



Renewed Ambitions in Space-Exploration Lawmaking

By Christopher D. Johnson

On May 30, 2020, Space Exploration Technologies Corporation (SpaceX) wowed spectators, confounded detractors, and thrilled anxious fans with the first successful commercially built and operated launch of the American astronauts to the International Space Station (ISS) orbiting at around 17,500 miles per hour at approximately 248 miles above the Earth. Departing from Launch Pad 39A at the Kennedy Space Center in Florida—the same launchpad used by the Apollo and Space Shuttle programs—astronauts Bob Behnken and Doug Hurley become the first American astronauts launched on American rockets from American soil in almost 10 years. This mission ends the almost decade-long lack of domestic human-launch capability that followed the retirement of the Space Transportation System (Space Shuttle) in 2011. With this new mission, the commercial provisioning and service of human orbital spaceflight has now begun. As with many new commercial activities and technological advances, new laws and regulations follow.

Recent ambitious regulatory initiatives at the national and international level demonstrate that, at long last, American lawmaking specifically focused on space exploration and utilization is accelerating. A few recent notable initiatives in national legislation directed at space exploration and development are detailed below.

White House Executive Order on Space Resources

On April 6, 2020, the White House issued Executive Order No. 13914, recontextualizing American commercial space activity within government-led exploration programs and firmly placing the use of space resources within America's economic sphere.¹ This Order, *Encouraging International Support for the Recovery and Use of Space Resources*, takes a bold position on the access, recovery, possession, use, and right to sell space resources, as well as on how the United States will undertake international engagement on these issues. It proclaims that "Americans should have the right to engage in commercial exploration, recovery, and use of resources in outer space, consistent with applicable law."

This order will have national and international implications. First, the order reaffirms the importance that the U.S. government places on commercial partners for government-led space activities, including crewed space exploration programs. This reaffirmation

makes reference to the Trump Administration Space Policy Directive 1 of 2017, which set multiple national space-exploration goals and established the priority of fully leveraging the domestic commercial space sector to accomplish these aims.²

However, the main import of the Order is to direct and advance the discussion on space resources. To do this, the Order comments forcefully on the international context surrounding space resources by first stating that international legal uncertainty exists concerning the right to recover and use space resources, including the commercial right to recover and use space resources—in part because of uncertainty surrounding the 1979 Moon Agreement.³

Additionally, while the United States is not a party to the Moon Agreement, it *is* a party to the 1967 Outer Space Treaty,⁴ and the Order takes the position that differences between those two treaties' regulation of space resource use create significant uncertainty for any advanced space missions or for any long-term human presence on celestial bodies.

The Order explicitly rejects the Moon Agreement as reflecting customary international law; it rejects the wider ratification of the Moon Agreement as a desirable way to address legal uncertainty regarding space resources; and it rejects the Moon Agreement as a source for any substantive guidance for any potential way forward. This strong denunciation is a wise move, as the Moon Agreement (in this author's opinion) is truly a poor path forward for current or future space activities. Written long before space-resources utilization was even technologically possible, the Moon Agreement contains untested concepts such as the Common Heritage of Mankind principle applied to the space domain. It also contains articles with overlapping and contradictory clauses that make it unclear what a subject of the law can legally do with space resources. And while a few State delegations at COPUOS (the United Nations Committee on the Peaceful Uses of Outer Space) continually bring up

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the Moon Agreement at each session, the U.S. position is firm and has remained consistent. The Order states:

Sec. 2. *The Moon Agreement.* The United States is not a party to the Moon Agreement. Further, the United States does not consider the Moon Agreement to be an effective or necessary instrument to guide nation states regarding the promotion of commercial participation in the long-term exploration, scientific discovery, and use of the Moon, Mars, or other celestial bodies. Accordingly, the Secretary of State shall object to any attempt by any other state or international organization to treat the Moon Agreement as reflecting or otherwise expressing customary international law.

Besides this comprehensive dismissal of the Moon Agreement, the Order also rejects the contention that outer space, including the Earth's Moon and other celestial bodies (e.g. Mars, asteroids) or "void" space itself, is somehow legally a global commons. The phrase "global commons" is more of an economics concept than a term with legal consequence and is rather difficult to apply to outer space. No source of international law positively designates any portion of outer space, or the entirety of outer space itself, as a global commons. Additionally, outer space is not on our globe (it's . . . in outer space) so logically, how could it be a "global" commons when it's not on the globe? Other domains that are sometimes referred to as "global commons" include the high seas, the deep seabed, and international airspace. In contrast, Antarctica is referred to as an "international commons," as only some particular States share rights and responsibilities there. The Order's pronouncement that outer space is not a global commons will spark mostly academic refutation, but it serves to show how strongly this administration feels about acting to prevent possible obstacles to national and commercial recovery and use of space resources.

The Executive Order will also have domestic implications. First, it is rare, and thus precedential, for a White House to use an Executive Order to address civil space activities and space exploration.⁵ The Order is also consistent with and expands on previous legislative action, namely the Space Resource Exploration and Utilization Act of 2015, which is the landmark U.S. law on space resource utilization.⁶ The 2015 law created definitions of space resources and established the right for private American entities to access and possess such space resources. The first of its kind anywhere in the world, this national space legislation governing private commercial space resources has influenced similar national lawmaking internationally. Now the Executive Order further solidifies and develops the rights of private commercial space resource access and use. It will be received warmly by private commercial space exploration advocates and actors and their financial backers.

The Order also directs the Secretary of State, in the course of its international engagement (and in consultation with the Departments of Commerce and Transportation, NASA, and other federal agencies) to "take all appropriate actions to encourage international support for the public and private recovery and use of resources in outer space . . ." These actions will include the negotiation of bilateral and multilateral agreements with other States around the globe regarding the safe and sustainable recovery and use of space resources.⁷ Following the release of the Order, such international engagement efforts did not take long, as we have now seen with the announcement about the Artemis Accords, a NASA-led international space exploration framework.

The Artemis Accords

For those not keeping track, the last time anyone set foot on the surface of the Moon was December 13, 1972, when NASA Astronaut Gene Cernan (1934–2017) climbed aboard the Apollo 17 Lunar Module to return to Earth after three days of lunar exploration. After almost 50 years, the United States has resolved that it is time to go back. To that end, NASA created the Artemis program, its mission being to bring the first woman and the next man to the surface of the Moon by 2024,⁸ and its name derived from the ancient Greek goddess Artemis, the twin sister of Apollo.

The Artemis program will be implemented and led by NASA with significant international and commercial partnerships. Traditional space agency partners may include the European Space Agency (ESA), the Russian Space Agency (Roscosmos), the Japanese Space Agency (JAXA), the Canadian Space Agency (CSA), and others. Emerging space powers such as Australia, New Zealand, Luxembourg, or the United Arab Emirates may also join in. However, as of this writing, no firm details on partnerships between NASA and other space agencies have been announced. Artemis will also fully leverage U.S. commercial space industry capacity, and companies such as SpaceX and a host of others are expected to participate. Currently, the plan envisions 37 launches and a Moon base beginning in 2028.⁹

Structuring and executing the Artemis program will require international legal agreements between NASA and its foreign governmental and space agency partners. Artemis's immediate human-spaceflight predecessor, the International Space Station (ISS), was legally structured as a multilateral treaty with subsidiary bilateral arrangements between the United States and partner nations.¹⁰ Artemis will take a different approach. On May 15, 2020, NASA Administrator James F. Bridenstine gave a presentation on the Artemis Accords, a set of legal and policy principles for agreements with other countries about using and operating in space and fulfilling the Artemis mission.¹¹

The basic elements of the Artemis Accords appear to be a reiteration of basic principles of the Outer Space

Treaty with some additional progressions and innovations.¹² The restatements of basic principles include the exhortation that the Moon be used exclusively for peaceful purposes, as well as obligations concerning transparency about national space activities, release of scientific data to the international community, the international registration of space objects, the emergency assistance of astronauts, and an understanding that the use of space resources is permissible under existing international space law. These basic elements of space law are found in the first 11 articles of the Outer Space Treaty, as well as the 1968 Astronaut Rescue and Return Agreement. In turn, the elements of the Artemis Accords that offer a progressive development of international space law include a requirement that national Artemis partners implement interoperability between actors, the protection of lunar heritage sites, the deconfliction of lunar activity, and obligations for the removal of spacecraft and orbital debris.

The protection of lunar heritage sites (including American, Soviet, Indian, and Israeli spacecraft) on the Moon is necessary to preserve and protect those locations as historically significant, precious artifacts of human space exploration. There is even an organization, For All Moonkind, promulgating the legal protection of these heritage sites.¹³ In 2011, NASA developed guidelines on lunar heritage sites.¹⁴

However, perhaps the most interesting and undeveloped element of the Artemis Accords has to do with deconfliction of lunar activities among Artemis partners. On the topic of deconfliction, NASA states that

[a]voiding harmful interference is an important principle of the Outer Space Treaty which is implemented by the Artemis Accords.

Specifically, via the Artemis Accords, NASA and partner nations will provide public information regarding the location and general nature of operations which will inform the scale and scope of “Safety Zones.”

Notification and coordination between partner nations to respect such safety zones will prevent harmful interference, implementing Article IX of the Outer Space Treaty and reinforcing the principle of due regard.¹⁵

Consequently, while national appropriation of space and subparts thereof is impossible under Article II of the Outer Space Treaty, States retain jurisdiction and control over their registered space objects under Article VIII, and therefore the concept of “safety zones” appears necessary under Artemis. In reality, given the physical circumstances of the Moon, safety zones make sense. On average, the horizon of the Moon is only around 1.5 miles from any given location (omitting hills, valleys, and craters). Additionally, any takeoffs and landings from the Moon will certainly create plumes of lunar dust—some

of which might not only encircle the entire Moon but may even leave the Moon permanently. As lunar dust can be harder, sharper, and smaller than grains of broken glass, dust plumes are a real threat to operations.¹⁶ Additionally, radio-frequency interference is another potential threat for surface operations. Consequently, the establishment, maintenance, and observance of safety zones will be necessary for Artemis and other lunar activities.

Conclusion

These two initiatives, the White House Executive Order and the Artemis Accords, demonstrate an energetic and proactive stance taken by the United States (whether from the White House, NASA, or Capitol Hill, or on an interagency basis) to address current and emerging space activities head on by regulating carefully but robustly what needs to be regulated and creating an enabling environment for anticipated governmental, public-private, and wholly private space activities.

Lastly, it should be noted that these are not the only recent regulatory initiatives affecting users of space that interested readers may wish to learn about. Other recent national regulatory endeavors have addressed activities closer to Earth, with new rules focused on space debris. These include the updated *Orbital Debris Mitigation Standard Practices* (ODMSP), which now encompass different orbital regimes and different categories of small spacecraft.¹⁷ The updated ODMSP might be contrasted with the perhaps more ambitious *Report and Order and Notice of Further Rulemaking on Orbital Debris* from the Federal Communications Commission (FCC).¹⁸ Both of those documents, released in 2019, are aimed at addressing the persistent and growing problem of space debris, especially in light of the growing field of new users to the space domain, including numerous small satellite operators, and so-called “megaconstellations” of large numbers of spacecraft in orbital shells around the Earth. Whether focused closer to Earth or further out, budding space lawyers have plenty to consider.

Endnotes

1. Exec. Order No. 13914 (Apr. 6, 2020), 85 Fed. Reg. 20,381 (Apr. 10, 2020) (“Encouraging International Support for the Recovery and Use of Space Resources”), <https://www.federalregister.gov/documents/2020/04/10/2020-07800/encouraging-international-support-for-the-recovery-and-use-of-space-resources>.
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3. Agreement Governing the Activities of States on the Moon and Other Celestial Bodies, Dec. 18, 1979, 1363 U.N.T.S. 3 [hereinafter Moon Agreement].
4. Treaty on Principles Governing the Activities of States

in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies, Jan. 27, 1967, 610 U.N.T.S. 205 [hereinafter Outer Space Treaty].

5. *Compare with* Exec. Order No. 13905 (Feb. 12, 2020) (“Executive Order on Strengthening National Resilience through Responsible Use of Positioning, Navigation, and Timing Services”) 85 Fed. Reg. 9350 (Feb. 18, 2020), <https://www.whitehouse.gov/presidential-actions/executive-order-strengthening-national-resilience-responsible-use-positioning-navigation-timing-services/> (last visited Jul. 12, 2020).

6. H.R. 1508, 114th Cong. (2015); *see also* U.S. Commercial Space Launch Competitiveness Act, H.R. 2262, 114th Cong. (2015), <https://www.congress.gov/bill/114th-congress/house-bill/2262/text> (last visited Jul. 12, 2020).

7. Exec. Order No. 13914, *supra* note 1.

8. NASA, *Artemis*, <https://www.nasa.gov/specials/artemis/> (last visited Jul 12, 2020).

9. Eric Berger, *NASA’s Full Artemis Plan Revealed: 37 Launches and a Lunar Outpost*, ARS TECHNICA, May 20, 2019, <https://arstechnica.com/science/2019/05/nasas-full-artemis-plan-revealed-37-launches-and-a-lunar-outpost/> (last visited Jul 12, 2020).

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11. Jeff Foust, *NASA Announces Artemis Accords for International Cooperation in Lunar Exploration*, SPACE NEWS, May 15, 2020, <https://spacenews.com/nasa-announces-artemis-accords-for-international-cooperation-in-lunar-exploration/>.

12. NASA, *The Artemis Accords* (2020), <https://www.nasa.gov/specials/artemis-accords/index.html>.

13. FOR ALL MOONKIND, <https://www.forallmoonkind.org/> (last visited Jul. 12, 2020).

14. NASA’S RECOMMENDATIONS TO SPACE-FARING ENTITIES: HOW TO PROTECT AND PRESERVE THE HISTORIC AND SCIENTIFIC VALUE OF U.S. GOVERNMENT LUNAR ARTIFACTS (2011).

15. NASA, *supra* note 12; scroll down to “Deconfliction of Activities.”

16. Loren Grush, *High-Speed Lunar Dust Could Cloud the Future of Human Missions to the Moon*, THE VERGE (July 17, 2019, 9:00 AM EDT), <https://www.theverge.com/2019/7/17/18663203/apollo-11-anniversary-moon-dust-landing-high-speed>.

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18. In re Mitigation of Orbital Debris in the New Space Age, FCC Report and Order and Further Notice of Proposed Rulemaking, IB Docket No. 18-313 (Apr. 24, 2020), <https://ecfsapi.fcc.gov/file/04240586604013/FCC-20-54A1.pdf>.