Laws of Tomorrow: The Moon
The Space Law Resource Series
Compilation
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Introduction

The story of the Space Law Resource

Everything began with the Asgardia Project, set to create the first Space Nation applying to the United Nations. As a legal professional, I have always deemed fringe fields of the law the most interesting and valuable, in challenges and research terms. I had studied medical law and specialized in Bioethics; the only time I came across space law was during my international law studies, when my teacher spoke about Rolando Quadria\(^6\) and the analogy between maritime, aerial navigation and cosmic navigation. I understood it was a legal topic deserted for far too long, with only a handful of international treaties and agreements trying to shape it into fundamental principles:

- the exploration and use of outer space shall be carried out for the benefit and in the interests of all countries and shall be the province of all mankind;
- outer space shall be free for exploration and use by all States;
- outer space is not subject to national appropriation by claim of sovereignty, by means of use or occupation, or by any other means;
- the Moon and other celestial bodies shall be used exclusively for peaceful purposes

And more, as provided by the 1967 Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies, also called the Outer Space Treaty\(^7\).

The Agreement Governing the Activities of States on the Moon and Other Celestial Bodies, or Moon Treaty, can also be mentioned; however, it has only been ratified by 17 countries\(^8\) – excluding states engaged in self-launched manned space exploration like the United States, Russia or China), and is considered a failed treaty. It could, however, serve the purpose of a customary law for future scientific and mining activities on the Moon.

The [ASK] feature

As time went by, I began to notice, on various social media, the need people expressed to get a better understanding of all this legal principles governing space: the place of the nations, their sovereignty at the dawn of this new space era – is the concept even still

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\(^6\) Pioneers of Space Law, International Institute of Space Law, ed. Stephan Hobe (Boston 2013)

\(^7\) See the Office for Outer Space Affairs of the United Nations website for more informations: www.unoosa.org/oosa/en/ourwork/spacelaw/treaties/introouterspacetreaty.html

\(^8\) For a complete list of signatory states and states parties, see it here: http://disarmament.un.org/treaties/t/moon
valid? And, of course, the dizziness caused by all those new projects of private spaceflights, human and robotic settlements on the Moon and the planet Mars, automated exploration beyond the Solar System... The legitimate questioning about the relevance of such old legal instruments nowadays, with new technologies available like the reusable SpaceX Falcon 9 rocket\(^9\) or the Johnson Space Center NASA’s RS, aka Valkyrie, an « entirely electric humanoid robot capable of operating in degraded or damaged human-engineered environments\(^10\) » or « participate in precursor missions to selected landing sites, arriving long before astronauts to set up habitats, life support systems [...] and even begin preliminary scientific research\(^11\) ». The « Moon village » project of the European Space Agency, described by its Director General Professor Johann-Dietrich Woerner as a « multinational settlement involving astronauts, Russian cosmonauts and maybe even Chinese taikonauts », proves that scientific interest in space is still uppermost.

The Outer Space Treaty dates back to the first era of space exploration and the Cold War, when the United States and the Soviet Union engaged in a battle to send the first man in orbit and the first manned mission on the Moon. The Soviets won the first battle with Yuri Gagarin in 1961, the United States won the second round with the 1969 Moon Landing – putting an end to the space race.

How could we enforce the full meaning of this « province of all humankind » principle, to that new world of space tourism and – more importantly – incoming space mining industries? How could we provide a legal framework for the commercial use of the Moon and celestial bodies like asteroids, without interfering with companies interests? And how could we prevent risks such as abusive claims of ownership or economical collapses? According to my colleague Hamza Hameed, contributor for the Space Law Resource, asteroids can be valued « from figures such as $195 billion to $10,000 quadrillion » depending on their composition – mostly metal, water and carbon dioxide\(^12\). As for the Moon, it may be interesting for helium-3 deposits, « purportedly an ideal fuel

\(^9\) « SpaceX Falcon 9 Blasts Off From Historic Apollo Launchpad, Then Nails A Tidy Landing », by Brid-Aine Parnell, Feb. 20, 2017


\(^10\) https://www.nasa.gov/feature/valkyrie


(https://www.nasa.gov/directorates/spacetech/centennial_challenges/feature/space_robotics_challenge.html)

\(^12\) « The Legality and Ethics of Mining an Asteroid », by Hamza Hameed on Niume

(https://niume.com/post/272137)
for fusion reactors but almost unavailable on Earth–from the moon’s surface » according to the MIT Technology review\textsuperscript{13}.

Humanity is about to step – again – in space, this time willing to send much more people, and even settlers in other worlds. We understood the legitimate concerns of people willing to understand that evolution, and wanted to try answering them. That is why we opened a feature named [ASK], allowing anyone to send us specific or general questions on the topic of space law. On January the 3rd, 2017, we received a series of questions about the Moon from Miss Lisa Moura, master student in Spaces and Communication at HEAD-Genève, Switzerland, and interested in developing a project related to matters of Space Law and International Politics. We decided to answer them one by one, by publishing and sharing our contributions on social media. The Space Law Resource Moon Series constitutes the final collection of all our articles on the subject. Like all our publications, it is available to download for free under the Attribution-NonCommercial-NoDerivatives 4.0 International (CC BY-NC-ND 4.0) licence.

« The important achievement of Apollo was demonstrating that humanity is not forever chained to this planet and our visions go rather further than that and our opportunities are unlimited ». Neil Armstrong

May we prove we are able to bridge problems between Earthly Nations, and work towards a peaceful and respectful exploration of outer space.

\textit{Oriane Kaesmann, Space Law Resource Founder}

\textsuperscript{13} « Sustainable Energy : Mining the Moon », by Mark Williams Pontin August for the MIT Technology Review, Aug. 23, 2007

(https://www.technologyreview.com/s/408558/mining-the-moon/)
Oriane Kaesmann,
Founder of the Space Law Resource, legal professional in Bioethics and Medical law field. Passionate about Space law.

Mihai-Claudiu Dragomirescu,
Space Law Resource contributor, specialized in International Law, Space law, Humanitarian Law, Human Rights and Environmental law.

Kamil Muzyka,
Polish Space Agency expert, specialized in asteroid mining, space salvage regulations, robot law, industrial property and space stations.
Mankind and the Moon

Kamil Muzyka

Lisa Moura: The moon, according to the Space Treaty signed in the 60's, is considered a "common heritage of mankind". What does this mean and what does this imply? For example, what would happen if Russia or any other country, would go the moon and take down one of the U.S. flags? (in the possible scenario that the flags are still there and did not disappear because of the erosion).

The Outer Space Treaty, or the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies of 1967, commonly referred to as the Outer Space Treaty, does not recognize the moon or other celestial body as the Common Heritage of Mankind. The CHM has been outlined in the Moon Treaty of 1978, which has not entered into force, and the UNCLOS of 1982. The Outer space treaty however states that the moon, and other celestial bodies are Province of all mankind. It should be noted that province means the mutual area of activity, while the common heritage implies, that the moon should remain "untouched" or "unaltered".

As Joanne Gabrynowicz writes in The "Province" and "Heritage" of Mankind Reconsidered: A New Beginning:

« The main difference is that Province refers to activities, and Heritage to the matter ». 

Thus, the idea of Province of mankind means that no state may establish it's sovereignty on a celestial body, yet it may peacefully use it, for construction, habitation, resource extraction and other peaceful, non-military purposes. However, the International space law works only as Lex generalis, in referents to national legislations, such as the US Space resource exploration and utilization act of 2015, in terms of asteroid mining, or the Russian Law « About Space Activity » from the year 1993, regarding safety zones and conventional weapons in outer space.

In regards to the flag placed on the moon. Placing the flag on a celestial body doesn’t constitute any real estate rights towards that celestial body, nor national sovereignty. Article II of the Outer Space Treaty states that “Outer space, including the moon and other celestial bodies, is not subject to national appropriation by claim of sovereignty, by means of use or occupation, or by any other means." In that sense no manner of placing a national flag is a valid form of claiming land ownership on a celestial body. Although nations tend to extend their jurisdiction upon space stations and vehicles, that does not apply to land marks. There can be an issue with creating artificial tunnels or using existing lava tubes as basis for a subsurface moon station, yet the juristidtion only

extends to the interior and vehicles (for that purpose, an EVA suit counts as a vehicle). The flag however is still regarded as the property of the government of the United States. And as such, russian entities should obtain the permission to use it from the proper US authority.

However there are approaches to that issue. First is the “NASA’s Recommendations to Space-Faring Entities: How to Protect and Preserve the Historic and Scientific Value of U.S. Government Lunar Artifacts”, which is more of a set of voluntary guidelines than an actual act of law. It invokes the idea of creating exclusion zones around the Apollo and rover landing sites, which allow flyby’s, but recommend keeping distance from historical landmarks. The second is the that 2013 “Apollo Lunar Landing Legacy Act”, which recognized Apollo landing sites as Historical Park had failed to pass through the congress. Also, none of the landing sites, especially the Tranquility base where the flag is placed, cannot be recognized by UNESCO as a World Heritage Site, since those apply only to historical landmarks “within the national boarders”.

However, the issue of eventual repercussions for destroying or damaging the flag by a potential Russian expedition might be more of a political than legal. According to the 1972 Liability Convention, states are liable for damage done by their autonomous probes and astronauts/nationals, whilst any damage to a property of another party would occur. Although the conventional procedures complicated and takes a long time, parties should eventually settle for a compensation, for there is no criminal law prohibiting such act. Violation of the international space law, in case of lack of proper provisions in the national criminal law, doesn’t carry any outright criminal sanctions.
The Moon
To own the Moon

Oriane Kaesmann

Lisa Moura: Regarding the selling of properties on the moon: Dennis Hope, who is currently doing it through the institution he created in the U.S.A.—Lunar Embassy—, claims he owns the Moon because he found a loophole in the Space Treaty, since it only considers nations and not individual people. His statement doesn’t seem to be taken very seriously among authorities, but is there anyway that this could be taken seriously and plausible?

According to National Geographic\(^{15}\), Dennis Hope, United States citizen and head of the Lunar Embassy Corporation, “has sold real estate on the moon and other planets to about 3.7 million people so far”.

He then proceeded to create his own government in 2004, including a ratified constitution, a congress, a unit of currency—even a patent office. He declared « We’re now a fully realized sovereign nation ».

But, as Tanja Masson-Zwaan\(^{16}\) stated, nobody can legally own the moon or anything else in space. « What Lunar Embassy is doing does not give people buying pieces of paper the right to ownership of the moon. »

Mr. Hope declared that a loophole in the 1967 Outer Space Treaty, ratified by 100 United States members – including the United States, allows him to claim the Moon: the treaty prohibits countries from claiming property in space, but "I filed my claim of ownership as an individual."

In that regard, it is worth mentioning the article II of the 1967 Outer Space Treaty\(^{17}\):

**Article II**

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


\(^{16}\) Tanja Masson-Zwaan is Asst. Professor and Deputy Director of the International Institute of Air and Space Law at Leiden University, The Netherlands.

About the « national appropriation », what is the legal definition of a nation? According to the Black’s Law dictionary\(^{18}\),

\[
\text{« A people, or aggregation of men, existing in the form of an organized jural society, inhabiting a distinct portion of the earth, speaking the same language, using the same customs, possessing historic continuity, and distinguished from other like groups by their racial origin and characteristics, and generally, but not necessarily, living under the same government and sovereignty. »}
\]

Going by this legal definition of a nation, the Outer Space treaty does apply to governments and their private citizens, « which invalidates Hope's claim to the moon and other celestial bodies », asserts the space-law institute's professor Masson-Zwaan.

However, Hope declared he has been sending letters on behalf of his government asking other countries, for example China\(^{19}\), not to trespass on the Moon without a license.

« Hollywood actors Tom Cruise, Tom Hanks, and Clint Eastwood, and Star Wars creator George Lucas are said to be among his six million customers. Presidents Reagan, Carter and Bush Junior have also had plots bought for them, while companies such as Hilton and Marriott have also invested » - Dailymail\(^{20}\)

However, according to Mrs Masson-Zwaan, « You don't need to own a place to make money on it, But you do need a clear legal framework for doing business on the property—something the moon currently lacks [...] Such rules would apply to businesses looking to establish hotels, mining operations, and other commercial endeavors on the moon ».

Claims on individual and corporate ownerships on the Moon and celestial bodies are not uncommon : « Nemitz v United States\(^{21}\) » illustrates a case where the Moon Agreement or the Outer Space Treaty prohibited an individual from appropriating private property rights on asteroids.

\(^{18}\) http://thelawdictionary.org/nation/


\(^{21}\) Nemitz v United States and ors, Decision on motion to dismiss, 2004 WL 3167042 (D Nev 2004), ILDC 1986 (US 2004), 26th April 2004, United States
In 2001, NASA landed a robotic spaceship on Asteroid 433, named Eros. Online entrepreneur and space enthusiast Gregory W. Nemitz of Carson City, had previously registered an ownership on the celestial object and asked NASA to pay a "parking/storage fee" of $20 for one century, plus late-payment fees. The agency refused, arguing that a claim "of a celestial body», according to the provision of the 1967 Outer Space Treaty, appears to have «no foundation in law." In response, Nemitz sued NASA and the U.S. State Department, hoping, according to him, to set a legal precedent for future cosmic exploration. The U.S. District Court in Reno tossed out Nemitz’s suit "for lack of a recognizable legal theory" in April 2004. The United States Courts for the Ninth Circuit then proceeded to issue a simple ruling, that upheld the district court decision without further explanation.

In 2012, Google executives Eric Schmidt and Larry Page and former Microsoft chief software architect Charles Simonyi, along with other tech billionaires, announced their intention to mine an asteroid.

The 2014 publication of the SciTech Lawyer on «Properties rights in Outer Space» reminds us that the Outer Space Treaty, like the Antarctic Treaty, "sought to prevent a new form of colonial competition and the possible damage that self-seeking exploitation might cause." However, "as new, affordable spaceflight technologies become available, extensive private space activity" and interests "is a serious possibility in the very near future" and should be addressed legally.

As Keay Davidson stated, «Space enthusiasts look forward to an age of space commercialization on a grand scale, ranging from orbital hotels with zero-gravity swimming pools that float in the middle of a room to lunar factories that mine nuclear fuel for terrestrial fusion reactors. They fear such dreams might be stillborn if the legal niceties - especially property rights - aren’t worked out in advance».

23 http://www.ca9.uscourts.gov/
24 http://www.americanbar.org/content/dam/aba/publications/scitech_lawyer/2014/summer/property_rights_in_space.authcheckdam.pdf
I’ll conclude by quoting Wayne White:\(^{26}\):

« As resources on Earth become increasingly difficult and expensive to mine, and as the need for orbital debris removal becomes increasingly critical, it is clear that our laws and policies must encourage appropriation of space resources\(^{27}\).»

\(^{26}\) Wayne White is President and CEO of SpaceBooster LLC, an aerospace technology company in Albuquerque, New Mexico. He is a longtime member of the International Institute of Space Law, and represented the United States as a member of the State Department Delegation to the UN Committee on the Peaceful Uses of Outer Space, Legal Subcommittee in 2003. Copies of Wayne White’s published articles, and a slide presentation of the Space Pioneer Act, are available for download at https://independent.academia.edu/WhiteWayne.

\(^{27}\) http://www.spacereview.com/article/2627/1
Lisa Moura: The Moon was once part of a stage for a war: the Cold War. What other sort of scenarios regarding the moon do you imagine could initiate serious conflicts and even possible wars on Earth or even in Space?

the Moon has always been a great part of humans imaginary world, and entered a whole new realm of possibilities when Galileo published his Sidereus Nuncius, or "The Starry Messenger » in 1610. With his telescope, the astronomer and physicist provided proof the moon’s soil was quite alike Earth, allowing further kinds of exploration.

During the Cold War, The United States and the Soviet Union battled to gain supremacy in space race, but it was the latter that had started the Space Age with the world’s first artificial satellite, Sputnik 1, launched in 1957. Yuri Gagarin was also the first human to orbit the Earth on April 12, 1961.

Answering the fact the first man in space was russian, the space program of the US aimed to send a man to the Moon with the 3 projects Mercury, Gemini and Apollo. The American Government felt it had to catch up with its competitor in the best, quickest way possible. The historian Robert Dallek quotes Vice President Johnson:

“How long, how long, oh God, how long will it take us to catch up with the Russians’ two satellites?”

In the press Conferences of the Apollo 11 ‘s crew following the first Moon landing on July 20, 1969, Astronauts Niel Armstrong, Michael Collins and Edwin Alden showed unexpected behavior, highlighting the fact that coming together to solve problems would allow humanking to deal with all sort of challenges, including rivalries, « in the long time fraction».

Nowadays, the symbol is mostly gone. New contestants are about to restart the Space Race: private contractors and business, looking to organize tourist spaceflights around Earth’s orbits ; and mining companies, aiming at the Moon and celestial bodies resources.

Last year, Ian Crawford, professor of planetary science and astrobiology at Birkbeck College, London, assessed on the economic case of mining the Moon. He said:

« it’s hard to identify any single lunar resource that will be sufficiently valuable to drive a lunar resource extraction industry on its own. Nonetheless, the moon does possess abundant raw materials that are of potential economic interest. [...]the overall case for

any future payoff from exploiting the moon’s resources has yet to be made. However, lunar resources « could be used to help build up an industrial infrastructure in near-Earth space, Crawford said, a view shared by space scientist Paul Spudis of the Lunar Planetary Institute and others29 ».

As we said earlier, the space property is still under unclear regulation. Ownership on the whole body or planet is not possible, but it should not prevent interested parties from aiming at what they can extract from it – should the initiative prove fruitful. At the beginning of February, Naveen Jain, a billionaire entrepreneur, has announced that « he will start mining the Moon for gold and other precious metals before the year is out; the company he co-founded in 2010, had raised enough money to start extracting natural resources from the lunar surface. [...] Moon Express is the only private company to have been granted permission by the US Government to leave Earth and land on the moon. Its first mission will involve sending up its MZ-1 rover, which is no bigger than a washing machine, to collect moon samples and send high-definition video images back to Earth30 ».

In 2014, Bigelow Aerospace, an American firm, was already « pushing for the adoption of a series of recommendations supporting the ability of the private sector to enjoy the fruits of any extraterrestrial labor — on the moon and elsewhere — and to operate on "a non-interference basis31." 

Those recommendations are yet to be made in an effective way, in order to allow private companies initiatives while protecting the « common heritage » nature of outer space and, most of all, the peaceful use of it.

30 http://www.mirror.co.uk/science/billionaire-entrepreneur-start-mining-moon-9746422
31 http://www.space.com/26644-moon-asteroids-resources-space-law.html
Space Travel
The Common Province of Humankind

Kamil Muzyka

Lisa Moura: some advocate that the understanding of the moon as “common heritage of mankind” has become an obstacle to technological advancement. It is unfortunately acknowledgeable that war, international conflicts and competition have been historically fruitful in terms of technological and even social/political advancements. What do you think would happen if Outer Space started to be perceived as space for individual appropriation?

As it was pointed out earlier, the Moon is not recognized as Common Heritage of Mankind, due to the failure of the 1979 Moon Agreement. Failing to be signed and ratified by most spacefaring nations, it has never entered into force, thus it’s provisions do not apply.

Therefore the Moon and other celestial bodies is being recognized as the Province of mankind. Thus, the Moon is free to use in any peaceful, non-military manner in compliance with the Outer space Treaty of 1967.

As for eventual territorial disputes, those should not occur, on the basis on the non-appropriation principle. Yet the problem might occur with asteroid mining. Up to this day, there is no international legal regime nor procedure to avoid collision of two competing missions towards a certain Near Earth Asteroid. Neither party may lay claims to and asteroid, nor “reserve” one for it’s scientific or mining mission at the Secretary General of the United Nations, who holds the register of space objects. Neither has UNOOSA the capacity, to dictate the which mission would gain priority.

Lacking the mechanism to administer and settle such disputes, two commercial companies, one registered in the US and the other in Luxemburg might find themselves racing towards one particular object. As space launches go, one cannot simply pick another target, while on a certain trajectory, if the mission wasn’t designed with such possibility in mind. Therefore both are authorized by their respective governments, and that might lead to an Ad Hoc solution, for the international law itself doesn’t distinguish asteroid redirection, in situ mining or hauling to a Lagrangian point. That solution, either settled before the PCA, or the United Nations Commitee on Peaceful Use of Outer Space, or the United Nations Security Council. However, the possibility of political pressure or biased ruling might spark an economical conflict, a breaking diplomatic ties, or open disobedience towards the UN ruling on the issue of priority, or any solution, not in favor to one side.

One must recall, that the issues of space resources, land scape engineering, influencing the climate, or other manner repurposing a celestial body, were the reasons the Moon Agreement has failed.

The issue of a legal void in space resource governance leaves much uncertainty. Efforts to create a treaty based regulatory system were futile. The reason to this was that all
governance models were either based on one Space Resource Authority, or claim systems.

The one Space Resource Authority mostly fell due to the ITU style of governance, creating “paper asteroid miners”, favoring some countries. Claim systems had a similar problem with legitimacy of claims and astrotrolling – where the claimant is in fact a non-practicing entity, blocking others (ie. those with actual asteroid mining capacity) from actually mining and prospecting, unless they are forced into a non-negotiable contract, or faced to pay fees to the claim owner. On the other hand, a system where the asteroid miners are deemed only as contractors for a UN based entity, paid the operation costs, not profits form hauled asteroid's precious ores, would in theory favor the developing countries of Earth over the developed states and superpowers. There might be a big issue of corruptability and “rigging” international economical statistics. Also some nations, especially superpowers, would be more in favor for creation of small, puppet state autonomies in disputed regions, in order to get even more shares of the space resource benefits. In that sense, developing countries would become even more reliant on super power's policies and policies.

Individual appropriation on the other hand means nothing if the individual lacks the capacity to enforce it. That might be a cause for conflict, if there are rules, on which all sides have agreed upon.

For example, states would still reserve their monopoly on astronauts (who have a diplomatic status of Envoys of Mankind, which grants them access and right to inspect all and any installations in outer space, upon further notice), whereas private entities and their personnel might officially lack such status. That notion of enforcement however might lead to consequences, such as private entities form “weaker” nations, might face the problem of being bullied into submission by entities with “sufficient back up”.

Tricks and treachery are the daily bread of politics and war, yet one must bear in mind, that even the best ideals and the most flawless regulations can be subverted, directly or indirectly, to serve ones bidding.

However, carrying out simple, uncomplicated and strict rules for private entities operating in outer space, should help to lessen the probability of any conflicts. No state party may lay claim of sovereignty or real estate on the Moon, yet some point out that private entities are excluded from this equation. Eventually, either the state must authorize such endeavor, or will have to protect it's national interest with political and military support. One can imagine a private space company bypassing the idea non-appropriation principle, by creating a chickenwire fence around it's habitats, then selling plots as "space within the station". No entity is forbidden from landing or constructing habitats, using lava tubes or digging tunnels underneath the surface of the Moon or Mars, yet they may not lay any claim to any land in the vicinity of their habs. They may utilize the surrounding area, building solar panels or extracting resources, or even, as in the case of the Russian Federation's law “About Space Activity”, create safety zones, that would protect the infrastructers from “non-personnel” activities, and the “non-personnel” from getting harmed, due to heavy conditions of mining operations or construction site. Space activities and creating private manned and unmanned
infrastructure might not be a cause for a conflict, unless one is carrying atrocious activities, such as military maneuvers, intentionally obstructing the work or endangering the lives of other nation’s citizens. That kind of activity, if supported by one’s government, might be a true cause of a political crisis or even an armed conflict.

Progress is however associated with the issue of funds directed into solving a problem, and thus a larger involvement of private parties in space exploration and utilization, should lead to more spin-off technology based terrestrial commodities, as well as in-space solutions. Companies tend to compete with each other, without the need to destroying each others infrastructure or equipment.
To begin answering this question, one must know how to define the notion of colonization. In common language, according to the Oxford Online English Dictionary, the verb “to colonize” represents the action of sending settlers to a place and establishing political control over it\(^\text{32}\). Another sense is to appropriate a place or a domain for one’s use. The Merriam Webster dictionary defines the colony as “body of people living in a new territory but retaining ties with the parent state\(^\text{33}\)”:  

However, definitions from international law sometimes differ greatly from the common sense, so we must seek the legal meaning of these words as well. In a legal context, the term “to colonize” is mostly used in a different context, the context used by the Cambridge Online Dictionary, which is “to send people to live in and govern another country\(^\text{34}\)”. In the Declaration on the Granting of Independence to Colonial Countries and Peoples adopted by General Assembly of the United Nations resolution 1514 (XV) of 14 December 1960\(^\text{35}\), colonization is indirectly defined in the first paragraph as “the subjection of peoples to alien subjugation, domination and exploitation”. Ab initio, we might find this definition useless for our case, as currently there aren’t any human beings on the Moon or on other celestial bodies. As we will see later in the article, this definition will regain importance after people settle such bodies.  

In general public international law there is a doctrine that allows states to claim territories that belong to no one, terrae nullius. The most recent cases involve occupation, which, as professor Malcom N. Shaw notes, must be done “by a state and not by private individuals, it must be effective and it must be intended as a claim of sovereignty over the area\(^\text{36}\)”. This legal concept stems from a long history of territorial claims.
The best historical example relevant to the question is how the New World was split between Spain and Portugal, through a papal bull and a treaty. After Columbus’ return from the Caribbean, Pope Alexander VI at the appeals of Spain and Portugal, issued the 1493 bull which established a line 100 leagues west of the Cape Verde Islands off the African coast. All the territory west of this line not currently under Christian sovereignty would become Spain’s. The Portuguese, naturally, did not support this bull and after negotiations, concluded the Treaty of Tordesillas with Spain in 1494, and the line was moved 370 leagues west of Cape Verde.

This historical example is relevant to the way nations tend to struggle over land in the absence of strict international law regulations. However, the current conditions are different from the New World colonization movement. International Law had different principles during the “conquest of paradise”, and countries like Portugal, Spain, the British Empire, France or the Netherlands lay claim quite quickly upon the previously unknown lands.

It is also difficult to compare the two situations because the Americas could be colonized quite easily, in terms of transport and sustainability, compared to the intrinsic natural obstacles of the celestial bodies. It might take a century until a stable large-scale colony could be established on a celestial body. It is interesting to observe that, as international law changed through the ages, the requirement for successful territorial claims have become more and more rigid.

The space lawyers of the 60’s and 70’s, when drafting the treaties, tried to make Outer Space a source of peace rather than a source of conflict, and they uses all the available legal tools for this purpose. Thus, the preamble of the Moon Treaty clearly states the desire to “prevent the moon from becoming an area of international conflict”. For the time being, the international space law treaties and customary law forbid any national appropriation of a celestial body. The term predominantly used is “national appropriation”. Article II of the Outer Space Treaty establishes that “outer space, including the moon and other celestial bodies, is not subject to national appropriation by claim of sovereignty, by means of use or occupation, or by any other means”. As space law professors Francis Lyall and Paul Larsen note, the Treaty takes into consideration both the situation where a country claims to be sovereign over a celestial object or a part of it from afar, and the situation when a country has already established a base with the intention to act like a sovereign in relation to the occupied location.

Let us return to the current era, though, and conclude that with the current normative landscape, establishing bases on the Moon, or Mars, or any other celestial body, can only be carried without ambitions of sovereignty. Indeed, article I of the Outer Space Treaty provides that “the exploration and use of outer space, including the moon and other celestial bodies, shall be carried out for the benefit and in the interests of all countries, irrespective of their degree of economic or scientific development, and shall be the province of all mankind”. The prospect of colonization is also somehow hindered by the

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pressing obligations of not contaminating the celestial body and ensuring full access to all areas of the said celestial body. As such, with our current space legislation, a large scale colonization might be illegal, due to the impact on the extraterrestrial environment.

As about new countries in space, it is not difficult to envisage a dream for independence of an already established colony. However, it might be much more difficult to do this in Outer Space than on the Earth. On Terra, one can acquire quite easily an auto-sustainability from resource based point of view. In Outer Space, unless major progress is made with air, water and food production and also engineering capacities, a colony would be extremely dependent on Earthly resources.

Furthermore, even after a de facto autonomy is reached, according to the current international law, one of the requirements of the existence of a state on the international firmament is recognition. The more countries recognize one state, the better. The stronger the state that that grants recognition, the better. A space colony, and this is where the situation is similar with the known history, might find it very hard to achieve this recognition. Unless it has a leverage upon the Earthly nations, due to various scenarios: economic power granted by mining rare resources, deft diplomatic abilities, a role in the protection of Earth from asteroids, or in an extreme case even military power. However, the most probable success scenario would be due to economic power and/or diplomatic abilities. Only military power can make a country isolated.

One current attempt of creating a country in Outer Space is the Asgardia initiative. In this case, a group of space law scholars and scientists presented to the public a project of a space nation based on a space station. The space station would be considered their territory, thus complying with the current space legislation. They are currently trying to achieve recognition from the United Nation from their project, and launch their first satellite towards the end of the year.

As you can see there are some similarities between the historical colonization of the New World, yet the outer space environment, both natural and legal, differs in such a measure that a reliance only on history to anticipate the future might be a poor bet. There are general patterns in history, but we should be wary before jumping to conclusions, as every situation is unique and has unique effects on the wheel of time.

Perhaps, in the far future, if humankind survives and space travel and colonization become natural, the sheer vastness of the Universe will lead to many declarations of independence, as national identities form.
Dear Ms. Moura, I would like to begin answering your question by analyzing the premises that led to it. For the moment, there is indeed a great consensus regarding Outer Space. In regards to terrestrial space, one might think that we live in a world of constant rivalry over territory. However, as I will further show, there isn’t that much conflict over terrestrial space as it would seem to be.

Conflict over territory, in all its legal and illegal forms, has dwindled in intensity and frequency after the Second World War and especially after decolonization. From a normative perspective, this is due to the advancement of international law as a method of conflict resolution. In present international law military conquest in itself, as a method of obtaining territory, has no more legitimacy. This is in accordance with the 1928 Briand-Kellogg pact, which “condemned recourse to war for the solution of international controversies, and renounced it, as an instrument of national policy in their relations with one another”. Moreover, one of the principles enumerated in the Charter of the United Nations is that “all members shall refrain in their international relations from the threat or use of force against the territorial integrity or political independence of any state, or in any other manner inconsistent with the Purposes of the United Nations”. These fundamental legal documents are the proof of a change in international politics. Now, the preservation of territorial status quo has become more and more important, leaving aside ancient rivalries.

Many causes have been invoked for this change. Harvard psychologist Steven Pinker, in a great statistical effort, reaches the conclusion that violence in itself has declined over recorded human history, micro and macro levels, and even that “today we are living in the most peaceable era of our species’ existence”. He contends that, from a historical point of view, “more peaceable societies tend to be richer, healthier, better educated, better governed, more respectful of their women, and more likely to engage in trade”. He even takes into consideration the possibility that our genome could have evolved to

40 Available at the Avalon Project: http://avalon.law.yale.edu/20th_century/kbpact.asp
make us more peaceful, though it is difficult to ascertain. The author identifies four endogenous human traits, empathy, self-control, moral sense and the faculty of reason, which coupled with five major historical factors have led to the current more peaceful state of affairs. The five historical forces are the Leviathan, or the state’s monopoly on violence, Commerce, the positive-sum game, Feminization, with its peaceful outlook, Cosmopolitanism, which “can prompt people to take the perspective of people unlike themselves and to expand their circle of sympathy to embrace them”; and finally the Escalator of Reason, which “can force people to recognize the futility of cycles of violence, to ramp down the privileging of their own interests over others’, and to reframe violence as a problem to be solved rather than a contest to be won”.

In the light of Steven Pinker’s findings, the decrease of territorial disputes in the last half of the century seems indeed to make sense. We can only hope that he is right and the trend will continue.

An international relations based point of view is provided by professors Barry Buzan and Richard Little, who consider that the fixed territoriality of the current international state system stems from the process of colonization, which has led to a certain imitation of European forms, many times without a basis\(^43\). Perhaps that in the absence of the colonization, the non-European international units would have reached a non-conflictual territorial form eventually, due to the simple fact of defining their action limits with regards to where the European-style fixed states territorial borders begun. Nevertheless this fixity has greatly been hurried by the colonization.

However, Outer Space is indeed a very special case. It is indeed a place without much conflict, for the moment.

Until the advent of the space era, this lack of conflict was simply due to the inaccessibility of the celestial spheres. However, after Sputnik’s flight in 1957, the territoriality of outer space took an interesting form. It was the Americans who started to define the regime of Outer Space, and President Eisenhower, while addressing the U.N. General Assembly, proposed four famous points\(^44\):

- We agree that celestial bodies are not subject to national appropriation by any claims of sovereignty.
- We agree that the nations of the world shall not engage in warlike activities on these bodies.
- We agree, subject to appropriate verification, that no nation will put into orbit or station in outer space weapons of mass destruction.
- All launchings of space craft should be verified in advance by the United Nations.

These points would be later found as major principles of the Outer Space Treaties. Why? Because the other major space power, the Soviet Union, quickly agreed with them. As


the world was dominated by the two superpowers, the others states did not oppose the new status of the outer space. And therein lies the mystery. Why a rivalry so profound, anchored in different ideological perspectives, suddenly dissolved on the subject of outer space?

One reason put forward by researchers is the economic one. As space law professor von den Dunk notes, “the cost, even more prohibitive in those early days than today, of moving large military structures into outer space and maintaining them” was a powerful motivation\(^{45}\). Another economic reason might had been the lack of technology to make outer space profitable. Mining or solar energy harvesting was just a science fiction dream in those days. Another reason might had been the fear of war due to territorial claims, so instead of adding one more conflict point which could have tensed even more the already bad relations between the two superpowers and destroyed the balance of power, they decided to allow for a release valve.

There might be yet another reason, more profound for this outcome, although certainly not exclusive.

In order to analyze this particular reason, we need to think even more about the sources of international law, not the formal one, but the material ones, those that stem from the psyche of the person who drafts the law, who gives power to the law.

And in the psyche of the human being, Outer Space is indeed something very special. When looking at the starry sky, every man, like Van Gogh, can enter a world of mystical wonder. The moon is still the lover’s intimate guardian. Psychologist Carl Gustav Jung noted that although “modern space flight has proved that the moon is only a cratered ball of dirt, we have retained something of the archetypal attitude of the moon with love and romance”\(^{46}\). Using a term from the repertoire of Max Weber, we might say that the moon is only partially disenchanted. Echoes from its sacred past reverberate in our unconscious and the prospect of battling over the Moon as something that belongs to one or another might even seem...sinful.

Philosopher Michel Foucault, in one particular essay, “Of Other Spaces: Utopias and Heterotopias\(^{47}\)”, observed too that “despite all the techniques for appropriating space, despite the whole network of knowledge that enables us to delimit or to formalize it, contemporary space is perhaps still not entirely desanctified”. Introducing the notion of heterotopia, he defined it as a place that is linked with all other places, a space that can contradict itself by “juxtaposing in a single real place several sites that are in themselves incompatible”, a place common to all cultures in the world, yet capable of interpretation, a place that presupposes a system of opening and closing that both isolate it and makes it penetrable.

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\(^{45}\) Frans Von Der Dunk, Fabio Tronchetti, Handbook of Space Law, Edgar Elgar, 2015.


\(^{47}\) Available at: http://web.mit.edu/allanmc/www/foucault1.pdf
He even notes that the sometimes individual has to submit to rites and purifications in order to enter that place. Maybe it is not accidental that one of the two first people on the Moon also performed a Eucharist on the very site on the first landing. Buzz Aldrin recalls: “I poured the wine into the chalice our church had given me. In the one-sixth gravity of the moon the wine curled slowly and gracefully up the side of the cup. It was interesting to think that the very first liquid ever poured on the moon, and the first food eaten there, were communion elements.”

As regarding Earthly space, it is worthwhile to consider that most current territorial disputes are vestiges of either pre-modern history or outcomes of nationalist ideologies. As Ernst Gellner defines nationalism, it is a theory of political legitimacy, which requires that “ethnic boundaries should not cut across political ones, and, in particular, that ethnic boundaries within a given state”. No ethnical boundaries exist on the moon, so no nationalism can exist on it, at least, not yet.

As for the ancients reason for claiming outer space, the spacefaring nations had none, both the USA and the Soviet Union having Christian roots, the Christian doctrine being one especially reverent regarding the heavens. One might argue that this religious determination goes even further in history than Christianity. As historian of religions Mircea Eliade observed, “the sky, of its very nature, as a starry vault and atmospheric region has a wealth of mythological and religious significance. Height, being on high, infinite space, all these are hierophanies of what is transcendent, what is supremely sacred.”

This might seem a romantic conclusion, far from the reality of everyday politics. Yet, I believe that this layer of analysis should be taken into consideration, for a state’s actions can be driven by its population’s unconscious, under a diplomatic mask. I cannot quantify the importance of this psychological aspect in the current legal regime of outer space, I can only show it as worthy hypothesis. Yet, if this sacred image of the celestial spheres exists, I can only expect it to wane, but perhaps never completely. Mircea Eliade was very optimistic. He considered that “archetypal images keep their metaphysical valencies intact in spite of later "concrete" re-valorisations, syncretism, or convergent religious thinking.”

As technology evolves, our vision of outer space will change, and the legal regime will have to adapt too, to make way for the demand for resources, be it space minerals, or dwelling space. Yet, in all honesty, I believe that if military conflict appears in Outer Space...

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48 How Buzz Aldrin’s communion on the moon was hushed up, Matthew Cresswell, 13 September 2012, available at: https://www.theguardian.com/commentisfree/belief/2012/sep/13/buzz-aldrin-communion-moon


Space, as a result of territorial rivalries, then all the effort of the international scholars would have been in vain.
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