CATEGORY Operations and International Law

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Moon Wars:

Legal Trouble in Space and Moon Law

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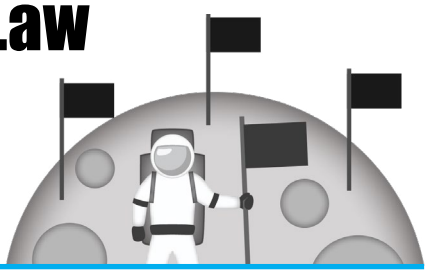

Will the Cold War-era Outer Space Treaty survive in the current geopolitical environment? And if not, then what? Does the success of the Artemis Accords point towards further developments in the near future?

A major milestone took place in the history of space and technology on 2 January 2019.[1] For the first time, a man-made object was successfully landed on the far side of the Moon. Because the Moon rotates around its axis and revolves around the Earth in the same period of time, only a single side of the Moon is visible to us on Earth. Despite what the Pink Floyd rock song may suggest,[2] the far side of the Moon is not always in darkness, but it is shrouded in a mist of scientific mystery. The U.S. has successfully landed people and equipment on the familiar side of our nearest celestial neighbor, and several other countries have had similar successes.[3] But no country had ever landed anything on the far side of the Moon. No country, that is, until China landed Chang'e-4. This singular achievement raises important questions that existing law does not adequately address. My desire with this article is to inspire dialogue on how to address the inadequacies of international space law to address the potential conflicts that soon could be happening on the Moon.

CHANG'E: THE MOON GODDESS

On 8 December 2018, China launched the Chang'e-4 probe on its Long March 3B rocket from the Xichang Satellite Launch Center in Sichuan province.[4] Less than a month later, it made the 384,000-kilometer (239,000 miles)[5] trip to the Moon and landed in the Von Kármán crater near the South Pole-Aitken basin. This first was made possible because of the incredible efforts and focus of the burgeoning Chinese Space Program.

As the name suggests, Chang'e-4 is the fourth mission of the Chinese Lunar Exploration Program (CLEP), also known as the Chang'e Project. The project is named after the legend of the Chinese goddess of the Moon, Chang'e, and the missions are aimed at making milestones on the Moon.[6] The Chang'e project started with the launch of Chang'e-1 on 24 October 2007, which mapped the entire surface of the Moon in unprecedented detail.[7] Chang'e-2, which tested new tracking technologies, launched on 1 October 2010,[8] followed

by China's first lunar rover, Chang'e-3, on 1 December 2013.[9] In 2019, China doubled down on its success with the Chang'e-4 lunar rover. And while the schedule was plagued by the COVID-19 pandemic and other delays[10], China launched its Chang'e-5 probe to the Moon on 24 November 2020.[11] That mission successfully led to the return of samples of the lunar surface back to the earth.[12]

The Chinese Communist Party has pushed forward with ambitious plans for the Moon.

The Chang'e-4 landing is most significant because it landed near the Moon's South Pole, an area that National Aeronautics and Space Administration (NASA) scientists have labeled "one of the most compelling places in the entire Solar System."[13] The unique geography in this area has allowed for minerals to coalesce in ways which could give clues about the oldest aspects of our Solar System.[14] The area also contains large amounts of water and helium-3.[15] Water, a resource so common on earth, is a costly commodity to transport into space. More importantly, it is a vital part of the human physiology and will be an absolute necessity in order to sustain a future human presence on the Moon. Not only are the water molecules themselves vital for human survival, but with the most basic of chemical processes, water can be broken down into its respective parts to provide oxygen to breathe and rocket fuel to meet transportation needs. What this means is that the location contains the building blocks of potential human habitation. It contains resources that could be used as a launching-off point to explore further out into space. And ingredients can be found there for an estimated multi-trillion-dollar industry that is waiting to be tapped into.[16]

CHINA AND THE U.S. ON THE MOON

Given that context, it is no wonder that China has been investing the funds and political focus to pursue a presence there. With complete control over all government decisions, the Chinese Communist Party has pushed forward with ambitious plans for the Moon.[17] China is doing this with an eye toward its scientific value, the prestige long-term presence there could bring, and the rich resources it offers.[18] President Xi Jinping has stoked nationalist excitement about the prospect of Chinese superiority in space.[19] The messaging used by President Xi and the Chinese Communist Party has successfully made the Moon and its potential as a source of resources, technological advancements, and global prestige a popular focus for the country at large.[20]

One way such focus has manifested itself is in clear signs that China plans to send people to the Moon. Since at least 2017, universities in China have been hard at work researching what the requirements would be for a permanent manned presence on the Moon.[21] And in 2018, China announced that it would be accelerating its development of the Long March 9 rocket, a system equivalent to the Saturn V rocket booster that took NASA astronauts to the Moon in the 1960s and '70s.[22] In late 2018, former NASA Administrator Mike Griffin estimated that with current technologies, China could be a mere six to eight years away from having boots on the lunar surface—a feat that no country has accomplished in almost a half-century.[23]

On 26 March 2019, Vice President Mike Pence called for NASA to reach the Moon, and to establish, **"by any means necessary,"** a permanent settlement by 2024.

Understandably, the U.S. is not planning on sitting by idly. After taking office in 2017, the Trump administration revitalized the Nation's space exploration efforts, published multiple space policy directives, empowered the private sector, created a military Space Force, and re-instituted the National Space Council which had been inactive since the Clinton administration.[24] On 26 March 2019, Vice President Mike Pence gave a speech at a National Space Council meeting in which he made a surprise announcement. He called for NASA to reach the Moon, and to establish, "by any means necessary," a permanent settlement by 2024.[25] It is yet to be seen whether or not this speech will go down in history as a

successful repeat of President John F. Kennedy's "We choose to go to the Moon" speech in terms of technological and policy advancement in space.[26] What is clear, however, is that the U.S. seems to recognize the potential impact that having a presence on the Moon will have for whichever nation, or nations, reach there first.

> Rules regarding sovereignty over airspace were evolving on the international level.

SOVEREIGNTY OVER AIRSPACE

So why does all of this matter for us, the lawyers? To answer that, we need to look back at another first in space history that set the rule on space. That event was not Neil Armstrong's "one small step" for a man on the Moon. It was the first success ever to take place in space,[27] the launching of the Sputnik satellite into orbit by the Soviet Union in 1957.

Ownership of airspace has been a well-understood concept since ancient Rome. The Romans called it *cujus est solum ejus est usque ad coelum*.[28] This roughly translates to "he who owns the soil owns up into the sky," or in other words, "he who owns the soil owns also everything above."[29] Once air travel became a technological possibility, this private property right began to be curtailed by national sovereign authority to use and govern airspace.[30]

At the same time, rules regarding sovereignty over airspace were evolving on the international level. This was done by a mix of both international agreement and customary international law. The Paris and Chicago conventions,[31] the latter of which now has 193 State parties,[32] recognized that the airspace over a nation would be subject to the exclusive sovereignty of the nation that controlled the land and territorial waters beneath that airspace.[33] Since the signing of these two conventions, nations around the world, both signatories and otherwise, have recognized this right to sovereignty,[34] and it has thus made its way into customary international law.[35] This sovereign right was tested in 1956 by the United States when it began flying U-2 surveillance aircraft above the sovereign territory of the Soviet Union.[36] When a plane was shot down in 1960, the United States was faced with enormous pressure to put an end to its spy plane program by the international community. The Soviet Union labeled the intrusion an act of aggression that would legitimize the declaration of war. In response, most members of the United Nations Security Council concluded that the flying of the U-2 airplanes over Soviet territory clearly violated Soviet sovereignty, but resoundingly rejected the Soviets' declaration that it therefore amounted to an act of international aggression.[37]

Even before this happened, Dr. Wernher von Braun and his team of German scientists during World War II had been working in Nazi Germany to create the V-2 missile with the intention of using this military technology to build a rocket that would travel above the atmosphere into orbit around the earth;[38] it was a revolutionary idea. What was unclear at the time was what this would mean to the international community. It would not be until 1957 that a successful launch into orbit would first be accomplished, and it would not be by Dr. von Braun and his then Americanized team, but by the Soviet Union.

> Was the flying of that first satellite a breach of sovereignty of the territories over which Sputnik flew?

But was the flying of that first satellite a breach of sovereignty of the territories over which Sputnik flew? At the time of the signing of the Paris and Chicago conventions, space travel was not yet a possibility, let alone a factor for consideration. Would flying through space be treated by the law in the same way that flying through the air would be as illustrated in the aftermath of what has come to be known as the "U-2 Incident?" In 1957, no one knew.

That is, until Sputnik flew.

SPUTNIK AND SPACE SOVEREIGNTY

On 4 October 1957, Sputnik was launched into low Earth orbit and traveled around the entire globe, passing over every nation in its path including the United States. What made this event important from a legal perspective is that the United States and other nations chose to let it happen without objecting. Public fears of missile launches, the outbreak of war, and the raining down of nuclear firepower notwithstanding, the United States and other nations were unwilling to label this as a breach of their sovereignty. In fact, in a rush to catch up, only a few months later, the first U.S. satellite Explorer I accomplished the exact same thing with the same result: no international uproar.[39]

> The legal consensus became that there was a **fundamental difference** between "airspace" and "outer space."

So what happened? The legal consensus became that there was a fundamental difference between "airspace" and "outer space."[40] The "Sputnik moment" created what has since been described as a moment of "instantaneous international customary law" that remains to this day.[41] It is what allows the thousands of space objects to be in space today, all flying over dozens of nations without any national sovereignty-based objections.[42] Arguably, with a single launch of a rocket, a customary international law principle was created that sovereignty over outer space does not exist.

This was put into hard law in 1967 by the signing of the now well-known Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, also known as the Outer Space Treaty.[43] Articles I and II of the treaty lay out a somewhat counter-intuitive combination of declarations which have formed the backbone of how space is accessed and utilized by nations. Article I declares that "Outer space, including the Moon and other celestial bodies, shall be free for *exploration* and *use* by all States without discrimination of any kind."[44] This right to the use of space is followed immediately by the declaration in Article II that "Outer space, including the Moon and other celestial bodies, is not subject to *national appropriation* by claim of sovereignty, by means of use or occupation, or by any other means."[45]

As emphasized above, the key concepts in these first two articles are that nations are free to "use" space, they are just not allowed to "appropriate" it. When a nation places objects into orbit this is a fairly simple landscape to work with. This means that actors are allowed to have anything they want in space, as long as what is up there does not cause any sort of undue burden on the ability of another nation to use space.[46] The number of objects in orbit around the earth has reached the thousands of pieces, leading to a growing concern with the overcrowding of orbits.[47] Even with this growth, however, no nation has yet challenged the right of another to add additional objects into space.

Where these rules become complicated is when you are on a celestial body like the Moon. As previously discussed, there is a relatively small area on the Moon that is considered resource-rich.[48] It is well-recognized that the use of these resources and these lunar locations is permitted by custom and the Outer Space Treaty,[49] but the universal right to use space resources is still not fully tested because no nation has yet attempted to extract resources on a large scale. The time of that testing, that "Sputnik moment," appears to be approaching.

> What if China decided that it did not want to defer to an American presence?

BATTLE FOR THE MOON?

Imagine the near future. Let's assume that the timelines laid out by China and the United States for reaching and staying at the Moon described above end up reflecting reality. That would mean that the United States would have a permanently manned base on the Moon by sometime in 2024, with the Chinese following suit in about 2027. If it happened in that order, then the United States would likely have the pick of the most opportune locations, meaning the lunar sites with the most easily accessible natural resources.

China would then have to make its pick based on whatever was left over. With the size of the Moon and the amount of resources that appear to be on or just below its surface, one hopes this would not be a difficult task.

But what if China decided that it did not want to defer to an American presence? According to the law as it stands, this would mean that after the United States had put in the legwork, landed on the Moon first, and begun the massive construction and infrastructure project that would be required to begin extracting and utilizing the surface of the Moon, China could then come in and begin using that cultivated landscape for its own purposes. Moreover, in at least a purely legal sense, it could also mean that there is absolutely nothing that the United States could do to stop them.[50] It is important to keep in mind here, that although facilities for human habitation on the surface of the moon, as well as equipment, would likely not take up much space, the area being mined for resources could be extensive.[51] And while any structures or equipment are protected under international treaty, the geographic areas of efforts on the moon are not.

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To illustrate, let us imagine a future rudimentary lunar mining location set up by a U.S. company. At its most basic, such an operation would likely consist of base of operations, a launch pad where rockets can land and take-off, and an area being mined. Under the current law, the base of operations and launch pads would remain the property of the U.S. company. But the area being mined, as well roads created between the structures or pathways into the mining area, would technically not be owned by anyone and in theory, China or other nations could use these roads if they wanted to.[52]

So would such a Chinese use of lunar land be acceptable? Even if it is land and that cannot be owned via international treaty? And what if the parts were reversed? If China spent billions of tax-dollars laying down the groundwork first, building roads and perhaps clearing rough terrain, could U.S. companies resist sweeping in and taking advantage of it? What if such companies could prove that their use would not interfere with Chinese uses? Should licensing agencies allow such a thing? What would such a regulatory setup look like? Should the United States be required to receive Chinese permission before doing so? What if a Chinese mining layout was purposely designed to encompass dozens or even hundreds of square kilometers? Would China acquiesce to American efforts to take advantage of their mining layouts? Could or should they have a right to veto a U.S. policy they disagree with? And if so, how is that different than claiming appropriation?

The questions don't stop there. It is far more likely that China and the United States would create camps at respectable distances from one another, thus avoiding the immediate conflict of having to answer the kinds of questions outlined above. Even assuming both sides avoid conflict for several years, resource utilization and huge profits will eventually become a reality and, like the number of objects in orbit, the population of persons and equipment on the Moon will blossom. Inevitably, paths will begin to cross, leading to greater potential for conflict. Will China (or the U.S.) adhere to international norms currently set in place that deny the right to claim territory? At what point might the needs of lunar markets induce leading space powers to repudiate the Outer Space Treaty's ban on appropriation of celestial territory?

PREDICTING CHINA'S PLANS FOR THE MOON: LAWFARE

One interesting theory that could help predict how China would act in such a situation comes from the South China Sea. International maritime law has long recognized the principle that open seas are open territory for nations to use freely.[53] China, however, does not see it this way. Rather than openly attack nations attempting to utilize the South China Sea though, China has stretched its definitions of the

law by claiming sovereign control of the area, creating islands, and even just exerting economic and social pressures on states to recognize its claims to the maritime geography.[54] Similar pressures have been used to claim continued ownership of Taiwan.[55] One such fascinating example has been China's use of propaganda maps and periodicals to show Taiwan as being a part of mainland China, or to demand that public and private entities only use maps that show the same.[56] With the growth rate of China, it makes sense for many international merchants to acquiesce to these seemingly small demands, but in so doing, they have permitted China to rely on these small acquiescences as historical proof of their claims to territory in international debates.

So with China on the Moon's surface and other interested parties beginning to encroach close by, what would stop China from claiming territory over an area that they had (1) landed on first; (2) cultivated into a useful location; and (3) spent billions of dollars on?[57] For now the only answer we have is the same one that China has ignored in the past—a combination of customary international law and treaty.

Moreover, on the other side of the coin, how would the United States feel as a nation if our country built up the lunar mining infrastructure first, only to have China come in and try to take advantage of the prepared surface area? Are we comfortable with funding the infrastructure necessary for China or other nations to come in and capitalize on our efforts? To many, the answer is no. There is nothing in the law, as it exists now that would allow the United States to play favorites. That is, we have no right to tell U.S. companies or entities that they could gather resources in a location but that Chinese or Iranian nationals could not.

There are theories which may be used to protect against such uncertainty. One potential protection comes from Article IX of the Outer Space Treaty. This article states that

> In the exploration and use of outer space, including the Moon and other celestial bodies, States Parties to the Treaty shall be guided by the principle of co-operation and mutual assistance and shall conduct all their activities in outer space, including the Moon and other celestial bodies, *with due regard* to the corresponding interests of all other States Parties to the Treaty.[58]

Due regard for the interests of other nations and their resources on the Moon would presumably include some sort of respect for the efforts of those nations to extract resources—perhaps including a responsibility to refrain from active harmful interference with those efforts. However, the extent of what due regard would require is far from clear. For example, due regard likely does not require States to agree not to extract resources that another nation had merely shown or declared an intention to extract.

NASA has recently negotiated the Artemis Accords, an effort to forge agreement among partner nations to respect non-exclusionary rights to non-interference on the surface of the Moon.

MOON AGREEMENT

Another option lies with principles outlined in what has become known as the Moon Agreement.[59] This 1979 agreement was originally designed to elaborate on the rules for use of the Moon and its resources that had been discussed in the Outer Space Treaty.[60] The controversy over this agreement, which has not been ratified by the U.S. or any other country that has landed an object on the Moon,[61] is that it defines the Moon and its natural resources as "the common heritage of mankind."[62] Such a provision, in theory, would easily solve the problem of contention over ownership or extraction rights because it eliminates such rights altogether. Some argue, however, that such rights are not completely destroyed, merely hampered by the need to share any resources extracted amongst all nations of the world, and have thus suggested that an international regime to determine such resource allocations should be created.[63] The United States disagrees strongly with this view, and

passed legislation to encourage the private commercial exploitation of space resources.[64], [65]

This sort of legal uncertainty could lead (and arguably has led) to a hesitancy to beginning this lunar resource renaissance. Therefore, NASA has recently negotiated the Artemis Accords, an effort to forge agreement among partner nations to respect non-exclusionary rights to non-interference on the surface of the Moon.[66] While the Accords are an important step towards creating a precedent of respect on the Moon, both China and Russia, our most likely program rivals, have specifically rejected them.[67] Also, noticeably missing from the Accords is any mechanism for enforcement. While this author looks forward to continued efforts by NASA and others, we are still left with the unanswered questions illustrated in this article.

The international community will have to solve a problem whose solution has been historically elusive: **how do you fairly allow nations to claim new territory in a way that does not lead to war?**

CONCLUSION

So whether the right answer is an international organization, an unpopular Moon treaty, or an untested legal principle, the fact remains that there is deep uncertainty as to how the world will face the coming legal controversy. This lack of clarity remains a troubling situation, and it is a legal problem of considerable magnitude. Will the Cold War-era Outer Space Treaty survive in the current geopolitical environment? And if not, then what? Does the success of the Artemis Accords point towards further developments in the near future? The international community will have to solve a problem whose solution has been historically elusive: how do you fairly allow nations to claim new territory in a way that does not lead to war? The rapid advancement of space technology in both the U.S. and China suggests that answers to these questions will become necessary sooner than previously thought.

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ENDNOTES

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[22] Berger, *supra* note 19.

[23] *Id.* The last men to walk on the Moon were Eugene Cernan and Harrison H. Schmitt, in the 1972 Apollo 17 mission. NASA, *Who Has Walked on the Moon?* (3 June 2019, updated 18 March 2020), https://solarsystem.nasa.gov/news/890/who-has-walked-on-the-moon/.

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[30] *Id.* at 21, *cf.* United States v. Causby, 328 U.S. 256 (1946) (holding that, although U.S. military aircraft were entitled to overfly respondents' farm, the overflight impaired use and enjoyment of the property and constituted a taking for which the government owed compensation).

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[43] 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, 610 U.N.T.S. 205, T.I.A.S. 6347, 18 U.S.T. 2410 (entered into force 10 October 1967) [hereinafter Outer Space Treaty or OST].

[44] *Id.* art. I (emphasis added).

[45] *Id.* art. II (emphasis added).

[46] *See also id.* art. IX, discussed *infra*.

[47] Loren Grush, *As Satellite Constellations Grow Larger,* NASA *is Worried about Orbital Debris*, Verge (28 September 2018), https://www.theverge.com/2018/9/28/17906158/nasa-spacex-oneweb-satellite-large-constellations-orbital-debris.

[48] As NASA and other contemporary scientific organizations around the world continue to study the Moon, recent reports suggest that in fact water may be far more common on the Moon's surface than previously thought. *See* Sean Potter, Felicia Chou & Allison Hawkes, NASA*'s SOFIA Discovers Water on Sunlit Surface of Moon*, NASA (26 October 2020, updated 4 January 2021), https://www.nasa.gov/press-release/nasa-s-sofia-discovers-water-on-sunlit-surface-of-moon/.

[49] *See* Int'l Inst. of Space Law, Position Paper on Space Resource Mining (2015), http://iislwebo.wwwnlss1.a2hosted.com/wp-content/uploads/2015/12/SpaceResourceMining.pdf, *cf.* 51 U.S.C. § 51303 (2015) (stating that U.S. citizens are entitled to possess, own, transport, use, and sell space resources they lawfully recover).

[50] It should be noted, however, that this infrastructure would apply only to the actual landscape of the Moon, not to structures placed on the moon by the U.S. or other states. Both Articles VIII and XII of the Outer Space Treaty clearly dictate that objects in space remain the property of the launching states that placed them there. In contrast to this, regolith and ore prepared for extraction on the Moon may have no such protections.

[51] *See* Leslie Sour Gertsch, *Surface Mine Design and Planning for Lunar Regolith Production*, AIP Conf. Proceedings (2003) (calling for open-pit single-site mining layouts spread 1-2 km); Walter W. Boles, David B. Ashley & Richard L. Tucker, *Lunar-Base Construction Equipment and Methods Evaluation*, 6 J. Aerospace Engi'g 217-235 (1993) (suggesting a mining layout of approximately 25 km).

[52] It is important to note that this use could not lawfully interfere with the U.S. company's use. See Article IX, Outer Space Treaty; see also discussion *infra*.

[53] *See* United Nations Convention on the Law of the Sea, 10 December 1982, 1833 U.N.T.S. 397, https://www.un.org/depts/los/convention_agreements/texts/unclos/closindx.htm.

[54] Council on Foreign Rel., Territorial Disputes in the South China Sea, https://www.cfr.org/interactive/global-conflict-tracker/conflict/territorial-disputes-south-china-sea (last visited 26 June 2019).

[55] Joshua Keating, *China Is Trying to Wipe Taiwan off the Map*, Slate (1 August 2018), https://slate.com/news-and-politics/2018/08/china-is-trying-to-wipe-taiwan-off-the-map.html.

[56] *Id.*

[57] "*Will China Claim Ownership?"—Chang'e-4 Rover to Touchdown on the Moon's Far Side New Year 2019*, Daily Galaxy (14 December 2018), https://dailygalaxy.com/2018/12/will-china-claim-ownership-change-4-rover-is-destined-to-touchdown-on-the-Moons-far-side-new-year-2019/.

[58] OST art. IX (emphasis added).

[59] Agreement Governing the Activities of States on the Moon and Other Celestial Bodies, 18 December 1979, 1363 U.N.T.S. 3; A.T.S. 1986 No. 14; 18 I.L.M. 1434 (entered into force 11 July 1984) [hereinafter Moon Agreement].

[60] Frans von der Dunk, Handbook of Space Law 99 (2017).

[61] U.N. Office of Outer Space Affairs, *Status of international agreements relating to activities in outer space (as at 1 January 2020)*, https://www.unoosa.org/documents/pdf/spacelaw/treatystatus/TreatiesStatus-2020E.pdf; *see also* Nuclear Threat Initiative, *Agreement Governing the Activities of States on the Moon and Other Celestial Bodies (Moon Agreement)*, https://www.nti.org/learn/treaties-and-regimes/agreement-governing-activities-states-moon-and-other-celestial-bodies-moon-agreement/ (last visited 18 May 2020).

[62] Moon Agreement art. 11.

[63] *Id.* cl. 5, *cf.* Sarah Coffey, *Establishing a Legal Framework for Property Rights to Natural Resources in Outer Space*, 41 Case W. Res. J. Int'l L. 119 (2009).

[64] 51 U.S.C. §§ 51301-03 (2015).

[65] Interestingly, whether agreement with the contents of the Moon Agreement necessitates a stop to lunar resource utilization by individual nations has been called into question. While Australia is among the signatories of the Moon Treaty, it also recently signed the Artemis Accords. *See* United Nations Office for Outer Space Affairs, Status of International Agreements Relating to Activities in Outer Space as at 1 January 2020, 5, https://www.unoosa.org/documents/pdf/spacelaw/treatystatus/TreatiesStatus-2020E.pdf; Sean Potter & Cheryl Warner, NASA, *International Partners Advance Cooperation with Artemis Accords*, NASA (2020), https://www.nasa.gov/press-release/nasa-international-partners-advance-cooperation-with-first-signings-of-artemis-accords (last visited 21 November 2020).

[66] *See* Potter & Warner, *supra* note 64; *see also The Artemis Accords: Principles for Cooperation in the Civil Exploration and Use of the Moon, Mars, Comets, and Asteroids for Peaceful Purposes*, NASA (13 October 2020), https://www.nasa.gov/specials/artemis-accords/img/Artemis-Accords-signed-13Oct2020.pdf.

[67] *See* Elliot Ji, Michael B. Cerny & Raphael J. Piliero, *What Does China Think About* NASA*'s Artemis Accords?*, Diplomat, 17 September 2020, https://thediplomat.com/2020/09/what-does-china-think-about-nasas-artemis-accords/ (last visited Nov 21, 2020); Liu Zhen, *China, US Space Rivalry 'May Heat Up' after* NASA*'s Artemis Accords Signed, Analysts Say*, S. China Morning Post, 15 October 2020, https://www.scmp.com/news/china/diplomacy/article/3105722/china-us-space-rivalry-may-heat-after-nasas-artemis-accords; Morgan McFall-Johnsen, *China and Russia Haven't Signed on to* NASA*'s New Plan to Unify How Humanity Explores Space*, Bus. Insider, 13 October 2020, https://www.businessinsider.com/nasa-artemis-accords-deep-space-exploration-moon-mars-asteroids-comets-2020-10.