]

Weiss and Thakur provide a contemporary, comprehensive but not too wide, definition to define global governance as follows:

> *"the sum of laws, norms, policies and institutions that define, constitute and mediate transborder relations between states, citizens, intergovernmental and nongovernmental organizations and the market."*[4]

Global governance is not a formal institution or sets of rules. It is all that navigates or directs the behavior of the international society and its various players. Global governance is made by the UN system, national governments, international treaties and international law in general, international organizations (NGOs, intergovernmental) and more.

1.1.3 Global space governance

Global space governance is roughly the global governance of outer space (above and beyond air space) and of space activities. It is the sum of laws, norms, policies, institutions and forums that directs the activities of actors in or about space.

The Global Space Governance Study, led by McGill's Institute of Air and Space Law (IASL), currently in its final stages, includes in its outline the following definition of global space governance:

> *"…the international action or manner (process) of governing or regulating space-related affairs or activities. The concept encompasses a wide range of instruments, institutions and mechanisms, including international and/or regional treaties, agreements, and regulations, model national laws and regulations; technical standards and procedures, codes of conduct, 'rules of the road', guidelines; and transparency and confidence building measures that are discussed, formulated and implemented at various international for a. More importantly, a governance system is a means to achieve a stated goal that is shared by the parties governed under the system. The nature and the level of acceptance of global governance system determine the effectiveness, predictability, and stability of the order intended to be created by the system."*

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[3] The Commission on Global Governance, Our Global Neighbourhood, Oxford: Oxford University Press, 1995, p. 4. The report is available online at http://www.gdrc.org/u-gov/global-neighbourhood/ (viewed November 29, 2015). See also the archived website of the Commission at http://web.archive.org/web/20020124121152/http://www.cgg.ch/.

[4] Thomas G. Weiss and Ramesh Thakur, Global Governance and the UN (Indiana University Press 2010).

Global space governance is therefore the sum of numerous factors. I will now provide an introduction to its two main factors – the rules, norms and practices, i.e space law, and the international fora on space affairs.

1.2 Introduction to Space Law

International space law is embedded in general international law. It is promulgated according to the law-making processes of general international law. The common notion is that the sources of international law are stipulated in Article 38 (1) of the Statute of the International Court of Justice, and it applies also to international space law. National (domestic) space law is part of national laws, and differs between countries. I will herein discuss only international space law and will refer to it simply as "space law".

International space law is essentially conventional and has been primarily negotiated through the UN system – the UN Committee on the Peaceful Uses of Outer Space (COPUOS) and its Legal Subcommittee. Soft laws as well as regional and bilateral agreements are often negotiated outside the UN system.

1.2.1 The five UN Treaties

There are five UN Treaties directly and exclusively relating to space activities. There were negotiated at COPUOS and adopted by the UN General Assembly, as well as signed by numerous countries. The five treaties are:

- The 1967 Outer Space Treaty: Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies
- The 1968 Rescue Agreement: Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into Outer Space
- The 1972 Liability Convention: Convention on International Liability for Damage Caused by Space Objects
- The 1976 Registration Convention: Convention on Registration of Objects Launched into Outer Space
- The 1979 Moon Treaty: Agreement Governing the Activities of States on the Moon and Other Celestial Bodies

The first four treaties are widely accepted and many states, including the major spacefaring nations, have joined them – around 100 states joined the first three and a little over sixty joined the forth. However, the Moon Treaty has only a small number of state parties – less than 20 - and none of the spacefaring nations with launching capabilities.

No treaties have been introduced since 1979 and none is currently negotiated (except for ITU and UNIDROIT, which I will later introduce). There was a move towards soft law.

1.2.2 Main UN Resolutions

There are dozens of UN General Assembly Resolutions on space issues, at least one per year. Most of the resolutions are titled simply "International Cooperation in the Peaceful Uses of Outer Space", few, however, have the words "declaration" or "principles" in their title, pointing to a more general, normative content. The main resolutions are:

- 1963 Declaration of Legal Principles Governing the Activities of States in the Exploration and Use of Outer Space (RES 1962 (XVIII)).
- 1982 Principles Governing the Use by States of Artificial Earth Satellites for International Direct Television Broadcasting (RES 37/92).
- 1986 Principles relating to remote sensing of the Earth from outer space (RES 41/65).
- 1992 Principles Relevant to the Use of Nuclear Power Sources in Outer Space (RES 47/68).
- 1996 Declaration on International Cooperation in the Exploration and Use of Outer Space for the Benefit and in the Interest of All States, Taking into Particular Account the Needs of Developing Countries (A/RES/51/122).
- 2004 Application of the concept of the "launching State" (A/RES/59/115).
- 2006 United Nations Platform for Space-based Information for Disaster Management and Emergency Response (A/RES/61/110).
- 2007 Prevention of an arms race in outer space (A/RES/62/20).

- 2007 Recommendations on enhancing the practice of States and international intergovernmental organizations in registering space objects (A/RES/62/101).
- 2013 Recommendations on national legislation relevant to the peaceful exploration and use of outer space (A/RES/68/74).
- 2015 Transparency and confidence-building measures in outer space activities (A/RES/70/53).

1.2.3 Soft Law and Other international instruments

As in other areas of international law, soft law has also proliferated in international space law. In fact, the last hard law convention was introduced in 1979, and since then the only instruments introduced are soft law instruments. Perhaps the most important soft law instrument in the context of space is the Space Debris Mitigation Guidelines: prepared by the Inter-Agency Space Debris Coordination Committee (IADC). The instrument was adopted by UN-COPUOS Legal Subcommittee in 2007 and later that year endorsed by the UN General Assembly.

The UNIDROIT framework for the unification of private law has produced the 2006 Cape Town Convention on International Interests in Mobile Equipment (Cape Town Convention) and its 2012 Protocol to the Convention on International Interests in Mobile Equipment on Matters specific to Space Assets (Space Assets protocol).

The International Telecommunication Union (ITU) covers issues that include, but not limited to, space activities. The ITU framework includes the new 2014 ITU Constitution and Convention and the 2015 ITU radio regulations, and these are hard law instruments.

The 1963 Treaty Banning Nuclear Weapon Tests in the Atmosphere, in Outer Space and Under Water (Partial Test Ban Treaty) covers outer space, though not exclusively.

1.2.4 Key principles and issues in Space Law

The 1967 Outer Space Treaty is the principle (framework) treaty of space law stipulating the basic important principles of space law and governance. Some of these principles were later elaborated in subsequent treaties and soft law instruments. The major principles it establishes include: the application of international law to the activities of states in outer space (Article III); the freedom of exploration and use of outer space

(Article I); a duty of international cooperation (Article I); no national sovereignty (Article II); a complete ban on the placement of weapons of mass destruction in orbit and on the establishment of military bases on the moon (Article IV); astronauts are the envoys of mankind and there is a duty to help any astronaut in distress (Article V); activities by non-governmental entities allowed, but under the supervision of their state (Article VI); a launching state is liable for damages from a spacecraft it launched or procured its launch (Article VII); and spacefaring states must refrain from harmful interference with the environment of space and revers harmful interference (Article IX).

The 1968 Rescue Agreement, the 1972 Liability Convention and the 1976 Registration Convention, elaborate on the relevant principles set in the 1967 Outer Space Treaty.

1.3 International institutions and fora on space affairs

There are numerous international institutions and fora on space affairs. These may or may not be affiliated to the UN, they may be international or regional, formal or informal.

1.3.1 UN affiliated fora

The UN Committee on the Peaceful Uses of Outer Space (UN-COPUOS) is the most important international forum on space affairs. It was established in 1958 and has two subcommittees: the legal subcommittee and the scientific and technical subcommittee. The legal subcommittee prepared all five Space Law treaties. The committee originally had 18 members, but it gradually expanded and currently boasts 78 members, which makes it the largest UN committee. Several international organizations, including intergovernmental and non-governmental organizations, have an observer status in the committee.

The United Nations Office for Outer Space Affairs (UN-OOSA) is an administration, headquartered in Vienna, which provides administrative support for COPUOS and national and regional efforts in capacity building. The UN Expert on Space Applications, works under OOSA.

The previously mentioned ITU was established in 1865, the oldest international organization. Originally entrusted with telegraph communication, its mandate today includes, inter alia, allocation of radio frequencies, including for use by satellites, and allocation of orbits for satellites. The ITU has 193 members, practically every state.

1.3.2 Regional fora

The main regional fora are: the European Space Agency (ESA), a space agency common to many European countries, independent from the EU; the Asia-Pacific Space Cooperation Organization (APSCO), an inter-governmental organization established in 2005 with full international legal status led by China and headquartered in Beijing; and the Asia-Pacific Regional Space Agency Forum (APRSAF), led by Japan, first established in 1993 and revived in recent years after the establishment of APSCO.

1.3.3 Non-binding fora

There are also non-binding fora, often established in conjunction with a soft law instrument. These include: the Inter-Agency Space Debris Coordination Committee (IADC); the Committee on Earth Observation Satellites (CEOS); the International Committee on Global Navigation Satellite Systems (ICG); the International Space Exploration Coordination Group (ISECG); the United Nations Platform for Space-based Information for Disaster Management and Emergency Response (UN-SPIDER).

2. Current challenges facing global space governance

2.1 Structural challenges

2.1.1 Stagnation

Since 1962 COPUOS and its subcommittees conduct their work in a way to be able to reach agreement without a need for voting. The consensus rule has been followed also in the conference on the law of the sea, the conference on disarmament, etc. This method of consensus is problematic now that there are 78 members, as the diverse interests of the actors coupled with the consensus rule resulted in a practical halt in the progressive development of international space law, considering that no new treaty has been concluded since 1979. Instead, various soft law instruments have emerged as kind of a substitute. Indeed, the emergence of "soft law" in international law did not skip Space Law. Soft law may be defined as "normative provisions contained in non-binding texts"[5], and Space Law, especially since 1979, includes many soft law instruments.

[5] Shelton, Dinah, ed. Commitment and Compliance: The Role of Non-binding Norms in the International Legal System. Oxford: Oxford University Press, 2000. See also Abbott, Kenneth, and Duncan Snidal. "Hard and Soft Law in International Governance." International Organization 54 (2000): 421–456.

The notion of soft law embraces different types of instruments, some more effective than others. In the context of the governance of space activities, the development of soft law and voluntary institutions has not been proven to be effective, but rather general and non-binding declarations. The halt in the effective development of international space law is evident in the three most pressing issues, and I will later introduce them in brief.

2.1.2 Fragmentation and soft law

Fragmentation is not a new phenomenon in international law[6]. Margaret Young have described it as an "uneven normative and institutional development and evolution in inter-state relations. Separate legal norms and institutions…[developing] largely independently from one another, often instigated by non-identical groupings of states and in response to specific functional issues."[7] Fragmentation has not skipped international space law, and the literature on fragmentation of general international law[8] may provide insights to addressing fragmentation in space law. The Space Debris Mitigation Guidelines, which I will now introduce, are an example for an important, even crucial, issue addressed by soft law, instead of a binding treaty.

2.2 Specific challenges

2.2.1 Space debris

The environment of near space is collapsing. Space debris has become a real danger, already obstructing the normal operation of satellites and rendering several defunct. Scientists forecast space debris will block our way to outer space within a few decades. There are no hard law instruments addressing this pressing issue. Instead there is the 2007 Space Debris Mitigation Guidelines, adopted by COPUOS and endorsed by the UN General Assembly[9] and the Inter-Agency Space Debris Coordination Committee (IADC)[10]. However, and despite numerous other soft law instruments, these forum and

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[6] See, Wilfred Jenks, Conflict of Law-Making Treaties, 30 British Year Book of International Law (1953), 401.

[7] Margaret A. Young, Fragmentation, Oxford Bibliographies (July 30, 2014), online at http://www.oxfordbibliographies.com/view/document/obo-9780199796953/obo-9780199796953-0113.xml#obo-9780199796953-0113-bibItemGroup-0008 (viewed April 17, 2016).

[8] See a thorough review and suggestions by Koskenniemi in Martti Koskenniemi,. The Fate of Public International Law: Between Technique and Politics, 70(1) Modern Law Review (2007), 1.

[9] UNGA Resolution 62/217.

[10] http://www.iadc-online.org/index.cgi?item=home.

instruments did not prevent a sharp increase in space debris that occurred after their introduction.

2.2.2 Weaponization of space

Outer space is already heavily used by advanced armies, and it is already an inseparable part of modern warfare. Space weapons are in the development and simultaneous efforts to restrict or even ban space weapons. The initiative is led by Russia and China, which have presented a draft treaty[11], so far with no support from the US, which claims it benefits only Russia and China, and does not answer US concerns. The US backed, instead, the European initiative of a (voluntary, soft law) Code of Conduct[12], but also this initiative has failed. This issue has not been regulated by neither a hard law nor soft law, apart from the provisions of the old 1963 Partial Nuclear Test Ban Treaty[13] and 1967 Outer Space Treaty.

2.2.3 Extraction of space resources

The extraction of space resources is expected in the foreseeable future, and two US corporations are devoted to this goal – Planetary Resources[14] and Deep Space Industries[15]. However, there is no agreed normative framework in the international level for such an extraction. In November 2015 the US has adopted legislation[16] that recognizes the right of US citizens to all asteroid resources they obtain, a highly contested move which many claim to be contrary to the 1967 Outer Space Treaty. Also with regards to this issue, there is neither hard law nor soft law agreed regulation, and the leading actor, the US, is pursuing an independent, and disputed, course. Luxembourg is eyeing the economic benefits of space mining, is negotiating operating a subsidiary of an American mining company and is expected to follow with national legislation adopting the US model in this regard.

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[11] Treaty on Prevention of the Placement of Weapons in Outer Space and of the Threat or Use of Force against Outer Space Objects (PPWT), jointly introduced to the Conference on Disarmament (CD) by Russia and China in 2008. Pursuant to comments from other nations, the draft was amended, but is still not supported by the US.

[12] International Code of Conduct for Outer Space Activities.

[13] Treaty Banning Nuclear Weapon Tests in the Atmosphere, in Outer Space and Under Water.

[14] http://www.planetaryresources.com.

[15] https://deepspaceindustries.com.

[16] U.S. Commercial Space Launch Competitiveness Act of 2015, online at https://www.gpo.gov/fdsys/pkg/BILLS-114hr2262enr/html/BILLS-114hr2262enr.htm (viewed April 17, 2016).

2.3 The crisis of global space governance

A stagnated legal system is destined to fail and collapse. Times change, circumstances change, new challenges arise, and the legal system has to address all these, and to continue to develop. International space law is experiencing a long stagnation and continued stagnation will lead to its losing its relevance. The results are already here: Weaponization of space is not regulated; further, the US law from 2015 that is establishing a legal precedent with regards to space mining is a sign of diminishing capacity of the international society to regulate the issue in the international level. Moreover, with other states following the US lead, there will be a retreat from multilateral arrangements to national regulation. The formal institutions are also experiencing the same problem. COPUOS is no longer capable of producing new legally binding instruments and is encountering difficulties in performing its other duties in the absence of consensus among its many member states. This institutional and legal stagnation is a serious crisis in global space governance.

The importance of space to life on earth, and the new horizons it promises to open to us, if we use it wisely, mandate that we address the crisis in global space governance. We cannot replace the actors – the states of this planet. We must therefore search for a better model for global space governance. This is what I personally have set to do, and it fits with the agenda of the McGill Institute of Air and Space Law to explore the needed reforms to global space governance.

3. In search of new paths to governance

3.1 McGill IASL leading an international effort

The issue of global space governance is of great importance, getting the attention of the space community, and high on the agenda of McGill Institute of Air and Space Law. The Institute devoted the 2014 Manfred Lachs international conference, its annual flagship international interdisciplinary event, to this issue. The Institute further leads an international study on the issue and will present its outcomes at various international fora, including the UN-COPUOS. The outcome will be more thoroughly presented at the 2016 Manfred Lachs international conference in Montréal, which will again be devoted to global space governance, and published as a book.

3.2 My search for a feasible and effective model for global space governance

My research focuses on global governance. The aim is to design an effective model for global space governance that is both: (i) feasible, given the anarchic international society (in the sense of absent of a global government); and (ii) effective.

The reality is of multiple actors with diverse and conflicting interests. While some actors and scholars advocate for a hierarchical governance, others strictly oppose it and reject any supra-national authority. One of my first conclusions was that any attempt to create a central governance of space is likely to fail and prevent the development of proper governance and cooperation[17]. Similarly, all attempts in the UN General Assembly to make Antarctica a UN responsibility have failed[18]. Instead of developing a utopian model that is destined to fail, and taking into account that failure will have a huge cost, my study focuses on finding a model for global space governance that will be both feasible and effective. For that purpose I utilize the theories and vast empirical database of institutional analysis, in specific the study that awarded Elinor Ostrom with the 2009 Nobel Prize for Economic Sciences.

Ostrom's life work was the research of diverse institutional arrangements for governing common-pool resources (CPRs) and public goods. Common-pool resources are resources used by more than one actor. Examples often used in the literature are fish stocks, pastures, woods and water (for drinking or irrigation). Ostrom rejected and refuted the presumption that users' management of CPRs inevitably ends in a tragedy, as most famously coined by Hardin as "the tragedy of the commons"[19]. Ostrom found strong empirical proof, in lab and in the field, across countries and sectors, that collective action is feasible and that decentralized local institutions perform better than their counterparts. The research also suggested that the core goal of public policy should be to facilitate the development of such institutions, rather than impose rules from above[20]. As the Nobel committee noted, "[Ostrom's] observations are important not only to the study of natural resource management, but also to the study of human cooperation more

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[17] Narayanan Komerath, James Nally, and Elizabeth Zilin Tang, Policy Model for Space Economy Infrastructure, 61(11-12) Acta Astronautica (2007), 1066.
[18] Aust, Anthony, Handbook of International Law (Cambridge, 2005), entry for The Antarctic Treaty System (ATS).
[19] Garrett Hardin, The Tragedy of the Commons, 162(3859) Science (1968), 1243, 1244.
[20] Elinor Ostrom, Beyond Markets and States: Polycentric Governance of Complex Economic Systems, American 100 Economic Review (2010), 1,

generally"[21]. Ostrom's research is in the micro level of persons, and it can be applied to the micro level of states and even firms. Another important lesson from Ostrom is that large-scale cooperation can be amassed gradually from below.

Given the division of international society and the obstacles for achieving effective global governance, Ostrom's research brings good news: cooperation is feasible, and polycentric governance is a feasible and effective model for governance of complex economic systems. Ostrom further provides 'design principles' for building effective institutions.

My study aims to apply Ostrom's theory, insights and design principles to global space governance and to provide a feasible and effective model therefore. In addition, I am studying the possible application of the International Relations' paradigm of Regime Complex.

As my thesis currently stands, global space governance should be constructed in the following way: a model of polycentric governance, i.e. decentralized governance with different regimes for different issue-areas, made and managed by the users. All regimes will be interconnected in a center-less web and shall confirm to the norms set in the 1967 Outer Space Treaty.

I hope to come here again and present you the outcomes of my research, and the exact features of the governance structure that I propose for global space governance.

Thank you for your attention. I will be happy to take questions or comments.

4. Conclusions

Outer space has become essential to life on earth, and space applications are being used by every person holding a smartphone and every company who is using electronic payments. It is used in agriculture, air travel and more. A disruption in the use of space application will have serious ramifications on the economy, public health and almost all aspects of our lives. The necessary governance framework for outer space

[21] The Economic Sciences Prize Committee of the Royal Swedish Academy of Sciences, Scientific Background on the Sveriges Riksbank Prize in Economic Sciences in Memory of Alfred Nobel 2009: Economic Governance, (12 OCTOBER 2009) available online at http://www.nobelprize.org/nobel_prizes/economic-sciences/laureates/2009/advanced.html (viewed January 15, 2014), 8, 2.

activities is in crisis and fails to address the challenges from the quick progress of space applications. There is a clear need for re-thinking the structure of global space governance. The McGill Institute of Air and Space Law is conducting research on the issue, including an international study and my own research, in which I suggest to apply Ostrom's polycentric model for governance to the governance of space activities. I hope the collective effort will pave the way to overcome the current governance crisis.