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Business, Legal, and Policy Issues in Relation to Increased Private Space Activity

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Summary and Keywords

Throughout the history of human activity in outer space, the role of private companies has steadily grown, and, in some cases, companies have even replaced government agencies as the primary actors in space. As private space activity has grown and diversified, the laws and regulations that govern private actors have been forced to evolve in reaction to the new realities of the industry. On the international level, the treaties concluded in the 1960s and 1970s continue to be in force today. However, these treaties only govern state activity in space. The rules regulating private industry are necessarily domestic in nature, and it is in these domestic laws that the evolution of space law can be most clearly seen. That said, new industries, such as asteroid mining, are testing the limits of international law and have forced the international community to examine whether changes to long-standing laws are needed.

Keywords: space industry, space commercialization, space law, international law, treaties, asteroid mining, launch services, rockets, satellites

Introduction

After the government programs of the United States and the former USSR opened outer space to human activity, the expansion of private activity in outer space has ensured that this new era of human history will be driven by the energy of entrepreneurial investment. Although the strides taken by private companies have grown bolder in recent years, the history of private companies' involvement in space activity begins at the very start of the Space Age. Before long, however, private companies began to pursue their own space missions rather than simply supporting governmental missions. Moreover, in the early part of the 21st century, the emergence of entirely new technologies and uses of outer space have been driven by private industry. From suborbital space tourism to asteroid

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mining, these new uses of space have attracted immense capital investment for private companies.

Just as the nature of space actors has evolved, from governments to private companies, so has the landscape of law and policy evolved to address this new reality. The regulation of space activity takes place on multiple levels, including international law, regional arrangements (such as the European Union), national laws, and even local laws (such as state law in the United States). The original international treaties governing space are showing their age, and the debate regarding the need to update the law has grown in volume. Due to the requirement under international law that states “authorize and continually supervise” the space activity of their nationals, state legislatures have been enacting new statutes and regulatory regimes to govern the activity of private companies in space. This situation has sparked the creativity of lawyers and lawmakers as they develop entirely new regulatory systems to govern this activity.

Before beginning the story of private industry in space, a brief mention of the definition of “government” activity, “private” activity, and “commercial” activity is warranted. Private activity describes the activity of private companies. All private activity is commercial in nature. Even if the company is working under contract for a government space agency, it is still commercial activity; in this case the government is the customer. Contrast this with a government activity that can be noncommercial, such as when a deep space probe is developed fully in-house by a space agency. However, governmental activity can be deemed commercial in two ways: either through the outsourcing of work to private companies (as the National Aeronautics and Space Administration [NASA] did during the Apollo era) or through the offering of services to private companies (as the commercial arm of the Indian space agency, Antrix, offers launch services to private satellite operators).

The Early Years: Government Actors and Private Contractors

Perhaps the best illustration of the role of government agencies and private companies in the early years of the Space Age is found in the Apollo missions to the moon. Although a governmental agency, NASA, oversaw the program to build, launch, and operate these spacecraft, the construction, launch, and operation of the spacecraft were subcontracted out to private companies in the United States. North American Aviation built the Apollo command and service modules. The lunar module was built by Grumman Aircraft Engineering Corporation, and Boeing and McDonnell Douglas worked with North American Aviation to construct the massive Saturn V rocket that carried the Apollo astronauts into space. Although the predecessor to NASA, the National Advisory Committee for Aeronautics (NACA), had relied on some extent on private companies, NASA greatly increased the volume of work outsourced to private entities while keeping only some activities in-house, such as overall project management and certain cutting-edge research and development. In 1965, when the Apollo technology was being created,

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over 91% of those working on NASA missions were employed by private companies under contract with NASA.

Although the use of space was originally limited to governments, this quickly changed when private telecommunications companies emerged in the 1960s that owned and operated their own satellites. However, these companies still relied on governmental launch services in order to place their satellites in orbit. In the United States, satellite operators would procure these launch services from NASA. However, while NASA provided the services in name, the launch vehicles were actually built and the launches carried out by private companies from a government launch site. For example, NASA's Titan rocket was built by Martin Marietta, the Atlas rocket by General Dynamics, and the Delta rocket by Boeing.

NASA was the only entity in the world that provided launch services to private companies until the first Ariane rocket was launched in 1979. The Ariane program was a joint venture by France, Germany, and the UK that was undertaken to improve Europe's access to space. Although European satellites could be launched by NASA, the conditions placed on European customers were problematic, such as a requirement that any European satellite launched by NASA be functional only over Europe (European Space Agency, 2009). In 1984, the operation of the Ariane rocket series was taken over by a private company, Arianespace.

In 1982, NASA's dominance of the launch services market was confirmed with the first operational launch of the reusable Space Shuttle, which was intended to provide orbital delivery services at a fraction of the cost of expendable vehicles. The development of the Space Shuttle threatened to eliminate the possibility of U.S. companies ever offering launch services, since NASA planned to rely entirely on the shuttle for government payloads as well as using it to provide, at a price, launch services to private companies and foreign governments.

Although the Space Shuttle was expected to meet the demand for all government and private launches, the abilities of the shuttle were overestimated, and the need for additional launch service providers soon became evident. As a result, after launch services had been exclusively in the hands of governments since the beginning of the Space Age, in 1982 Space Services Inc. of America (SSIA) became the first private company to launch a rocket into space without being under contract to do so by a space agency. The Conestoga rocket carried a dummy payload into space on this first launch. A subsequent launch of a NASA payload failed, however, and SSIA did not launch another vehicle until 1989.

Despite the problems encountered by SSIA, this first foray into private launch services had powerful repercussions in the development of space law. In order to launch the Conestoga rocket, SSIA faced a chaotic licensing process and, at the end, was required to acquire licenses from numerous U.S. government agencies, including NASA, the Department of State, the Federal Aviation Administration (FAA), the Federal Communications Commission, the Department of Defense, and the Bureau of Alcohol,

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Tobacco, and Firearms. This outrageous regulatory burden was recognized by the U.S. government, and a series of governmental actions reshaped the legal landscape to encourage and facilitate the development of private launch services. President Reagan set the wheels in motion in 1983 by issuing a National Security Directive, which set forth the following policy in support of private industry:

The U.S. Government fully endorses and will facilitate the commercialization of U.S. Expendable Launch Vehicles. The U.S. Government will license, supervise, and/or regulate U.S. commercial ELV operations only to the extent required to meet its national and international obligations and to ensure public safety.

In 1984, President Reagan issued an Executive Order designating the Department of Transportation (DOT) as the lead agency for commercial space transportation in order to eliminate the regulatory complexity faced by SSIA by identifying a single agency that would serve as a “one-stop shop” for companies seeking a launch license. That same year, Congress affirmed the role of the DOT as the lead licensing agency for private launches by enacting the Commercial Space Launch Act (CSLA; FAA Office of Commercial Space Transportation, N.D.). The CSLA continues to serve as the legal foundation for regulating private space transportation.

Although the licensing process was streamlined by the CSLA, there was still a policy issue that prevented private companies from growing their launch service business. The U.S. government, which was by far the largest potential customer for any private launch company, required all government payloads to be launched on the new reusable launch vehicles, the Space Shuttle orbiter (which was built by a private company, Rockwell International). This changed, however, in 1986 due to the Space Shuttle Challenger tragedy that resulted in a significant loss in the ability of the shuttle fleet to provide the launch services required by both government and commercial entities. In order to make room for government payloads on the shuttles and to spur the development of private launch service providers that could serve as an alternative to the shuttle, President Reagan issued an executive order that restricted NASA’s launch of commercial satellites to only those satellites that required the “unique capabilities” of the shuttle (National Security Council, 1986). As a result, the need for private launch service providers quickly grew, and private industry soon began filling this need. The demand for private launch services accelerated when, in 1988, President Reagan issued another directive requiring government agencies to use commercial launch service providers “to the fullest extent feasible” (NASA, 1988).

The law and policy of the United States was now optimized for the rapid expansion of the commercial space launch industry. In 1989, SSIA received the first launch license under the CSLA to launch its Starfire vehicle on a suborbital mission with a scientific payload developed by the University of Alabama. Later that same year, McDonnell Douglas performed the first private orbital launch with its Delta I rocket.

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When the last operational Space Shuttle, the *Atlantis*, was retired in 2011, the U.S. government no longer had an operational launch vehicle and had to purchase launch services from private companies in order to place government satellites in orbit. Since no private entity was capable of delivering crew and cargo to the International Space Station (ISS), NASA had to rely on its international partners (primarily Russia) for ISS missions. Not content with this reliance on foreign governments, NASA launched programs to encourage the development of private launch services to deliver crew and cargo to the ISS. The cornerstones of this initiative were the Commercial Orbital Transportation Service program, the Commercial Resupply Services program, and the Commercial Crew Development (CCDev) program. These programs resulted in the rapid development of multiple private launch service providers that competed for NASA contracts to deliver cargo and crew to the ISS. In 2012, SpaceX became the first private company to deliver cargo to the ISS and was followed by Orbital Sciences in 2013. SpaceX and Boeing have been awarded contracts under the CCDev program to deliver crew to the ISS beginning in 2018.

International Law and the Expansion of Private Space Activity

International space law first took shape in the early 1960s in the wake of the launch of Sputnik and other early space activity by the former Soviet Union and the United States. The codification of space law began with the 1962 United Nations Declaration of Legal Principles Governing the Activities of States in the Exploration and Use of Outer Space. This declaration included the following principles that formed the bedrock of international space law:

- Space is open to free exploration by all states;
- No state can appropriate space or celestial bodies;
- States must bear responsibility for their activity in space, supervise activities of nongovernmental parties, and be liable for harm caused by their activity or by their nationals;
- States must maintain a registry of their space objects and the state of registry must maintain jurisdiction and control over the space object; and
- States must provide assistance to astronauts in distress and return errant space objects to the launching state.

In the years following the adoption of the Declaration of Legal Principles, five treaties were drafted under the auspices of the United Nations to codify, elaborate upon, and expand upon the principles contained in the declaration:

- The 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);

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- The Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into Space (Rescue and Return Agreement);
- The Convention on International Liability for Damage Caused by Space Objects (Liability Convention);
- The Convention on Registration of Objects Launched into Outer Space (Registration Convention); and
- The Agreement Governing Activities of States on the Moon and Other Celestial Bodies (Moon Agreement).

The laws established by these treaties have been placed under stress over the years by the expansion of private activity in space. In particular, the rules regarding (a) the liability of the launching state for damage caused by space objects, (b) the registration of space objects and the jurisdiction of the state of registry, (c) the application of the duty to rescue astronauts and return errant space objects to private space activity, and (d) the prohibition of national appropriation of celestial bodies have been strained by the advent of new space technologies and activities.

The Liability of the Launching State

The liability paradigm set forth in the treaties primarily contemplates governmental space activity that involves a state launching a space object and maintaining control over that space object for its entire lifespan. With the advent and expansion of private space activity, the realities of commercial transactions, such as the sale of a satellite during its operational lifespan, challenged the propriety of the existing liability rules.

The 1972 Liability Convention imposes strict liability on the “launching state” for all damage caused by a space object on Earth or to aircraft in flight (Convention on International Liability for Damage Caused by Space Objects [Liability Convention], 1972, Art. II):¹ “A launching State shall be absolutely liable to pay compensation for damage caused by its space object on the surface of the Earth or to aircraft in flight.”

In contrast, Article III of the convention imposes liability on the launching state when a space object causes damage to the space object of another state when the object is in the air or in space but only when the launching state is “at fault” (Liability Convention, 1972, Art. III):²

In the event of damage being caused elsewhere than on the surface of the Earth to a space object of one launching State or to persons or property on board such a space object by a space object of another launching State, the latter shall be liable only if the damage is due to its fault or the fault of persons for whom it is responsible.

One troubling aspect of Article III is that it lacks a clear standard for determining when a state (or a person for whom a state is responsible) would be found at “fault” for causing damage. As space activity becomes increasingly commercialized and privatized, debate

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will likely grow as to whether it is appropriate and desirable for the launching state to be liable for damage caused by space objects that are launched and controlled by private entities. Although imposing liability on the launching state has the effect of motivating the launching state to take greater care in the supervision of private space activity, at some point the sheer volume of commercial space activity may render this potential liability an unreasonable burden on states.

Another widely criticized shortcoming of the existing law of outer space is that the launching state continues to be liable under the Outer Space Treaty and Liability Convention even after the transfer of the space object by the launching state, or by one of its nationals, to another party. The liability imposed by the treaties on a launching state is perpetual, with only a few narrow exceptions. For example, if State X launches a satellite, sells the satellite five years later to State Y, and, due to State Y's negligence, the satellite reenters the atmosphere and causes extensive damage on the surface of the earth, State X will bear absolute liability for the damage under the Liability Convention. Critics of this result see a fundamental unfairness in imposing liability on the launching state when it was in no way involved in the harmful activity. The free trade of satellites and other space objects may be inhibited due to the liability that launching states face if the object causes harm while under the control of the buyer or lessee. For damage caused by the sold satellite in space, the problem is not as likely to arise since liability for damage in space requires the showing of the launching state's fault. Such fault is unlikely to be found if the launching state had no control over the object or the operator at the time that the damage occurred.

This risk of a launching state being held liable for damage caused after the sale or lease of a satellite can be minimized by restrictions on the transfer of the object under domestic law. If the state is the owner of the object, it can simply decide not to transfer the object. The problem is more complicated if a private entity subject to the state's jurisdiction owns the object. The state can enact legislation prohibiting its nationals from transferring a space object without state permission—a type of legislation that is in effect in many countries.

The Rescue of Astronauts and Return of Space Objects

Of the many legal challenges that have emerged with respect to the suborbital space tourism opportunities offered by private companies, including Virgin Galactic and Blue Origin, one critical issue is whether the duty to rescue astronauts and return errant spacecraft will apply to space tourism ventures. As tourism companies prepare to launch their maiden flights, their primary concern will be the safety of their customers and ability to recover their spacecraft. A steady flow of customers will be essential to the success of the tourism business model, and this flow will only be possible if the public views the flights as safe. Safe operations will also reduce the risk that a space tourism company will be subjected to the crushing liability that would follow an accident.

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Moreover, since the space tourism companies plan to fly reusable spacecraft, they will want to provide for the recovery of their spacecraft in the event of a flight anomaly.

Article 5(3) of the Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into Space (Rescue and Return Agreement; 1968) requires the return of any space object to the “launching authority” whenever the object is found outside of that state’s jurisdiction, regardless of the circumstances leading to the discovery of the object:

Upon request of the launching authority, objects launched into outer space or their component parts found beyond the territorial limits of the launching authority shall be returned to or held at the disposal of representatives of the launching authority, which shall, upon request, furnish identifying data prior to their return.

The Outer Space Treaty and the Rescue and Return Agreement also require efforts to rescue the people on board a spacecraft. Article V of the Outer Space Treaty requires states to give astronauts “all possible assistance in the event of accident, distress, or emergency landing on the territory of another State Party or on the high seas.” Article 2 of the Rescue and Return Agreement requires that a state “immediately take all possible steps” to rescue spaceflight “personnel” in the event of an unintended landing in that state’s territory.

Article 3 of the Rescue and Return Agreement complements Article 2 by addressing accidents that occur outside of a state’s jurisdiction and provides that if a state discovers that

the personnel of a spacecraft have alighted on the high seas or in any other place not under the jurisdiction of any State, those Contracting Parties which are in a position to do so shall, if necessary, extend assistance in search and rescue operations.

The broad duty imposed on states to engage in search and rescue operations in the event of a downed spacecraft could benefit not only the personnel on board the spacecraft but could ultimately benefit a company operating the spacecraft. Safety is a critical concern of the flying public and the spaceflight companies. The rescue obligations imposed on all signatory states will contribute to the safety of such company’s operations and could help the company maintain solvency in the event of an accident.

From the outset, it is worth noting that none of the terms in the Rescue and Return Agreement exclude commercial enterprises. In fact, the term “personnel” is typically used in a commercial context (e.g., cruise ship personnel) as well as in government contexts. This lack of any distinction between private and public spaceflight in the plain language of the Rescue and Return Agreement supports a broad interpretation that would require states to rescue nongovernmental personnel and return private spacecraft.

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Although no state has yet been required to fulfill its duty to rescue astronauts, the record is richer with respect to the return of space objects. There have been seven instances of space objects being found on Earth resulting in the notification of the secretary-general and the return of the assets to the launching authority. Five of these episodes involve the discovery of government assets—but two involve the discovery of private spacecraft. Specifically, the governments of Argentina and South Africa, in 2000 and 2004, respectively, notified the secretary-general of the discovery and planned return to the United States of space objects that had been found in their respective territories (United Nations Office of Outer Space Affairs, List of Reported Space Objects Discovered by Member States, N.D.). Thus we have some evidence of states extending the duty to return to privately owned commercial vehicles. And if states feel compelled under the law to fulfill the duty to return private vehicles, there is no reason why the other duties imposed by the treaty, including the duty to rescue, should be viewed any differently.

One approach to seeking a broad definition of “personnel” is to take into account the humanitarian purpose of the Rescue and Return Agreement when interpreting the term as is required under Article 31 of the Vienna Convention. That the main principle and purpose behind the Rescue and Return Agreement was the humanitarian desire to protect the life of those aboard a spacecraft is reflected in the treaty’s fourth recital, which states that the treaty was “prompted by sentiments of humanity” (Rescue and Return Agreement, 1968, Recitals). In fact, when the treaty was being drafted the Italian delegation made clear that “everyone on board has a right to assistance for humanitarian reasons” (Proposals, Amendments and Other Documents Relating to Assistance to and Return of Astronauts and Space Vehicles, 1967). This is a clear indication that the drafters understood the term broadly in a way that should include private passengers.

Jurisdiction over Space Objects

Pursuant to the Registration Convention, when a space object is launched into space, the launching state is required to record the launch in its national registry (as well as provide information about the object to the secretary-general of the United Nations to be included in the international register; Convention on Registration of Objects Launched into Outer Space, 1975, Art. II(1)). This act of registration has profound legal effects under Article VIII of the Outer Space Treaty, which declares that the state of registry has perpetual “jurisdiction and control” over the object.

The increase in commercial transactions involving space objects raises a critical issue, namely, that jurisdiction remains with the state of registry even after transfer of the object to another state. The issue arises when the immutable rule of jurisdiction and control found in Article VIII of the Outer Space Treaty faces the reality of commercial space use where changes in ownership and control of a space asset already take place (and are likely to take place more frequently in the future). Examples of the transfer of on-orbit satellite include (a) the sale by Telesat Canada of the Anik CI and Anik CII satellites to the Argentine corporation Paracomsat S.A, (b) the sale of the satellite BSB-1A by the United Kingdom to the Swedish company Nordic Satellite AB, and (c) the taking of

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title by Lloyds of the Indonesian Palapa B satellite following the payment of insurance proceeds to the insured and the subsequent sale of the satellite to a new operator.

The Outer Space Treaty does not provide for any change in this assignment of jurisdiction and control but holds that it will perpetually remain with the original state of registry. While this approach made sense during an age when space objects were launched by states and the objects were not the subject of subsequent commercial transactions that would result in the transfer of ownership and actual control to a new party, the current realities of commercial space use have revealed the flaws in the immutable rule of Article VIII. When a satellite has been transferred to another state, or a national of another state, it no longer makes sense for the original state of registry to retain jurisdiction and control. In fact, the transferee state should be granted jurisdiction and be required to exercise control, since this would reflect the reality that the new owner has de facto control of the satellite.

One solution to the problem of jurisdiction remaining with the state of registry following a transfer is to have the state of registry enter into an agreement with the transferee state granting the transferee state jurisdiction over the satellite. Such agreements are expressly permitted under Article II of the Registration Convention in order to transfer jurisdiction between launching states, but there is nothing preventing a nonlaunching state from accepting jurisdiction under such an agreement as well.

Another way of transferring jurisdiction and control to the transferee state is for the original state of registry to deregister the space object by removing it from its domestic registry. Although such “deregistration” is not mentioned in the space treaties, there is nothing in the treaties that prohibits the practice.

Asteroid Mining and the Prohibition on National Appropriation

In one of the newest applications of space technology, private companies are developing spacecraft to locate, extract, and process natural resources on the moon, asteroids, and other celestial bodies. Certain classes of asteroids contain high quantities of valuable natural resources, and so the mining of asteroids and other celestial bodies could soon turn into a Space Age Gold Rush. Whereas the Apollo missions collected moon rocks for scientific study, private industry plans to harvest space resources to sustain their activities in space and to sell these resources to other space actors. The growing list of such companies includes Planetary Resources, Deep Space Industries, Shackleton Energy, iSpace, and Kepler Energy and Space Engineering LLC.

Despite the unlimited resources awaiting in space, investors in these new companies will be wary to invest the billions of dollars needed to develop the technology if there is uncertainty about the legality of laying claim to the resources that are extracted. The highest legal hurdle to clear in the terms of ownership rights over space resources is found in Article II of the Outer Space Treaty, which states that “[o]uter 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.” Although the debate

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continues, some scholars interpret this article as prohibiting the appropriation of celestial bodies while at the same time allowing for the ownership of extracted resources. In other words, the law regarding the extraction of space resources is largely seen as analogous to the law of the high seas, which allows international waters to be fished and its seabed to be mined.

Despite the weight of expert opinion falling on the side of ownership rights over extracted resources being permitted under international law, there are still some who question its legality. International discussions of the issue have arisen at the United Nations and other fora. In order to prepare the way for the future regulation of space resource extraction, The Hague International Space Resources Governance Working Group (N.D.) was created to develop “building blocks” for use in the construction of a future legal framework governing mining activities. This legal framework may eventually take the form of a treaty, but it is more likely to be a softer form of international law or a model law for adoption domestically state by state.

While the international debate on the issue continues, some countries have taken steps under domestic law to comfort investors in the space resource industry. In 2015, the United States enacted the Space Resource Exploration and Utilization Act (SREUA), which assures private companies that ownership rights may be asserted over any “abiotic resource in situ . . . found on or within a single asteroid” that have been “recovered” by a U.S. citizen. To allay any concerns that the United States is preparing to lay claim to celestial bodies, the SREUA goes on to state that “United States does not . . . assert sovereignty or sovereign or exclusive rights or jurisdiction over, or the ownership of, any celestial body.” A law enacted in 2017 in Luxembourg also grants rights to asteroid miners by stating that “[s]pace resources are capable of being appropriated.” Similar domestic legislation is expected in Japan and other countries in the near future as these countries vie to become a center of the space resource industry.

Domestic Law and the Regulation of Nontraditional Uses of Space

While negotiating the terms of the Outer Space Treaty, USSR and U.S. diplomats disagreed regarding the following question: Should private space ventures be allowed? The Soviets wanted to ban private space activity and reserve space for governments only, whereas the U.S. delegation insisted on opening space to nongovernmental entities. A compromise was found in Article VI of the Outer Space Treaty, which explicitly allows for private (or “nongovernmental”) space activity: “States Parties to the Treaty shall bear international responsibility for national activities in outer space, including the Moon and other celestial bodies, whether such activities are carried on by governmental agencies or by non-governmental entities.”

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The nature of this compromise was that private ventures were permitted—but the launching state had to accept responsibility for any harm caused by those private actors. This concept of state responsibility for the operations of its nationals was complemented by a duty to “authorize and continually supervise” nongovernmental activity: “The activities of non-governmental entities in outer space, including the Moon and other celestial bodies, shall require *authorization and continuing supervision* by the appropriate State Party to the Treaty.”

This duty to authorize and supervise means that countries must create (typically through legislation) a process for licensing private space missions and then monitoring that activity to ensure compliance with international law. As more states become involved in space activities, different approaches to fulfilling the Article VI obligation to “authorize and continually” supervise its nationals. One approach is to draft “catch-all” legislation that requires governmental authorization for private space activity of any kind, without addressing different sectors of the space industry separately. The United States takes a different approach by the regulating space activity through a more complex statutory regime that separately regulates different sectors of the space industry (including launch services, telecommunication, and remote sensing). Through this statutory regime, the United States certainly meets the duty to “authorize and supervise” the types of private activity addressed by existing statutes (i.e., launch services, telecommunications, and remote sensing). However, the U.S. government is concerned that the nontraditional space activities being pursued by U.S. companies may fall outside the scope of the current laws. Some of these new activities include asteroid mining, on-orbit satellite servicing, and private space stations. In other words, there is a “regulatory gap” in U.S. domestic space law that could put the United States in jeopardy of violating its Article VI duties under the Outer Space Treaty.

The U.S. Congress took a critical first step in addressing this regulatory gap by passing the 2015 Commercial Space Launch Competitiveness Act (CSLCA). In Section 108 of the CSLCA, titled “Space Authority,” Congress asked that the director of the White House Office of Science and Technology Policy submit a report within 120 days of enactment recommending any legislative actions that were necessary to meet the international obligation regarding “authorization and supervision” of non-traditional space activities (U.S. Commercial Space Launch Competitiveness Act of 2015).

While waiting for the next legislative step in filling the regulatory gap, business has moved forward as companies push their projects ahead at an aggressive pace. Bigelow Aerospace is contemplating private space stations and lunar habitats after proving its technology through the successful deployment of the Bigelow Expandable Activity Module at the ISS. Moon Express requested (and received) a positive payload determination to be the first private company to land an object on the moon. Asteroid mining companies are celebrating the dawn of a “second age of exploration” after both the United States and Luxembourg unveiled laws ensuring investors that these companies will be able to profit from the extraction of natural resources in space. During the unprecedented rush of

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business, the FAA has continued to encourage, facilitate, and promote the goals of the U.S. space industry.

Facing the question of how to respond to requests and applications from companies planning activities outside of the FAA's jurisdiction over licensing the launch and reentry of spacecraft, the FAA Office of Commercial Space Transportation decided to "leverage its authority" in a manner that would allow for industry to move forward while giving subtle indications at the same time that it was acting cautiously near the limits of its jurisdiction.

Perhaps the most exciting new business in outer space is the burgeoning business of space tourism. Virgin Galactic and Blue Origin are among the companies that plan to fly the first private passengers into suborbital space in the near future. SpaceX has reportedly contracted to fly a space tourist around the moon. As with all space activity, space tourism required regulation under Article VI of the Outer Space Treaty. The United States took the lead on this issue in order to properly regulate its nationals and passed the Commercial Space Launch Amendments Act of 2004 (CSLAA). The CSLAA created a licensing regime for the operation of suborbital space tourism companies and authorized the FAA to promulgate regulations to implement the act. The CSLAA embodied a "light touch" regulatory approach that placed only very limited design and operational requirements to ensure the safety of the crew and passengers on the fledgling industry. The FAA was empowered to implement such design and operational safety requirements only if an accident resulting in serious injury had occurred on a licensed flight or an unexpected event had occurred that threatened serious injury. Rather than issue a bevy of safety requirements, the U.S. Congress decided not to dictate design to the entrepreneurs of spaceflight and instead opted for a regulatory regime that only required the informed consent of the passengers. More specifically, the CSLAA required that space tourism companies obtain the written consent of all passengers after fully informing them of the risks of spaceflight, including the risk of death. Despite this laissez-faire approach to regulation, Virgin Galactic has received a vast number of deposits from people eager to fly into space as the first private astronauts. A number of countries are developing similar laws modeled on the U.S. statute in an effort to participate in the space tourism industry. As the industry progresses, so will the regulation of the industry as countries try to maintain the balance between law and innovation.

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Notes:

(1.) “Space object” is broadly defined in Article I of the Liability Convention as including “component parts of a space object as well as its launch vehicle and parts thereof” (Liability Convention, 1972, Art. I(d)).

(2.) Note that both Article II and Article III address damage caused in airspace, with the distinction being that Article II governs damage caused to aircraft while Article III addresses damage to space objects (which are presumably either en route to or returning from space).

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