SPACE LAW CERTIFICATE COURSE

SESSION 3

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9 – 12.30

4 SPECIAL ISSUES OF SPACE LAW AND POLICY (continued)

- Principles common to space law, sea law and the Antarctic Treaty
- Peaceful uses of space and arms control
- Environmental protection
- Delimitation; physical and legal limits of space and air law; the Bogotá declaration and claims of equatorial countries
- Establishment and legal framework for International Space Station

5 ROLE OF INTERNATIONAL AND REGIONAL SPACE BODIES

- The United Nations Committee on the Peaceful Uses of Outer Space (UN COPUOS)
- The International Telecommunication Union (ITU); regulation of the frequency spectrum; allocation of orbital locations; coordination and non-interference issues
- Regional institutions (ESA, EU, NATO)

ENVIRONMENTAL PROTECTION IN SPACE ACTIVITIES[1]

RELATIONSHIP BETWEEN INTERNATIONAL ENVIRONMENTAL LAW AND SPACE LAW

International space law is the special law addressing space activities, existing within a larger system of international law.

In international law, when both general and special law applies to a particular set of circumstances, the special law overrules the general law. For instance, smoking might be legal, but special laws for a specific building may make smoking there against the rules. The special law overrules the general.

Space law is special law that applies to outer space activities. The OST, (in Art. 3), incorporates international law, including the Charter of the United Nations. Consequently, general public international law applies to space, especially when there are not particular rules of space law applicable. In the context of environmental concerns, there are relevant space laws, and there is also a body of general international law concerning the environment that can apply to space activities.

SOURCES OF GENERAL INTERNATIONAL ENVIRONMENTAL LAW

Sources of law, in general, include

1) treaties;
2) the general practices and customs of States; and
3) basic principles of international law.

Secondary to these are two auxiliary sources:

1) case law (the decisions of courts); and
2) the writing of scholars on what the law is, and perhaps what it should be.

Decisions of international courts like the International Court of Justice are only binding on the parties in the case itself, but the cases indicate what the court considers to be the general custom and practice of States, what are the rights and obligations in international treaties, and also what are the general principles of international law.

CASE LAW

Two important cases in international environmental law are the *Trail Smelter Case*[2] and the *Corfu Channel Case*[3]. In these, the Court ruled that a State has a duty not to permit the use of its territory in a way that harms or is to the detriment of another State, for example, a factory that produces pollution that damages neighbouring lands across an international border. These cases establish a principle of international law: that of preventing activities in your State that cause trans-boundary harm.

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[1] In addition to the UN Treaties, 1967 OST, 1968 ARRA, 1972 LC, 1974 RC and 1979 MA, the Principles Relevant to the Use of Nuclear Power Sources in Outer Space, 14 Dec. 1992, the IAEA Safety Framework for Nuclear Power Sources (at: http://www.iaea.org/Publications/Booklets/Safety/safetyframework1009.pdf), and the COSPAR Planetary Protection Policy (at: https://cosparhq.cnes.fr/sites/default/files/pppolicy.pdf.) are relevant to this topic.

[2] 1941, U.N. Rep. Int'l Arb. AWARDS 1905 (1949); http://www.scribd.com/doc/3847450/The-Trail-Smelter-Case-

[3] http://www.icj-cij.org/docket/index.php?p1=3&p2=3&case=1

PRINCIPLES OF INTERNATIONAL ENVIRONMENTAL LAW[4]

Within international law on the environment are some significant principles. In 1996, a dissenting opinion in the ICJ's *Nuclear Weapons* case stated that States have a general obligation to ensure "that activities within their jurisdiction and control respect the environment of other States *or of areas beyond national control"* [emphasis added]. This concerns global commons, such as the high seas, international airspace, the Antarctic, and outer space. It also concerns the first major principle of international environmental law, the Precautionary Principle. The Precautionary Principal, stated as an aspect of municipal law, asserts that it is better to be safe than sorry, and better to take precautions that may not be needed, than to fail to take them and risk unfortunate environmental consequences. In 1992, the *Rio Declaration on Environment and Development* stated the Precautionary Principle in this way:

> In order to protect the environment, the precautionary approach shall be widely applied by States according to their capabilities. Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation.

The second legal principle is the concept of Sustainable Development. This includes elements that may to some degree conflict with each other:

> 1) the integration of environmental protection and economic development;
> 2) the right to development;
> 3) sustainable utilization and conservation of natural resources;
> 4) inter-generational equity;
> 5) equity within the existing economic system.

The third legal principle is the Polluter-Pays Principle. This is also stated in the 1992 *Rio Declaration*:

> National Authorities should endeavour to promote the internationalization of environmental costs and the use of economic instruments, taking into account the approach *that the polluter should, in principle, bear the costs of the pollution*, with due regard to the public interest and without distorting international trade and investment. [Emphasis added.]

The principle that States should prohibit activities in their territory which harm other States is augmented by three emerging principles: the Precautionary Principle, the concept of Sustainable Development, and the Polluter Pays Principle. Fundamental to all this is the general principle of State responsibility, where States can be held liable for wrongful acts. Treaties and conventions establish what constitutes a wrongful act, and there are various multilateral conventions dealing with the environment usually do not have enforcement provisions. These include:

- *Convention on Long-Range Trans-boundary Air Pollution (1979)*
- *Convention for the Protection of the Ozone Layer*
- *Convention on Early Notification of a Nuclear Accident (1986)*
- *Protocol on Substances that Deplete the Ozone Layer (1987)*
- *Convention on the Control of Trans-boundary Movements of Hazardous Wastes and their Disposal (1989)*
- *Framework Convention on Climate Change (1992)*
- *Convention on Biological Diversity (1992)*

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[4] For more on international environmental law, see Ian Brownlie, *Principles of Public International Law*, Seventh ed. (Oxford University Press, 2008) at 275–285.

- *United Nations Convention to Combat Diversification (1994)*
- *Kyoto Protocol to the UN Framework Convention on Climate Change (1997)*

Within this evolving general public environmental law, there is special law that is applicable to space activities.

SPACE LAW RELATING TO THE EARTH'S ENVIRONMENT

Arts. 6 and 7 of the OST make States responsible for their national activities, and liable for damage resulting from space objects they launch. States may be held liable to other State parties, whether damage is on Earth, in airspace, or in outer space. This has significant implications. If a space object causes damage within that State's territory, it is not normally a matter for international law. If, however, the space object causes damage on the territory of another State, then both general public international law and space law are involved.

Damage caused anywhere by a space object is addressed in the 1972 *Liability Convention*. The location of the damage is important. The *Liability Convention* refines these obligations by assigning strict liability for damage on Earth or to flying aircraft, and fault-based liability for other damage. These provisions of space law might be invoked. Damage might be of a type that is not recognized as "damage" within the context of the *Liability Convention*. In those circumstances, general international law might apply. If the damage is not of a specific type as defined in the *Liability Convention*, the launching State might still be liable under environmental law. If a launch pollutes the sea, or a satellite crashes into Antarctica causing irradiation, it may be that no other State can claim compensable damages.

A few other hard law provisions exist in space law. The second sentence of *OST* Art 9 obliges States not to introduce extra-terrestrial matter into the Earth's environment in a way that harmfully contaminates or adversely changes the Earth's environment.

Additionally, Art. 5.4 of the 1968 *Rescue Agreement*, creates two sets of duties: a space object or its component parts are recovered by another State, and is discovered that the space object is of a hazardous or deleterious nature, recovering State *may* notify the launching authority of those facts. If they do, the launching authority, "shall immediately take effective steps, under the direction and control of the [other party] to eliminate possible danger of harm."

SPACE LAW RELATING TO THE OUTER SPACE ENVIRONMENT

The first source of law addressing the outer space environment was the 1963 *Nuclear Test Ban Treaty*, which prohibits the testing of weapons in various places on the Earth, including the upper atmosphere and in outer space. By the early 1960s the USA and Russia had exploded a few weapons in outer space. This Treaty was widely ratified and is considered to bind non-parties, which include France. The 1963 *UN Principles* declarations also forbid the placing of nuclear weapons in orbit. This principle was hardened into an actual binding prohibition in *OST* Art. 4. The first sentence of the *Principles* requires States not to:

> [P]lace in orbit around the Earth any objects carrying nuclear weapons or any other kinds of weapons of mass destruction, install such weapons on celestial bodies, or station such weapons in outer space in any other matter.

This clause and the 1963 *Test Ban Treaty*, are disarmament treaties as well as treaties that have an impact on environmental concerns.

OST Art. 9 also addresses the outer space environment. The second sentence states:

> States Parties to the Treaty shall pursue studies of outer space, including the Moon and other celestial bodies, and *conduct exploration of them so as to avoid their*

> *harmful contamination* and also adverse changes in the environment of the Earth resulting from the introduction of extra-terrestrial matter and, where necessary, shall adopt appropriate measures for this purpose. [Emphasis added.]

This Article addresses contamination of space and celestial bodies including the Earth. The article relates to both contamination of the Earth with extra-terrestrial matter, and contamination of outer space, the moon and other celestial bodies.

Although the Earth is continually bombarded with matter from outer space, such as meteors, this Article concerns contamination caused by human activity. Harmful material includes nuclear waste, and something as seemingly innocuous as a mechanical component. Note also that the Article refers to "harmful" contamination, not all contamination, and that States should adopt appropriate measures "where necessary". States must decide how to interpret these clauses.

Finally, the *Moon Agreement* contains a clause in Article 7.1 on preserving celestial environments. This Agreement has not been widely ratified, but its provisions are nevertheless of interest as affecting the general international law of outer space.

PLANETARY PROTECTION

Certain principles or guidelines developed by other organisations are also adopted by some space agencies. These include the *COSPAR Planetary Protection Policy,*[5] which is non-binding and has been periodically refined. These policies are intended to preserve unique space environments, which may harbour alien life. NASA's planetary protection policy[6] is based on the requirements defined by COSPAR as well as Art. 9 of the OST. Among other things these deal with matters such as robotic extra-terrestrial missions, biological contamination control on both outbound and inbound planetary spacecraft, and curation of extra-terrestrial materials. ESA has been studying planetary protection policies and practices.[7]

NUCLEAR POWER SOURCES

The 1992 *UN Nuclear Power Sources Principles*[8] also concern the space environment and enshrine the Precautionary Principle. They state that in order to minimize the amount of nuclear material in space, nuclear power sources *are* permissible for space missions, but that they should only be used when a mission cannot reasonably use a non-nuclear power source.

SPACE DEBRIS

The environmental laws are also concerned with space debris, but this will be covered in another lecture.

AIR LAW, SPACE LAW AND STATE SOVEREIGNTY

The legal regimes for air and space law are very different. States' assertion of sovereignty over their air space was established early in the flight era. There is free right to travel in non-sovereign

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5 http://science.nasa.gov/media/medialibrary/2012/05/04/COSPAR_Planetary_Protection_Policy_v3-24-11.pdf

6 Office of Planetary Protection, http://planetaryprotection.nasa.gov/methods

7 For more on planetary protection issues, see http://www.esa.int/SPECIALS/ECSL/SEMS492VQUD_0.html#subhead5

8 IAEA (International Atomic Energy Agency) Safety Framework for Nuclear Power Source Applications in Outer Space http://www.iaea.org/Publications/Booklets/Safety/safetyframework1009.pdf

airspace as on the high seas. However, States have sovereignty over the airspace above their territory and their territorial waters. Article 1 of the 1944 *Chicago Convention* governing international civil aviation provides that "every state has complete and exclusive sovereignty over the airspace above its territory". It is not permitted for civilian or military aircraft to overfly a foreign State's territory without prior permission. (The global civil aviation industry is possible because States have entered into international agreements.) In addition, each aircraft has the nationality of a certain State, and being aboard that craft is almost identical to being in that State's territory.

The situation is different in space law. There is a free right of travel. Art. 1 of the OST states that outer space is free for use and exploration, and that States cannot appropriate outer space, by claims of sovereignty, by means of use, by means of appropriation, or by any other means. Therefore, although States have jurisdiction and control over space objects on their registry, there is no sovereignty in outer space.

DELIMITATION

Two methods are commonly applied to the problem of distinguishing between *air* and *space*.

SPATIALIST APPROACH

This approach seeks to define a physical boundary above the surface of the Earth where space law begins. It has been argued that the limit should be set somewhere around 100 km above the Earth's surface, as it is midway between 80 and 120 km. (80 km is regarded as the highest altitude from which a plane's wings can still derive lift from the atmosphere, and 120 km is the lowest point (perigee) from which a satellite can still orbit the earth without its orbit degrading.) This suggestion was put forward by Theodore Von Karman. The Von Karman line is accepted by the *Fédération Aéronautique Internationale*, but this is a non-governmental body and its views do not bind any States.

However, these boundaries, 80 km, and 120 km, may change with technological advances, and may not even be consistent around all parts of the globe, or where air density changes. A 1998 Australian law governing space activities requires licenses for any vehicle or payload intended to reach over 100 km above sea level.

FUNCTIONALIST APPROACH

The functionalist approach does not attempt to define an arbitrary or shifting physical line where space begins, but addresses what laws should apply to which objects. The proposition is that air law should govern aviation activities, and space law should govern space activities. In deciding which legal regime to apply, it looks at the instrument or object, and its objectives.

The argument is that air law should apply to all aviation activities and aviation craft, including airplanes. It also seeks to apply air law to suborbital craft that may enter microgravity and briefly travel above the limits of various strata of the Earth's atmosphere, rejecting the notion that air law should apply for 95% of the journey, then space law for 5% of the journey that is in microgravity.

Space law would to all space activities, such as space launches, even when those launches are travelling through the Earth's atmosphere. The US Space Shuttle reached an orbital altitude in less than seven minutes after launch. The spatialist approach would have air law apply to the first 7 minutes, then space law. The functionalist approach would classify this as a space activity and apply space law from lift-off.

The functionalist approach can be detected in the1972 *Liability Convention*, where *absolute liability* lies for damage on the surface of the Earth or to flying aircraft [supported by lift], and *fault-based* liability for damage elsewhere.

ON-GOING DEBATE

There are questions of which regime is most workable, brings more benefits, aligns with the interests of States, and provides clarity. The matter has been on the agenda of UN COPUOS for decades. A clear distinction between the separate legal regimes has not been drawn on an international level. However, in future more activities may require the resolution of this problem, including sub-orbital space tourism, point-to-point suborbital aviation, greater orbital tourism, and re-usable space planes which may combine elements of aircraft (e.g. wings) and characteristics of space objects once they reach orbital velocity.

In the Legal Subcommittee to the United Nations Committee on the Peaceful Uses of Outer Space, there is a working group on the definition and delimitation of outer space. The working group's most recent meeting included the following statements:

> 5. Some delegations expressed the view that scientific and technological progress, the commercialization of outer space, the participation of the private sector, emerging legal questions and the increasing use of outer space in general had made it necessary to define and delimit airspace and outer space.
>
> 6. Some delegations expressed the view that States should continue to operate under the current framework, which had functioned well, and that, at the present time, any attempt to define or delimit outer space would be a theoretical and academic exercise that could complicate existing activities and that might not be able to anticipate future technological developments.[9]

The delimitation question is unresolved. International law is made when the interests of States are served by creating law, and so far, the delimitation of outer space has remained undefined.

GEOSTATIONARY ORBIT: 1976 BOGOTÂ DECLARATION

The prohibition on national appropriation is one of the foundations of space law. Article 2 of the 1967 *Outer Space Treaty* states that:

> Outer space, including the Moon and other celestial bodies, is not subject to national appropriation by claims of sovereignty, by means of use or occupation, or by any other means.

The OST is binding on the states that are parties to it. In relation to other States, the prohibition on national appropriation is thought to have become part of general international law, and the prohibition applies.

Furthermore, the wording of Article 2 of the Outer Space Treaty is taken directly from the *United Nations General Assembly Declaration* of 1963, the *Declaration of Legal Principles Governing the Activities of States in the Exploration and Use of Outer Space*, which "solemnly declares that in the exploration and use of outer space, States should be guided by the following principles….", and uses the exact prohibition on national appropriation that is found three years later in the OST. The prohibition against national appropriation seems clearly established by the end of the 1960s.

However, several countries have tried to establish control of segments of outer space, specifically the geostationary orbit. This is a band or zone of space about 35,786 km above the Earth's equator. Anything placed in geostationary orbit stays there rotates with the Earth, synchronized

[9] A/AC.105/C.2/2013/DEF/L.1 at: http://www.oosa.unvienna.org/pdf/limited/c2/AC105_C2_2013_DEF_L01E.pdf

with its motion. Consequently, it is efficient for communications satellites, as ground stations don't have to track a satellite moving in relation to the Earth's surface. (Note that synchronisation is still subject to "station keeping" measures by operators, because the Earth is not a perfect sphere and its mass is not evenly distributed.) The geostationary orbit has been used for many purposes, including broadcasting and telecommunications satellites, and for Earth observation applications like meteorology.

In 1976, at the 30th session of the United Nations General Assembly, the delegation from Columbia, located on the equator, made a claim to the segment of the geostationary orbit existing above its territory. The delegate argued that the geostationary orbit is a part of Colombian territory and is not included in the conception of outer space as defined in the Outer Space Treaty.

At the next year's UN General Assembly, Colombia again asserted a claim on the geostationary orbit above Colombia, while Ecuador and Panama claimed sovereignty over their nations. In November 1976, a conference was held in Bogotá, Colombia. A common Declaration was signed, citing two arguments for the claim by 8 equatorial countries to the GEO orbit.[10]

The Declaration asserts that States placing satellites in GEO need prior and express permission.

The Declaration also asserts that "the geostationary orbit is a physical fact linked to the reality of our planet, because its existence depends exclusively on its relation to gravitational phenomena generated by the Earth, and that is why it must not be a part of outer space". The unique properties of this area are due to the Earth's mass and the effects of gravity, and consequently it is a physical part of the underlying Earth. Furthermore, because s have sovereignty, this area is just as much a natural resource as the ground.

Another argument claimed in support of the Declaration relates to the Outer Space Treaty, asserting that the geostationary orbit is not a part of outer space. Because "outer space" is never defined in the Outer Space Treaty, or in any of the treaties on space, its prohibition on national appropriation does not apply to the GEO orbit.

The following year, at the UN COPUOS legal subcommittee, the Bogotá Declaration was discussed. Objections from a number of space-faring nations, including the USSR and the USA, were heard. The USSR argued that the geostationary orbit was inseparable from outer space that the location of States underneath space did not create any right of ownership to it or to any segment of it. The USSR was the first nation to orbit a space object, Sputnik-1, and this orbit was not objected to by the USA. Both States allowed space law to develop with free over-flight above all nations, in distinction to national sovereignty in airspace. That State practice was argued to establish a precedence of non-ownership of outer space. In addition, the British delegate pointed out that it was unclear whether the parties to the Bogotá Declaration were trying to assert ownership of the GEO alone, or for all space under it as well.

The first claim, that the GEO is a physical "fact", was countered by the argument that GEO is nothing more than a satellite trajectory. Placing a satellite into a geosynchronous orbit depends on the trajectory of launch, station-keeping to keep the space object in the same place relative to ground stations, the gravitational forces of the Earth, the Moon, and the Sun, and other factors like solar weather, background radiation and pressure. The Earth's gravity is merely one force among many that creates this trajectory. Furthermore, the Earth's gravity is dependent on the entire planet's mass, and not on a single component of the Earth corresponding to one State. Thus, the geostationary orbit cannot be a "natural resource" of any State.

[10] Brazil, Colombia, Ecuador from Latin America; Congo, Kenya, Uganda, Zaire from Africa; and Indonesia from the Asia-Pacific. Five had either signed or ratified the OST: Brazil, Ecuador, Uganda, Indonesia and Zaire. 3 countries were not party to the OST: Colombia, the Congo, and Kenya. Kenya has since ratified the OST.

Second, while the OST does not delimit space, this lack of delimitation does not affect its prohibition on national appropriation. The OST was meant to regulate activities in outer space, which includes launching objects into outer space. The Treaty's aim is to regulate the actions of those objects, regardless of whether the area or zone that we call "outer space" is precisely defined by the Treaty. Additionally, States cannot arbitrarily select where the OST applies, or there would be disorder in the international law. Thus, the *Bogotá Declaration* conflicts with technological understandings of space, with agreed principles of international law, and the application of international law.

Since 1976, no space-competent or space-faring State has complied with the procedure under the *Bogotá Declaration* requiring States to ask for permission to place satellites in GEO.

ESTABLISHMENT AND LEGAL FRAMEWORK FOR THE INTERNATIONAL SPACE STATION

Session 1 referred to multi-lateral agreements relating to cooperative space activities that add to the body of space law and have an impact on its developments and norms. Notable among these is the *Inter-Governmental Agreement* (IGA) establishing the International Space Station, ISS, and the rules and laws that govern its operation and use.[11]

The Agreement between the relevant Governments is supplemented with a number of bilateral or multilateral Memoranda of Understanding (MoUs) dealing with specific matters affecting those Parties.

The IGA specifically recognises the application of international law to the ISS, and provides for the discharge of obligations and benefits of the rights to be enjoyed among the Parties. Article 2 of the IGA states:

> INTERNATIONAL RIGHTS AND OBLIGATIONS
>
> 1. The Space Station shall be developed, operated, and utilized in accordance with international law, including the Outer Space Treaty, the Rescue Agreement, the Liability Convention, and the Registration Convention.
>
> 2. Nothing in this Agreement shall be interpreted as:
>
> (a) modifying the rights and obligations of the Partner States found in the treaties listed in paragraph 1 above, either toward each other or toward other States, except as otherwise provided in Article 16;
>
> (b) affecting the rights and obligations of the Partner States when exploring or using outer space, whether individually or in cooperation with other States, in activities unrelated to the Space Station; or
>
> (c) constituting a basis for asserting a claim to national appropriation over outer space or over any portion of outer space.

[11] The International Space Station Intergovernmental Agreement, referred to as 'the IGA', is an international treaty signed on 29 January 1998 by the fifteen governments involved in the Space Station project. Parties to the IGA are Canada, Member States of ESA (Belgium, Denmark, France, Germany, Italy, the Netherlands, Norway, Spain, Sweden, Switzerland, and the United Kingdom), Japan, Russia and USA.

The IGA provides that each Partner shall register and have ownership, jurisdiction and control over the elements of the ISS contributed by that Partner [Arts. 5 & 6]. There is a cross-waiver of liability of liability among the Partners, so as to encourage exploration and *exploitation* of outer space through the ISS [Art. 16]. [Emphasis added]

For the purposes of intellectual property, Art. 21 deems any activity on the flight element of a Partner to have been carried out in the territory of that Partner. Art. 22 makes provision for the exercise of criminal jurisdiction over those committing crimes on the ISS.

It should be noted that for the intellectual property laws of the relevant State to apply to the ISS, it is also necessary for the State to extend its intellectual property laws specifically to space objects over which it enjoys jurisdiction and control. For example, the US does so with its intellectual property legislation.[12]

UN COPUOS

UN COMMITTEE ON PEACEFUL USES OF OUTER SPACE, COPUOS

Space law is largely public international law, regulating relations between sovereign States. To better understand important sources of space law, including the 1967 *Outer Space Treaty*, the 1968 *Rescue Agreement*, the 1972 *Liability Convention*, the 1975 *Registration Convention* and subsequent treaties, as well as other less binding sources of space law, we have to know where they come from. Shortly after the launch of Sputnik-1, and the beginning of space activities by the USSR and the USA, and other countries, the United Nations General Assembly was asked to consider what problems might arise in the use and exploration of outer space. The UNGA first assembled an *ad hoc* committee, called the Committee on the Peaceful Uses of Outer Space, in 1958.[13] UN COPUOS was made a permanent committee the next year.

Member States of the United Nations send their delegations to UN COPUOS, which meets for 2 weeks each year. It used to meet in New York, but it now meets at the United Nations in Vienna, at the Office for Outer Space Affairs, UN OOSA. From its earliest days, it established two important subcommittees: 1) the Scientific and Technical Subcommittee, and 2) the Legal Subcommittee. They also meet in Vienna. The STSC meets for 2 weeks in February, and the LSC meets for 2 weeks in April. UN COPUOS now has 74 member States that can send delegations to UN COPUOS and its 2 subcommittees, which is quite a large body for the UN System. Some of these delegations are from large, spacefaring powers like the US, Russia, China, European States, Japan, and India. Others are emerging space powers, like Brazil and Nigeria. Other member States are not very active in space, but want to have a say in space matters. New members to join include Azerbaijan, Armenia, Costa Rica, and Jordan. There are also a number of permanent observers to UN COPUOS, who can attend but not vote, and can only take the floor to speak when the chairman allows them, rather than in general debate and discussion like Member States.

The Legal Subcommittee drafts legal instruments for consideration at the regular UN COPUOS, and the STSC advises UN COPUOS on scientific and technical aspects of space use and exploration. It was in the LSC that the principal international texts in space law were drafted. These include the 5 major treaties, but the first which should not be forgotten is the 1963 Principles Declaration, the first and most foundational space law text, which inaugurated all of the hallmarks of space law that were later adopted and refined in subsequent treaties. The golden age of

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12 USC 35, Sec 105. See also, Sa'id Mosteshar, *Research and Invention in Outer Space* (Martinus Nijhoff, 1995), Chapter 16.

13 UNGA Res. 1348 (XIII), 31 Dec. 1958, made permanent by UNGA Res. 1472 (XIV) 12 Dec. 1959.

international space law making is from 1966 with the drafting of the outer space treaty, until 1979 with the adoption of the Moon Agreement.[14] The Moon Agreement is likely to gain in interest and relevance as exploitation of outer space resources, for example asteroid mining, become feasible and attract increased attention from States and commercial entities.

Since the Moon Agreement, UN COPUOS has not drafted any major international legal instrument, but has focused on promulgating guidelines and best practice instruments in the form of *Declarations of Principles*, including the 1982 *Direct Television Broadcasting Signals*, the *Remote Sensing Principles* in 1986, the *Nuclear Power Sources Principles Declaration* in 1992, and the 1996 *International Cooperation Declaration,* which seeks to benefit developing countries.

It is important to note that UN COPUOS operates by consensus. Text adopted by consensus in UN COPUOS is then sent to the UN General Assembly. An action is taken unless there is any dissention. There is no voting and no majority blocks of States can team up on issues. A draft text, treaty, declaration or other instrument is negotiated until there are no further comments or amendments to it, and all are willing to let it proceed. This does not mean that the instrument is adopted and approved unanimously; it merely means that no one is still requiring changes to it. Detractors say that this slows UN COPUOS as a decision-making body.

2013 UN COPUOS

UN COPUOS will meet from 12 to 21 June this year. The draft agenda shows the Committee's current concerns:

1. General exchange of views.
2. Ways and means of maintaining outer space for peaceful purposes.
3. Report of the Scientific and Technical Subcommittee on its fiftieth session.
4. Report of the Legal Subcommittee on its fifty-second session.
5. Space and sustainable development.
6. Spin-off benefits of space technology: review of current status.
7. Space and water.
8. Space and climate change.
9. Use of space technology in the United Nations system.
10. Future role of the Committee.

OTHER FORA

Some States may pursue their political agendas in space via other avenues and not through UN COPUOS. It should be clear that UN COPUOS is the Committee on the *peaceful* uses of outer space. Consequently, non-peaceful uses and military concerns are not discussed at UN COPUOS. Discussions on nuclear weapons and militarization are taken up either by the UN Security Council or at the UN Conference on Disarmament.

Additionally, many space-faring States have not gone to UN COPUOS to resolve pressing issues, such as space debris, and have preferred to negotiate by bilateral discussion between interested and affected States directly. For discussions on space debris mitigation, space powers are proceeding through the Inter-Agency Space Debris Coordinating Committee. The sustainable uses of outer space are discussed inside UN COPUOS. Work toward an international Code of Conduct for space activities is being spearheaded by United Nations Institute of Disarmament Research (UNIDIR), in Geneva.

Private international law related to financing for space was developed through UNIDROIT, the International Institute of the Unification of Private Law. Additionally, partners on the International Space Station (ISS) do not meet through UN COPUOS, but on a separate multilateral basis

[14] The Moon Agreement came into force on 11 July 1984 and has been ratified by 15 States.

between partners. Likewise for the International Space Exploration Coordination Group (ISECG), which is 14 space agencies pooling resources.

THE INTERNATIONAL TELECOMMUNICATION UNION (ITU)

The ITU (International Telecommunication Union) is the United Nations specialized agency for information and communication technologies – ICTs. It allocates global radio spectrum and satellite orbits, develops the technical standards that ensure networks and technologies seamlessly interconnect, and works to improve access to ICTs to underserved communities worldwide.

The ITU comprises three sectors. They are:

ITU's Radiocommunication Sector (ITU-R) coordinates this vast and growing range of radiocommunication services, as well as the international management of the radio-frequency spectrum and satellite orbits. An increasing number of players need to make use of these limited resources, and participating in ITU-R conferences and study group activities – where important work is done on mobile broadband communications and broadcasting technologies such as Ultra HDTV and 3D TV – is becoming an ever-higher priority for both governments and industry players.

Telecommunication Standardization Sector (ITU-T) is responsible for the creation and revision of ITU standards (called Recommendations). These are fundamental to the operation of today's ICT networks. Without ITU standards you couldn't make a telephone call or surf the Internet. For Internet access, transport protocols, voice and video compression, home networking, and myriad other aspects of ICTs, hundreds of ITU standards allow systems to work – locally and globally.

ITU's Telecommunication Development Sector (ITU-D) is responsible for programmes to enter or expand ICT activities in emerging markets, demonstrating global ICT leadership, learning how to put good policy into practice, or pursuing mandates for corporate social responsibility.

Clearly, ITU functions most relevant to space activities are those of ITU-R, both in the management of frequencies and orbits. These are primarily regulated under the Radio Regulations and associated Recommendations. In the RR a distinction is made between the services being managed. Broadly, the Fixed Satellite Service, FSS, is subject to two schemes of management, planned and unplanned. The planned scheme applies to broadcast services, with ranges of frequencies allocated and allotted for use by different Administrations, so as to give equitable access to developing countries.

The main function of the ITU is to prevent *harmful interference* between radio stations. This is expressed in the RR:

> **0.5** With a view to fulfilling the purposes of the International Telecommunication Union set out in Article 1 of the Constitution, these Regulations have the following objectives:
> **0.6** to facilitate equitable access to and rational use of the natural resources of the radio-frequency spectrum and the geostationary-satellite orbit;

0.7 to ensure the availability and protection from harmful interference of the frequencies provided for distress and safety purposes;

0.8 to assist in the prevention and resolution of cases of harmful interference between the radio services of different administrations;

0.9 to facilitate the efficient and effective operation of all radiocommunication services;

0.10 to provide for and, where necessary, regulate new applications of radiocommunication technology.

0.11 The application of the provisions of these Regulations by the International Telecommunication Union does not imply the expression of any opinion whatsoever on the part of the Union *concerning the sovereignty or the legal status of any country, territory or geographical area*.[15]

.....

. **1.16** *allocation* (of a frequency band)*:* Entry in the Table of Frequency Allocations of a given frequency band for the purpose of its use by one or more terrestrial or space *radiocommunication services* or the *radio astronomy service* under specified conditions. This term shall also be applied to the frequency band concerned.

. **1.17** *allotment* (of a radio frequency or radio frequency channel)*:* Entry of a designated frequency channel in an agreed plan, adopted by a competent conference, for use by one or more *administrations* for a terrestrial or space *radiocommunication service* in one or more identified countries or geographical areas and under specified conditions.

. **1.18** *assignment* (of a radio frequency or radio frequency channel)*:* Authorization given by an *administration* for a radio *station* to use a radio frequency or radio frequency channel under specified conditions.

There is a requirement that before a satellite service is brought into use its frequency assignment is to be coordinated with that of any other satellite operating in accordance with the RR. A procedure exists for this to occur.

For some years there was growing concern over paper satellites, those notified by Administrations and not brought into use, essentially hoarding orbital slots and frequencies. To meet this problem assignments are coupled with a limited period within which the satellite or its relevant ground station must be brought into use.[16]

REGIONAL INSTITUTIONS (ESA, EU, NATO)

In considering the role of regional organisations in outer space and its regulation, it is worth noting that these have very different purposes and compositions, affecting aspects of space law.

[15] Emphasis added. This provision is to meet the claims under the Bogotá Declaration.

[16] RR-9 and RR-11.

THE EUROPEAN SPACE AGENCY

ESA is an international organisation with 20 Member States. By coordinating the financial and intellectual resources of its members, it can undertake programmes and activities far beyond the scope of any single European country.

ESA draws up the European space programme and carries it through. ESA's programmes are designed to find out more about Earth, its immediate space environment, our Solar System and the Universe, as well as to develop satellite-based technologies and services, and to promote European industries. ESA also works closely with space organisations outside Europe.

Its members are Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, the Netherlands, Norway, Poland (latest member to join in September 2012), Portugal, Romania, Spain, Sweden, Switzerland and the United Kingdom. Canada takes part in some projects under a Cooperation agreement.

Hungary, Estonia and Slovenia are 'European Cooperating States'. Other countries have signed cooperation agreements with ESA.

ESA's activities fall into two categories – 'mandatory' and 'optional'. Programmes carried out under the General Budget and the Science Programme budget are 'mandatory'; they include the agency's basic activities (studies on future projects, technology research, shared technical investments, information systems and training programmes).

All Member States contribute to these programmes on a scale based on their Gross Domestic Product (GDP). The other programmes, known as 'optional', are only of interest to some Member States, who are free to decide on their level of involvement.

Optional programmes cover areas such as Earth observation, telecommunications, satellite navigation and space transportation. Similarly, the International Space Station and microgravity research are financed by optional contributions.

ESA operates a *juste retour* policy, under which it spends its funds in its Member States according to the amounts contributed by each to the ESA budget. This policy in particular is one of the central issues that engages ESA and the European Union in their longer term objectives, with an impact on the future of European space policy.

THE EUROPEAN UNION

The EU has limited competence in outer space, under the terms of Article 189 of the Treaty on the Functioning of the EU, TFEU. In broad terms, it prevents the EU Commission, EC, harmonising the laws of Member States.

> Article 189
>
> 1. To promote scientific and technical progress, industrial competitiveness and the implementation of its policies, the Union shall draw up a European space policy. To this end, it may promote joint initiatives, support research and technological development and coordinate the efforts needed for the exploration and exploitation of space.

2. To contribute to attaining the objectives referred to in paragraph 1, the European Parliament and the Council, acting in accordance with the ordinary legislative procedure, shall establish the necessary measures, which may take the form of a European space programme, excluding any harmonisation of the laws and regulations of the Member States.

3. The Union shall establish any appropriate relations with the European Space Agency.

4. This Article shall be without prejudice to the other provisions of this Title.

EU AND ESA

Clearly, the EU is heavily dependent on the expertise and capabilities of ESA and there is a focus on the way they interact. ESA defines its own policies, which may not always correspond to those of the EU. A major topic of discussion within the European space sector is the ways in which the two will interact in the future and how the *juste retour* practice of ESA can be adapted or accommodated to meet EU legal requirements.

Another topic that will need to be carefully resolved is which body is going to register and have control of the Galileo and Copernicus satellite systems.

GALILEO

The EC is developing Galileo, its own independent GNSS to reduce dependence on GPS. GPS (US), GLONASS (Russia) and the other regional systems developed by Japan and China are military systems under military control – indeed they provide a civil service but that civil service could be either switched off or made less precise when desired e.g. in case of conflict. The Galileo system will comprise 30 satellites, of which 4 are already in position.

The definition phase and the development and In-Orbit Validation phase of the Galileo programme were carried out by the European Space Agency (ESA) and co-funded by ESA and the European Union. The Full Operational Capability phase of the Galileo programme is fully funded by the European Union and managed by the European Commission. The Commission and ESA have signed a delegation agreement by which ESA acts as design and procurement agent on behalf of the Commission.

COPERNICUS FOR GMES

Environmental information is of crucial importance. It helps to understand how our planet and its climate are changing, the role played by human activities in these changes, and how these will influence our daily lives.

The well-being and security of future generations are more than ever dependent on everyone's actions and on the decisions being made today on environmental policies. To take the right actions, decision makers, businesses and citizens must be provided with reliable and up-to-date information on how our planet and its climate are changing. The European Earth observation programme Copernicus, previously known as GMES (Global Monitoring for Environment and Security), provides this information.

The Copernicus programme is coordinated and managed by the European Commission. The development of the observation infrastructure is performed under the aegis of the European Space Agency for the space component and of the European Environment Agency and the Member States for the in situ component.

NATO

The North Atlantic Treaty Organisation, NATO, regards space as part of the four commons and has a policy for maintaining global access to space.