

# An International/Contractual Model for Future Space Activities: A New Status for Private Companies?

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## Abstract

The entry of private companies into the space sector has posed a critical dilemma: can the “classical framework” meet the needs of the new space economy? On the horizon, there could be problematic inconsistencies between the OST and national laws; the full exploitation of an asteroid, to the point of causing its destruction, may constitute appropriation, prohibited by Article II OST but allowed by the 2015 Space Resource Exploration and Utilization Act. The aim of this paper is to analyse the weaknesses within the current framework, as well as to propose new legal solutions. Private enterprises would be placed at the centre of international space law and would assume a status of subjects of international law. The relations between private companies and national agencies would also be organised on a private-contractual model that would facilitate the resolution of disputes, with the possibility of resorting to rapid compensation procedure.

## 1. Introduction

Space activities have only been the purview of government agencies for a couple of decades. Since the first space activities in the 1950s, for strategic, military and political reasons, space agencies have reserved the development of space programmes for themselves. Both the enormous financial risks and the technological complexity required to undertake any kind of operation in space have discouraged potential investors; not least, the legal framework for private activities in space was uncertain and, in some respects, inadequate.<sup>1</sup> The progress of the space sector was thus fuelled solely by the huge funds allocated by the American and Soviet governments, competing for supremacy

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1 Fabio Tronchetti, *Fundamentals of Space Law and Policy*, Springer Briefs in Space Development (2013) p. 25.

in space. With the United States' historic space race victory over the Soviet Union in 1969, the space sector lost the strategic and political importance it had had for some 15 years. As a result, the considerable funding that had enabled so many technological breakthroughs to be achieved also disappeared.

Starting from the 1970s, attempts were made to replace the lack of public funds with private ones. Nowadays, private companies are even more enticed to invest in space. The prospect of extracting the mineral resources of celestial bodies is probably one of the most attractive businesses for the near future. In particular, "space resource utilization" activities include both those involving the use of resources *in situ*.<sup>2</sup>

Another business, but whose legality is being discussed, concerns claims of ownership over celestial bodies by private companies.

Since the current legal framework does not provide any clear regulations on the above activities, the future conduct of space mining and other space activities could lead to contradictory outcomes, also from the perspective of international liability and responsibility, if not outright legal inconsistencies. Therefore, it is essential to understand whether it is better to modify the OST or whether it would be better to leave room for domestic legislation.

After analysing what would be the difficulties in adapting the legal system of outer space to the new needs of the private sector, the author will propose a new regulatory framework, aimed at allowing them to operate more flexibly with the nations to which they belong and to address more effectively the liability-responsibility.

## 2. Introduction to the non-appropriation principle

Although the OST does not prohibit *expressis verbis* the extraction of space resources, there is a possibility that the recognition of property rights over extracted resources by a state may break its international obligations. According to the interpretation on which there is more consensus, use of extracted resources would be permitted, but without such uses conflicting with third parties wishing to access the same celestial bodies. This would not affect the prohibition on states extending their sovereignty over celestial bodies or parts thereof.

Another question would be whether the prohibition of appropriation should be extended to private operators. Some private persons, both individuals and corporations, have set up an extravagant business activity consisting of the

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2 ISRU (in-situ resource utilisation) is the collection, processing, storage and use of materials encountered in the course of human or robotic space exploration that replace materials that would otherwise be brought from Earth to fulfil a critical mission need at reduced cost and risk. (Sackstender & Sanders, "In-Situ Resource Utilization for Lunar and Mars Exploration", 2007).

allotment and sale of celestial bodies on the basis that Article II, OST, does not contain any explicit reference to the activities of private persons. Among them, the Lunar Embassy, which divided the Moon side into three million lots, many of which were sold in the following years; subsequently, the Lunar Embassy sent notifications of its claim to the Soviet and US governments and to the U.N., and registered with the land registry a genuine claim to the Moon.

### **2.1. Facets of the Prohibition of Appropriation Under Civil and Common Law Systems**

Over the past two decades, some questions have arisen about the scope of the non-appropriation principle, because of the different interpretation it might receive under the lens of common law or civil law categories.

Starting from the English common law system, a brief historical-legal excursus of its origins must be carried out. After the Battle of Hastings in 1066, which decreed the defeat of the Anglo-Saxon nobility, William I occupied England. From the outset, the chief landowners strongly resisted William's attempt to gain supremacy; the latter reacted by confiscating the land and then only granting it in return for services of various kinds. A centralised feudal system was created, with the king as supreme lord; all land therefore became *terra regis*, i.e. owned by the Crown (which assumed the position of ultimate ownership or eminent domain).

This premise was made in order to explain that the principle of the Crown's ultimate ownership is still in force, so that every landowner continues to have the formal position of the one who owns under the direct or indirect dependence to the sovereign. In England no one can be considered the absolute owner of land, as he can only have possession of it. Real estate is not considered to be the object of absolute ownership since it is the object of a concession (tenure). In fact, although the feudal grant relationship is but a historical legacy, it can be considered to have remained at the basis of the common law landlord model. A system of real property rights was developed where the Roman concept of ownership remained absent and irrelevant,<sup>3</sup> unlike the rest of the European continent (where there were no rulers able to centralise all land holdings).

Returning to the issue of private ownership of celestial bodies, the interpreters of Article II, OST, who use the legal categories of English common law, consider that the prohibition of private ownership is implicit in the prohibition of national appropriation. As has been said, in English

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3 What comes closest to the concept of the 'owner of a property' as understood in civil law countries is the tenant in fee simple, i.e. the person who has the land (the object of a feudal concession) for himself and his heirs, on the basis of a concept of enjoyment *ad infinitum*; the tenant in fee simple has the right to use and abuse the land and to exclude any interference by others.

common law systems, ultimate ownership of the land belongs to the Crown and, for private individuals, the land is instead subject to tenure. In other words, since private ownership is not possible without “prior” ownership by the sovereign, it is implicit that the prohibition of national appropriation in Article II OST precludes any kind of ownership also for privates.

In civil law legal regimes, property rights have historically not been based on a concession by the king to the inhabitants of the kingdom;<sup>4</sup> historically, in these regimes, property is based on the natural law principles of *pedis possessio*, where the government simply recognises these rights.<sup>5</sup> This is probably one of the reasons why, in the discussions leading up to the conclusion of the 1967 Outer Space Treaty, the French delegation indicated that it was not entirely satisfied with the wording of Article II OST; the French representative “thought about the risks of ambiguity between the prohibition of sovereignty, which comes under public law, and the prohibition of non-appropriation, which comes under private law”.<sup>6</sup>

In view of this, if one accepts that the prohibition of appropriation of Article II constitutes a concrete limitation only in respect to governmental activities, might the claims of companies carrying out “extraterrestrial real estate” not be entirely unfounded? In order to be able to speak of occupation of a thing not belonging to anyone, aimed at obtaining ownership of it, in many legal systems both the de facto exercise of a power over the thing (objective element or *corpus possessionis*) and the will of the possessor to hold the thing as owner (subjective element or *animus possidendi*) are necessary.

As far as the objective element is concerned, it is necessary that there is the *corpus possidendi* of a thing that does not belong to anyone; that is an act of physical nature directed towards the material thing, addressed to obtain its material possession. The things that are not owned by anyone can be of two categories according to whether they have never formed the object of property (*res nullius*) or they have had and no longer have an owner and have been abandoned (*res derelictae*).

As far as the subjective element is concerned, in some codes this is expressly contained; this is the case of the German code: “whoever takes possession of a movable thing belonging to no one with the animus of having it for himself acquires ownership” and the Chinese code: “whoever, with the intention of being owner, takes possession of a movable thing without owner, acquires ownership”. Other codes, such as the Italian one, do not specify the content of the subjective element necessary to obtain occupation.

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4 Lee O. Reed, *What is Property?*, 41 AM. Bus. L. J. n.30 (2004) pp. 459, 501.

5 Richard A. Epstein, *International News Service v. Associated Press: Custom and Law as Sources of Property Rights in News*, 78 Virginia Law Review 85 (1992) 106-109.

6 U.N. Comm. on the Peaceful Uses of Outer Space, Legal SubComm., Summary of the Record of the Seventeenth Meeting, at 14, U.N. Doc. A/ AC.105/C.2/SR.70 (Oct. 21, 1966).

Given that the claims of private companies to allot areas of celestial bodies cannot currently be based either on the *corpus possidendi* or on the *corpus possessionis*, they are not to be considered legitimate.

As regards to the requirements of *corpus possidendi* and *corpus possessionis*, these could one day be refined if private operators manage to reach a celestial body and establish a settlement there; in that case, the lack of clarity of the Article II could be used to the advantage of those interested in such claims. It is necessary to clarify the content of the OST and not to leave it to the mere interpretation of doctrine; it would be better to shed light on which claims would be allowed and which would not, in order not to have to face situations of already advanced property claims to be declined *ex post facto*.

## 2.2. Other Legal Inconsistencies of International Space Law

Article VI OST requires states to authorise and supervise the space operations of private operators, and no specific indication is given as to what concrete actions would be sufficient to comply with this requirement. Some jurists claim that Article VI, OST, is only an indication of principle, arguing that it is only intended to ensure that space activities are carried out in accordance with international obligations.<sup>7</sup> It is true that, even if one understands Article VI as a mere regulation in principle, an authorisation framework for the mission would be needed to comply with it (the OST only directly binds States and not private individuals). Taking the example of the U.S., which was the first to enact legislation on mining from celestial bodies, it does not currently have an agency specifically designated to authorise such operations; nor has it issued any guidelines on the conduct of mining in outer space. Since Article VI OST is not “self-executing” for private operators, it is not clear why private companies that will carry out space mining activities should comply with international obligations.

Other critical elements might concern the requirements for a State to properly fulfilling its authorisation and supervision obligations; there have not even been any subsequent treaty provisions clarifying its content. The possibility remains open for national legislations to freely implement the content of Article VI, with obvious dangers of heterogeneity between legislations; states, in order to attract the activities of launching space objects could compete aggressively with each other to attract investments, launching a real race to the bottom of the safety standards of space operations. This would lead to a disorderly and above all dangerous phenomenon of offshoring in countries where there is no adequate national legislation. OECD studies indicate that multinational companies involved in extractive industries are particularly

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<sup>7</sup> James Dunstan and Berin Szoka, Written Testimony of James Dunstan and Berin Szoka Before the Subcommittee on Space, Science, and Competitiveness of the Committee on Science, Space, and Technology United States Senate (23 May 2017).

prone to bribing governments to lower the legal standards required to carry out that activity.<sup>8</sup>

Also, with regard to the obligation to supervise and control mining activities, since mining operations will take place at a great distance from Earth, it will be difficult, both from a technological and regulatory point of view, to supervise and control such operations effectively. The same article declares that “states Parties to the Treaty shall bear international responsibility for national activities in outer space”. It is not clear how a state, even one equipped with state-of-the-art space technology, could supervise space mining activities taking place hundreds of millions of kilometres away. One of the questions that might arise would be about to what extent is it fair to automatically charge the State for any wrongdoing by the private operator. How would it then be possible to ensure that private operators act in accordance with the terms of their license and, above all, with their obligations under international space law? What action could national licensing authorities take to prosecute and punish possible violations? These and other questions are still open and unanswered.

Further critical elements concern the issues of responsibility and liability, the former being attributed to the home state for the commission of an internationally wrongful act, and the latter being attributed to the launching State only for the economic consequences of the damage caused by a space object. This double attribution lends itself to various legal issues, starting with the possible *probatio diabolica* that may be required in the identification of the appropriate State, as in the case of SwarmTechnologies, a Silicon Valley-based startup that launched four satellites through an Indian launcher; or in the identification of the launching State, in the case of a High Sea launch.

Other problems could concern the consistency between national and international legislation in the extraction of resources. The future practical implementation of the mining activities contemplated by Title IV will open the door to important challenges for the world of law, as there is a likelihood of conflicts between domestic and international space law.<sup>9</sup> It is no coincidence that there is already talk of possible incompatibilities between US mining legislation and international law, with particular reference to the violation of the right of other states to access and use celestial bodies (Article I OST).

Moreover, the concept of prohibition of harmful interference of Article IX OST could lead to conflicting outcomes. According to Section 51302 of the

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8 *Multinational Enterprises in Situations of Violent Conflict and Widespread Human Rights Abuses*, OECD Working Papers on International Investment, Number 2002/1.

9 Fabio Tronchetti, *Title IV – Space Resource Exploration and Utilization of the US Commercial Space Launch Competitiveness Act: A Legal and Political Assessment*, *Air & Space Law* 41, no. 2 (2016) p. 149.

Commercial Space Competitiveness Act of 2015, US citizens have the right to carry out space resource extraction activities free from harmful interference. Since the concept of “harmful interference” is not defined in law, one could imagine that, if implemented, this provision could lead to the unilateral creation of exclusion-security zones on the surface of an asteroid, with the function of protecting the activities of US mining companies. Absurdly, the concept of harmful interference expressed in the US legislation could conflict with the right of other States Parties to have free access to space and its celestial bodies under Article I of the Treaty.

Furthermore, the implementation of the “right” of US citizens to carry out space mining activities free from harmful interference could also conflict with the prohibition of appropriation enshrined in Article II, OST. This scenario of illegitimacy would be made even more critical by the prolonged presence of anything that could directly or indirectly serve space mining operations (such as stationary mining equipment and bases for possible human personnel).<sup>10</sup>

Another problem could be represented by the multiplicity of interpretations of the prohibition of appropriation. While it is true that the national laws of the U.S. and Luxembourg, by recognising the property rights of their respective nationals over resources extracted from celestial bodies, follow what is perhaps the most established reading of Article II, OST, there is currently no international consensus on this position.

Finally, it would have been more desirable if the U.S. had consulted with space-faring nations before enacting this legislation because it interprets a controversial provision. Such a unilateral choice could in fact undermine the stability and uniform application of space law, and also contribute to a situation of uncertainty for non-US companies.

### **2.3. From the Need to Change the Current Regulatory Framework to New Solutions**

In order to cope with the new requirements of the space economy, the international community will be faced with a fundamental choice:

- (a) allow commercial mining activities from celestial bodies to be governed solely by a heterogeneous patchwork of domestic laws;
- (b) develop international rules that provide clarity in the interpretation of key principles of space law (such as articles II and VI, OST).

Each of the two options would bring disadvantages. On the one hand, national regulations could be fragmented, often inconsistent with each other,

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<sup>10</sup> Ivi, p. 153; see also Ivan Fino, *Building a New Legal Model for Settlements on Mars*, in Froehlich A. (eds) *Assessing a Mars Agreement Including Human Settlements*, *Studies in Space Policy*, no. 30, Springer (2021) p. 78.

and certainly in favour of the companies of the State where they have been adopted. On the other hand, the adoption of an international treaty could be far too long and laborious, without a concrete result being guaranteed.

### **3. From the Need to Change the Current Regulatory Framework to New Solutions**

#### **3.1. The Foundations of a New Model to Meet the Challenges of the New Space Economy**

It has been said previously that the current regulatory system does not consider the peculiarities of space activities which take place literally “in other worlds”, such as asteroid mining, and which would therefore be difficult to supervise and control by the “appropriate state”, as enshrined in Article VI, OST. At the same time, it was analysed how the model of responsibility and liability could be subject to the risk of illusory practices that could make it impossible, if not highly difficult, to address the offender.

It has often been seen that, even for 'ordinary' activities on Earth, all too often multinationals escape any responsibility, for instance, in situations where the host state is not interested in respecting basic levels of security, or insurance for possible damages, or protection of the Earth and space environment. In a scenario where states may not be able to enforce the principles of international law on private operators, companies will be forced to compete aggressively with each other in order to attract investment from companies with a turnover sometimes even larger than the national GDP. In this situation, the classical model of the launching state for liability and the appropriate state for international responsibility do not offer an effective remedy because governments may not be able to stand up to companies engaged in space mining in outer space. These companies, because of the immense mineral wealth of asteroids, could easily “rig” the licensing and oversight concessions of their appropriate states under Article VI OST.

Other critical elements concern the conflicts between national and international jurisdiction in the space sector, the lack of adequate rules for space activities involving transnational aspects, such as Earth Observation or Cybersecurity.

How to remedy these shortcomings and the looming threats to the sustainability of space activities? To this end, a system using private/contractual remedies is proposed. Specifically, any entity intending to carry out activities in space should adopt Codes of Conduct (CoC) to self-regulate its operations according to sustainability criteria established by soft law and provide insurance in case of accidents. Furthermore, the CoC would require compliance with certain international protocols produced by the associations of the categories of private and public bodies involved not by international treaties to avoid lengthy procedures that are necessary for their adoption.



Every entity which is interested in carrying out space activities shall deposit in a public registry of UNOOSA a contract which includes contractual clauses referring to the CoC. Such a contract would be valid between all entities which are carrying out space activities. Thus, private law would be the tool through which private actors, delegated by the international law, participate in international life with respect of the international space law rules.

In order to speed up the resolution of legal issues relating to space, it is proposed to set up a tribunal competent for all space matters, following the example of the International Tribunal for the Law of the Sea.

This system would therefore have all the advantages of private law, speeding up compensation procedures, and providing the best guarantee for third parties who suffer damages (Articles 5.2.1 and 5.2.6 of the UNIDROIT) even in the event of non-compliance with the environmental sustainability obligations of space activities. CoCs could be used to self-regulate future space colonies as well as in the satellite domain.

One of the most remarkable advantages of this approach is the possibility to reach a solution avoiding the complexity that result from the negotiation of international agreements within the framework of public regulation.

### **3.2. The Dilemma of a New Legal Status for Private Space Companies**

Private companies operating in space would, at least in part, acquire a new legal status in the panorama of international law, becoming directly liable for obligations towards the international community.

Establishing some sort of international liability for companies operating in deep space will therefore be crucial to filling the legal gaps that will be created; if from the point of view of international law a “subject” is, an entity that can influence and be influenced by international law and, directly or indirectly, can enforce compliance with the rules of international law, a private company could then be as much a subject of international law as an individual or an international organisation.<sup>11</sup> In support of this thesis and of the potential influence of private companies on international law, Wolfgang Friedmann suggested as early as 1964 that private companies actively participate in the evolution of contemporary international law.<sup>12</sup>

There is no rule in international law directing liability for international torts against private companies, so it cannot automatically be inferred that companies have the same international obligations as states. However, in recent decades international law seems to be moving in a different direction. Several proposals from both doctrine and policy have helped to build a new role for private companies. For example, in 1998, in the context of the Rome

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11 So stated the International Court of Justice in the so-called “Reparation Case” of 1949 (Reparation for Injuries Suffered in the Service of the United Nations, Advisory Opinion, 1949 I.C.J. pp. 174, 179.

12 Wolfgang Friedmann, *The Changing Structure of International Law* (1964) 230.

Conference it was proposed to extend the jurisdiction of the Court also to legal persons.<sup>13</sup>

Generally, there is a strong reluctance to admit the international subjectivity of commercial companies; however, according to some authors, these entities could be counted among the subjects of international law.<sup>14</sup> However, the question remains open. Certainly, private companies have certain rights, for example, in the area of international investment, having the right not to be discriminated against in favor of domestic companies and the right to receive compensation in case of expropriation. Others include the right to a fair trial, the right to freedom of expression, the right to privacy and property rights.<sup>15</sup> They also can sue (or be sued) in some international courts, such as the tribunals under the International Convention for the Settlement of Investment Disputes.

Although multilateral treaties generally impose obligations on states and not on private companies, there are exceptions such as the 1969 Convention on Civil Liability for Oil Pollution Damage, which provides that the owner of a ship is liable for any pollution damage caused by it.<sup>16</sup> The 1982 United Nations Convention on the Law of the Sea also contains provisions directly aimed at private companies, imposing a ban on natural and legal persons appropriating parts of the seabed or its minerals.<sup>17</sup>

These cases show that there is no reason in principle why companies cannot have direct obligations under international law. Indeed, it would be inconsistent to exclude *a priori* that private actors, unlike other non-state actors, cannot have minimum obligations under international law. Why

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13 In the end, however, the proposal failed to gather sufficient support. Moreover, as has been pointed out, the absence of international jurisdiction does not imply that private companies have no international legal obligations, nor does it prevent them from violating international law. See Andrew Clapham, *The Question of Jurisdiction under International Criminal Law over Legal Persons: Lessons from the Rome Conference on an International Criminal Court*, in Menno T. Kamminga and Saman Zia-Zarifi (eds.), *Liability of Multinational Corporations under International Law* (2000) pp. 139-195.

14 Klabbers, *An Introduction to International Institutional Law* (2009) p. 38.

15 J.A. Zerk, *Multinationals and Corporate Social Responsibility. Limitations and Opportunities in International Law* (2006) p. 75.

16 Art. III, International Convention on Civil Liability for Oil Pollution Damage (1969): ‘... the owner of a ship at the time of an incident, or where the incident consists of a series of occurrences at the time of the first such occurrence, shall be liable for any pollution damage caused by oil which has escaped or been discharged from the ship as a result of the incident’.

17 Art. 137(1), UN Convention on the Law of the Sea (1982): ‘No State shall claim or exercise sovereignty or sovereign rights over any part of the Area or its resources, nor shall any State or natural or juridical person appropriate any part thereof. No such claim or exercise of sovereignty or sovereign rights nor such appropriation shall be recognized’.

should individuals, if not also armed opposition groups,<sup>18</sup> have international legal obligations while private companies, with the enormous capital that can be raised from space activities, especially space mining, could not?

While it will not be possible to fully remove responsibility from states, it would be desirable, for all the reasons listed above, to consider for the future, i.e., when the mining of celestial bodies is possible, that there should also be international obligations for private actors (in the same way as individual responsibility under international law, which has not replaced but coexists with state responsibility for violations of international law).<sup>19</sup>

It will probably not be useful to classify private space companies as subjects of international law. Moreover, the very notion of subject of international law has never been defined in any international treaty or resolution, constituting in a sense a mere doctrinal construction without any real practical use; it is not by chance that some consider the question of international subjectivity to be confusing, even misleading,<sup>20</sup> especially since different actors may have different sets of rights and obligations in the international arena. Jennifer A. Zerk suggests considering the degree to which international law recognises the existence of different types of actors participating in the world of international relations and their respective capacities to enjoy rights and incur obligations under international law, rather than dividing the participants in the dynamics of international law.<sup>21</sup>

With regard to the establishment of this model in which private operators are the real protagonists of the new space economy, not only from a financial point of view but also from the point of view of international law, it is certainly necessary to modify the current legal framework of space activities. Most of the provisions of the Magna Charta of outer space, i.e., the OST, need to be amended, with recourse to the procedure provided for in Article XV of the OST, which allows each State party to the treaty to propose amendments.<sup>22</sup>

To conclude, the answer to which model could be most effective is not ready because space is a continually developing sector; the legal analysis of the scientific and technological development is a sine qua non to facilitate the entrance of the private sector in the space domain.

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18 See, for example, Protocol II to the Geneva Conventions on international humanitarian law.

19 See André Nollkaemper, *Concurrence Between Individual Responsibility and State Responsibility in International Law*, 52 ICLQ (2003) pp. 615-640.

20 A. Clapham, *Human Rights Obligations of Non-State Actors* (2006) p. 80.

21 J.A. Zerk, *Multinationals and Corporate Social Responsibility. Limitations and Opportunities in International Law* (2006) p. 73.

22 According to article XV, OST, amendments shall enter into force for each State Party to the Treaty accepting the amendments upon their acceptance by a majority of the States Parties to the Treaty and thereafter for each remaining State Party to the Treaty on the date of acceptance by it.