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Legal Issues of Commercial Space Activities

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"The international community prospers when law and power are in partnership, not when they are in conflict."
Sir Arthur Watts KCMG QC[1]

Commercial space activities became extraordinarily important for the development of space activities in all countries and they are not impeded by existing international space law, but they need to be better regulated in order to assure them still more legal security, to foster their performance and benefits, as well as to protect public interests both international and national.

These are the major ideas of the present paper.

As it is a quite large topic, indeed, and we are here mainly to diffuse space law, let try to focus didactically its most basic questions.

1) What are commercial space activities?

Commercial activities – or simply commerce – are actions involving the buying, selling and exchanging of goods and services. Hence, commercial space activities – or "commercial use of outer space", or "space commerce" – are actions involving buying, selling and exchanging of space goods and services.

There is not yet such a definition in current International Space Law. Lawyers and researchers have been thinking about it, of course.

According to He Qizhi[2], "space commercialization denotes the rendering or selling of services such as satellite communications, remote sensing, the launching of space objects, etc., as well as the manufacture, transfer, or exchange of space products for remuneration."

Stephen Doyle[3] gives us a broad vision: "These activities extend from the design, development and manufacturing of satellites, launch vehicles, Earth stations, and another ground support equipment, components of these products, and consulting and engineering services to support them, to the operation of launch systems and spacecraft, to provide products and services for governments, businesses, or the using public."

James A. Vedda[4] affirms that "Space commerce is exemplified by the following characteristics: private capital is at risk in

development and operations; there are existing or potential non-governmental customers; market forces, such as demand and competition, ultimately determine viability; and primary responsibility and management resides with the private sector." He adds that "commercial activities in space become a large and rapidly growing area of activity where technological prowess and marketing skills join forces in the quest for profitability."

No doubts that the presence of market forces is a characteristic of commercial activities. But it is hardly right to say that commercial activities involve only private capital and non-governmental customers. There are a lot of commercial activities between non-governmental entities, without private capital and non-governmental customers. That is a common event among developing countries.

Of course, the privatization of space activities has the major impact on the commercial space activities.

H. L. van Traa-Engelman[5] sees the most significant feature of the expressions "commercial" and commercialization" in its central objective: "to make a profit" or at least "to secure a reasonable return of investment". That is true.

States involved in space activities promote commercial participation of private companies in these activities. Private sector is now increasingly providing satellite telecommunications, remote sensing, global positioning and space launch services directly to its customers.

Space became definitely a big business and tends to grow dramatically, as we have seen the last ten years. Only the worldwide revenue of the Satellite Industry Association (SIA) for 2003 reached US$ 91 billion, which more than doubled since 1996. To these figures, one can add an estimated US$ 1 trillion worth of consumption of telecommunication and sensing services or a wide range of other economic activity that is satellite-enabled or satellite enhanced, such as use of satellites to authenticate and process financial transactions or to track package delivery.[6]

2) When did commercial space activities start?

The first experimental commercial satellite was dedicated to telecommunications: the American Telstar 1, launched in 1962.

The USA President at that time, John F. Kennedy, made a far-seeing statement: "The successful firing and subsequent operation of the Telstar 1 (…) is an outstanding example of the way in which government and business can cooperate in a most important field of human endeavor. The achievement of the communications satellite while only a prelude already throws open to us the vision of an era of international communications."[7]

Kennedy signed the Communications Satellite Act, paving the way for the formation of the first commercial enterprise dedicated to Satellite communications – the Comsat Corporation, a public-private

hybrid entity, which began operating in 1963. In 1964-1965, 45 States set up the International Telecommunications Satellite Consortium, predecessor entity of Intelsat[8] (International Telecommunications Satellite Organization), with Comsat as a majority owner. Comsat Labs developed and launched "Early Bird", the first commercial communications Satellite, which was later used to broadcast live shots of the historic Apollo 11 mission and first lunar landing from the moon back to earth.[9] Today Intelsat supplies voice, data and video connectivity in over 200 countries and territories.

The Outer Space Treaty was opened for signature two years later, on January 27, 1967.[10]

USA efforts to use its monopoly on launch services at that time had the unintended effect of spurring the European governments and private companies to develop independent satellite manufacturing and launch capabilities. Hence, the first commercial space transportation company, Arianespace[11], was created in Mars 26, 1980, according to the French law, aiming at producing, commercializing and launching the rockets Ariane, developed by European Space Agency (ESA). Today, Arianespace is the commercial launch services leader, holding more than 50 percent of the world market for satellites to geostationary transfer orbit (GTO). It has signed contracts for more than 265 satellite payloads[12].

The first commercial space legislation was the USA Commercial Space Launch Act, adopted in 1984, regulating the launch services in commercial basis conducted by private entities.

Today there is an increasing group of States which have already issued national legislation regulating commercial and private space activities: Argentine, Australia, Belgium, Brazil, Canada, Japan, Kazakhstan, Korea, Norway, Russian Federation, South Africa, Sweden, Ukraine, United Kingdom and United States of America. The Netherlands, Germany and France are preparing their laws on space activities.

National space legislation in times of a growing commercialization and privatization of space activities becomes more and more important.[13]

3) Which space activities are commercial ones?

Stephen Doyle says: “Commercial spaceflight activities include, *inter alia*, the operation of (1) launch services; (2) communications satellite services; (3) earth observation satellite systems; (4) meteorological services; and (5) navigation and position determination services.” He also added the activities of the satellite manufacturer, as well as of the insurance companies.

Telecommunications became the economic driver of a market for launch vehicles, satellites and related services.[14]

4) Who can conduct commercial space activities?

Commercial space activities can be conducted by States, international organizations and private entities.

The role of the private entities has been increasing exponentially since the Eighties, mainly among developed countries.

Developing countries, as a rule, are more and more aware of the need to stimulate the creation and development of their national private space industry.

In Brazil, for instance, still today it is a great challenge to set up the conditions for vigorous flourishing of space private enterprises.

5) Are commercial space activities synonym of privatization of space activities?

No, rigorously they are not. Privatization of space activities means the transition of space goods and services from government ownership or control to strictly private ownership and operation. Today there are commercial space activities conducted by government, by private entities, as well as by both in joint venture.

In our time, these two intensive processes are remarkable: the commercialization and the privatization of space activities.

Space telecommunications are the most commercialized as well as privatized space activities. After that come remote sensing activities from outer space.

Notwithstanding, States and international intergovernmental organization remain playing the central role in space activities, as policymakers, great investors and/or great clients (customers). This situation hardly will be changed in visible future.

6) Why commercial activities are necessary to the use of outer space?

H.L. van Traa-Engelman[15] stresses that “since space operations need heavy investment, while carrying high risks, the economic factor that is inherently decisive in every commercialization process bears a special relevance to space activities.”

Commercial considerations became fundamental in the process preceding the appropriation of funds required to create new solutions and technologies, to initiate new fields of space applications, or to cover developments in existing fields.

In the first decades of the space age, state security and military reasons have defined the content and the direction of national space programs. Now the development of space activities depends on quite large scale upon the possibility of recovering investments and making attractive profit.

Very serious political and legal questions may be raised here:

1) Are the market forces sufficient criteria to evaluate commercial space activities, both internationally and domestically?

2) How to guarantee that the market dynamism and creativity will be used exclusively for the benefit and in the interests of all countries, irrespective of their degree of economic or scientific development?

7) What kind of relationship can be possible between national space policy and commercial space activities?

Normally, Governments issue national space policy, which embraces all projects and actions in different fields. Commercial space activities play an extremely important role in this policy, as rich and dynamic sources of investments and technological development.

However, commercial space activities cannot be considered an end in their selves or the unique or the major driven force of the entire national space program. Such an approach could generate a critical distortion. The commercial space actors, in special private ones, have to work as much freely and creatively as possible, but they should be legally and politically oriented and supported in accordance with the higher national necessities and interests, as well as with the international public interests expressed in treaties, agreements and resolutions ratified or approved by a given State.

As the Proposal for a Protocol to the 1967 Outer Space Treaty, elaborated by Space Committee of International Law Association (ILA), suggested "all commercial uses of outer space and celestial bodies shall be carried out for the benefit and in the interest of all States, irrespective of their degree of economic and scientific development, and shall be the province of all mankind. Particular account shall be taken of the needs of developing countries."[16]

Frans von der Dunk[17] believes that public and private interests in space activities "are not necessarily contradictory". He argues: "To the extent that clear and logical legal regulation is already in the interest of private parties, a balance with the public interest should be achieved rather easily. *Vice versa*, to the extent that private participation in space alleviates financial burdens of governments, the public interest is served by allowing private enterprise to undertake space activities."

Of course, according to the rule of law, there is a hierarchical relationship between public and private interests, with the prevalence of the public ones. However, it is not necessarily a barrier for the implementation of private initiatives. Just on the contrary, it can be a strong guarantee for their legitimacy, security and success.[18]

According to James A. Vedda[19], "some have suggested that the government end its efforts (other than basic science) and let the more efficient market-driven private sector take over." However, he considers "unrealistic" the suggestion that "government exodus from space development would open the floodgates of private investment." In his view, "at that point in time, the private sector has shown no indication that it is willing to independently fund and operate all the

spaceports, launchers, tracking systems, space platforms, and R&D necessary to maintain the current level of commercial space activities, let alone drive expansive dreams of space profits in the new business sectors…"

The active presence of the governments is indispensable in space activities, not only in developed countries, but also – and particularly – in developing countries. In these countries, they clearly are the only institution capable to elaborate and implement a space program, including stimulating the active participation of commercial and private entities, in order to attend national needs and interests.

The Brazilian National Program of Space Activities 2005-2014[20] (PNAE) has adopted as one of the six principles for its implementation "the search for the sustainability of the space activities financing pattern through the commercialization of space goods and services." On the basis of its principles, the PNAE defined ten priorities. One of them is "the promotion of commercialization of means of access to outer space with the implementation of the general infrastructure of the Alcantara Space Center, which includes platforms for commercial launchings." The first platform for commercial launchings in Alcantara will likely be one planned and constructed by the Brazilian-Ukrainian company Alcantara Cyclone Space[21], created this year on the basis of the Brazilian-Ukrainian Treaty, signed in 2003, to explore commercial launchings by Cyclone-4 from Alcântara.

8) Is there a legal basis for commercial space activities? Does the Outer Space Treaty permit this kind of activities?

Yes, by all means. Today there is not any doubt that, in principle, commercial space activities are absolutely legal as well as legitimate. No matter that they are not mentioned in the existing international space law, which was created during the Cold War by quite different motivations – international peace and security. Commercial space activities are supported not only by a legal basis – including a solid custom –, but also by a general recognition as fair and crucial activities, since they can attend fundamental needs and interests of all countries.

In fact, the major international instruments governing outer space activities[22] were elaborated and adopted before the development of commercial uses of outer space and don't make reference to them.

Nevertheless, when Article I of Outer Space Treaty mentions "exploration and use of outer space", it is universally accepted that the word "use" covers the commercial use.

At the same time, it is widely admitted that commercial space activities, in principle, meet the interests of all countries, "irrespective of their degree of economic or scientific development", as is required by the same Article I. If it is not always true, there is at least a general and growing conviction (and a hope) that it must work in this

sense. No one State refuses the idea that world commerce is an essential tool for its development in all fields, particularly nowadays in that time of absolute interdependence among nations. The difficulties here usually do not involve the merit of the commercial activities themselves, but the manner how they are conducted – under which practice, as well as under which rules and their interpretation and applications. These questions, of course, may also appear in relation to commercial space activities.

Commercial space activities are also compatible to the Article I (2), which establishes that "outer space shall be free for exploration and use by all States without discrimination of any kind, on a basis of equality and in accordance to international law", since of course they are carried out in accordance with the letter and the spirit of this relevant provision. A step ahead in this regard will be the creation of an international legal instance for resolving space disputes.

If taking the principle of free use of outer space as one side of the coin, the other side is the principle of non-appropriation of outer space and celestial bodies, fixed by Article II. The later strengthens the former and definitely does not intend to prevent commercial space activities. To exert such activities it is plenty enough to use outer space, not to appropriate it or even a part of it.

The Article VI is the most convincing to give legal support to commercial space activities. It recognizes the private space activities as national activities and establishes the international responsibility for them by the appropriate state. "Because space activities by private sector automatically introduce the commercial aspect, which is not the case with governmental activities, the creation of this Article has to be considered as one of the strongest incentives of an overall recognition of commercial utilization within the general framework of the Treaty."[23]

The Article VII and its spin-off, the 1972 Liability Convention[24], as victim-oriented, bring more clarity to the question about who pays and more certainty (or probability) that the damage caused will be paid, no matter if the entity which suffers damage is a governmental or a commercial one. This principle can be, in great measure, a guarantee for commercial activities.

According to Article VIII, any State can decide to exclude commercial activities in relation to space object under its national jurisdiction and control. But it is absolutely not realistic to admit such a possibility in the contemporary world, due to the highest relevance of commerce – private or public – for all countries, without exception.

Examining accurately all provisions compiled in the Outer Space Treaty, it is evident that none of them could be used as an argument to deny the commercial space activities.

Reflecting certainly this reality, the 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, adopted by General Assembly of

United Nations in 1996, considers commercial activities as one of the effective and appropriate modes to conduct international cooperation.

Its § 4 reads: "International cooperation should be conducted in the modes that are considered most effective and appropriate by the countries concerned, including, *inter alia*, governmental and non-governmental; commercial and non-commercial; global, multilateral, regional or bilateral; and international cooperation among countries in all levels of development."[25]

9) Are commercial space activities properly regulated?

There is not yet a special international legislation on commercial space activities. And there is not yet any proposal in that direction. Would it be reasonable and useful to have such legislation? Yes, it could be so. In 1990, Bin Cheng argued that "as commercial development in outer space gathers pace, there is a need, and, in many cases, an urgent need, for the new international agreements we have discussed."[26]

Although today it seems to have not propitious political climate for the elaboration of new space international agreements, Bin Cheng's opinion deserves to be remembered. The absence of political climate does not signify that there is not a need at least to undertake study of a competent international legal solution.

Stephan Hobe properly notes: "Without any doubt, the sharpening of key notions of international space law is needed. In times of the growing likelihood of future commercial exploration of the Moon and other celestial bodies, a concrete and precise understanding of these key notions (…) is of great importance. What is also important in this respect is therefore that the international legal obligations of states and private entities are precisely phrased and have binding character."

The key notions of international space law which need to be clarified and concretized, according to Hobe, are the obligations to international cooperation in the sense of Article I (1) of the Outer Space Treaty, as well as the concept of "space object" and "launching state", the timing for registration of space object in terms of "as soon as practicable", as it is written in Registration Convention.

The Registration Convention, by the way, has particular relevance for commercial activities, be they public or private. The question of transfer (selling) of satellites in orbit is claiming for a better legal solution.

Let us consider a very recent case. In August 18, 2006, Brazil has finally registered at the United Nations Secretary-General five Brazilian telecommunications satellites, Brasilsat-A2 (launched on March 28, 1986, and re-orbited on March 6, 2004), Brasilsat-B1(launched on August 10, 1994), Brasilsat-B2 (launched on March 28, 1995), Brasilsat-B3 (launched on February 4, 1998) and Brasilsat-B4 (launched on August 17, 2000). All these satellites

belong today to Star One S.A., a private company, as in 1998 the Brazilian State Enterprise Embratel, which procures the launching of them, was privatized. Nevertheless, Brazil, as launching state, continues to be responsible and liable for the satellites. A situation like that must be legally changed.

Not by chance, Hobe concludes with a "strong plea" "for the United Nations Committee on the Peaceful Uses of Outer Space (COPUOS) and the United Nations General Assembly to come back to the first phase of international space law-making and to enrich such existing international agreements that are somewhat out of date by specific amendments accompanied by national space legislation."[27]

10) Are there concrete proposals to update the existing space treaties in view of the commercial activities?

Yes, there are. In this regard, it is appropriate to recall some important events and proposals:

- In July 1999, in Vienna, Austria, UNISPACE III Conference has recommended to United Nations Committee on the Peaceful Uses of Outer Space (COPUOS) to "analyze the desirability of drafting new legal instruments relating to various space applications, taking into particular account the commercial growth of some of those applications."[28]

- In October 1999, the importance of this measure has been fully recognized by the Ibero-American Institute of Air and Space Law at its XXIX Conference, held in Panama;

- In April 2000, the Legal Subcommittee of the United Nations Committee on the Peaceful Uses of Outer Space (COPUOS) has placed the review of the status of the five international legal instruments governing outer space on its agenda;

- In 2000 and 2001, the Institute of Air and Space Law of the University of Cologne, Germany and the German Aerospace Center (DLR) have carried out the "Project 2001 – Legal Framework for the Commercial Use of Outer Space"[29]; this joint research initiative had the active participation of more than 90 experts from all over the world and comprised all together six areas: Launch and Associated Services, Remote Sensing, Telecommunication, Space Station, Privatization, and National Space Legislation.

- During the last decade, the annual Colloquium on the Law of Outer Space organized by the International Institute of Space Law of the International Astronautical Federation has dedicated special attention to the issues of commercial and private space activities.[30]

- In July 2000, the International Law Association (ILA) at its 69th Conference, held in London, United Kingdom, requested its Space Committee "to elaborate concrete proposals regarding possible amendments of, as well as possible supplements to, the UN space law instruments in view of commercial space activities, to be presented to the next ILA Conference in 2002."[31]

In the 70th ILA Conference held in New Delhi, India, in 2002, according to the Chair and General Rapporteur of the Space Committee, Professor Maureen Williams, four Special Rapporteurs, previously appointed – Stephan Hobe, Maureen Williams, Vladimir Kopal, Frans von der Dunk –, have presented concrete proposals regarding possible amendments and supplements to the UN space law instruments in view of commercial space activities.[32]

I) The Proposal for a Protocol to the Outer Space Treaty, based on Hobe's special report, includes additions to Articles 1, 2, 3 and 4.

Addition to Article 1 (3):

"1. States Parties hereby agree that the use of outer space and celestial bodies is inclusive of all commercial uses.

2. States parties are free to define the way in which they shall implement the principle of international cooperation. All commercial uses of outer space and celestial bodies shall be carried out for the benefit and in the interest of all States, irrespective of their degree of economic and scientific development, and shall be the province of all mankind. Particular account shall be taken of the needs of developing countries."

Addition to Article VI:

"States Parties undertake to enact national legislation concerning authorization and continuing supervision of space activities carried out by non-governmental entities."

Addition to Article VIII:

"States Parties are under the obligation to register any object launched into outer space both on their national registers and on the international register maintained by the Secretary-General of the United Nations in accordance with the Convention on the Registration of Objects launched into Outer Space[33]."

New norm concerning the peaceful settlement of disputes:

"States Parties undertake to adopt an international legal instrument on the peaceful settlement of disputes which should include provisions for binding mechanisms. In this sense, the 1998 ILA Convention on the Settlement of Disputes related to Space Activities is referred to as a model."

II) The conclusions of the discussion on Articles I (definition of damage, adding damage caused by space debris), XII (the applicable law) and XIX (dispute of settlement) of the Liability Convention, according to the Maureen Williams's report, are, briefly:

- To try to include the legal aspects of space debris in the agenda of the Legal Subcommittee of COPUOS, with a specific definition of damage caused by them;

- The Article XII should not be amended;

- To recommend States to be prompted to accept in advance the binding force of the Claims Commission's decisions and awards;

III) According to the General Rapporteur, the Special Rapporteur on the Registration Convention and related issues, Vladimir Kopal, "recommends, first and foremost, the unification of

national registries and the adoption of more detailed requirements concerning space objects (thus, Article IV should be supplemented, especially from the technical point of view"; Kopal "believes, further, that entries in national registries and information furnished for inclusion in the UN Register, as provided in Articles II, III and IV of the Registration Convention, should be reviewed. It is important nowadays to ease identification, not only of the launching State or States, but also other entities participating in space activities as well. Dual registration, in Kopal's view, should enable to give sufficient information about the characteristics and extent of space activities which are relevant for the purpose of registration. The above-mentioned provisions should be re-examined having in mind the development of commercial space activities and the participation of a variety of actors, as well as the change of subjects in the performance of such activities."

As General Rapporteur also noted, "Professor Kopal mentions two options by means of which the interpretation and application of the existing space law instruments should be improved on, namely:

- Legally binding implementation agreements or protocols to the existing Outer Space Treaties in order to shed more light on their provisions without touching upon their substance, or

- UN General Assembly Resolutions recommending States Parties to the UN Space Treaties the way and means of interpreting and applying the respective provisions of those treaties within the changing conditions in which space activities are currently being carried out."

IV) Amendments proposed by Frans von der Dunk to the Moon Agreement[34]:

1) To Article 4 (1):

"The exploration and use of the moon, including commercial exploitation and use, shall be the province of all mankind and shall be carried out for the benefit and in the interests of all countries, irrespective of their degree of economic or scientific development. *Commercial exploitation and use are, however, only allowable (permissible) in conformity with the provisions of Article II*[35]. Due regard shall be paid to the interests of present and future generations as well as to the need to promote higher standards of living and conditions of economic and social progress and development in accordance with the Charter of the United Nations."

2) To Article 11 (1):

"The moon and its natural resources are the *province of all mankind* [*the common concern of all mankind* – alternative offered by the General Rapporteur], which finds its expression in the provision of this Agreement and in particular in paragraph 5 of this Article."

3) To Article 11 (2):

"The moon is not subject to national appropriation by any claim of sovereignty, by means of use or occupation, or by any other means. *This shall not preclude any commercial exploitation or use as*

long as in conformity with the provisions of this article, other articles of this Agreement or any legal régime regarding commercial exploitation and use established on the basis of this Agreement."

4) To Article 11 (3):

"Neither the surface nor the subsurface of the moon, nor any part thereof shall become property of any State, international intergovernmental or non-governmental organization, national organization or non-governmental entity or of any natural person. The placement of personnel, space vehicles, equipment, facilities, stations and installations on or below the surface of the moon, including structures connected with its surface or subsurface, shall not create a right of ownership over the surface or subsurface of the moon or any areas thereof. The forgoing provisions are without prejudice to the international régime referred to in paragraph 5 of this article."

5) To Article 11 (5):

"States Parties to this Agreement hereby undertake to establish an international régime, including appropriate procedures, to govern the exploitation of the natural resources of the moon, *including commercial exploitation by non-governmental entities. Such international régime should include, as minimum* – the duty of establishing a licensing obligation by means of national law [legislation] for every State Party whose non-governmental entities are interested in undertaking relevant activities:

- guidelines for the licensing requirements to be imposed;
- the duty of establishing a transparent, fair, and comprehensive monitoring system in respect of activities thus licensed,
- a procedure for international registration of activities on the moon licensed in accordance with this régime, including payment of a reasonable registration fee to the international authority charged with such registration; and
- a procedure for providing other States Parties involved, or their non-governmental entities involved, with reasonable means to ascertain that their rights an interests are duly respect.

In the absence of such a régime, commercial exploitation and use of the moon will be permitted on condition that no commercial exploitation or use of the moon should cause serious harm to the interests of other States Parties including their economic interests, no substantial risk should affect future exploitation and use, and the moon's environment should not be put substantially at risk. *Likewise, such commercial exploitation and use will continue to be subject to the provisions of this Agreement, including the general principles of paragraph 7.*"

6) To the Article 11 (7):

"The main purposes of the international régime to be established shall include:

(a) The orderly and safe development of the natural resources of the moon;

(b) The rational management of those resources;

(c) The expansion of opportunities in the use of those resources.

(d) *This provision is suppressed.*[36]

All these concrete proposals raised in the excellent work made by ILA Space Committee show that the challenging task of review the space law treaties in view of commercial space activities is complex and polemical, but at the same time it is possible and necessary.

11) Why the national space legislation is necessary?

The national space legislation is necessary for many reasons:

- To establish and apply domestically the principles and norms of space treaties ratified by the State, as well as international space customs;
- More specifically, to implement responsibilities and liabilities obligations fixed by treaties, requiring from each State Party authorization and continuing supervision of all space activities under its jurisdiction, including commercial and private (Article VI of the Outer Space Treaty; requiring from launching State international (at UN Secretary General) and national registering of all objects it launches into outer space (Article II of the Registration Convention); providing for a national system of liability, in order to safeguard the interests of the State (recovery of costs due to liability, for instance) and, at the same time, to encourage the national space development, particularly through commercial activities and private investments;
- To create general secure legal environment propitious to creative and beneficial space undertakings specially conducted by private enterprises;
- To fulfill legal vacuum in international legislation or to clarify (detail, develop) too general or vague international provisions;
- To regulate exports control, insurance, environmental and Intellectual Property Rights issues, reflecting international treaties;
- To create mechanisms for the settlement of potential disputes in space field;
- To establish or adapt procedural rules for the implementations of all these regulations.

It is also up to National legislation to play an irreplaceable role in international efforts to unify legal space terminology, in order to facilitate the cooperation and exchange – commercial, in particular – among countries with different legal systems.

However, it is important to point out that national legislation – as much valuable as it can be – should have necessarily a complementary character, as solely national legislation definitely could not regulate modern space activities, which are global by their

own nature, as “province of all mankind” (Article I of Outer Space Treaty), having strategic implications for all States.

12) Can the diversity of national space laws be harmful for the international space cooperation, including in the field of commercial activities?

Yes, it can. That is why the unification of national space laws regarding many central issues is a growing demand in Europe, but it can increase all over the world in the future, depending on the intensity of cooperation among countries in space fields.

However, this unification must be concretized taking into due account the rights and legitimate interests of all countries. The law of one or some countries should not be imposed to others. An equitable approach and a constructive negotiation in this matter, based on international law principles, are simply indispensable.

13) What legal issues of commercial space activities are pending on solution?

There are many questions related to commercial space activities pending on a sound and effective legal solution. They can be divided into general and particular ones.

General questions are, for instance:

- To band stationing or orbiting of all kinds of weapons in outer space[37];
- To introduce international cooperation and competition in space launch industry, in view to really have a free and fair trade in launch services, which will be in the interest of all countries[38];
- To create the international private space law, in order to give a deep and solid structure to commercial and private activities.

As more particular questions, we can quote, *inter alia*:

- To harmonize national space legislation, in order to enhance commercial activities and avoid the “flag of convenience”;
- To regulate the practice of selling satellite in orbit;
- To adopt a consistent legal régime for exploitation and commercial activities on the Moon and other celestial bodies;
- To create an international legal régime for space tourism.

It is an opportune and recommendable exercise to list as much as possible the questions that should be regulated by international and national space legislations and their respective urgencies.

14) Is an international space organization to coordinate space activities, including commercial ones, necessary?

Doyle gives an interesting answer to this question: “There will have to be a central intergovernmental regulatory organization for space, as there are for aviation, communication, postal affairs,

maritime affairs, and meteorology. The United Nations is the logical starting point for establishment of a world space organization. (...) The problem arising from the lack of such an organization will only intensify and become more complex with time. The longer the problem is put off, the more difficult its solution will become."[39]

This question deserves to be examined seriously, even if in the present international political context the idea of a World Space Organization is not viable.

15) What could be the conclusion?

There is in fact a good base for commercial space activities, but we still have a lot to do to improve, spread and accelerate them, ensuring benefits for all countries.

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(8) See <*www.intelsat.com/home.asp*>.

(9) See <www.comsat.com.ar/about/history.html>.

(10) Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies, adopted on December 19, 1966, opened for signature on January 27, 1967, entered in force on October 10, 1967. See its full text in <*www.unoosa.org/oosa/en/SpaceLaw/index.html*>.

(11) Gallagher, Nancy, id ibid.

(12) See <*www.arianespace.com/site/index2.html*>.

(13) Hermida, Julian, Legal Basis for a National Space Legislation, The Netherlands: Kluwer Academic Publishers, 2004; National Space Legislation of the World – Thematic Collection (Russian and English versions), Editors in charge N. Malysheva, Yu. Shemshuchenko, National Academy of Sciences of Ukraine, National Space Agency of Ukraine, oretsky Institute of State and Law, International Center for Space Law, Volumes I and II, Ukraine, Kyiv: Atika, 2001, 2002.

(14) Genta, Giancarlo, and Rycroft, Michael, *Space the Final Frontier?*; United Kingdom: Cambridge University Press, 2003, pp. 26-35.

(15) Traa-Engelman, H. L. van, id ibid, p. 17.

(16) Report of the 60th Conference of The International Law Association, New Delhi, April 2-6, 2002; London: 2002, p. 196.

(17) Dunk, Frans G. von der, *Private enterprise and public interest in the European "Spacescape" – Towards harmonized national space legislation for private space activities in Europe*, Doctorate Thesis, Leiden University, The Netherlands, 1998, p. 2.

(18) Francis Neate, President of International Bar Association, wrote: *"The Rule of Law touches and affects the daily lives of all of us, individuals and companies. Business only flourishes when there is broad adherence to it. Freedom and democracy cannot exist without it."*

(19) James A. Vedda, id ibid, pp. 226-227.

(20) Programa Nacional de Atividades Espaciais 2005-2014 (PNAE), Agência Espacial Brasileira, Brasília, DF, 2005.

(21) The By-Laws of company Alcântara Cyclone Space was published by the Brazilian Governmental Gazette on September 4th, 2006, as a Minister of Science and Technology's Edict Nº 559, of August 31, 2006.

(22) See <*www.unoosa.org/oosa/en/SpaceLaw/index.html*>.

(23) Traa-Engelman, H. L. van, id ibid, p. 22.

(24) Convention on International Liability for Damage Caused by Space Objects, adopted on November 29, 1971, opened for signature on March 29, 1972, entered into force on September 1st, 1972.

(25) UN General Assembly Resolution 51/122, December 13, 1996. See <*www.unoosa.org/oosa/en/SpaceLaw/index.html*>.

(26) Cheng, Bin, *Studies in International Space Law*, USA: Osford University Press, 1997, p. 667. He also stressed that "the simplest way of regulating commercial space activities internationally is by means of international law, including treaties" and that "all those involved in commercial space activities need to be directly concerned and fully conversant with all the relevant rules of international space law, including all the pertinent treaties." (p. 644).

(27) Hobe, Stephan, *International Space Law in its first half century*, 49th Colloquium on the Law of Outer Space (International Institute of Space Law), 57th International Astronautical Congress, Valencia, Spain, 2-6 October 2006.

(28) See<*www.unoosa.org/pdf/reports/unispace/ACONF184_6E.pdf*>

(29) *Project 2001: Legal Framework for the Commercial Use of Outer Space: Recommendations and Conclusions to Develop the Present State pf the Law: Proceedings of an International Colloquium*, Cologne, May 29-31, 2001 to present conclusions of "Project 2001," a Joint International Research Project by the Institute of Air and Space Law, University of

Cologne and Deutsches Zentrum Für Luft-Und Raumfahrt E.V., DLR (German Aerospace Center)/Edited by Karl-Heinz Böckstiegel; Köln: Heymann, c2002. xiv, 724p; ISBN/ISSN: 3452251136.

(30) See the *Proceedings of annual Colloquium on the Law of Outer Space*, International Institute of Space Law, published and distributed by American Institute of Aeronautics and Astronautics (AIAA).

(31) *Report of the 69th Conference of the International Law Association* (ILA), London, 2000.

(32) *Report of the 70th Conference of the International Law Association* (ILA), New Delhi, 2002, pp. 192-215.

(33) Convention on Registration of Objects Launched into Outer Space, adopted on November 12, 1974, opened for signature on January 14, 1975, entered into force on September 15, 1976.

(34) Agreement Governing the Activities of States on the Moon and Other Celestial Bodies, adopted on December 5, 1979, opened for signature on December 18, 1979, entered into force on July 11, 1984.

(35) The Article II of Moon Agreement reads: "All activities on the moon, including its exploration and use, shall be carried out in accordance with international law, in particular the Charter of the United Nations, and taking into account the Declaration on Principles of International Law concerning Friendly Relations and Co-operation Among States in accordance with the Charter of the United Nations, adopted by the General Assembly on 24 October 1970, in the interests of maintaining international peace and security and promoting international co-operation and mutual understanding, and with due regard to the corresponding interests of all other States Parties."

(36) Text of the suppressed provision [Article 11 (7,c) of Moon Agreement: "An equitable sharing by all States Parties in the benefits derived from those resources, whereby the interests and needs of the developing countries, as well as the efforts of those countries which have contributed either directly or indirectly to the exploration of the moon, shall be given special consideration."

(37) Stefania Barbieri, Head of the Legal Department of European Space Agency, taking into account the "essentially global nature of space activities," argues that is necessary to "ensure non-aggressive use of space systems and applications." See in Barbieri, Stefania, *Towards a Legal Framework for Space Activities and Applications: The European Perspective*, April 26, 2006.

(38) Fenema, Hector Petrus van, *The International Trade in Launch Services – The effects of U.S. laws, policies and practices on its development*, Doctorate Thesis, University of Leiden, The Netherlands, 1999, pp. 380.

(39) Doyle, Stephen, id ibid, p. 138. See also *Faut-il créer une organization mondiale de l'space?*, Rapport établi par un groupe de spécialists de questions spatiales, Centre d'éudes et de recherches sur le droit de l'espace de l'Institut de droit compare de l'université Panthéon-Assas (Paris II) Associé au CNRS (UMR 135), Paris: La documentation Française, 1982.