

LSIC 2022

Space Law and Policy Follow-up Questions

1. ***The Articles of the Outer Space Treaty seem to remain relevant, but can we expect this to be adhered to by States who may have signed 55 years ago and are now considered adversaries?***

Chris Johnson: I would say that yes, in almost all circumstances, States will observe and obey the obligations and restrictions in the Outer Space Treaty. That a treaty is old, but still in effect, is a testament to its longevity - rather than a sign of its irrelevance. Because the Treaty is so old, and so widely accepted (111 Parties) means that it exists as binding international law as a treaty, but also as another form of international law – customary international law, and therefore binding even on States which are NOT a party to the treaty. So, there really is no getting out of the Treaty and its obligations without severe consequence, such as many other States (whom you have to work with in space) noticing and condemning violations of the Outer Space Treaty. Also note that the US, as well as Russia and China, are long standing parties to the Treaty, have yet to violate it, and have often made reference to the Treaty as the most important source of international space law.

2. ***How do we dispose of things on the moon/in lunar orbit— Crash satellites into the surface (similar to a Pacific Graveyard)? Lunar dumps? Lunar graveyard orbits?***

Chris Johnson: There are the general obligations to avoid “harmful contamination” and the obligation to adopt appropriate measures to avoid such harmful contamination, both found in Article IX of the Outer Space Treaty, which give some guidance as to how to behave in this regard. However, they don’t give that much guidance. Specific to disposal, there is no international space law specifically mandating how things must be disposed of on the Moon, or in lunar orbits. It is likely an unintentional gap in international space law, i.e., an area of activity that the drafters and negotiators of the OST did not imagine, consider, or legislate upon. Consequently, it is up for debate as to what an actor should do.

- ***Additionally, how does this fit into the Outer Space Cultural Heritage? What is cultural heritage and what is debris? From a Native American point of view, there’s no unnecessary debris on the moon***

Jess Kate Schingler: We don’t have any rules about this yet. Some folks have suggested that satellites should be disposed of by kicking them out to a solar orbit. Left unattended, depending on the orbit, some will crash to the lunar surface, but others in stable orbits might just remain, eventually cluttering the orbits and making them less useful for others. There aren’t any norms yet for surface disposal, and there’s no atmosphere for them to burn up in, and no oceans to crash into.

Chris Johnson: The Outer Space Treaty is essentially silent on cultural heritage in space. The Treaty regulates the behavior of States and their sub-national actors in space, rather than regulating the domains of outer space or celestial bodies. Many might consider human-created hardware on the Moon as culturally significant – this is a growing field amongst space archeologists, for example.

3. *Are there any definitions of what constitutes "harmful contamination"? Who decides, and how?*

Chris Johnson: On the Moon, this is an unanswered question. Harmful interference is a topic in the regulation of frequency use in space telecommunications, and perhaps we can draw some analogies from harmful interference – for example by parsing out what makes interference “harmful” and what are the qualities that make it harmful. Perhaps ‘harmful’ is something like ‘negatively affecting the interests or activities of other actors’ in that regime. If so, then we might be able to use that to discuss harmful contamination.

Another area to consider is that COSPAR’s planetary protection guidelines have elaborated what they consider, for the purposes of astrobiology, what is harmful, and what should be avoided. In planetary protection, harmful is probably any materials, whether chemical or biological, that might harm / interfere / ruin / prejudice the search for past or present life on celestial bodies. For the Moon, however, COSPAR considers it largely a dead world, but we can still take the qualities or elements of COSPAR’s thought – where a scientific inquiry is imperiled or ruined – and we can transpose that risk of peril or ruination over to other activities we’d like to do on the Moon. However, none of this is written into either international space law, or national space laws or regulation (at present). Feel free to follow up with me on this interesting inquiry, as the time to start these discussions is absolutely now.

4. *Terrestrial international law is challenging to enforce and seldom is. How are space laws like the Outer Space Treaty enforced?*

Chris Johnson: I would contend that public international law, as the law governing the relations between States, fundamentally supports our globalized and interconnected world, and is complied with and observed almost all of the time, and in almost all circumstances – and that it is the egregious exceptions and violations of this overwhelming compliance which people notice. The American Society of International Law (ASIL) has a very excellent resource to explain this, at:

<https://www.asil.org/resources/100Ways>

As far as enforcement of space law, of course this can happen in space if possible, but it can also be enforced here on Earth. Spacecraft are the responsibility of their launching States, and States retain jurisdiction and control over their registered space objects, and over any personnel on those spacecraft. So, enforcement over a State’s national space activities (including private space activities) is quite direct. For actions done by foreign actors, the consequences of violation can take a number of avenues, depending on how the State wants to respond. These can be direct judicial proceedings through the judicial arm of the United Nations, such as the International Court of Justice (ICJ) or the Permanent Court of Arbitration (PCA), both in the Hague, Netherlands. Or, direct bilateral consultations and negotiations with the other State. Or, unilateral actions by the victim State, including everything from economic responses such as the loss of favored nation trading status of the violating State, tariffs and sanctions, or the revoking of diplomatic and consular staff, or naming and shaming in the public sphere and in diplomatic fora. There are many peaceful but asserting responses that a victim State (or coalition of States) can choose to take, outside of more forceful responses.

5. *Would issuing exclusive, but temporary rights of an area on the lunar surface be in violation of Article 1 and 2 of the OST?*

Jess Kate Schingler: There has not yet been a decision about this in the international community one way or the other! But it has been discussed fairly extensively, in particular developed by the [Hague Building Blocks](#) process a few years ago.

Chris Johnson: In principle, I would say ‘No.’ A State issuing a license to one of its national space actors (whether they be a governmental actor or a private, non-governmental entity) to conduct an activity on the Moon – with the governmental promise to protect that licensee against other national space actors which would interfere with that activity, and to not grant other licenses to national actors which would interfere with that activity, would not rise to the level of violating Article II’s requirement that national appropriation of the Moon is legally impossible.

Article I of the Outer Space Treaty, as well as the preamble and the very title of the Treaty, make it clear that a wide range of exploration and use of the lunar surface was envisioned and is permissible in conformity with the Treaty, and an exclusive but temporary right to a wide variety of otherwise lawful activity, does not run afoul of those freedoms.

6. *How do rights change as material changes hands or are processed? For example, for ISRU, once metals or fuel has been extracted/processed from lunar soil?*

Jess Kate Schingler: We don’t really know yet, but by default it’s likely that norms and rules about objects and ownership would transfer from the approaches we have on Earth, to the extent that they can be applied without being seen to conflict with the Outer Space Treaty.

Chris Johnson: United States Code (USC) Title 51, Chapter 513 states:

§51303 Asteroid resource and space resource rights.

A United States citizen engaged in commercial recovery of an asteroid resource or a space resource under this chapter shall be entitled to any asteroid resource or space resource obtained, including to possess, own, transport, use, and sell the asteroid resource or space resource obtained in accordance with applicable law, including the international obligations of the United States.

This law can be found at (and click “PDF”):

<https://www.govinfo.gov/app/details/USCODE-2015-title51/USCODE-2015-title51-subtitleV-chap513>

And in the above law, keep in mind the definition of “asteroid resource” and “space resource” included in the definitions sections of Chapter 513. I’m no expert on property law, but it appears that the rights over space resources don’t really change if the resource has already been extracted from their previous location, or processed or used in other materials. Note that the definition above includes a broad range of rights: “possess, own, transport, use, and sell”. If the owner of the space resource owned them before those resources were processed, they continue to have all of those rights listed in §51303 after they have processed or manipulated them. The words “possess” as well as “use” in the above definition seem to show that an owner can extract and process lunar material.

7. ***Laws of Salvage on the Moon: When a lander or surface element is considered “disposed,” what are the original owner’s rights to that equipment? Arbitration?***

Jess Kate Schingler: There is no definition of “disposed” yet (this is part of why we think coming up with some agreements about this would be useful). I believe by default an owned object would stay that way unless something happens to change that. But it’s not just about rights— it’s also about obligations and liability. If some equipment leaks a hazardous material or interferes with the mission of another operator, then the owner would be liable for that. We also don’t have any precedents for what that means!

Chris Johnson: Ownership of a spacecraft, rover, or other such space object, if it was launched from Earth and ends up on the Moon, does not change due to the location of the object. The ownership rights of the owner persist. Now, if ownership of the object is transferred to another entity (a State, company, or person) then that second entity retains all of the rights of ownership and possession of that space object. Unless they contract away those rights, such as including some type of reversion clause in the contract or sale between the original owner and the purchase.

8. ***If I land on the Moon, and claim a 5 km “safety zone” around me where nobody can operate, is not appropriation of territory de facto if not de jure?***

Jessy Kate Schingler: This is exactly the concern that a lot of folks have with the idea of “safety zones” and why they are considered contentious in the international community. Many are proposing that they be called “notification” or “coordination” zones which more accurately represents what is being proposed, which is that these regions are ones where notification/coordination is requested. So far, we also don’t have a mechanism for how one would assert one of these zones, who has a right to assert them, what conditions have to be met, how long they last, etc. These are important questions to ask!

Chris Johnson: A government would be the entity proclaiming a safety zone, and that unilateral claim by one State would, in principle, be seen as largely a political & scientific action, and not a legally operative proclamation. If the government was a party to the Artemis Accords, then likely the other Artemis partner countries would give more weight to that proclamation. Nevertheless, a statement by an actor of a safety zone is not appropriation pursuant to Article II of the Outer Space Treaty. It is more likely seen as the exercise of a right created under Article IX of the Outer Space Treaty, whereby states must adhere to the principles of cooperation, mutual assistance, and due regard to the corresponding interest of other States. As such, the proclamation of a safety zone allows other actors to observe their obligations of cooperation, mutual assistance, and due regard with greater clarity, as now they know with more precision where and how the first actor (the one making the safety zone proclamation) will be performing activities on the Moon.

9. ***As a rookie in the industry, could you help me understand how industry will legally perform full scale ISRU on the Moon? Water extraction -> fuel sale?***

Jessy Kate Schingler: This is a complicated question and we don’t know yet :). But some of the legal questions that will need to be answered include priority rights to prospected areas, legal rights to extracted materials, the possibility of any requirements for benefit sharing or other commitments/obligations to the wider community as a result of undertaking these activities, conditions around/rights to site occupancy

(conditions for a claim, duration, limitations), and any decisions around areas to be excluded/limited for ISRU activities.

Chris Johnson: Not sure I understand the full scope of the question, but at least in the US we have the beginnings of a regulatory regime in place, under Title 51 USC, in the chapter dealing with space resources. The regime is pretty minimal at present.

10. *Are the Artemis Accords a treaty? And what are the implications of treaties vs. other international agreements?*

Chris Johnson: The Artemis Accords are actually, despite their public reception, NOT a treaty. Section One – Purpose and Scope of the Accords reads (in part) “[t]he Accords **represent a political commitment** to the principles described herein, many of which provide for operational implementation of important obligations contained in the Outer Space Treaty and other instruments.” Also see the Preamble, which calls them a “political understanding”.

Regarding the second question, this is a much larger discussion, but I would just add that the further development of norms for cislunar activity will happen at the UN level, as well as bilaterally and multilaterally outside of the UN (i.e., as the Artemis Accords were done), as well as at the national level with further national space legislation and regulation, as well as lower down at the operator level – through contractual arrangements between industrial partners, and through industry-led consortia and standard setting by industrial groups. This multiplicity of norm creation is what Jessy Kate Schingler at Open Lunar often discusses as polycentricity in norms for outer space behavior.

11. *Who is the trustee for the Breaking Ground trust?*

Jessy Kate Schingler: I should have mentioned this! You can find them all on our website at <https://breakingground.space/about#team> (full disclosure: I am one of the currently 4 trustees; there is also a special role called a “trust enforcer” which is a role distinct to the perpetual purpose trust).

12. *Do you also include power distribution systems and facilities in these areas that have to be developed and the standards governance processes?*

Jessy Kate Schingler: Power distribution systems and facilities will definitely need governance and standards! Many of the same questions that come up for ISRU (see other answer) will also apply to power distribution. In addition, another question I could see coming up is whether you have a right to limit who your customers are or are required to provide service to all lunar actors. In any service provision, understanding liability will also be relevant.

13. *Can lessons from Commons’ government on Earth be applied to the Moon?*

Jessy Kate Schingler: Absolutely. Most successful examples of Commons governance involve bringing together the key stakeholders to make decisions together about how to manage a resource, which creates buy-in and commitment to upholding the rules. There are several analogies we can look to for commons governance— the arctic has an arctic council with a number of associated multi-stakeholder groups; the antarctic isn’t exactly a Commons but is divided up into territorial “management” areas; the high seas has

its Deep Seabed Mining Authority, which is an IGO; and the internet has the Internet Engineering Task Force (IETF) and Internet Association for Assigned Names and Numbers (ICANN), among a few others. Each has a slightly different approach which reflects the characteristics and needs of that resource and its stakeholders' interests.

14. *How many Artemis Accord members already have a mineral resource property law mirroring the US Asteroid Mining Act?*

Jessy Kate Schingler: The ones I know about are Luxembourg and Japan, though I am not familiar with each in detail.

Chris Johnson: Yes, as far as I know, just Luxembourg and Japan.

15. *Are Artemis Accord nations that lack such a law planning to implement an enabling legal mechanism in the near term?*

Jessy Kate Schingler: That's unclear, but most likely they will wait and see what the major space actors do.

Chris Johnson: They may be waiting to see what develops at the UN level, or they otherwise waiting for it to be a more urgent matter.

16. *What are some proposed responses to bad actors?*

Jessy Kate Schingler: It depends on the nature of the bad behavior of course, but if the bad actor is a commercial one, then revoking future launch licenses or licenses to operate could be one option. Litigation could be another. Much of contract law we have on Earth would in general extend to the Moon, so we can draw on that as well.

17. *Are there any stakeholders who you feel are not currently represented in conversations about norms?*

Jessy Kate Schingler: Formally speaking, industry is not represented in any of the discussions happening at the UN, though informally they can express their views through observer organizations. Beyond that, there are not really any forums for civil society at large! So there are indeed many voices missing from all walks of life.

Chris Johnson: Non-space experts such as environmentalists, economists, civil society, those who work in international humanitarian work – they all need to be in discussions about space activities. We also need more space scientists, such as planetary scientists and astrobiologists, to be present to inform the work of space lawyers and diplomats who are making decisions on norms for space. The private sector is present, but we need them to continue to participate in discussions at the international level, if possible.

18. *Any recommendations for learning more about Space Law and engaging further (Especially Healthcare Policy)? Professional Societies/conferences/books/podcasts?*

Jessy Kate Schingler: Good question! Following space law folks on twitter is a really great way to follow discussions of current affairs and new articles that are released. [Chris Johnson](#), [Timiebi Aganaba](#), [Brian](#)

Weeden, Victoria Samson, Jessica West, Thomas Cheney, Dr. Cassandra Steer, Daniel Porras, SGACSpaceLaw, Jessica West, European Space Policy Institute, Cris van Eijk, EAGLE Team, Theresa Hitchens, and myself.

There's also [Space News](#) and [The Space Review](#). Organizations of interest might include: Secure World Foundation, Moon Dialogs, ISU, and Open Lunar.

Chris Johnson: There are a few excellent text books on space law, such as the *Space Law – A Treatise*, by Lyall and Larsen (this is what I use to teach with), but first start with reading the five UN treaties on outer space. From there, attending (even virtually) the Legal Subcommittee of the United Nations Committee on the Peaceful Uses of Outer Space (COPUOS), as well as the Colloquium of the International Institute of Space Law (IISL) which is held annually during the International Astronautical Congress (IAC), and reading any papers presented there that sound interesting.

If you are in DC, the annual Galloway Symposium on Critical Issues of Space Law is held each December, at the Cosmos Club in Washington DC. Attendance is free, and this is both a great networking and educational event.

19. *How do you test the legal framework you are setting up? Buy lunar dirt from someone, do something with it, and see if anyone calls “foul”?*

Jessy Kate Schingler: That's one way, yes. But first we are working to develop the framework in conversation and collaboration with stakeholders, to get their buy-in/endorsement for the approach we're taking. We can also collaborate with others developing formal implementations to harmonize approaches, whether they be countries or private operators.