

Digital Policy Hub – Working Paper

Walking with Grandmother Moon: Advancing UNDRIP in Space Governance

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Key Points

- Indigenous perspectives must be included in missions to the Moon and Mars to ensure respectful, sustainable exploration in line with the Outer Space Treaty (OST) and international law.
- The rapid expansion of commercial and numerous state activities on the Moon risks violating Indigenous rights and perpetuating a colonial approach centred on economic expansion and exploitation.
- The cultural, spiritual and traditional knowledge rights; environmental rights; and free, prior and informed consent protected by the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP) apply to outer space.
- Canada should develop a national space policy grounded in its obligations under UNDRIP, establish a national permanent advisory body and fund Indigenous participation in fora such as the United Nations Committee on the Peaceful Uses of Outer Space (COPUOS).

Introduction

In January 2024, Astrobotic's Peregrine lander flew a National Aeronautics and Space Administration (NASA)-backed commercial mission to the Moon, carrying human remains and marking America's first lunar return in 50 years (Hernandez 2024). Navajo Nation President Buu Nygren objected to the mission on the basis that the Moon is considered a sacred relation to the Navajo people and many other Native Americans, and that depositing human remains would desecrate it. Peregrine launched amid objections, only to suffer a technical failure that resulted in its 66 "memorial capsules" not reaching the Moon (ibid.). The CEO of Celestis, one of the companies that launched the capsules, asserted its freedom of exploration and use to support the lawfulness of its mission, stating that "no one owns the Moon" and "there should be no religious test" (Fisher 2024).

Countries and companies often cite the freedom of use of space (article I of the OST¹) to justify their interests, fuelling the popular idea of space as a lawless "Wild West." In fact, the OST provides that all space activities must be carried out "in accordance with international law" (article III), which means that a range of international instruments apply to space activity. This includes, but is not limited to, UNDRIP.² Canada is bound by UNDRIP, which it implemented domestically through the 2021 UNDRIP Act (UNDA),

1 *Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies*, 27 January 1967, Res 2222 (XXI) art I (entered into force 10 October 1967), online: UNOOSA <www.unoosa.org/oosa/en/ourwork/spacelaw/treaties/outerspacetreaty.html>.

2 UNDRIP is an international legal instrument that recognizes and affirms Indigenous rights. The negotiation of UNDRIP started in the 1980s as an extensive effort involving Indigenous peoples from around the world and only finalized in 2007. While many of the rights are already guaranteed under customary international law and other rights-based conventions, UNDRIP itself is a declaration that is not considered a binding instrument in international law, but Canada brought it into domestic law through national legislation. See *United Nations Declaration on the Rights of Indigenous Peoples*, GA Res 295, UNGAOR, 61st Sess, Supp No 49, UN Doc A/RES/61/295, 46 ILM 1013 (2007).

which the Supreme Court of Canada upheld as a framework and interpretive tool for reconciliation in 2024 decisions.³

A permanent lunar presence, and further exploration missions to Mars and beyond, means that lunar resources are slated to be used for construction materials, energy systems, rocket propellant, human life support systems and more (Byers and Boley 2023). Infrastructure will be developed that will irrevocably change the character of the lunar surface. Commercial uses of the Moon may include not only “space burials” (such as the 2024 Peregrine mission) but also advertisements, tourism, art projects⁴ and more.⁵ A mature lunar economy is projected to generate US\$31 billion in annual revenue (Webber 2024). Canada is part of the race back to the Moon and currently contributes to lunar exploration by developing rovers and robotic arms to map lunar resources, and by sending an astronaut on a crewed mission around the Moon as part of NASA’s Artemis program (Government of Canada 2024).

Coloniality and the Cosmos

Indigenous peoples have cautioned against the “explore and exploit” approach to space that mirrors colonial histories. Instead, they advocate for treating space as part of a broader ecological system, connected to the Earth’s environment. Ojibwe geographer Deondre Smiles (2020) emphasizes that space exploration is currently shaped by settler colonialism, which centres Western science and conquest while erasing Indigenous knowledge, echoing the colonial mindset that historically justified land seizure and cultural suppression through the doctrine of discovery. Mi’kmaw astronomer Hilding Neilson raises similar concerns about lunar and Martian settlement in a statement to the Canadian Space Agency (CSA), warning that colonial logic persists in a rhetoric framing space as a “frontier” to be conquered (Neilson and Ćirković 2021). Natalie Trevino (2020) argues that treating space as a frontier fuels nationalism, Western glorification and economic expansion into space under the guise of benefiting an amorphous “humanity.” The Bawaka people in Australia reject the term “outer space” altogether as a false division between Earth’s environment and the cosmos, instead asserting that “Country” includes land, sea, animals and celestial bodies due to their interconnectedness (Noon 2024).⁶

3 See *Dickson v Vuntut Gwitchin First Nation*, 2024 SCC 10, Reference re *An Act respecting First Nations, Inuit and Métis children, youth and families*, 2024 SCC 5.

4 See Moon Ark, a payload containing images, poems, nano objects, mechanisms and earthly samples created by Carnegie Mellon University and 18 other universities, that burned up in the unsuccessful Peregrine mission in January 2024 (<https://design.cmu.edu/news/there-and-back-again-incredible-journey-moonark>). See also Lunar Codex, part of the NASA Commercial Lunar Payload Services Program, which included submissions from two First Nations artists, Teagan Littlechief from White Bear First Nation and Nigel Bell from La Ronge, Saskatchewan (www.lunarcodex.com).

5 Other proposals for lunar commercial activity have included racing on the Moon and construction of a 400,000 km space elevator to ferry resources from the Moon to Earth (Radley 2017).

6 Acknowledging this discrepancy in language may explain why “outer space” is not explicitly named in international frameworks such as UNDRIP.

Canada's Historical Policy Position on Indigenous Rights in Space

While Canadian astronaut Jeremy Hansen is set to orbit the Moon in 2026 wearing a personal mission patch⁷ honouring the Anishinaabe Seven Sacred Laws,⁸ Canada has not yet taken meaningful leaps toward honouring Indigenous rights and knowledge in its approach to space exploration. Domestically, the CSA has recognized Indigenous communities' interests in relation to outer space, including in policy and legislative development processes, although it has not acknowledged Indigenous rights. In its 2021 consultation on a Framework for Future Space Exploration Activities, the CSA acknowledged the cultural significance of the Moon, Mars and the night sky to Indigenous peoples, emphasizing the need to include Indigenous knowledge in space resource and exploration framework discussions (Government of Canada 2021). In 2023, the CSA released a follow-up report on modernizing Canada's space regulations, noting calls to protect dark skies from satellite mega constellations and to engage Indigenous communities, professionals and knowledge keepers in government decision making (Government of Canada 2023). Despite these acknowledgements, there have been no material policy changes, and the CSA's website refers to the Moon as a "stepping stone," emphasizing the benefits to be obtained from space for Canada, which echoes a colonial "explore and exploit" logic.

In international fora, Canada has not placed significant emphasis on Indigenous perspectives or rights, though it has made statements about the importance of a "dark and quiet sky" to the cultural and spiritual identity of Indigenous peoples in Canada (Pacey-Parker 2023). Canada's participation in the Thirty Meter Telescope project on the sacred mountain Mauna Kea in Hawaii drew criticism for characterizing the Kanaka Maoli people's resistance to the project as merely a domestic issue between the state and Indigenous communities, as opposed to an international one (Bellrichard 2020). In other fora, such as the Arctic Council and the United Nations Permanent Forum on Indigenous Peoples, Canada is a strong advocate for Indigenous participation and knowledge sharing.⁹ Advancing Indigenous perspectives domestically and internationally as it relates to space exploration is an opportunity for Canada to be consistent in its commitments and to contribute to salient questions of lunar sustainability.

⁷ See www.asc-csa.gc.ca/eng/multimedia/search/image/18857.

⁸ The seven Sacred Laws (or seven Grandfather Teachings) are ancestral values represented by seven animals: Buffalo (Respect); Eagle (Love); Bear (Courage); Bigfoot (Honesty); Beaver (Wisdom); Wolf (Humility); and Turtle (Truth). The patch artwork was created by Henry Guimond (Sagkeeng First Nation, Manitoba).

⁹ In relation to UNDRIP, the Permanent Forum called upon all member states to redouble efforts to fully realize the right of self-determination for Indigenous peoples by ensuring that Indigenous peoples remain at the centre of all decision-making processes that affect their peoples, their communities, their lands, their territories and their resources.

Indigenous Peoples and Space

The teaching that the stars are “our oldest living relatives” cannot be understated.

—Annette S. Lee, Lakota artist-astronomer (Lee et al. 2020)

The Moon as a Relation

Indigenous world views or knowledge systems around the world, while distinct, often hold the Moon (and stars) as a relation or kin (Harris et al. 2013; Lee et al. 2020). The Navajo Nation refers to the Moon as “Our Mother Moon,” and it is revered as it regulates life cycles (NASA 2019). For the Algonquin people, a Medicine Woman resides on the Moon.¹⁰ The Métis view the Moon as “Our Grandmother,” and she is prayed to for teachings on water stewardship (Dorion and Sanderson 2020). Inuit peoples in Canada have a male Moon spirit (known by different names, including Tshakapesh) who is a hunter and moral guardian (Prokop 1990). For the Māori people in New Zealand, the traditional knowledge of the celestial realm, including phases of the Moon, assists with navigation through the Pacific and “distributing knowledge to ensure collective responsibility” (Toki 2021). A world view that treats the Moon as a relation is consistent with movements to assert its legal personhood,¹¹ such as the Declaration of the Rights of the Moon, which affirms its right to “exist, persist and continue its vital cycles unaltered, unharmed and unpolluted by human beings; maintain ecological integrity; and the right to remain a forever peaceful celestial entity, unmarred by human conflict or warfare” (Australian Earth Laws Alliance 2021). In the author’s conversations with Indigenous scholars and friends, their response to the range of lunar activities planned or attempted was often: “How could we do that to our grandmother?”

Indigenous Astronomy, Knowledge Systems and Self-Governance

Indigenous astronomy¹² and knowledge systems, including creation stories, form the basis of natural law for distinctive peoples.¹³ As part of efforts to preserve Indigenous knowledge systems foundational to distinct cultures and communities, Indigenous astronomy is being revitalized (Lee et al. 2020). In Canada, Indigenous astronomers including Wilfred Buck,¹⁴ first Innu astrophysicist Laurie Rousseau-Nepton¹⁵ and

10 See www.nlm.nih.gov/nativevoices/exhibition/healing-totem/totem-stories/medicine-woman-in-the-moon.html.

11 Legal personhood recognizes legal rights and the sentience of natural entities, and is gaining traction around the world. In 2021, the Magpie River in Canada was granted legal personhood status. The river’s rights, granted by the Innu Council of Ekuanitshit and the Minganie Regional County Municipality in Quebec, include the right to evolve naturally, to be preserved and to be protected, to be free from pollution, and the right to sue (see <https://ecojurisprudence.org/initiatives/recognition-of-legal-personality-and-rights-of-the-magpie-river/>). In 2018, Colombia’s Supreme Court granted legal rights to a part of the Amazon.

12 Indigenous astronomy is “a living relationship with nature focused on the sky and celestial phenomena that is deeply embedded in keen observation and participation, anchored to heritage that goes back tens of thousands of years, and includes recognition that all living things are embedded with spirit and therefore related” (Lee et al. 2020).

13 Aimée Craft (2023), an Anishinaabe-Métis legal scholar, describes the connection between creation stories and their relationship to law and governance: “Natural law is derived from spiritual law. With the basic spiritual instructions, we are able to connect to our original mother, the Earth. From her and all other beings in Creation, we learn natural law.”

14 See <https://acakwuskwun.com/> and the National Film Board documentary *Wilfred Buck*.

15 See www.youtube.com/watch?v=rFsNo27AtQg.

Mi'kmaq astronomer Hilding Neilson¹⁶ share sky stories to sensitize Canadian publics and scientists to Indigenous world views. Indigenous astronomers and communities have had to defend their rights and have been successful in establishing joint governance mechanisms for astronomy projects.¹⁷ Respecting Indigenous astronomy and traditional knowledge is vital to fulfilling Canada's reconciliation commitments. It can also be a meaningful part of Canada's international contribution to advancing principles for responsible stewardship of the Moon and her resources.

Existing Lunar Governance and Gaps

The Moon is subject to both hard law such as the OST and soft law such as the Artemis Accords.¹⁸ The OST says that states “shall carry on activities...in accordance with international law” including the UN Charter and other “terrestrial” law, which should include UNDRIP. Article 9 of the OST requires that activities be conducted with “due regard to the corresponding interests of all other state parties,”¹⁹ which offers an avenue for Canada and other countries to raise the interests of Indigenous peoples and negotiate non-interference (for example, on specific environmental practices related to lunar resource use, or prohibitions against activities that would desecrate the Moon). Finally, the Artemis Accords do not explicitly mention Indigenous peoples but refer to “outer space heritage preservation,”²⁰ which could also provide an entry point to discuss wider protections of cultural rights for signatories. COPUOS is the primary forum for shaping and interpreting international space law. In March 2025, the Space Resources Working Group delivered 10 draft principles for space resource governance, applicable to lunar resources. Importantly, the draft principles say that states are to create an authorization mechanism including an environmental impact assessment (EIA) that considers “environmental, ethical, cultural heritage and Indigenous peoples’ considerations.”²¹ A revised version of the draft principles was published in July 2025 in which state parties added text emphasizing that the principles are not legally binding, they do not reflect legal rights, and they support a common understanding of existing conduct around space resource activities and progress.²² Portrayed squarely as non-binding and a mere reflection of the status quo, the draft principles’ aspirational value appears diminished,

16 See <http://hildingneilson.com/publications/>.

17 See Zastrow (2023). In Hawaii, the construction of the Thirty Meter Telescope triggered extensive negotiations with native Hawaiians that concluded in the establishment of a joint native and non-native statutory oversight board with a mandate to manage the sacred mountain top.

18 Although relevant, the Moon Agreement is not widely ratified and thus lacks binding force on most space actors.

19 While the treaty explicitly mentions “state parties,” legal scholars and interest groups have flagged the need to directly include Indigenous peoples and other non-state actors. For example, in 2022, the Canada-Europe-US-Asia-Africa Network (CANEUS) proposed integrating Indigenous knowledge into space legal frameworks at the COPUOS Legal Subcommittee, citing a lack of stakeholder inclusion and its importance for space governance. The proposal addressed overlaps between the Artemis Accords and UNDRIP, advocating for a unified approach via article III of the OST. CANEUS has pushed for this since 2019, alongside the Fund for the Development of Indigenous Peoples of Latin America and the Caribbean, highlighting fragmented efforts and urging COPUOS to lead integration (Pimprikar 2022).

20 *The Artemis Accords: Principles for Cooperation in the Civil Exploration and Use of the Moon, Mars, Comets, and Asteroids for Peaceful Purposes*, 13 October 2020, online: <www.nasa.gov/wp-content/uploads/2022/11/Artemis-Accords-signed-13Oct2020.pdf>.

21 COPUOS, *Initial draft set of recommended principles for space resource activities*, COPUOS, 64th Sess, UN Doc A/AC.105/C.2/L.339 (2025), online: <<https://documents.un.org/doc/undoc/gen/v25/021/86/pdf/v2502186.pdf>>.

22 COPUOS, *Updated draft set of recommended principles for space resource activities*, COPUOS, 64th Sess (2025), online: <www.unoosa.org/documents/pdf/copuos/lsc/space-resources/Updated_Initial_draft_set_of_recommended_principles_WG_SRA.pdf>.

though it remains to be seen how states apply the principles in guiding their domestic legislation and policy for lunar activity.

How UNDRIP Applies to the Moon

UNDRIP applies broadly to a state's compliance with its obligations under the OST to conduct space activities in accordance with international law. In the near term, UNDRIP must inform the development of standardized mechanisms such as EIAs for space resource activities on the Moon and beyond. It can do so in various ways, including by assessing the impact of proposed lunar activity on cultural and environmental rights, and by setting a clear standard for Indigenous peoples' procedural rights.

Indigenous Cultural Rights in Space

UNDRIP protects the rights of Indigenous peoples to practice, share and develop their spiritual beliefs, customs and knowledge, and to pass them on to future generations:

- article 12 acknowledges the right to manifest, practise, develop and teach spiritual and religious traditions;
- article 13 recognizes the right to pass down cultural knowledge;
- article 31 protects traditional knowledge from an intellectual property perspective; and
- article 25 affirms the right of Indigenous peoples to maintain and strengthen a distinctive spiritual relationship with their environment.

Certain practices on the Moon, including depositing human remains, may violate these rights, and other proposed commercial or scientific activities and processes, such as those for lunar resource extraction, manufacturing, tourism and waste management, also merit scrutiny from a cultural rights perspective. Canada can address its positive obligation to safeguard cultural rights through domestic regulations for companies, including an EIA, co-developed with Indigenous peoples.

Environmental Rights of Indigenous Peoples in Space

UNDRIP affirms the environmental rights of Indigenous peoples as integral to their broader self-determination and cultural survival. The declaration's preamble highlights the importance of Indigenous knowledge, cultures and traditional practices in contributing to "sustainable and equitable development and proper management of the environment."²³ Article 29(1) explicitly states that "Indigenous peoples have the right to the conservation and protection of the environment and the productive capacity of their lands or territories and resources."²⁴ Space is understood as part of a wider

²³ UNDRIP, *supra* note 2, Preamble.

²⁴ *Ibid*, art 29(1).

ecological system reflective of “environment.”²⁵ Article 32 directs states to “establish and implement assistance programmes” to support such conservation efforts without discrimination.²⁶ For Canada, this can include programs such as funding and resources for teaching Indigenous astronomy, as well as funding Indigenous organizations’ participation in policy development nationally and internationally.

Procedural Rights and Free, Prior and Informed Consent

Indigenous peoples have the right to “participate in decision-making in matters which would affect their rights,”²⁷ and states must cooperate with Indigenous peoples to obtain their free, prior and informed consent (FPIC) before adopting legislative or administrative measures that may affect them.²⁸ These procedural rights are powerful levers for Indigenous peoples’ inclusion in the development of domestic and international space law and policy. Canadian courts have supported the elevated standard of consultation required by FPIC, with a federal court in 2025 concluding that it is not a veto power but that the FPIC standard “requires a process that places a heightened emphasis on the need for a deep level of consultation and negotiations geared toward a mutually accepted arrangement.”²⁹ This is the first time that a Canadian court has defined FPIC in detail, and the result of the appeal will be instructional on federal government decision makers’ (such as the Canadian Space Agency, Ministry of Transport, Global Affairs Canada or other ministries) duty to comply with the UNDA. In the near term, procedural rights are especially relevant for the ongoing modernization of Canada’s regulatory framework, such as for satellites, launches and space exploration, including on the Moon.

Challenges and Open Questions

Challenges are almost certain to arise with full recognition and implementation of UNDRIP in space. This could include conflicting perspectives of Indigenous groups in Canada, challenges developing appropriate consultation mechanisms and oversight of commercial entities conducting impact assessments. Cultural rights may also conflict among state parties to the OST, which begs the question of how such conflicts would be settled. Proponents of Indigenous rights in lunar exploration may continue to be sidelined by the dominant logic of Western science and capitalism, or met with resistance in the context of the wider geopolitics and great-power competition animating the race back to the Moon. Concepts such as *Etuaptmumk*, or “Two-Eyed Seeing,” can be a useful way to balance competing interests and world views³⁰ (Bartlett, Marshall and Marshall 2012; Lee et al. 2020; Young 2023).

25 The view of space as an environment is supported by international documents such as the Guidelines for the Long-Term Sustainability of Space Activities, adopted by the UN General Assembly in 2019 (A/RES/74/82).

26 *UNDRIP*, *supra* note 2, art 32.

27 *Ibid*, art 18.

28 *Ibid*, art 19.

29 In *Kebaowek First Nation v Canadian Nuclear Laboratories*, 2025 FC 319 at para 130, a federal court quashed a decision by the Canadian Nuclear Safety Commission, ruling it had failed to consider UNDRIP in its decision-making process in relation to a nuclear waste facility.

30 *Etuaptmumk* is learning to see from one eye with the strengths of Indigenous knowledges and ways of knowing, and from the other eye with the strengths of Western knowledges and ways of knowing, and to use both these eyes for the benefit of all.

Recommendations

- **Adopt a rights-based national space policy grounded in UNDRIP and the UNDA.**
In Canada, this includes legislative and policy reviews by ministries and agencies involved in space resource governance such as the CSA; Innovation, Science and Economic Development Canada; Global Affairs Canada; Natural Resources Canada; and Transport Canada.
- **Establish and resource permanent Indigenous participation in space governance.**
Create a permanent Indigenous advisory body and fund participation of researchers and communities in domestic and international fora. Projects can include co-developing an EIA with Indigenous peoples to assess potential impacts of lunar activities (for example, commercial payloads, resource extraction and waste management) on Indigenous cultural and environmental rights.
- **Decolonize space discourse and promote Indigenous knowledge systems.**
Reframe Canada's space narratives to move beyond frontierism and extraction while integrating Indigenous astronomy and knowledge into public and STEM (science, technology, engineering and math) education and communications.

Conclusion

As humans make unprecedented leaps into the cosmos, including crewed missions to the Moon, it is vital to integrate Indigenous perspectives into the foundation of these efforts. Indigenous peoples' cultural, environmental and procedural rights, as outlined in UNDRIP, must be upheld. Doing so will not only support domestic reconciliation efforts but also allow for lunar exploration to advance in a way that respects the Moon, the Earth's only natural satellite, which people have related to since time immemorial.

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