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In Defence of Shadows: Legal Protection of the Dark Side of the Moon

Maddalena Cogorno[1]

Abstract: A new space race seems to have begun in recent years. It involves new actors, new interests, new goals, new technologies. Therefore, the exploitation of space resources represents one of the most critical aspects to consider, and urgent is a careful assessment of the consequences of new and advanced space activities. While the defence of the space environment from uncontrolled pollution falls under the protection granted by Article IX of the 1967 Outer Space Treaty, in the last decades space scientists have been advocating for a specific protection of a portion of the Dark Side of the Moon and the space above it. The mass of the Moon, in fact, shields such area from radio interferences coming from the Earth and the satellites, potentially allowing particular observation of the universe free from human contamination. The indeed fascinating project is now in seek of legal recognition, for effectively binding space stakeholders and protecting a unique natural environment, in the name of science. The present contribution, thus, aims to present in detail such an ambitious initiative, while recapping the legal tools that can, in the meantime, provide temporary protection to the Moon's far side.

Keywords: Space Law; Outer Space Treaty; Moon Treaty; UN Committee on the Peaceful

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In Defence of Shadows: Legal Protection of the Dark Side of the Moon

Maddalena Cogorno

Introduction

There is no darker place than the Universe. There is no more mysterious dimension than outer space: the gloomiest shadows and the brightest sources of energy surround our Blue Planet like a silent and inscrutable mantle. The shimmering celestial vault has accompanied mankind throughout its whole history, and humans have never been able to help but remain enchanted and look up at that endless darkness with wonder.

The silvery profile of the Moon has lulled generations, guided peoples in their travels, illuminated the path of those who walked at night, oriented sailors, and accompanied the vigils of wandering shepherds of Asia, like the Italian poet Leopardi exquisitely described (Leopardi, 1831). Humans have been so fascinated by the universe that all cultures have set among the stars numerous legends, thus populating the Universe with gods and goddesses, heroes and heroines, mortals and animals, rewarded or punished for their own behaviour on Earth.

Throughout the 20th century humans achieved the thousand-years dream of touching the Moon. And not content, in recent days, a new space race seems to have begun[2]. This age of

[2] The term 'space race' recalls the 20th-century competition between the Soviet Union and the United States of America to achieve superior spaceflight capability. Leonard David, *Moon Rush: The New Space Race* (Washington: National Geographic Society, 2019); Rivka Galchen, "L'ottavo continente", in *The Passenger* 14 (2021): 33- 53; Luke Harding, "The space race is back on- but who will win?", *The Guardian*, July 16, 2021. https://www.theguardian.com/science/2021/jul/16/the-space-race-is-back-on-but-who-will-win; Justin Bachman, "New Space Race Shoots for Moon and Mars on a Budget", *The Washington Post*, August 22, 2021.

space flights, led by private corporations such as Elon Musk's SpaceX and Jeff Bezos's Blue Origins, has been pointed out by industry insiders as 'NewSpace'— as opposed to 'Old Space', a Cold War-era mode of space relations when States dominated outer space. NewSpace marks the arrival of capitalism in space (Shammas and Holen 2019, 2).

It involves new actors: if previously space activities were of the exclusive prerogative of States, now private enterprises and even individuals manifest their intention to go to the Moon and beyond (Yuan 2021)[3].

New are also the interests and the goals: the private sector is looking at the space as the ground for developing commercial activities, encompassing tourism, transports, communications, exploitation of natural resources[4]. Furthermore, new are the technologies that developed enormously in the past decade and now allow for a better knowledge of outer space and the possible exploitation of its resources.

Therefore, the use of space sources represents one of the most critical aspects to regulate, and urgent is a careful assessment of the consequences of new and advanced space activities. While the defence of the space environment from uncontrolled pollution falls under the

https://www.washingtonpost.com/business/new-space-race-shoots-for-moon-and-mars-on-a-budget/2021/08/20/5f7a0eac-01c7-11ec-87e0-7e07bd9ce270_story.html.

[3] For an overview see: Alessandra Vernille, *The Rise of Private Actors in the Space Sector* (Berlin: Springer, 2018); Louis Salomon, *The Privatization of Space Exploration: Business, Technology, Law and Policy* (London: Taylor and Francis, 2017).

[4] For an overview, see: Victor L. Shammas and Tomas B. Holen "One giant leap for capitaliskind: private enterprise in outer space". 3-5; K.R. Sridhara Murthi and V. Gopalakrishnan. "Trends in Outer Space Activities—Legal and Policy Challenges" in *Recent Developments in Space Law*, ed. R. Rao, V. Gopalakrishnan, Kumara Ab- hijeet (Singapore: Springer, 2017), 27-42; "Moon Dreams". *The Economist*. February 20, 2010, 74. Last modified October 21, 2021. https://www.economist.com/node/15543675?story_id=15543675.

protection granted by Article IX of the 1967 Outer Space Treaty, in the last decades space scientists have been advocating for a specific protection of a portion of the Dark Side of the Moon and the space above it. The spheric body of the Moon, in fact, shields such area from radio interferences coming from the Earth and the telecommunication satellites, potentially favouring particular observation of the universe as free from any contamination caused by human activities.

The indeed fascinating project is now in seek of legal recognition, for effectively binding space stakeholders and protecting a unique natural environment, in the name of science and for the sake of Mankind.

The present contribution, thus, aims to present in detail such an ambitious initiative, while recapping the legal tools that can, in the meantime, provide temporary protection to the Moon's far side.

The work is divided in four sections: first, we will present some necessary scientific definitions useful to understand the project and its scope. Second, we will illustrate the project of a legal protection of the Dark Side of the Moon, from the earliest proposals to a final draft. Third, we will identify which international legal subjects may be the recipient of the project and may best adopt and enforce it, and possible obstacles to such recognition. Fourth, we will recall the legal framework already in force and currently able to provide some protection to the shaded side of the Moon, and verify whether it is sufficient for its effective safeguard.

The Dark Side of the Moon, the Quiet Cone, and the Protected Antipode Circle

The Moon takes exactly the same time to have a full rotation around its own axis as to fully orbit around the Earth. Due to this synchronously rotation with the Earth, the Moon always shows the same portion of its spheric surface to our planet. The optic result is that of the Moon having two sides: one, we see from the Earth and seems 'enlightened', the other, we can never

admire from our "Blue Planet" (Davis 2021). This latter face is often referred to as 'the Dark Side of the Moon'–or, by sector experts, as 'the Far Side'.

Above the Dark Side of the Moon extends the so-called 'Quiet Cone', a conical portion of outer space that the spherical body of the Moon shields from man-made radio frequency interferences coming from the Earth and satellites orbiting around it. The shape of a cone comes from the projections of the radio waves tangent to the Moon's body that delimit it (Maccone 2003, 2005). The adjective 'quiet' comes from the fact that no radio frequency interference corrupts the outer space within the cone.

The Far Side can represent the ideal place for astronomic studies, as long as it is maintained in its actual condition of un-corruption by man-produced interferences. Scientists, acknowledging how unlikely it is to preserve the whole surface of the 'Dark Side' in its virgin conditions, identified a limited area to protect: the Protected Antipode Circle.

The Protected Antipode Circle (hereinafter also referred to as 'PAC') is a "a circular piece of land about 1820 km in diameter, centred around the Antipode on the Far Side and spanning an angle of 30° at the Moon centre and around the Earth-Moon axis in all is radial direction, and thus also in longitude and latitude" (Maccone 2008, 111).

In the centre of the Protected Antipode Circle there is a lunar crater, named Daedalus, which, according to experts, would be the ideal location for a future Lunar Far Side Radio research laboratory. The crater, being the most proxime to the Earth's antipode to the Far Side of the Moon, turns out to be the most shielded of all from man-provoked interferences (*Ibid*, 114). Thus, there, the radio frequency interferences provoked by human activities on and around the Earth is extremely attenuated (Maccone 2005; Pluchino, Antonietti, and Maccone 2007).

Experiments conducted within Daedalus may, thus, offer new perspectives on the outer space, allowing for scientific studies to have the potential to make scientific breakthroughs, in

several fields. Such potential is menaced by the fact that space stakeholders may implement activities within the quiet cone and the designed 'Antipode Circle', so polluting once and for all this area of the Moon land. The risk is an irreparable damage.

Furthermore, the Moon is a celestial object with an extremely fragile ecology: it took more than twenty years for the dust raised in the places visited by the Apollo probes to settle down again. We must deal with the idea that visiting another celestial body requires great respect, with particular attention to the preservation–in the case of the Moon–of the *pristine*: natural materials that have not been substantially altered by reheating since they were first formed.

A sustainable, respectful exploration of the Moon surface is therefore immediately needed.

The Proposal for a Legal Protection of the Dark Side of the Moon

Scientists and space enthusiasts proposed that the PAC should be officially recognised by the United Nations as an Internationally Protected Area, for the benefit of all Mankind (Maccone 2019, 234; Heidmann 2002)[5].

The reasons for such proposals are manifold. First, due to the unique radio-shaded environment of the Far Side, it offers the chance to perform low radio frequency experiments having the potential to make scientific breakthroughs, in several fields, such as precision cosmology, the exploration of unobserved Dark Ages and Cosmic Dawn of the early universe,

[5] For further studies, see: Claudio Maccone, "Moon Far Side Protection, Moon Village and PAC (Protected Antipode Circle)", in *Acta Astronautica* 154 (2019): 234; Jean Heidmann, "A New IAA Cosmic Study: Establishing a Radio Observatory on the Moon Far Side", in *Acta Astronautica* 50 (2002): 59-63.

as well as the possibility to observe minor solar phenomena from an unpolluted environment[6].

Second, scientists and space experts do feel a 'moral duty' to maintain a zone of the Moon land uncorrupted by Radio Interferences produced by human activities on the Earth (Maccone 2005, 636). Such ethical commitment derives from the sensibility to limit the expansion of Man's colonisation of space in respect of the original, unique, and spectacular conditions in the universe.

Third, some curious experts have even pushed for the establishment of such protection to continue the evocative search of "[…] the first Contact with Aliens!" (Maccone 2003, 70).

In 1994 the French radio-astronomer Jean Heidmann considered for the first time the issue of protecting the Far Side of the Moon. He proposed, in a Cosmic Study of the International Academy of Astronautics (IAA), that a lunar crater on the Dark side, originally identified in the crater Saha, and only eventually in Daedalus, was the ideal location for a scientific observatory (Heidmann 1994, 2000). The results of this study, concluded under the guidance of the astronomer Claudio Maccone, after Heidmann's passing, were presented to the International Academy of Astronautics in 2003 and then published in 2005: it presented the issue of the growing interferences due to radio-activities; it defined the concept of 'Quiet

[6] For a more comprehensive bibliography, see: Jack O. Burns, Stuart Bale, Richard Bradley *et al,* "Global 21-cm Cosmology from the Far Side of the Moon", (2021): 3-4; Jack O Burns. "Transformative Science from the Lunar Far Side: Observations of the Dark Ages and Exoplanetary Systems at Low Radio Frequencies", in *Philosophical transactions of the Royal Society of London. Series A: Mathematical, physical, and engineering sciences* 379 (2021): 2-3; Aleksander Stanislavsky, Alexander Konovalenko, Serge Yerin, and Igor Bubnov, "Solar bursts as can be observed from the lunar Far Side with a single antenna at very low frequencies", in *Astronomical Notes* 339 (2018): 559-560; Neil Bassett, David Rapetti, Jack O. Burns, Keith Tauscher, Robert MacDowall, "Characterizing the radio quiet region behind the lunar Far Side for low radio frequency experiments", in *Advances in Space Research* 66 (2020): 1271.

Cone'; it proposed the establishment of a scientific base inside Daedalus; and it invoked legal permanent protection for the Protected Antipode Circle on the Far Side[7].

In June 2010, the project of recognizing the PAC internationally was presented to the United Nations Committee on the Peaceful Use of the Outer Space in Vienna by the representatives of the IAA[8].

The IAA enjoys the status of observer before the Committee on the Peaceful Use of the Outer Space[9]. Observer status is a privilege granted by some international organisations to non-member States and non-governmental organisations that have an interest in the international organisation's activities, to give them an ability to participate to some extent. Observers generally have a limited ability to participate in the activities of the international organisation, lacking the ability to vote or propose resolutions[10]. The IAA itself, having the status of observer within the United Nations system, could not raise the issue directly to the Committee on the Peaceful Use of the Outer Space (COPUOS). Nevertheless, the project fell on deaf ears and no

[7] On this subject, see: "Proposing a new radio-quiet zone on the Far Side of the Moon". *UNOOSA*. Last modified October 21, 2021. https://www.unoosa.org/pdf/pres/copuos2010/tech-06E.pdf; Claudio Maccone, "Lunar Far Side Radio Lab," in *Acta Astronautica* 56 (2005): 629-639.

[8] For an overview, see: UN Doc. A/65/20, *Report of the Committee on the Peaceful Sues of Outer Space*, 53rd session, June 9-18, 2010, para. 68; Claudio Maccone, "Moon Far Side Protection, Moon Village and PAC (Protected Antipode Circle)", in *The Search for Extra Terrestrial Intelligence: Proceedings of the 2nd SETI-INAF Meeting 2019*, ed. Stelio Montebugnoli, Andrea Melis, Nicolò Antonietti (Cham: Springer, 2021), 76-77.

[9] For more information, see: "Committee on the Peaceful Uses of Outer Space: Observer Organizations". *Committee on the Peaceful Uses of Outer Space*. Last modified October 21, 2021. https://www.unoosa.org/oosa/en/ourwork/copuos/members/copuos-observers.html.

[10] For more information, see: "Observer status". *United Nations Economic and Social Commission for Western Asia*. Last modified October 21, 2021. https://archive.unescwa.org/observer-status.

action of the United Nations derived from such presentation.

But the idea and the urgency of protecting the uncontaminated Far Side of the Moon did not lose its importance. On the contrary, it has become even more impellent since 2018, when China launched the mission 'Chang'e-4' sending a lander and rover to the Far Side, making a historic first-ever landing on that area of the Moon (Galchen 2021, 34-35). Other States (the USA, Russia, Japan, to only mention a few), as well as private actors, manifested an interest to reach the Moon. This makes the risk of irreparable damages to the environmental conditions of the Moon's Dark side highest than ever. Thus, on July 8, 2021, in the occasion of the Fifth Edition of the Space Festival held in Busalla, Italy, an interdisciplinary group of experts involved in the initiative, presented a draft for a "Moon Far-Side Declaration"[11]. The draft text, available to the public online, states:

> "We the People of Earth
>
> *Recognizing* the common interest of all mankind in the progress of the exploration and use of outer space for peaceful purposes,
>
> *Recognizing* that the Moon plays an essential role for life on Earth,
>
> *Recognizing* the importance of scientific research in outer space and on outers pace and celestial bodies,
>
> *Acknowledging* a key role to the scientific community in outer space activities for the progress of mankind and for the protection of earth;
>
> *Believing* that the exploration and use of outer space should be carried on for the betterment of mankind and for the benefit of States irrespective of their degree of economic or scientific development;

[11] For the "Moon Far-Side Declaration – Draft", *Franco Malerba* see: https://www.francomalerba.it/moon-far- side-declaration. Last modified October 21, 2021.

Reaffirming the importance of international cooperation in the field of the exploration and peaceful uses of outer space, including the moon and other celestial bodies, and of promoting the rule of law in this field of human endeavour;
Recalling the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies, the Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into Outer Space, the Convention on International Liability for Damage Caused by Space Objects, and the Convention on Registration of Objects Launched into Outer Space;
Recalling the 1979 AGREEMENT GOVERNING THE ACTIVITIES of STATES ON THE MOON AND OTHER CELESTIAL BODIES, that recognizes that the moon, as a natural satellite of the earth, has an important role to play in the exploration of outer space;
Acknowledging that the Moon Far-side is a peculiar place for conducting research in deep space since it is shielded by all radio waves produced on earth and in- orbit by satellite systems;
Recalling the relevance of the Moon Far-side for Cosmology, Exoplanet Technosignatures, SETI programme and, more in general, outer space scientific research
Ask the International Scientific Community, States and International Organisations to

- unite their efforts to save the radio-noise-free environment of the Far-side against man-made radio emissions
- take into consideration the scientific needs connected to the far-side of the moon when conducting space activities on the moon or orbiting

around the moon

- elaborate best practices and law rules allowing a fair balance between the scientific needs and the exploitation of space activities."

Such proposal balances appropriately with other uses of the Moon land and the space around it: while the near side of the Moon remains available for human activities, the Far side would be divided in different areas, with correspondent regimes of exploitation, and only the delimited area of the Protected Antipode Circle would be subtracted from any other possible use that States and private enterprises may wish to make of the lunar resources.

Legal Tools for Protecting the PAC

To implement a protection for the lunar's unique environment, it is necessary to identify which international legal actors may be the recipients of the project and may best adopt and enforce it. Also, it is useful to try to detect any possible obstacles to such recognition.

As the whole international community should be aware of the importance of protecting the Dark Side of the Moon, "The United Nations appears to be the natural international forum where this matter should be discussed" (Maccone 2005, 636).

The United Nations may play a fundamental role in sensitising its Member States and to seek for a consensus over the adoption of an international covenant to officially establish the Protected Antipode Circle. This is one reason why the United Nations system appears to be the best environment for boosting the project: any other, even if important, international body lacks the necessary conditions.

The United Nations encompasses a specialised Committee on the Peaceful Use of the Outer Space. The COPUOS, to which a first proposal of the project was presented in 2010, was established by Resolution 1472 (XIV) of 1959 adopted by the General Assembly of the United Nations. It has the task to review international cooperation related to outer space peaceful

activities, by assisting the mutual exchange of information between Member States, encouraging research programmes, and, furthermore, it was set up to study the nature of legal problems that may arise from the exploration of outer space (UN Doc. A/Res/14/1472 1959). By setting up the COPUOS, the United Nations recognised the common interest of mankind in furthering the peaceful use of outer space, granting peace, security, and development, beyond national rivalries.

As of 2021, the number of States of COPUOS is 95, becoming one of the largest Committees in the United Nations (UN Doc. A/Res/74/82 2019). The work of COPUOS has been assisted by the two subcommittees, the Scientific and Technical Subcommittee and the Legal Subcommittee (UN Doc. ST/SPACE/78 2020).

Only Member States can raise issues of their interest before the COPUOS, while organisations and other entities with the status of observer cannot intervene in the decision-making processes.

The Committee on the Peaceful Uses of Outer Space is the forum for the development of international space law. The Committee has concluded five international treaties and five sets of principles on space-related activities[12].

In addition, a number of declarations, principles, and recommendations on outer space have been developed by the Committee on the Peaceful Uses of Outer Space and its Subcommittees. Those non-legally binding instruments support the existing United Nations treaties on outer space, and have been adopted or recognised by the General Assembly in its various resolutions[13].

[12] See "Space Law Treaties and Principles". *United Nations Office for Outers Space Affairs*. Last modified October 25, 2021.

[13] See UN Doc. A/AC.105/C.2/2016/CRP.13, *Mechanisms adopted by States and international organizations in*

Thus, although the first attempt to present the project to the COPUOS did not succeed, it is indeed the correct forum to appellate for the official recognition of the PAC and consequent obligations for States to protect it.

In particular, it may be necessary to work in reaching out to States over the matter before the annual conference of the Committee, and to sensitise them. Member States may be more inclined to raise the issue before the Assembly of States Parties and activate a proceeding of formal adoption of a legal instrument for the protection of the Far Side of the Moon. This is the major challenge that the stakeholders of the PAC may encounter.

In addition, the opposition of the most active States in the space sector may also turn the project void. The Moon Agreement, about which we will discuss further below, represents a clear example of the scarce inclination of States to bind themselves against their own commercial interests.

Protection already applicable to the Moon Far Side

In the wait for a proper recognition of the protection of some area of the Far Side, it is urgent to recall the legal framework already in force and currently able to provide some kind of safeguard. Some of the most significant legal documents concerning the outer space appear to be: a) the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies; and b) the Agreement Governing the Activities of States on the Moon and Other Celestial Bodies.

a) The Outer Space Treaty

The Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies ('Outer Space Treaty') entered

*relation to non-legally binding United Nations instruments on outer spac*e, April 11, 2016.

into force in 1967 and is often referred to as the Magna Carta of space[14]. It declares that space should be preserved as the "province of all [hu]mankind" (Outer Space Treaty 1967, art. I), and this principle now has the status of customary international law (Vecchio 2017, 496).

Article I of the Outer Space Treaty also states that "[t]here shall be freedom of scientific investigation in outer space, including the moon and other celestial bodies, and States shall facilitate and encourage international co-operation in such investigation" (1967)**.**

Article IX seems to provide a safeguard too, by affirming that, in the exploration and use of outer space, including the moon and other celestial bodies, States Parties respect the principle of cooperation and mutual assistance and, thus, conduct all their activities with due regard to the corresponding interests of all other Parties to the Treaty. If a State Party to the Treaty has reason to believe that an activity or experiment planned by it or its nationals or by another State Party in outer space, including the moon and other celestial bodies, would cause potentially harmful interference with activities in the peaceful exploration and use of outer space, including the moon and other celestial bodies, it undertakes appropriate international consultations before proceeding with any such activity or experiment (Outer Space Treaty 1967, art. IX).

Furthermore, State Parties bear international responsibility for national activities on the Moon, even when such activities are carried out by non-governmental entities (i.e. private agencies), and for assuring that these are conducted in conformity with the Treaty itself (Outer Space Treaty 1967, art. VI).

[14] Sources for this discussion include: Thomas R. Irwin, "Space Rocks: A Proposal to Govern the Development of Outer Space and Its Resources", in *Ohio State Law Journal* 76 (2015): 217, 222; Maurice N. Andem, "The 1967 Outer Space Treaty (1967 OST) as the Magna Carta of Contemporary Space Law: a Brief Reflection", in *International Institute of Space Law* 3 (2004).

Reading these articles and taking into account our purpose, we may assume that States must guarantee that the activities carried out on the Far Side of the Moon and within the Quiet Cone, even by private enterprises, do not cause potentially harmful interference with activities in the peaceful exploration and use of outer space, such as that of scientific investigation in outer space. Thus, the irreversible pollution of the Quiet Cone and the PAC would violate the freedom of scientific investigation in the outer space and may give rise to State liability.

b) The Moon Agreement

The Agreement is important because it affirms that the Moon and its natural resources are the common heritage of Mankind (Moon Agreement 1979, art. 11). Thus, the protection offered by its provisions is in support of this statement and may greatly anticipate and benefit the idea of safeguarding a portion of the Far Side and the Quiet unpolluted from interferences.

Yet, the Moon Treaty was never ratified by all the major space-faring nations (Russia, USA, China, Japan, and the states of the European Union): in fact, as of October 2021, only 18 State are Parties to the agreement[15]. Thus, its provisions only binds very few States, making it a weak tool for granting some protection to the PAC in the wait of a formal recognition.

Nevertheless, it contains some statements that may guarantee some protection to the Moon Far Side. The Moon Agreement affirms, re-echoing the Outer Space Treaty, that the exploration and use of the Moon is the province of all Mankind and must be carried out for the benefit and in the interests of all countries, irrespective of their degree of economic or scientific development. It also adds that due regard shall be paid to the interests of present and future generations (Moon Agreement 1979, art. 4). Freedom of scientific investigation is also

[15] Armenia, Australia, Austria, Belgium, Chile, Kazakhstan, Kuwait, Lebanon, Mexico, Morocco, Netherlands, Pakistan, Peru, Philippines, Saudi Arabia, Turkey, Uruguay, and Venezuela. France, Guatemala, India, Romania, signed the Agreement but never ratified it.

confirmed (Moon Agreement 1979, art. 6). The activities carried on the Moon by States Parties cannot interfere with the activities of others and, in case such interference may occur, consultations are necessary to regulate the activities (Moon Agreement 1979, art. 8). It confirms the regime of State liability for national activities carried out on the Moon as constructed by the Outer Space Treaty (Moon Agreement 1979, art. 14-15).

Innovative and in line with the purpose of the project presented by the IAA to the COPUOS in 2010, is the provision of article 7, according to which in exploring and using the Moon, States Parties must take measures to prevent the disruption of the existing balance of its environment whether by introducing adverse changes in that environment, by its harmful contamination through the introduction of extra-environmental matter or otherwise.

It is evidently not in the interest of the State leading the new race to space to adopt the Moon Agreement. However, in a growing sensibility for the protection of the environment and natural resources[16], it is more desirable and urgent than ever that more and more States decide to submit to the limits imposed by the 1979 Agreement.

Conclusions

The new race to space that developed in the past few years is characterised by the advent of new private actors, and the desire to accelerate and expand the exploitation of the spatial natural resources. The Moon is one of the major objectives of such competition, and capitalistic

[16] See, for example, the initiative to introduce an international crime of 'Ecocide', presented by a group of legal experts in 2021. They propose to define 'Ecocide' as "Unlawful or wanton acts committed with knowledge that there is a substantial likelihood of severe and either widespread or long-term damage to the environment being cause by those act". Philipp Sands, Dior Fall Snow, in *Independent Expert Panel for the Legal Definition of Ecocide. Commentary and Core Text*, (Amsterdam: Stop Ecocide Foundation, 2021), https://static1.squarespace.com/static/5ca2608ab914493c64ef1f6d/t/60d7479cf8e7e5461534dd07/1624721314430/SE+Foundation+Commentary+and+core+text+revised+%281%29.pdf.

interests may consequently shape the implementation of activities on and around the Moon. Thus, other interests that Humankind may have in the outer space are under threat. In particular, the freedom of scientific investigation may be compressed by strenuous commercial activities causing radio interferences on the Far Side of the Moon that, until today, is uncorrupted. The spheric body of the Moon, in fact, shields such area from radio interferences coming from the Earth and the telecommunication satellites, potentially favouring particular observation of the universe as free from any contamination caused by human activities.

Although the Outer Space Treaty of 1967 may be interpreted in a way that allows the protection of the unique environment of the Dark Side of the Moon, it is insufficient to grant a solid safeguard. The ambitious project of the Moon Agreement of 1979 did not help in binding States to the respect of the Moon, since only a small number of States ratified the document and none of them is a major actor of the Space sector.

From 1994 onwards, a group of experts 'praised for the shadows' offered by the mass of the Moon in the Quiet Cone to be preserved. The United Nations appears to be the correct *forum* in which discussing the proposal of the official recognition of the PAC. Nevertheless, the opposition of the most active States in the space sector may also turn the project void. The Moon Agreement represents a clear example of the scarce inclination of States to bind themselves against their own commercial interests. Yet, it is not the time to give up over a matter that is of interest for Humanity and its future generations.

When Apollo 11 was about to bring the first man on the Moon, and thus breaking a part of the magic surrounding the Moon as observed from the Earth, a communication reached the shuttle, asking to watch

> […] for a lovely girl with a big rabbit. An ancient legend says a beautiful Chinese girl called Chang-O has been living there for 4,000 years. It seems she was banished to the Moon because she stole the pill of immortality from her husband. You may also look for

> her companion, a large Chinese rabbit, who is easy to spot since he is always standing on his hind feet in the shade of a cinnamon tree. The name of the rabbit is not reported. (Byghan 2020, 155; Norris 2019, 188)

Astronaut Michael Collins, aware of the extraordinary scientific importance of its mission, but even more of the cultural centrality of the Moon and the importance to preserve its mysterious and fascinating identity for humans to keep dreaming, seriously, and firmly replied: "Okay. We'll keep a close eye out for the bunny girl" (Byghan 2020, 155; Norris 2019, 188).

Hopefully, the international community will be as wise as Collins in preserving all interests on the Moon's far side, not only the capitalistic ones. Hopefully, in addition, the growing sensibility of people over environmental issues may be a symptom that it is also the time to insist and raise the cry that "We, the People of the Earth" wish that the shadows of the Moon's Far Side stay untouched and continue being the perfect place to observe the wonderful, mysterious, and pristine Universe.

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