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RESOURCE EXTRACTION IN OUTER SPACE – CURRENT STATE OF PLAY AND PATHWAYS FOR THE FUTURE

This panel was convened at 3:30 p.m. on Wednesday, April 3, 2024. The speakers included: LCDR Tracy Reynolds Charlotte Verdon, Monika Ehrman, Justin Ahasteen, and Emily Pierce.

Remarks by LCDR Tracy Reynolds, Charlotte Verdon, Monika Ehrman, Justin Ahasteen, and Emily Pierce

Terrestrial resource extraction has been a part of the human experience for eons. Soon, humanity may move away from digging in the earth the extracting resources among the stars.

In April 1972, astronaut Charlie Duke did just that when he used a 5.5 inch "moon rock scoop" with a spring loaded button to collect lunar soil and rock samples on the moon for seventy-two hours as part of Apollo 16's scientific mission.

Today, companies like Ad Astra Rocket Company and AstroForge, Inc., are developing technology and business practices to as they seek to find and extract resources in outer space. As Ad Astra points out, asteroid deflection/relocation and in-space resource recovery presents both a threat and an opportunity for humankind. Some asteroids could potentially be "mined" for water, nickel, iron, and other valuable resources. Others, however, could pose a threat to space stations and satellites in orbit around earth or to the very Earth itself.

The law associated with such outer space resource extraction is a new realm in an old story. Outer space resource extraction could be considered to have potential legal parallels to the U.S. 1872 General Mining Law. By connecting TransAstra's 2023 contract award from NASA to build an inflatable capture to "envelop a noncooperative object" in outer space to terrestrial mining legal concepts like the right of capture, one may demonstrate how terrestrial legal principles could influence the development of the outer space legal regime rule sets associated with such issues.

Private companies have a role in the development of new technologies, but sovereign states may be the only entities able to provide the longer term investments necessary for such technological research and development.

Any lure to analogize outer space activities to terrestrial legal regimes must be countered with careful consideration of the already existing outer space legal regime. Turning to other legal frameworks when considering questions of space law could be problematic. The 1967 Outer Space Treaty, plus three core binding treaties, the 1968 Rescue Agreement, the 1972 Liability Convention, and the 1975 Registration Convention, are the foundational outer space legal framework.

In addition, there is a lack of economically viable business cases that could support outer space resource extraction. When considering such extraction, policy makers and private business must consider whether such extraction is technically or scientifically possible. Simply because there may be water on the moon's south pole or helium-3 on the moon's surface, there may be no physical mechanism by which to extract those resources right now.

Which should come first? The capability to extract these resources or the law and policy to govern such extraction?

The UN Convention on the Law of the Sea (UNCLOS) provides a legal framework to govern resource extraction on the continental shelf within national jurisdiction and on the deep seabed

beyond national jurisdiction. These frameworks were negotiated and developed in 1982, many years before the technological capacity to extract these resources matured.

Even now, no deep sea mining has taken place and it seems unlikely, if not impossible, for any to begin before 2025. The International Seabed Authority (ISA), established in 1994 pursuant to UNCLOS, has issued exploration permits but no mining has taken place.

ISA has entered into fifteen-year contracts with twenty-two contractors to explore for potential resources, such as polymetallic nodules, polymetallic sulphides, and cobalt-rich ferromanganese crusts, in the deep seabed. The legal framework specific to the reciprocating states regime for the seabed that proceeded the regime in UNCLOS Part XI, might present options to consider for outer space.

Note that it was Malta's permanent representative to the UN who first proposed the legal concept of "common heritage of mankind" in his speech to the General Assembly in November 1967. During this speech, Arvid Pardo, proposed a "Constitution for the Ocean" which later became UNCLOS.

This principle is also part of the agreement under UNCLOS on the conservation and sustainable use of marine biological diversity of areas beyond national jurisdiction (BBNJ Agreement). The BBNJ Agreement was adopted on June 19, 2023, and is open for signature from September 20, 2023 to September 20, 2025. It requires sixty ratifications to enter into force and there are currently eighty-eight signatories and two ratifications.

Charlotte Verdon, judicial fellow at the International Court of Justice, points out that Part XI of UNCLOS left a gap in the legal regime of the deep seabed (Area) by covering only mineral resources. At the time UNCLOS was negotiated, scientists were not yet aware that living organisms existed in the deep seabed through chemosynthetic processes that allow organisms to use chemicals instead of sunlight to make energy. Now, we know and the BBNJ's legal framework reflects this fact.

Ms. Verdon noted that the scientific community will continue to learn and make discoveries here on earth and in outer space. Legal frameworks must be flexible enough to accommodate these discoveries without throttling advancement.

The BBNJ Agreement reflects a slightly different approach to the concept of common heritage of mankind than that of Part XI of UNCLOS, as the new Agreement does not establish an international entity tasked with managing and regulating the exploitation of marine genetic resources like the International Seabed Authority does in relation to the Area's mineral resources. This reflects a compromise between the concepts of common heritage of mankind and the freedom of the high seas. This could be a relevant model for an outer space framework, as the Outer Space treaty similarly suggests a middle ground between these two concepts.

Justin Ahasteen, executive director of the Navajo Nation Washington Office reminds the international legal community that outer space and celestial bodies do not belong to anyone; whether individual person, private company, or state. Consultation and cooperation with Indigenous persons is necessary to ensure compliance with domestic and international law as outer space resources are explored.

On December 28, 2023, the Navajo Nation clearly made this point when the Nation protested the potential desecration of a celestial body by NASA's launch of the Vulcan Centaur carrying the Peregrine Mission One, a moon lander with a payload that included human remains. NASA faced similar criticism in 1998 and the Biden administration signed a memorandum in 2021 that pledged to consult tribes on matters that impact them. Mr. Ahasteen noted that no such consultation occurred prior to Peregrine's launch.

Mr. Ahasteen further notes that both U.S. domestic law and international law serves as the legal framework regarding the rights of Indigenous persons and outer space. Executive Order 13175

(EO) of November 6, 2000 requires consultation and coordination with tribal governments on matters that impact them. The United States recognizes tribes as "domestic dependent nations under its protection" and, in certain situations, as sovereigns. As such, tribes exercise inherent sovereign powers over their members and territory.

EO 13175 requires the United States to work with tribes on a government-to-government basis to address issues concerning Indian tribal self-government, tribal trust resources, and Indian tribal treaty and other rights. Title 25 of the U.S. Code includes the general and permanent laws pertaining to Native Americans. In addition, the American Indian Religious Freedom Act of 1978, 42 U.S.C. § 1996, protects the rights of Native Americans to exercise their traditional religions.

Under international law, both the Outer Space Treaty and the UN Declaration on the Rights of Indigenous Peoples (UNDRIP) provide guidance. The Outer Space Treaty Article 9 requires treaty parties to be "guided by the principle of co-operation and mutual assistance" in their outer space activities.

The UN Declaration on the Rights of Indigenous Peoples, particularly Articles 12, 18, and 25, state that Indigenous people have the right to practice spiritual and religious traditions and have access to religious sites, the right to participate in decision making in matters that affect their rights, and the right to maintain and strengthen their distinctive spiritual relationship with traditional lands, territories, waters, and other resources.

But most importantly, the UNDRIP calls for the "free, prior, informed consent" of Indigenous peoples with respect to state action that impacts their ways of life. Mr. Ahasteen reiterated that this should include policy decisions dealing with the future of space exploration and exploitation.

Outer space resource extraction includes environmental, religious, and cultural impacts on Indigenous peoples and their rights. In Mr. Ahasteen's view, states and Indigenous peoples are co-stewards of outer space.

Clearly, the technology that supports outer space resource extraction will continue to develop. Just as clearly, there are lessons from past experiences with mining here on earth that could inform the choices yet to be made in outer space. Perhaps, with dedication and tenacity, the next "gold rush" will incorporate those relevant legal frameworks from other disciplines to benefit all.

Resource Extraction in Space and the BBNJ Agreement

By Charlotte Verdon

To determine what legal regime may apply to the extraction of resources in space, we may draw inspiration from those regimes governing other areas beyond national jurisdiction, such as the deep-seabed and the high seas. There are two competing principles that govern these areas: the freedom of the high seas and the common heritage of mankind.

Under the freedom-of-the-high-seas paradigm, which can be traced back to Grotius, the high seas are not subject to appropriation by any state or person, and they are open to all. This means that all states enjoy the freedom of navigation, exploration, scientific research, and fishing in the high seas on a first-come-first-served basis, with the caveat that the high seas are to be used strictly for peaceful purposes. This principle is firmly enshrined in the UN Convention on the Law of the Sea (UNCLOS).[1]

[1] *See* Convention on the Law of the Sea, Arts. 87 (Freedom of the High Seas), 88 (Reservation of the High Seas for Peaceful Purposes), 89 (Invalidity of Claims of Sovereignty Over the High Seas), 90 (Right of Navigation), Dec. 10, 1982, 1833 UNTS 397 [hereinafter UNCLOS].

The principle of common heritage of mankind is more recent. It was formally proposed in a speech by the Maltese Ambassador Arvid Pardo at the First Committee of the United Nations in 1967. He suggested that the deep seabed be declared "common heritage of mankind."[2] Prior to UNCLOS, the seabed was not regulated, and thus fell under the regime of the freedom of the high seas.[3] But there were two main problems with the freedom-of-the-high-seas approach: first, the so-called "tragedy of the commons," whereby a free-for-all regime leads to the depletion of resources. Second, a first-come-first-served approach would result in the inequitable exploitation of the seabed by the most developed states, as only those states had the technology to explore the deep seabed, and only they would be able to reap the benefits therefrom. This was a big concern for developing states after the discovery in the 1960s that the deep seabed was replete with polymetallic nodules, which contain valuable metals like cobalt. And, conversely, exporters of those resources, for the most part also developing states, were concerned that the exploitation of those nodules would disrupt the market.[4] Pardo's proposal was meant to alleviate these concerns.[5]

The concept made its way to the final text of UNCLOS, specifically Part XI, dedicated to the deep seabed (Area), which recognizes the Area and its resources as "common heritage of mankind."[6] There are five pillars to the concept of common heritage of mankind in Part XI:[7] First, like the high seas, the Area is not subject to appropriation by any states or persons.[8] Second, also like the high seas, the Area may be used only for peaceful purposes.[9]

The next pillars differ substantially from the high seas regime. Most significantly, the Area is to be regulated and managed by an international organization that acts as trustee for mankind, the International Seabed Authority (ISA).[10] This means that states and private entities may explore or exploit the Area only with the approval of the ISA.[11] Private entities must be sponsored by states,[12] which are responsible for ensuring within their legal systems that the contractors they sponsor abide by UNCLOS and ISA regulations.[13] To this day, the ISA has only adopted regulations for the exploration of the Area. Its draft mining code has yet to be adopted, and no contracts for exploitation have been awarded so far.[14]

The fourth pillar is benefit sharing. Under Part XI, activities in the Area must be carried out for the benefit of mankind as a whole, "irrespective of the geographical location of States, whether coastal or land-locked, and taking into particular consideration the interests and needs of developing States."[15] This means that contractors must pay to the ISA a royalty for the minerals removed,

[2] María Fernanda Millicay, *The Common Heritage of Mankind: 21st Century Challenges of a Revolutionary Concept*, *in* LAW OF THE SEA, FROM GROTIUS TO THE INTERNATIONAL TRIBUNAL FOR THE LAW OF THE SEA 272–73 (Lilian del Castillo ed., 2015).

[3] *Id.* at 272.

[4] *Id.* at 273.

[5] *Id*. at 272–73.

[6] UNCLOS, *supra* note 1, Art. 136.

[7] *See* Dire Tladi, *The Common Heritage of Mankind and the Proposed Treaty on Biodiversity in Areas Beyond National Jurisdiction: The Choice Between Pragmatism and Sustainability*, 25 Y.B. INT'L ENVTL. L. 113, 125–27 (2015) (distinguishing five normative elements in the principle of common heritage of mankind).

[8] UNCLOS, *supra* note 1, Art. 137.

[9] *Id.* Art. 141.

[10] *Id.*, Pt. XI, Sec. 4, Art. 153(1).

[11] *Id.* Art. 153(3).

[12] *Id.* Art. 153(2).

[13] *Id.* Arts. 139, 153(4), Annex III, Art. 4(4).

[14] International Seabed Authority, Draft Regulations on Exploitation of Mineral Resources in the Area, ISBA/25/C/WP/1 (Mar. 22, 2019), *at* https://www.isa.org.jm/wp-content/uploads/2022/06/isba_25_c_wp1-e_0.pdf.

[15] UNCLOS, *supra* note 1, Art. 140.

to be redistributed to states in a fair and equitable manner.[16] There has been no benefit sharing thus far since mining has not yet taken place.

Finally, the Area is to be preserved for future generations. The ISA is thus tasked with adopting rules for the effective protection of the marine environment in the Area, including the conservation of natural resources and the preservation of fauna and flora.[17] Of note, the ISA has adopted regulations governing the conduct of environmental impact assessments (EIAs) and monitoring for the exploration of the Area.[18] The current version of the Draft Mining Code would require an EIA to be conducted before every contract is approved.[19] The ISA also sets up Regional Environmental Management Plans for the conservation and sustainable use of the marine ecosystem. These plans can include "areas of particular environmental interest," where mining may be prohibited for environmental reasons.[20]

UNCLOS governs only the Area's non-living resources.[21] This is because, when UNCLOS was negotiated, the prevailing belief was that living organisms could not exist in the deep sea, as there is no light and therefore no photosynthesis possible. But in the 1970s, scientists discovered living organisms that thrived in the deep seabed through a process of chemosynthesis.[22]

Because these organisms can survive in extreme conditions of darkness, high pressure, and heat, they have attracted interest from the scientific community and industries. They believe that these species produce beneficial substances and genes that could have potentially lucrative applications in pharmaceuticals or biotechnology.[23]

These newly discovered "marine genetic resources" (MGRs) thus fall within the regulatory gap left by UNCLOS. This lacuna gave an impetus for the negotiation of the recently adopted Agreement on the Conservation and Sustainable Use of Marine Biological Diversity of Areas beyond National Jurisdiction (BBNJ Agreement), which purports to regulate the exploitation of MGRs in areas beyond national jurisdiction (both the high seas and the deep seabed).[24]

During the negotiations of the Agreement, a point of contention, generally along a North-South divide, was whether MGRs should be governed by the freedom-of-the-high-seas principle, or the

[16] *Id.*, Annex III, Art. 13(4); International Seabed Authority, Draft Regulations on Exploitation of Mineral Resources in the Area, *supra* note 14, Reg. 64.

[17] UNCLOS, *supra* note 1, Art. 145.

[18] International Seabed Authority, Decision of the Council of the International Seabed Authority Relating to Amendments to the Regulations on Prospecting and Exploration for Polymetallic Nodules in the Area and Related Matters, Regs. 5, 18, 31, ISBA/19/C/17 (July 22, 2013), *at* https://www.isa.org.jm/documents/2013-isba-19-c-17/; International Seabed Authority, Recommendations for the Guidance of Contractors for the Assessment of the Possible Environmental Impacts Arising from Exploration for Marine Minerals in the Area, paras. 8, 32–37, ISBA/25/LTC/6/Rev.3 (Aug. 4, 2023), *at* https://www.isa.org.jm/wp-content/uploads/2023/08/2315256E.pdf.

[19] International Seabed Authority, Draft Regulations on Exploitation of Mineral Resources in the Area, *supra* note 14, Regs. 7, 47.

[20] International Seabed Authority, Guidance to Facilitate the Development of Regional Environmental Management Plans, Annex, para. 11(f), ISBA/27/C/37 (Aug. 10, 2022), *at* https://www.isa.org.jm/wp-content/uploads/2022/12/2212509E.pdf.

[21] UNCLOS, *supra* note 1, Art. 133(a).

[22] Millicay, *supra* note 2, at 288.

[23] *See* Yao Huang and Changshun Hu, *The Principle of the Common Heritage of Mankind Can Be Applied to Marine Genetic Resources*, *in* GLOBAL COMMONS AND THE LAW OF THE SEA 50, 50 (Keyuan Zou ed., 2018).

[24] Agreement Under the United Nations Convention on the Law of the Sea on the Conservation and Sustainable Use of Marine Biological Diversity of Areas Beyond National Jurisdiction, June 19, 2023, *at* https://www.un.org/depts/los/XXI10CTC%28EN%29.pdf [hereinafter BBNJ Agreement]. The Agreement has not yet entered into force.

principle of common heritage of mankind.[25] States expressed familiar concerns about the impact of the extraction of MGRs on the marine environment, the depletion of resources, and the appropriation of MGRs' benefits by the most technologically advanced states through patent registration.[26]

The states eventually settled on recognizing "the principle of common heritage of humankind" as a general "guiding" principle of the Agreement,[27] though they fell short of expressly declaring MGRs to be a common heritage of mankind like UNCLOS did for the Area and its non-living resources, or like the Moon Agreement does for the Moon and its natural resources.[28] Nevertheless, the BBNJ Agreement applies to MGRs most of the same principles identified in UNCLOS in relation to the Area, that is: MGRs are not subject to any appropriation;[29] activities in relation to MGRs shall be conducted for peaceful purposes only,[30] and in the interests of all states and for the benefit of all humanity.[31]

On the latter aspect, the BBNJ Agreement goes further than UNCLOS by devising a more detailed scheme for benefit sharing. The Agreement provides for the sharing of both monetary and non-monetary benefits (i.e., access to samples and DNA information).[32] Monetary benefits are to be shared through a financial mechanism set up in the same Agreement (a special fund).[33] The Conference of Parties of the Agreement is to decide the modalities of monetary benefit sharing, which could include a form of royalty.[34] The special fund is not intended as a pool of money states will be able to use as they see fit. The fund will be used strictly to finance Agreement-related programs, such as capacity-building projects for developing states, or conservation and sustainable use programmes by Indigenous peoples.[35] This suggests that benefit sharing under the Agreement is not designed to lift developing economies up generally, but rather to achieve the specific purposes of the Agreement. Article 14(1) indeed provides that benefits arising from MGRs "shall be shared in a fair and equitable manner . . . *and contribute to the conservation and sustainable use of marine biological diversity of areas beyond national jurisdiction*."[36]

As to the protection of the environment, the BBNJ Agreement dedicates an entire section to detailed EIA provisions, which apply to all activities conducted in areas beyond national jurisdiction, or within national jurisdiction, if the relevant state determines that it "may cause substantial pollution of or significant and harmful changes to the marine environment in areas beyond national jurisdiction."[37] Under the Agreement's process, there is a first stage of screening to determine whether the activity meets the threshold for a full-scope EIA. If so, the next steps include scoping of activities and potential effects, assessment, reporting, and monitoring of activities, with stakeholder consultations.[38] In addition, another section of the Agreement concerns area-based

[25] *See* David Leary, *Agreeing to Disagree on What We Have or Have Not Agreed on: The Current State of Play of the BBNJ Negotiations on the Status of Marine Genetic Resources in Areas Beyond National Jurisdiction*, 99 MARINE POL'Y 21, 23–25 (2019), Tladi, *supra* note 7, at 120–23; Millicay, *supra* note 2, at 291.

[26] Huang & Hu, *supra* note 23, at 65.

[27] BBNJ Agreement, *supra* note 24, Art. 7(b).

[28] *See* Agreement Governing the Activities of States on the Moon and Other Celestial Bodies, Art. 11(1), Dec. 5, 1979, 1363 UNTS 3.

[29] BBNJ Agreement, *supra* note 24, Art. 11(4).

[30] *Id.* Art. 11(7).

[31] *Id.* Art. 11(6).

[32] *Id.* Art. 14(2).

[33] *Id.* Art. 14(5).

[34] *Id.* Art. 14(7).

[35] *Id.* Art. 52(6).

[36] *Id.* Art. 14(1) (emphasis added).

[37] *Id.* Art. 28.

[38] *Id.* Art. 31.

management tools (ABMTs), including marine protected areas, i.e., geographical zones in the ocean where human activities (like shipping, fishing, and mining) are restricted or banned for conservation or sustainable use purposes. The Agreement creates a comprehensive procedure for the establishment of such ABMTs in areas beyond national jurisdiction.[39]

In sum, the BBNJ Agreement reuses many of the core aspects of the common heritage of mankind as developed for the Area under UNCLOS. There is, however, a key difference for MGRs: under the BBNJ Agreement, there is no international entity tasked with managing the resources for the benefit of mankind and regulating their exploitation. The BBNJ Agreement thus retains the free-for-all aspect of the high-seas regime in terms of exploitation of MGRs.

On the topic at hand, the Outer Space Treaty, which entered into force well before UNCLOS, also embodies this tension between the two concepts of common heritage of mankind and the freedom of the high seas. The 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."[40] Moreover, "[o]uter space, including the moon and other celestial bodies, is not subject to national appropriation by claim of sovereignty,"[41] and is to be used "exclusively for peaceful purposes."[42] Yet the treaty also affirms that outer space "shall be free for exploration and use by all States."[43] The compromise solution in the BBNJ Agreement could therefore be a useful source of inspiration for a regime governing mining in space.

Indigenous Consultation in Space Policy: Upholding Sacred Connections and Legal Obligations

By Justin C. Ahasteen

Space exploration, while a symbol of human advancement and curiosity, intersects with the cultural and spiritual domains of Indigenous peoples. This intersection necessitates a deliberate and respectful engagement with Indigenous communities, particularly when activities in space jeopardize the sanctity of celestial bodies. For many cultures around the world, the Moon and other celestial bodies play an important role in civilization dating back to time immemorial. The following discusses the cultural significance of space to Indigenous peoples, specifically the Navajo Nation, and examines the legal obligations for consultation by the United States government. It further offers recommendations for ensuring Indigenous voices are respected and integrated into space policy decision making.

I. Historical Context and the Navajo Nation's Concerns

Navajo Nation leaders have consistently expressed concerns regarding space missions that they perceive could desecrate the sanctity of celestial bodies.[1] In the late 1990s, controversy arose when

[39] *Id.*, Pt. III.

[40] 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), Art. I, Jan. 27, 1967, 18 UST 2410, 610 UNTS 205 (1967).

[41] *Id.* Art. II.

[42] *Id.* Art. IV.

[43] *Id.* Art. I.

[1] Navajo Nation Office of the President Press Release, Navajo President Buu Nygren Asks NASA to Delay January Moon Launch to Consult with Nation, Respect Traditional Beliefs (Jan. 7, 2024), *at* https://opvp.navajo-nsn.gov/navajo-president-buu-nygren-asks-nasa-to-delay-january-moon-launch-to-consult-with-nation-respect-traditional-beliefs/.

NASA's Lunar Prospector carried a portion of the cremated remains of Eugene Shoemaker to the Moon. The Navajo Nation's then-President Albert Hale voiced objections, leading to a promise by NASA to consult with Indigenous tribes on such matters in the future.[2]

Despite this, in January 2024, the Vulcan Centaur rocket was launched, carrying the Peregrine Mission One Moon lander with a payload that included human cremains. This event took place without prior consultation with the Navajo Nation, breaching the prior assurances given by NASA and the commitment to tribal consultation by the Biden administration under the Memorandum on Tribal Consultation and Strengthening Nation-to-Nation Relationships.

The Navajo Nation's position is clear: the Moon should not be subject to desecration. This stance underscores the broader issue of ensuring that Indigenous perspectives and rights are adequately considered in space policy decisions, particularly when they intersect with sacred beliefs.

II. Cultural and Spiritual Significance of Celestial Bodies

According to the Navajo legend, First Man and First Woman made the Moon out of *tsé'tson* (star-rock, a kind of crystal), bordering it with white shells and placing *hadílkí's* (sheet lightning) and *tó'lanastsi* (all kinds of water) on its face. From there they counseled with the Moon on how it should interact with the Sun and where the Moon and Sun would rise. It was the intent of First Man and First Woman to create a protector of the night and to make the world brighter.[3]

The celestial bodies that hang in the night sky are more than scientific curiosities or potential commercial resources; for Indigenous communities such as the Navajo Nation, they are sacred entities that are integral to their cultural identity and spiritual practices. The Moon, known to the Navajo as *Ooljéé'* or *Tl'éé Honaa'éí*, holds a place of reverence and is essential to the fabric of Navajo cosmology. It is a living deity within the Navajo belief system, embodying feminine qualities and existing in tandem with the Sun to guide and protect the people. The Moon is vital to ceremonies that are the cornerstone of Navajo spirituality, serving as a guide for navigation, a measure of time, and a bearer of wisdom. The prospect of its desecration through human interventions, such as the depositing of human remains or other materials, is not only culturally insensitive but also spiritually harmful.

III. Commercialization of Space

The rapid progression of space exploration technology and the entry of private companies into this once government-dominated domain have outpaced the legal frameworks that govern outer space activities. The Outer Space Treaty of 1967,[4] which remains one of the foundational legal documents in space law, does not address the nuances of cultural and spiritual concerns. It was crafted at a time when the prospect of commercial space flights, lunar mining, and the carrying of human remains to celestial bodies seemed distant. Today, these activities are not only feasible but are being pursued by private entities seeking to capitalize on the lack of specific regulations.

Private companies are heavily motivated by profits and will frequently exploit any loopholes or voids left by the slow and inefficient governmental regulatory processes that cannot keep pace with technological innovation. However, their actions in space can have irreversible impacts on the cultural and spiritual heritage of Indigenous peoples. The case of the Navajo Nation illustrates a vivid disconnect between the values of Indigenous communities and the objectives of private space

[2] Enric Volante, *Navajos Upset After Ashes Sent to Moon; NASA Apologizes*, Spokesman-Review (Oct. 8, 2011), *at* https://www.spokesman.com/stories/1998/jan/15/navajos-upset-after-ashes-sent-to-moon-nasa.

[3] Washington Matthews, Navaho Legends, 80–81 (1994).

[4] Outer Space Treaty, Jan. 27, 1967, 18 UST 2410, 610 UNTS 205, *at* https://2009-2017.state.gov/t/isn/5181.htm.

missions. Left unregulated, there is a significant risk that the priorities of private companies will override cultural considerations, setting a dangerous precedent that equates the absence of explicit legal restrictions with a *carte blanche* for any space-related activity.

Historical precedents have shown that the legality of an action is not always synonymous with its ethical or moral standing. For instance, during the era of colonialism, many practices such as the occupation of Indigenous lands and the forced relocation of native populations were legal according to the colonizing power, but these acts are now widely recognized as unjust and inhumane. Similarly, the transatlantic slave trade was once a legal enterprise, yet it is now universally condemned as a grave violation of human rights. The argument that an action should be pursued simply because it is not expressly illegal neglects the evolving understanding of morality and ethics.

It is imperative that space policy is not left to the discretion of private companies, whose primary allegiance is to their shareholders rather than to the collective human heritage or the rights of Indigenous peoples. Governments have the responsibility to protect cultural and spiritual domains from being treated as mere resources or commodities. Space exploration should not come at the expense of culture and sovereignty. To ensure this, a proactive and inclusive approach to space law is needed, one that places the voices of Indigenous communities at the forefront of policy discussions and integrates their perspectives into binding regulations. The sanctity of celestial bodies, as perceived by Indigenous cultures, and the right to maintain spiritual and cultural practices must be preserved, requiring a delicate balance between the ambitions of space exploration and the imperatives of cultural respect and ethical conduct.

IV. Sovereignty and Political Classification of Native American Tribes

The recognition of Native American tribes as sovereign entities is a fundamental principle embedded in the legal fabric of the United States. This principle acknowledges the inherent authority of Indigenous tribes to govern themselves within the borders of the United States. The political classification of Native American tribes is central to understanding their unique status and rights under federal Indian law.

Sovereignty implies that Native American tribes possess the inherent power to regulate their internal affairs, establish government structures, and enact laws pertinent to their communities. This concept is supported by a wealth of legal precedents that affirm the political status of tribes as distinct, self-governing entities. In the case of *Worcester v. Georgia*,[5] the U.S. Supreme Court recognized that Native American tribes are distinct, independent political communities retaining their original natural rights as sovereign nations. This decision underscored the notion that the federal government must engage with tribes on a government-to-government basis. Furthermore, the Supreme Court in *Santa Clara Pueblo v. Martinez*,[6] emphasized the autonomy of tribes to determine their own membership and government structures, free from external interference, as a manifestation of their status as sovereign political entities.

The political classification of tribes is further reinforced by the recognition of treaties between the U.S. government and Native American tribes, which are akin to those made with foreign nations. Treaties, such as those established throughout the eighteenth and nineteenth centuries, constitute agreements made between sovereigns and are regarded as the "supreme law of the land," as articulated in Article VI of the U.S. Constitution.

The political sovereignty of Native American tribes has significant implications for the consultation process in space policy decision making. As sovereigns with a government-to-government

[5] Worcester v. Georgia, 31 U.S. 515 (1832), *at* https://supreme.justia.com/cases/federal/us/31/515.

[6] Santa Clara Pueblo v. Martinez, 436 U.S. 49 (1978), https://supreme.justia.com/cases/federal/us/436/49.

relationship with the United States, tribes must be consulted on actions that may affect their sacred sites and cultural practices, including those related to celestial bodies. It is not merely a matter of cultural sensitivity, but a legal requirement rooted in the acknowledgment of their political status. The consultation process must therefore be approached with the same formality and respect as diplomatic engagements with foreign sovereign nations.

V. Legal Frameworks and the Need for Consultation

The legal basis for requiring consultation with Indigenous communities in the United States is robust, grounded in both domestic policy and international law. Executive Order 13175 establishes the necessity for meaningful consultation with tribal governments in policy areas that have tribal implications.[7] Additionally, the American Indian Religious Freedom Act protects the rights of Native Americans to exercise their traditional religions, including access to and the sanctity of sacred sites.

The United States, as a leader in space exploration and a signatory to pivotal international treaties, carries the responsibility of integrating the concerns of its Indigenous populations into the fabric of global space policy. The Outer Space Treaty of 1967, which guides the activities of nations in the exploration and use of outer space, emphasizes the principles of cooperation and mutual assistance. These principles extend beyond merely technical or scientific cooperation; they speak to the broader requirement of respecting and integrating the diverse cultural and spiritual values of all communities involved in or affected by space activities.

The United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP),[8] while not legally binding and not formally endorsed via ratification by the United States, has been recognized through a supporting proclamation by President Obama.[9] The UNDRIP's advocacy for the rights of Indigenous peoples to maintain their spiritual and religious traditions, participate in decision making, and provide "free, prior, and informed consent" sets a standard for how states should engage with Indigenous communities, especially in areas that could impact their ways of life.

Given the commitment of the United States to these international frameworks, it is incumbent upon the nation to not only respect the sovereignty and rights of its Indigenous populations domestically but also to elevate their concerns within international arenas. This includes the duty to convey the importance of sacred celestial bodies to Indigenous peoples in international discussions and negotiations regarding outer space activities. By doing so, the United States would be upholding the spirit of the Outer Space Treaty's call for mutual cooperation by ensuring that the voices of all stakeholders, including Indigenous sovereign nations, are heard.

Additionally, the Artemis Accords,[10] to which the United States is a signatory, also contain provisions relevant to the concerns of Native American tribes. Specifically, Section 11, Subsection 5 of the Accords obliges signatories to share information on space activities that might interfere with or pose hazards to the activities of others. This provision can be interpreted as advocating for a broader understanding of what constitutes "harmful interference" as one that includes potential cultural and spiritual harm to Indigenous communities.

[7] Executive Order 13175, Consultation and Coordination with Indian Tribal Governments (Nov. 6, 2000), *at* https://www.federalregister.gov/documents/2000/11/09/00-29003/consultation-and-coordination-with-indian-tribal-governments.

[8] GA Res. 61/295, UN Declaration on the Rights of Indigenous Peoples, *at* https://www.ohchr.org/en/indigenous-peoples/un-declaration-rights-indigenous-peoples.

[9] U.S. Dep't of State Press Release, Announcement of U.S. Support for the United Nations Declaration on the Rights of Indigenous Peoples (Jan. 12, 2011), *at* https://2009-2017.state.gov/s/srgia/154553.htm.

[10] NASA, Artemis Accords (Apr. 16, 2024), *at* https://www.nasa.gov/artemis-accords.

If the United States fails to consult with tribal governments or to request such consultations on their behalf when engaging in international space activities, it may not only undermine the spirit of these agreements but also risk violating the very principles of cooperation and mutual assistance that it has committed to uphold. The implications of such an oversight could be far-reaching, potentially leading to international disputes, diplomatic tensions, and, most importantly, the erosion of trust between the United States and its Indigenous nations.

Despite these clear directives, recent space missions have proceeded without adherence to these principles of consultation, as evidenced by the launch of payloads containing human remains to the Moon without prior engagement with the Navajo Nation. Such actions represent a failure to respect the established legal frameworks and to honor the sovereign rights and spiritual needs of Indigenous communities.

VI. Improving Policy and Practice

To align space policy with the cultural and spiritual concerns of Indigenous peoples and fulfill the legal obligations of consultation, several measures should be considered. Policymakers must ensure that genuine consultation processes are central to the development of space policies. These processes must transcend tokenism and be grounded in the principles of "free, prior, and informed consent." Furthermore, for U.S. domestic policy, contractual agreements that include the use of federal dollars to fund commercial entities must be reflective of these values, including provisions that prevent actions that could desecrate sacred celestial bodies. The U.S. federal government should not be subsidizing these activities for private companies.

Finally, the inclusion of Indigenous representatives in advisory and decision-making capacities within space policy frameworks is critical. This would not only enrich the dialogue with valuable cultural insights but also serve as a mechanism for ensuring that space activities are conducted in a manner respectful of all humanity's shared heritage.