

## 4 Understanding space law

### Legal framework for space

*Jonty Kasku-Jackson and Elizabeth Waldrop*

The desire to define and codify legal principles applicable to Man's activities in space began in the context of the Cold War, during which time the governments of the Soviet Union and the United States developed and operated many military satellites and dominated the world's space activities. During these early years of the space age, satellites were mainly useful in maintaining peace and stability through reconnaissance, intelligence-gathering, early warning, and as the national technical means (NTM) of verification for monitoring arms control compliance. Viewed in this context, it is thus not surprising that space law is a relatively new, specialized body of international law that is very permissive for national security space operations. This chapter will first summarize the main principles of space law as reflected in the major international space treaties, examining these concepts in the context of other general international law principles that may impose additional restrictions on the use of space for national security purposes, particularly the use of force in space. The second part of this chapter will discuss US domestic law and policy that further shape how the United States cooperates with others on the use of space. Included in this section is an overview of US domestic laws associated with commercial space activities, since the US domestic commercial space industry is essential to meeting national security requirements as well as international legal obligations. It should first be noted that although US domestic commercial space-related legislation is necessarily restricted to what is allowable within the broad architecture of the previously discussed international laws, domestic laws are primarily enabling – not restrictive – in the sense that they promote domestic investment and cooperation on a scale that would not otherwise occur. Finally, the chapter will identify some space law-related issues about which nations do not agree and which are or may be the source of international and legal conflict in the future.

## Fundamental principles reflecting agreement among states

### *General international law*

International law reflects many space law principles generally accepted by the international community. Before we examine the four major international law treaties that apply specifically to space, we must briefly outline some general principles of international law.

There are two primary sources of international law: customary law (consensual principles that have evolved from the practices and customs of nations over time), and international agreements (those things which nations have explicitly agreed to in a convention, treaty, or agreement). Under international law, the terms "treaty" and "international agreement" are synonymous, although the terms do have different meanings within the US Department of Defense (DoD).<sup>1</sup> For the United States, treaties are concluded under the authority of the Constitution, Article II, which states that the president has the power, by and with the advice and consent of the Senate, to make treaties, provided that two-thirds of the senators present concur. As such, treaties are part of the "supreme law of the land" under the Constitution, Article VI. Generally, treaty terms take precedence over conflicting US statute terms. The major exception to this is when Congress explicitly intends for a later statute to override the conflicting treaty provision.

Since this is not a detailed chapter on international law, we can only summarize general international law principles important to our review of space law:

- 1 During time of conflict, treaty terms that are inconsistent with a state of armed conflict may not apply between belligerents, unless the terms of the treaty itself are specifically intended to apply during conflict (for example, the Geneva Conventions)<sup>2</sup>. Thus, many space law treaty provisions might not apply between belligerents during armed conflict.
- 2 States assume legal obligations only by affirmatively agreeing to do so or, arguably, by acquiescing by silence to activities of another state (lack of protest to known activity).<sup>3</sup>
- 3 Generally, and with some limits, activities are presumed to be allowed unless prohibited by law. This is the US view, and it is admittedly controversial in the international arena.<sup>4</sup>

### *The four major space treaties*

There are four main treaties that make up the specialized body of space law: the Outer Space Treaty (1967), the Rescue and Return Agreement (1968), the Liability Convention (1972), and the Registration Convention (1975).<sup>5</sup> The United States and all other major space powers are party to



all four of these treaties. Most of the principles in these treaties are generally accepted as customary international law binding on all nations, even those nations that are not party to them.

The Outer Space Treaty is the cornerstone of space law and sets out its major guiding principles: the common interest principle (Article I); the freedom principle (Article I); and the nonappropriation principle (Article II). These principles taken together establish the general idea that outer space (including the Moon and other celestial bodies) is not and cannot be owned by anyone, but that everyone is equally free to use it.<sup>6</sup> Another powerful provision of the Outer Space Treaty is the statement that international law, including the UN Charter, applies in outer space (Article III).

As noted previously, in the earliest years of the space age satellites were mainly useful in maintaining peace and stability through reconnaissance, intelligence-gathering, early warning, and as the NTM of verification for monitoring arms control compliance.<sup>7</sup> In part to assure the continued availability of satellite reconnaissance (especially of the very-secretive Soviet Union during the Cold War), the United States had a strong interest in establishing early on that the law of space is different from the law of the air, with perhaps the most important distinguishing aspect being a "right of overflight" by satellites over the territory of other sovereign nations (the opposite of existing air law, which recognizes sovereignty over a state's territory).<sup>8</sup> This concept of an outer space "right of overflight" was effectively established through US and Soviet satellite operations with no formal opposition from other states, and the concept was formally recognized in the 1967 Outer Space Treaty.<sup>9</sup>

Some of the greatest misconceptions about space law, however, concern limitations on weapons in space. In fact, the Outer Space Treaty only provides two "arms control" provisions limiting military uses of space:

- 1 nuclear or other weapons of mass destruction will not be placed in orbit around the Earth, on the Moon or any other celestial body, or in outer space; and
- 2 the Moon and other celestial bodies will be used exclusively for peaceful purposes; establishing military bases, testing weapons of any kind, or conducting military maneuvers on the Moon and other celestial bodies is forbidden.<sup>10</sup>

Consequently, ICBMs carrying nuclear warheads can traverse space without violating the treaty – they don't go into orbit, and they aren't installed or stationed in space or on celestial bodies. In addition, there is no prohibition against anti-satellite weapons (ASATs).

However, there has been much debate about the Outer Space Treaty's statement that the Moon and other celestial bodies must be used only for "peaceful purposes." It is from this language that other states and scholars have argued that space is a "sanctuary" that should be protected against

weaponization. In reality, recent years have seen a continuous escalation of the uses of space for national security purposes. As space powers reiterate their commitment to the use of space for "peaceful purposes," they also now routinely and overtly use satellites and space systems in direct support of military operations, stating that this direct support is "peaceful."<sup>11</sup> Such direct support includes the use of satellites for: communications between forces engaged in armed combat; intelligence-gathering for selection of targets; precision guidance systems to accurately steer weapons to their targets; and data-collection by remote sensing for battle damage assessment. These uses, coupled with a lack of formal protests regarding them, have led some experts to conclude that all military uses of space other than those specifically prohibited by treaties are lawful, so long as they do not violate other international law provisions.<sup>12</sup>

Thus, the definition of "peaceful" seems to be expanding according to state practice. For example, for over 40 years the United States has defended the position that "peaceful" means "non-aggressive," so that any military use is lawful so long as it does not violate either Article 2(4) of the UN Charter, which prohibits "the threat or use of force," or Article IV of the Outer Space Treaty.<sup>13</sup> Under this interpretation the development and deployment of weapons in space, as long as they are not weapons of mass destruction prohibited under Article IV, and if they are used for "peaceful purposes," would not violate the Outer Space Treaty.<sup>14</sup>

Further, the Outer Space Treaty contains a provision that "[i]n the exploration and use ... parties ... shall conduct all their activities ... with due regard to the corresponding interests of all other states." In the exploration of outer space (including the Moon and other celestial bodies), states must "avoid harmful contamination." In addition, there is an obligation for international consultation if a state's space activity could potentially cause harmful interference with the space activities of other states (Article IX).

The other space treaties expand on concepts introduced in the Outer Space Treaty. The Outer Space Treaty and the Liability Convention make states responsible and liable for all activities that occur in outer space, even those conducted by civilians and private entities. Thus, for example, if a foreign country or its nationals are damaged by the space activities of the fictional US corporation "Space Bus," that country would file its claim against the United States, not "Space Bus." The United States maintains control over this responsibility by imposing licensing requirements on commercial entities, and protects against its governmental liability through insurance requirements.

The Liability Convention further expands on the idea that "launching states" are liable for damage caused by space objects (including debris). If damage is caused to another space object *in outer space*, liability is based on fault. In other words, State A is liable to State B for damage by State A's space object to State B's space object *only if* State A was at fault. On the other hand, if damage is caused by a space object *on Earth* or to *an aircraft*



*in flight*, liability is absolute. For example, if State A's space object causes damage on Earth to State B, State A is liable *regardless of whether State A was at fault*. However, states are liable only for direct damage caused by a space object (e.g. loss of life; personal injury or other impairment of health; or loss of or damage to property).<sup>15</sup> Notably, there can be more than one "launching state" – a launching state is any state that launches an object, procures the launch of an object, or from whose territory or facility an object is launched. If there is more than one launching state, the states may apportion liability between them.

While space law was first being established, astronauts were often returned to Earth in capsules that landed in the ocean and were recovered. Accordingly, it was important to the spacefaring states that provisions be made to ensure the safe return of astronauts (and the spacecraft) to the launching state. In this context, the Rescue and Return Agreement established some key principles. It requires proactive, prompt, and safe rescue and return of spacecraft personnel who land in international waters and in foreign countries. The treaty also prohibits taking such persons hostage or imprisoning them.<sup>16</sup> Presumably, the term "spacecraft personnel" would cover space tourists in the future, but likely not combatants in a future conflict since they would likely be governed by laws of war (such as the Geneva Conventions).

While still protected by the treaty, space objects receive less protection than spacecraft personnel. If State A's space object lands in a foreign country, State A must request its return. If State A does so, the foreign nation must take steps to recover the object, if practicable, and return it. It is important to note that there is no requirement to return an object in the same condition in which it was found; therefore, the foreign country can inspect the object, reverse engineer it, take it apart, etc., prior to returning it. The launching state is responsible for the costs of the recovery and return. If State A learns that a space object has returned to Earth in its own territory or the high seas, or anywhere not under the jurisdiction of any state, State A must inform the launching state and the UN.

The Registration Convention sets up a UN registry for space objects and also requires states to establish their own national registries. This Convention has been criticized for its "loopholes" that enable states to avoid providing detailed information about their space objects:

- 1 States are not required to mark the space objects with the registration number; therefore, it is not always obvious to whom an object belongs.
- 2 States are only required to notify the UN "as soon as practicable" after launch. The treaty does not define "as soon as practicable" – therefore, the country decides for itself when it's practicable to notify the UN, which could be years after the launch or maybe never.
- 3 Because the treaty only requires a general description of the function of the satellite, countries do not often provide a very helpful description of

the function of the objects (for example: USSR entry "to explore the cosmos"; US entry "to conduct practical applications such as weather or communications"). Military satellites must be registered, as well as civil and commercial satellites.

- 4 States are only required to provide notice on the initial orbital parameters of the object. Therefore, if the object is moved later, there is no requirement to amend the initial notification or provide the updated information to the UN.

There are also a number of UN resolutions dealing with space activities. While UN resolutions are non-binding, in some cases they reflect international consensus on international law principles or are an attempt to contribute to the formation of customary international law. Due to the brevity of this chapter, the principles will not be discussed, but we mention in passing that there are resolutions governing the following space activities: direct TV broadcasting; remote sensing; and the use of nuclear power sources.

This brief summary of major space law principles illustrates that space law is quite permissive for national security space operations. However, since international law generally applies to outer space under the terms of the Outer Space Treaty, it is important to look at other areas of international law (as well as domestic law) that may further affect or limit space operations.

#### *Other international law impacting national security space activities*

Given the backdrop of relatively permissive international space law, it is important to look at other constraints on US national security uses of space imposed by other treaties and bodies of international law. First and foremost, the UN Charter,<sup>17</sup> which explicitly applies to space operations under the terms of the Outer Space Treaty, contains limitations on the use of force and the right to self-defense against an armed attack, which in the US view includes anticipatory (or preemptive) self-defense. As complicated as the analysis of these terms and issues is on the ground, when these principles are applied to space, satellites, and computer networks there are many more unresolved issues.

Article 2(4) of the UN Charter prohibits "the threat or use of force against the territorial integrity or political independence of any state."<sup>18</sup> Thus, the first question for national security space operations is whether an action against a satellite or its communications links is a "use of force." There are different approaches to the analysis of whether an act is a "use of force" under Article 2(4) of the UN Charter. The approach most likely to be taken by US national security decision-makers is that the *effect* of the attack is what matters (i.e. whether the damage done is equivalent to that done by actual force), not the actual means by which the attack was made.



On the other hand, many in international circles, particularly academia, argue that the *means* of attack governs the issue, and that "use of force" means exactly what the plain terms indicate, using actual force.<sup>19</sup> A third approach would combine these two approaches in a case-by-case analysis.

There are two exceptions to the UN Charter's prohibition on the use of force: first, an action taken pursuant to a UN Security Council mandate under Article 42; and second, an action taken in self-defense under Article 51. Article 51 of the UN Charter states in part: "nothing in the present Charter shall impair the inherent right of individual or collective self-defense if an armed attack occurs against a member of the United Nations." The next obvious issue in space operations, then, is whether an attack on a satellite or space system is an "armed attack" that would trigger the right of self-defense. As guidance, most international lawyers look to the definitions of the phrases "use of force" (from Article 2(4)) and "armed attack" (from Article 51) as given by the International Court of Justice in the famous Nicaragua case.<sup>20</sup> Under these definitions, a "use of force" is not always an armed attack (it could be lesser acts or indirect force, such as arming and training rebels),<sup>21</sup> but an "armed attack" would most likely require property damage or injury to humans. For national security space operations, then, it could be argued that providing information (such as satellite imagery) to rebel forces is not a "use of force," since it is more like providing money to rebels than equipping them with weapons.

Further, most states interpret Article 51 of the UN Charter to be much more limited in its coverage than the broader right of self-defense granted to states under customary international law – the right of preemptive self-defense. The United States, however, has long maintained that so-called "anticipatory" self-defense is authorized under both customary international law and the UN Charter.<sup>22</sup> This view is controversial and not accepted by many UN member states.<sup>23</sup> Essentially, the same unresolved controversies about using force and responding to armed attacks in self-defense (whether or not preemptively) will exist in space as they do on Earth.

The law of armed conflict (LOAC, also called the "law of war") is the branch of international law regulating the use of force in armed hostilities.<sup>24</sup> Under the US military's standing rules of engagement (SROE), "US forces will comply with the Law of War during military operations involving armed conflict, no matter how the conflict may be characterized under international law."<sup>25</sup> In other words, the United States does not have to be in a declared war for LOAC principles to be binding on its military forces. Although a detailed discussion of LOAC is beyond the scope of this chapter, it is important to briefly outline its sources and general principles to understand how they may apply to space operations.

Like the rest of international law, LOAC is derived from two main sources: customary international law and treaty law. The treaties regulating the use of force were concluded at conferences held at The Hague,

the Netherlands and Geneva, Switzerland and can be divided into two main areas: the "law of The Hague" and the "law of Geneva."<sup>26</sup> In general terms, The Hague treaties deal with the behavior of belligerents and the methods and means of war (for example, lawful and unlawful weapons and targets), while the Geneva agreements address the protection of personnel involved in conflicts (e.g. prisoners of war, civilians, the wounded). LOAC sets boundaries on the use of force during armed conflicts through the application of several principles:

- 1 Necessity: only that degree of force required to defeat the enemy is permitted. In addition, attacks must be limited to military objectives whose "nature, purpose, or use make an effective contribution to military action and whose total or partial destruction, capture, or neutralization at the time offers a definite military advantage."
- 2 Distinction or discrimination: military objectives must be distinguished from protected civilian objects such as places of worship and schools, hospitals, and dwellings.
- 3 Proportionality: military action must not cause collateral damage which is excessive in light of the expected military advantage.
- 4 Humanity: the use of any kind or degree of force that causes unnecessary suffering is prohibited.
- 5 Chivalry: war must be waged in accordance with widely accepted formalities, such as those defining lawful "ruses" (e.g. camouflage and mock troop movements) and unlawful treachery (e.g. misusing internationally accepted symbols in false surrenders).<sup>27</sup>

The combination of these LOAC principles, as implemented on the US domestic level by the SROE, imposes a legal and moral obligation to reduce non-combatant civilian casualties. In application, this can be difficult as military and civilian systems, particularly space systems, become more and more intertwined.<sup>28</sup>

While maintaining its own space assets and capabilities, in the past few years the US military has increasingly relied on commercial and civilian space assets, owned and operated by foreign, domestic, and even international entities. As part of a larger general trend toward military "outsourcing," such non-military organizations may provide cheap, technologically advanced space commodities in a number of areas, e.g. launch, communications, remote sensing, and weather. Even in situations in which the military relies on its own space assets (such as navigation, launch, and surveillance), partnerships with and investment in non-military (and even non-domestic) entities are common and openly encouraged. Thus, the United States must consider the LOAC implications of using its own civilian space systems for military purposes; such dual uses may turn these systems, under LOAC principles, into legitimate military targets. Likewise, the United States must be concerned with targeting adversary civilian space



systems which are used for military purposes, and must consider such factors as collateral damage to civilian space users. On the other hand, space systems also provide an enhanced ability to meet these LOAC requirements (particularly necessity, distinction, and proportionality), since military use of space systems enables accurate targeting and a reduction in unnecessary civilian collateral damage.

Under LOAC principles, legitimate military targets must be distinguished from protected civilian objects. Anticipated collateral damage must be weighed against expected military advantage, and excessive civilian damage avoided. However, force may lawfully be used against objects which an adversary is using for a military purpose, if negation of the object would offer a definite military advantage.<sup>29</sup> The analysis becomes even more complex, however, when the object being used by the adversary belongs to a "neutral" third party.

Nonparticipants in a conflict may declare themselves to be neutral.<sup>30</sup> As long as the neutral state does not assist either belligerent party, it is immune from attack by the belligerents. However, if one of the belligerents uses the territory of a neutral nation in a manner that gives it a military advantage and the neutral nation is unable or unwilling to terminate this use, the disadvantaged belligerent has the right to attack its enemy in the neutral's territory.

Traditionally, the laws of neutrality did not require a neutral state to prevent its private entities from trading with belligerents.<sup>31</sup> However, increasing governmental control and involvement in trade led to the practical erosion of the distinction between private and governmental actors, and it is now commonly accepted that neutral states have an obligation to prevent acts of supply to belligerents by their private entities.<sup>32</sup> Since space law accords states responsibility over their private entities involved in space operations, an even stronger argument can be made to hold a neutral state responsible for the actions of its private entities.<sup>33</sup> In addition, when a state issues a license authorizing a private entity to provide certain services, there can be little argument that the state should be held responsible for the subsequent conduct of the private entity. Accordingly, if a neutral state permits its space systems to be used by a belligerent military, the opposing belligerent would have the right to demand that the neutral state stop doing so. If the neutral state is unwilling or unable to prevent such use by one belligerent, it would seem reasonable to authorize the other belligerent to prevent the offending use. In the context of space systems used in a time of conflict, before resorting to force a belligerent could (or should) demand a neutral nation not to provide satellite imagery, navigation services, or weather information to its adversary.<sup>34</sup>

However, belligerents may have no similar right to limited self-defense in neutral territory when the use of satellite communications systems is involved. Articles 8 and 9 of The Hague Convention V (which notably was concluded in 1907, decades before satellite communications systems were

even envisioned) provide that a neutral state is not required to restrict a belligerent's use of "telegraph or telephone cables or of wireless telegraph apparatus belonging to it or to Companies or private individuals" as long as these facilities are provided impartially to both belligerents.<sup>35</sup> An argument can be made that these Articles would apply to modern-day satellite communications as well, but this remains an open question. In any event, scholars point out that the law of neutrality is heavily influenced by pragmatic factors such as power differentials between the parties to a conflict and nonparticipants; the intensity, time duration, and geographical scope of a conflict; and other available coercion techniques, including economic pressure.<sup>36</sup> There is no reason to believe that the application of the law of neutrality to space uses will be any different.

Military uses of outer space may also be limited by specific disarmament and arms control agreements. In addition to the Outer Space Treaty already discussed, the following merit mention:<sup>37</sup>

- 1 The 1963 Limited Test Ban Treaty prohibits "any nuclear weapon test explosion, or any other nuclear explosion" in the atmosphere, underwater, or in outer space.<sup>38</sup>
- 2 The Biological and Toxins Convention of 1972 and the Chemical Weapons Convention of 1992 prohibit development, production, stockpiling, and acquisition of biological agents, weapons containing toxins, and chemical weapons for hostile purposes.<sup>39</sup>
- 3 The 1980 Environmental Modification Convention prohibits all military or hostile environmental modification techniques that might cause long-lasting, severe, or widespread environmental changes in Earth's atmosphere or outer space.<sup>40</sup>
- 4 A series of bilateral agreements between the United States and the former Soviet Union (now binding on Russia) prohibit interference with early warning systems and NTMs of verification (reconnaissance and communications satellites) to reduce the risk of nuclear war and monitor treaty compliance.<sup>41</sup> Also, these agreements carry additional notification requirements for launches and reentry of unidentified objects from space into the Earth's atmosphere.

The United States is also party to numerous bilateral or multilateral agreements that, although not traditional "arms control" agreements, may restrict space activities by limiting certain activities from being performed in or from the territory of a state. For example, in the US pursuit of a ballistic missile defense system, it is entirely foreseeable that states could impose additional restrictions on US space activities (or use of data therefrom) in exchange for the US right to base ground- or link-segments in that state. The existence of such agreements and potential limitations on space activities thereby imposed should not be ignored in a discussion on national security uses of space.



Satellites require the use of communications links between space and the Earth, both for commanding, controlling, and monitoring them, as well as to get data to and from them. The International Telecommunication Union (ITU), a UN specialized agency which governs the use of the radio frequency spectrum, is therefore important to consider in an examination of national security space operations. The ITU member states, which include the United States, have established a legal regime for the radio frequency spectrum in order to avoid harmful interference among users of the spectrum. This regime is detailed in the ITU Constitution, Convention, and the Radio Regulations and is based on the main guiding principles of efficient use of and equitable access to the radio frequency spectrum and the geostationary satellite orbit (GSO).<sup>42</sup> To meet these goals, the ITU allocates different parts of the radio frequency spectrum to different types of radio communication services, allows member states to allot an assigned spectrum to specific users, and records the resulting frequency assignments and orbital positions. Recognizing the special importance of certain high-demand frequency bands and the GSO, the ITU regulates them slightly differently to allow more equitable access to these limited resources. For national security purposes it is important to note that while the ITU is mainly concerned with radio frequency interference, for many satellites (notably those in the GSO) the ITU also assigns physical slots, and satellites must stay within their assigned physical slots. Notably, although the ITU has no jurisdiction over the use of the spectrum for military purposes,<sup>43</sup> the United States implements ITU rules by domestic law and applies the ITU rules to the military.<sup>44</sup>

### **US domestic law and the regulation of commercial space**

As is evident from the previous review of international law, there are few restrictions on national security space activities at the international level. This section will examine domestic law, including law associated with commercial space activities. In such a brief introductory chapter into the law affecting national security space operations, it would be impossible to discuss all relevant domestic laws. Therefore, we will discuss only some key provisions in this chapter, focusing on those that implement international obligations, those that most impact the competitiveness of the US commercial space industry in the international market, and those that impact international cooperation. In other words, we will focus mainly on those commercial space law provisions that have the greatest impact on national security policy.

In the previous section we introduced the controversial issue of weapons in space. There are no domestic laws that would further prohibit space weapons; however, US policy will drive whether the United States will pursue them in the future. It is important to note, though, that all proposed "space weapons" being considered by the United States are not

This expressed concern was borne out as the early 2000s saw potential satellite customers moving from US companies to foreign companies. In 2003, Arabsat awarded two new satellites to Astrium (a European company) instead of Lockheed Martin, due primarily to fear that export regulations would delay delivery. Similarly, Telesat Canada chose to award the Anik FIR satellite to Astrium.<sup>124</sup> China has successfully marketed its DFH-4 bus to other countries fearing US export policies, including Nigeria and Venezuela.<sup>125</sup> In addition to losing satellite manufacturing opportunities to foreign businesses, the US is also losing launch opportunities. China has launched numerous foreign satellites (including US satellites) from its launch sites.

Restrictive export control regulations may also potentially impact the ability of a commercial company to obtain insurance. The insurance pool for satellite launch and operations consists of a number of multinational underwriters, and there is no single company or underwriter that can underwrite the launch of a satellite. Also, the pool of underwriters available to insure space activities grew smaller after the September 11, 2001 attacks in the United States, because the same pool of insurance underwriters covers both air and space policies. The smaller pool, combined with reluctance from commercial space companies to provide information that might lead to a violation of export control regulations, has made it more difficult to adequately insure commercial space activities.

Clearly, EAR and ITAR, as they implement international export control agreements, could significantly impact US commercial space companies. While these regulations may directly stifle competitiveness of the US commercial space industry in the international market, such restrictions may also ultimately harm national security through reduced international cooperation, resulting in a less effective "engagement strategy."<sup>126</sup> It is not surprising that affected companies would request relief from the regulations in order to prevent economic impacts to their industry. However, the United States must balance the potential harm to national security resulting from proliferation of WMD and sensitive technologies against potential harm to national security resulting from decreased international cooperation and economic harm to US domestic space industry due to export controls.

### **Unresolved issues for possible future international and legal conflict**

From a legal perspective, then, it is clear that space law is very permissive for national security space activities. There are also few or no enforcement mechanisms to punish violators, at least at the international level. Although this legal and regulatory permissiveness is seen as positive for the United States (at least to most of those in the defense community), many in the international community are trying to close these perceived "loopholes" in



international and domestic law. These are areas which are ripe for legal conflict in the future. This section will outline some of these areas.

### *Weaponization of space*

The 2002 withdrawal of the United States from the 1972 Anti-Ballistic Missile (ABM) Treaty<sup>127</sup> and recent US ballistic missile defense efforts have prompted many states and international non-governmental organizations to urge a ban on arms in outer space and/or a strengthening of space law in a new, overarching convention or treaty. The United States opposes these efforts, based on its belief that the "existing multilateral arms control regime adequately protects states' interests in outer space and does not require augmentation."<sup>128</sup> The United States has long refused to consider any negotiations on the creation of a comprehensive space treaty or one on space weapons. Recently, even the United States' closest allies have begun to criticize this refusal even to negotiate.

The United States has pushed space weaponization issues into the Conference on Disarmament (CD), rather than discussing them in the UN Committee on the Peaceful Uses of Outer Space (COPUOS). Two items that have been on the CD agenda for years are efforts toward the prevention of an arms race in outer space (PAROS), which would prevent weapons in space, and the Fissile Material Cutoff Treaty (FMCT). These issues are significant, because the United States has prioritized FMCT while China (with the support of Russia and Canada) has prioritized PAROS, with the result being an impasse in both. Proposals by other nations to break the deadlock over these two issues in the CD have failed.

Despite persistent objection by the United States, on June 28, 2002 China and the Russian Federation (in conjunction with the delegations of Vietnam, Indonesia, Belarus, Zimbabwe, and Syria) submitted a joint working paper titled "Possible Elements for a Future International Agreement on the Prevention of Deployment of Weapons in Outer Space, the Threat or Use of Force against Outer Space Objects."<sup>129</sup> The proposal, based on an earlier Chinese version, contained proposed elements for an international legal agreement to prohibit deployment of weapons in space. It would also generally prohibit the threat of use of force against space objects.

In addition to the repeated PAROS calls for an international convention to ban space weapons outright, there have also been more moderate middle-ground proposals such as those that would encourage unilateral restraint in developing or deploying all or certain types of space weapons, establish a "code of conduct" or "rules for the road," governing behavior in space and the use of weapons in space.<sup>130</sup> Key provisions of one such proposed code of conduct would include rules for

avoiding collisions and dangerous maneuvers in space; creating special caution and safety areas around satellites; developing safer

traffic management practices in space; prohibiting simulated attacks and anti-satellite tests in space; providing reassurance through information exchanges, transparency and notification measures; and adopting more stringent space debris mitigation measures.

Even US allies have begun to call for negotiations on the space weapons issue, if not an outright ban on weapons. For example, on June 30, 2005 the UK Ambassador in Geneva stated

Given the difficulty of verifying or agreeing on further legal treaties, we suggested last year in an informal setting that it might be a good idea to think about adopting "rules of the road" in space, similar to those that already exist at sea. These would not be easy to reach agreement on, but they might have immediate benefits such as reducing the risk of accidental collisions, preventing incidents, and promoting "safe passage" for satellites.

Desiring safety in commercial space operations and a strengthening of commercial space markets, even US commercial entities have entered into preliminary discussions with the US government on the mutual benefit they perceive in adopting such "rules of the road" for space operations, mainly focused in collision avoidance. China's destruction of one of its aging, yet orbiting, satellites by an anti-satellite weapon on January 11, 2007 has further focused international attention on the issue of space weapons. Accordingly, based on these widespread efforts at the national and international levels, and with the involvement of government and commercial entities in the debate, it is obvious that the controversial issue of space weapons will remain in the forefront in the international arena.

#### *Data-sharing and space surveillance*

International and commercial entities have begun to call for increased data-sharing by the United States, particularly for space situation awareness (SSA) in support of collision avoidance. A perception that the United States alone has such data and refuses to share it has spurred some in the international community to propose creation of an alternative space surveillance system to the SSA system. In addition, there have been proposals to create an international space traffic management authority that would rely on internationally created, maintained, or distributed space surveillance data. Again, safety for commercial space operations, as well as safety for national space assets, are concerns behind such proposals for data-sharing and collision avoidance.

Effective November 2004, a new law in the US Defense Authorization Act (Commercial and Foreign Entities or CFE) switched control of the distribution of US space surveillance data, orbital characteristics of spacecraft



and debris, from NASA to Air Force Space Command (AFSPC). In the new legislation (which created CFE as a pilot program), AFSPC, through the CFE Space-Track website, distributes two-line elements (TLEs), satellite catalog messages, satellite decay messages, and most of the miscellaneous messages previously offered by the NASA Orbital Information Group (OIG) website. Although the data is provided with the same latency that was provided by the NASA OIG website for many years, the international community has viewed the switch from NASA to AFSPC control as further restriction on data access by commercial and foreign entities. There was strong reaction from amateur astronomers and scientists whose work depends on this data. In particular, there has been sharp criticism of restrictions on redistribution of data and analyzed data without Secretary of Defense approval, and criticism over the legislated US option to charge for the data in the future. Thus, there has been increasing concern in the international community about dependence upon the United States for such crucial information, as well as increased calls for an international collaborative effort to develop an international space-monitoring and data-distribution capability. As outlined in the previous section, there has even been discussion that such data should be used for some form of international space traffic management authority.

#### *Near-space/high altitude operations*

The term "near space" is not a legal term, since "air" and "space" are the only legally defined regions above the surface of the Earth with legal significance. Rather, "near space" or "high altitude" merely describes a new US Air Force mission area in which it is envisioned that extremely high altitude balloons or aircraft would operate to provide effects similar to those provided by satellites. "Near space" or "high altitude" may be loosely defined as that region above which most military and civilian aircraft are unable to fly, but still below the altitudes at which satellites and other space objects orbit.

There is no defined altitude where "air" ends and "space" begins. In fact, the United States has consistently resisted defining such an altitude, despite international (mainly Russian) proposals to define the boundary as 100 km. In fact, a proposal has been on the UN COPUOS agenda for the past 40 years to define this altitude without resolution, due to US opposition.

However, despite US opposition to defining the exact altitude dividing air from space, it is almost certain that current "near space" or "high altitude" operations being considered by the US Air Force will be governed by "air law" rather than "space law," due to the altitudes and technologies currently being considered. Accordingly, as with any aircraft, overflight by these "near space" technologies over the territory of another nation may be an issue, since air law recognizes sovereignty over a nation's territory.

Balloons and other lighter-than-air craft are defined as "aircraft" under Annex 2 of the Chicago Convention, which governs international air law. Annex 2 defines an aircraft as "[A]ny machine that can derive support in the atmosphere from the reactions of the air other than the reaction of the air against the Earth's surface." Since a balloon or other lighter-than-air craft derives its lift through the displacement of air, it clearly fits within this definition. This is underscored by the fact that Annex 2 promulgates rules of the air for "unmanned free balloons," which are defined as "non-power-driven, unmanned, lighter-than-air aircraft in free flight." That being the case, it would be extraordinarily difficult to contend that these technologies, which would clearly operate as aircraft, are operating in something other than airspace.

### *Property rights, ownership, and resources*

There has been increasing interest in the international community about ownership of the Moon and exploitation of its resources, particularly as private entities consider the potential for the mining of resources in the future. In fact, private citizens and entities have begun to claim ownership of the Moon, purportedly selling acreage there. No state currently recognizes such sales as legal. However, most legal scholars recognize that the outer space property rights debate, including resource exploitation rights, should be addressed.

The basis for the legal debate originates in the terms of the Outer Space Treaty. The plain terms of the treaty only state that the Moon is not subject to claims of sovereignty by states; it does not specifically mention ownership by private parties. The Moon Treaty of 1982, which has not been signed by any space power for a number of reasons, would have explicitly clarified that the Moon and celestial bodies could not be owned by private entities.

It is generally accepted in the international community and among legal scholars, however, that the Outer Space Treaty does prohibit private ownership of the Moon and celestial bodies. First, the prohibition of national appropriation precludes national legislation that would form legal recognition of a private claim. Second, the Outer Space Treaty, by its terms, indicates that activities of a state's private entities are considered national activities for which states bear responsibility.<sup>131</sup> Third, the negotiating history of the Outer Space Treaty indicates that private entities cannot do what states are prohibited from doing. Further, allowing them to do so would defeat the very purposes of the non-appropriation and freedom principles. One thing is clear, that the topic of ownership and exploitation of celestial bodies will be addressed in international forums in the future. It may be that issues such as outer space property rights, which are important to civil and commercial entities, may open the door to future international space law negotiations, despite traditional resistance by the US government



to opening the Pandora's box of unresolved issues that could ultimately restrict national security space activities.

### *Space debris mitigation*

The United States is a major proponent in the international community for debris mitigation measures in outer space. NASA is the official US representative to the Inter-Agency Space Debris Coordination Committee (IADC), whose mitigation guidelines form the basis for US-proposed international debris mitigation guidelines in the UN. The current US position before the UN is that the IADC debris mitigation guidelines should form the basis of voluntary, non-binding international debris mitigation guidelines, with specific exceptions for national security or defense mission accomplishment. US national law (the CSLA specifically), national policy, and DoD policy is to minimize the creation of space debris. These requirements are consistent with the Outer Space Treaty's mandates (in Article IX) that states act with due regard for the interests of other states, "avoid harmful contamination," and engage in international consultation if a space activity could potentially cause harmful interference with the space activities of other states. As it focused international attention on the space weapons issue, the on-orbit space debris created by China's destruction of one of its aging satellites by an anti-satellite weapon on January 11, 2007 has also focused international attention on the space debris mitigation issue.

### **Conclusion**

The legal framework of space law, both at the international and domestic levels, impacts US defense policy. At the international law level, space law is very permissive for national defense activities. Most restrictions on defense space activities come from domestic law and/or policy, although even domestic space law is primarily enabling in nature. There is a strong international movement, however, to have international law impose more restrictions on national security space activities. With the recent international and commercial focus on space weapons and debris mitigation in particular, as well as recent efforts to increase international cooperation on space activities, it remains to be seen whether the law will change to restrict national space activities, or whether the law will remain as permissive as it is today.

### **Notes**

1 The DoD defines "international agreement" more broadly, as:

Any agreement concluded with one or more foreign governments (including their agencies, instrumentalities, or political subdivisions) ... that: Is