

# International Space Law Panel

Discussants: Henry Hertzfeld, Frans von der Dunk, Robert Harding, and Joanne Gabrynowicz

The *Whitehead Journal of Diplomacy and International Relations* attended a panel discussion at the International Law Weekend held at Fordham University on October 24, 2009. We were introduced to experts on the topic of law in outer space and attended a panel discussion highlighting the growing importance of outer space, and how it is becoming the “new frontier” for international law and state interaction. We decided that this would be the most exciting and relevant way to open our very special issue on science and diplomacy because the cooperation and interaction of states over matters not even of this world illustrates the direct effect of science and technology on diplomacy. By holding our own panel discussion here at the Whitehead Journal, we are pleased to present the discussion of international law in outer space!

**Whitehead Journal:** *To begin, can arms be effectively controlled in space? If so, how, and who do you believe should be responsible for this control?*

**Henry Hertzfeld:** The basic answer is no. We cannot control them very well on Earth either. Legally, the only weapons that are specifically prohibited in space are weapons of mass destruction (WMDs). Even those are not defined, but at the time the Space Treaties were drafted the major concern was nuclear weapons. Thus, it should be clear that nuclear weapons are banned, but it is less clear concerning biological and chemical weapons in space. Anything maneuverable in space, even an ordinary telecommunications satellite, could be turned into a weapon if it were positioned to interfere with another space object. Since we have no definition of a weapon in space, it follows that effective control of weapons in space is impossible. There is also a difference between weapons and using space assets for command, communications, and surveillance for military actions terrestrially. This occurs routinely for many space-faring nations and space assets are both an extremely effective means of transmitting information and potentially vulnerable in times of conflicts between states. The nature of the question implies weapons and fighting in outer space. It should also be noted that satellites can be disrupted from terrestrial

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sites in many ways from simple jamming of signals to more egregious actions such as destruction from lasers.

That said, one fundamental principle underlying the Space Treaties is that space should be used for peaceful purposes. For over 50 years this has been a principle that all states have followed, with only a few minor exceptions. For example, when the Chinese destroyed their own weather satellite a few years ago (which was technically not a violation of any treaty), the strong negative reaction of other space-faring states reinforces this underlying principle of not using space for aggressive actions.

Space-faring nations have to take the lead as they have both the most to gain and the most to lose from aggressive activity in space. The natural place to discuss the issues is the UN. From a legal perspective, new initiatives in the law of space begin

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in the legal sub-committee of the UN Committee on Peaceful Uses of Outer Space (COPUOS). However, the UN's Security Council is responsible for dealing with issues of responses to attacks and issues of self-defense. Another UN related venue is the Committee on Disarmament. Neither organization has true enforcement capabilities. Therefore, if arms in space are to be effectively prohibited, it is up to the nations with the capability of using weapons in space to agree through bi-lateral and multi-lateral agreements and/or treaties. Today the number of those nations is relatively small, so such agreements are feasible. If for no other reason, destruction of space assets in space creates debris which makes operations in space less reliable and much more risky for all space-faring nations. It is in the best interests, militarily and economically for any nation with space assets to maximize their use, not their destruction and the ensuing destruction of the space environment.

**Frans von der Dunk:** Strictly speaking of course this is not a matter of law, but of practical, operational, and political dimensions. Then, it depends on what you consider "effectively." Having made those first two caveats, I next wonder whether controlling arms is the best approach to preserving peace and security in outer space, and from outer space towards the Earth.

On one hand, we currently have a few prohibitions on arms in outer space, but all are limited to weapons of mass destruction (WMDs) as per Article IV of the Outer Space Treaty (OST) and the two Test Ban Treaties. The background of these prohibitions is the desire to preclude rash decisions resulting from the fear that actual employment of WMDs comes too close to actual use for comfort, and leaves too little room for something like 'defense' once somebody starts using them. I am of the opinion that for that precise reason, this is an exceptional case where the prohibition of certain arms in itself is appropriate - noting in addition that, strictly speaking, the use of outer space for WMDs, as long as they are not orbiting, is not

excluded.

On the other hand, in general public international law, which is applicable in broad terms to outer space (see Art. III, OST), the focus on efforts to preserve peace and security is much more on the use of force and arms, than on the arms themselves. Again, there are exceptions even beyond WMDs, such as landmines, but the general thrust of the UN Charter is that the use of force is sometimes allowed, even called for, in cases of self-defense, as mandated in the context of the Security Council's responsibilities for international peace and security (read: Iraq post-Kuwait invasion; Afghanistan post-9/11. Of course Iraq post-9/11 is the bad example, legally speaking).

In addition, inevitably, the monitoring of arms in space is more difficult than it is on Earth; only a few states would have the independent capacity to actually control whether a satellite launched contains anything that may be considered a weapon—whilst on the other end, monitoring the use of force is relatively easy, and any satellite crashing into another would result in threats to other space objects of the 'guilty' state just as much as to the space objects of any others (space debris does not discriminate). Therefore, it might be more feasible to focus on guidelines, and hopefully in the future legally binding instruments, to ban inappropriate uses of force in outer space (e.g., other than in clear and unambiguous self-defense or as mandated in a correct manner by the UN).

It should be understood furthermore, that a weapon, even in legal terms, is very difficult to define; and almost any space object, even if launched and used originally for the most peaceful of purposes could be used as a weapon by simply crashing it into another space object (or perhaps even de-orbiting it towards a specific target), just like in the case of 9/11, where normal commercial airplanes were used as weapons. Answers to questions such as, is a navigation satellite precisely guiding a missile to its target part of a weapon system, then become crucial to defining and enforcing space treaties.

If such an approach is taken, I believe that ideally the UN should be responsible for such control. Despite its shortcomings, it still presents us with the only more or less global organization having considerable experience in such issues. The UN should take heed of the special interests and roles of the few major space-faring states—but then, the current structure of the UN in dealing with threats to international peace and security, with a Security Council and five veto-holding powers, has accommodated such special interests as well. A dual structure, by which the UN sets the framework for monitoring and controlling activities, and individual member states are given relevant leeway in determining the details of execution would be the most likely and feasible result from this end.

**Robert Harding:** From the standpoint of understanding the development of space policy as an integral part of the national security policy of any space-capable country, I do not believe that the weaponization of space can be effectively controlled in the short-term or medium-term by current (or perhaps, future) treaties. The challenges

to doing so are both technical and political, the latter being the more salient, in my opinion. If we consider the historical evolution of space policy, despite space's novel physical characteristics, the growth of space programs in general has evolved as just another arena of potential national power and influence by the major space-faring states. The Cold War is replete with examples of the US and Soviet Union, which early on both attempted to capitalize on the "high ground" of space via elaborate surveillance schemes such as the United States' Manned Orbital Laboratory (MOL) and the Soviet Almaz programs. Likewise, both countries emphasized the potential use of space as either a means for the delivery of nuclear weapons or as a possible arena for conflict (such as the Soviet Union did by testing a cannon on the Almaz station).

Given that today modern militaries and intelligence agencies are inexorably dependent on space-based information and communication systems, any national strategy planner worth his or her salt will have considered the vulnerability of national space assets and the ways to eliminate potential rivals' assets in the event of conflict. This is precisely what China demonstrated with its 2007 Anti-Satellite Missile Test (ASAT). Thus, the effective control of the weaponization of space is not part of any current, serious scheme, nor will it be in the near future. If anything, I expect weaponization to accelerate, especially in light of the adopted doctrine of the United States Air Force, which places "counterspace operations" in a heightened place of importance.

**Joanne Gabrynowicz:** This question has many aspects to it: technological, political, and fiscal. I am a lawyer, so I will address it in legal terms. If the question is, can the law be effective in controlling arms in space, then the answer is yes. The law can be crafted to do anything that is legally, morally, and ethically permissible if there is the political will to do so. However, the point is, the answer to the question, can arms be effectively controlled in space is yes, if critical actors want it to be done. In fact, the existence of the Outer Space Treaty itself is proof of this: critical actors wanted an alternative to nuclear war from and in space. It happened.

Now, to address the assumption contained in the question: that weapons should be in space. And, therefore, in need of control. The answer to that assumption is, no. Weapons should not be in space. Prevention is easier and more effective than control.

The nations that have the most to lose by an unstable space environment have the most interest in maintaining that stability. Therefore the major space-faring nations, including the US and Russia, ought to be responsible for keeping space stable, including controlling weapons. Developing nations that aspire to use space for their growing economies and populations, such as China, should also have an interest in maintaining stability.

**Whitehead Journal:** *Building on our first question, we know that the Outer Space Treaty (OST) only prohibits the placement of weapons of mass destruction (WMDs) in orbit and on*

*celestial bodies. Is the weaponization of space inevitable or do you foresee a diplomatic resolution? Does Japan's recent lifting of their ban on military space activities affect your opinion?*

**Joanne Gabrynowicz:** Nothing is inevitable. I posit that any weapon can be successfully prohibited regardless of its technology. Weapons of mass destruction and nuclear weapons were, in fact, banned. After that, banning any weapon is possible. The ban on nuclear weapons and weapons of mass destruction is still solid more than 40 years after it entered into force. Space has been a stable environment for nearly half a century, in large part due to the legal framework that governs it. Russia and the US just concluded a new START Treaty. These are real. These are facts. It is realistic to advocate a ban on other kinds of weapons.

[Japan's lifting of their ban on military space activities] is troubling. However, the Japanese space law that made this change shows that lifting the military ban is not so clear-cut and must also be considered in the context of other Japanese law, including its Constitution. In an article in a recent issue of the *Journal of Space Law* by Professor Setsuko Aoki indicates there is still a lot of legal

detail to work through. She says, "Among the Basic Principles, more attention may be paid to Article 2 regarding peaceful use of outer space, for it shows the change of Japan's long-standing space policy. It provides that, '[S]pace Development and Use shall be carried out in accordance with treaties and other international agreements with regard to Space Development and Use including...[the Outer Space Treaty], in accordance with the pacifism of the Constitution of Japan.' It implies that Japan has adopted the interpretation of 'non-aggressive' use

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as being the peaceful use of outer space in accordance with the Outer Space Treaty, but within the limits of the pacifism reflected in Article 9 of the 1946 Japanese Constitution. Thus, the permissible scope of defensive use of outer space in Japan is narrower in concept than in other space faring nations." (35 J. Space L. 363 at 387.)

Professor Aoki also describes some of the politics that surrounded the new law. (35 J. Space L. 363 at 383.) It shows that there are still significant portions of Japanese politicians who are "adamant to keep the interpretation of 'peaceful' as meaning 'non- military.'" I think we need to see how all of this continues to develop.

**Frans von der Dunk:** Following from the foregoing analysis, I would be surprised if there are not already some space objects which would, or could be viewed as "weapons," certainly in the common parlor-sense of the word, but especially if the potential to do physical harm to other space objects and the potential to crucially support the use of force (navigation and reconnaissance satellites) would be included in any such concept. In other words, I would expect outer space is already weaponized to some extent Therefore, I would direct diplomatic resolutions towards

trying to limit the use of force involving any space objects.

Japan's ban on military space activities to some extent is a logical follow-up to some of the above. Even Japan has the right to self-defense (that was, if I am not mistaken, as per its Constitution, the only justification for developing and maintaining some military forces), and such a right to self-defense would also apply in space. Although further issues would then arise regarding the extent to which the defense in space would be deployed for the defense of Japan itself, as opposed to the defense of its space infrastructure, and whether that would still be incorporated in the concept of self-defense. If I remember correctly, in Japan, as in Germany, which for similar historical reasons had to forego any major military presence in the world or even in their home country—the discussion was also partly triggered by the now customary legal role of the UN and its member states in peacekeeping and peace-enforcement operations, inevitably involving questions of the use of force.

In this light, the Japanese development is part of a broader process around the world. For example, in Europe the classical focus on exclusively peaceful purposes of the European Space Agency and the non-presence of the European Union in areas of defense, military, and security issues is rapidly eroding, with projects such as Galileo, Global Monitoring for Environment Security (GMES), and the Common Foreign and Security Policy.

So yes, by being part of a broader trend, the Japanese development does not favor any call for the de-weaponization of outer space. Although, I do not necessarily see this as a negative development, certainly not if it leads to a more proper understanding of the political and legal mechanisms available for keeping outer space and the Earth as free from conflict as possible and to dedicated efforts to arrive at limitations to the use of force, as indicated above.

**Henry Hertzfeld:** Japan is more concerned than ever about their own self-defense since North Korea, in attempting to reach space, is launching rockets that fly over Japan. Their lifting of the ban does not necessarily imply that they are planning aggressive military actions in space. Japan has a new basic space law, which is general in nature and specific implementation laws are now being drafted. Much of their activity is a political reorganization of the space establishment, but what is somewhat new for Japan is commercial exploration of space and commercial activities in space. Japan has been and is a responsible space-faring nation, and a party to the Outer Space Treaties. All nations recognize the strategic value of space assets; this does not necessarily imply the weaponization of space.

**Robert Harding:** As a reluctant realist, I see Japan's step toward space weaponization as being an inevitable defensive initiative, driven both by its geopolitical situation and as indicative of a broader trend toward more forthright space utilization policies throughout the world. For Japan, its precarious position vis-a-vis North Korea and its cautious view toward China mean that its move toward space weaponization is not unexpected, especially as the United States has quietly

encouraged Tokyo to assume more responsibility for its own defense. In broader terms, I do not see the impetus for adhesion to the OST regime. As long as there is interstate competition, each capable space power will continue to use every available asset at its disposal. I recognize that some would point to previous regimes such as the 1996 Comprehensive Test Ban Treaty or even the OST as examples of a diplomatic resolution. However, the OST worked, in part, because the number of actors was so small, at the time, essentially, two. With the number of capable space actors growing, I would be very cautious about any expectation that they would all join any regime that limited their newly acquired space power.

**Whitehead Journal:** *In June 2010, the Obama administration laid out a new space policy that emphasizes international cooperation as key both for the United States' national security and in maintaining the freedom of space. This policy makes cooperation with others the cornerstone of developing future space policy. This new policy is a dramatic change from those of previous administration, which took a unilateral approach in space in the name of national security. That said, how do you foresee this new policy materializing? What recommendations would you make to the administrations in putting this policy into practice? Additionally, what effect could increased international cooperation in space policy have on other parts of the world, particularly developing and unstable regions? In other words, could enhanced space interaction and capabilities in regions such as the Middle East, Africa, and Latin America foster greater instability and competition, as opposed to the cooperation and security this new policy is aiming to achieve?*

**Henry Hertzfeld:** International cooperation has always been a cornerstone of space policy. Since 1958 there have been over 3,000 agreements (about 500 are presently active) between the US and over 100 foreign states. About two-thirds are related to space science missions. However, just 10 partners, mainly in Europe, Japan, Australia, and Russia, account for over 50 percent of all agreements. Over the past twenty years the development and now the operation of the International Space Station (ISS) is testimony to the longest and most complex international cooperative effort that has ever been negotiated and implemented.

These cooperative programs have incorporated one or more of several key characteristics. First, they were a means to involve our allies in space activities and to develop partnerships in scientific research. Second, they were used to further the peaceful purposes of space, one of the key principles of the UN Space Treaties. Third, they have provided the US with important expertise from other nations. Fourth, they have

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encouraged increased sales of US space equipment and services abroad. For many years in NASA's history, these cooperative programs did not involve direct exchanges of funds.

Cooperation cannot occur without the participating nations also having the ability to compete. In other words, both parties in a cooperative agreement need to have a certain level of expertise and accomplishments in order to benefit from cooperative efforts. Otherwise a cooperative agreement is nothing more than foreign aid—one country giving and the other taking. Cooperation is also expensive. It is rare that a cooperative inter-governmental cooperative program enables something to be accomplished more cheaply than doing it alone.

Cooperation for the United States has also been made more difficult through the enforcement of stricter export control rules applied to space equipment and technologies over the past ten years. There are now two competing regimes: that of international cooperation as called for in the UN treaties on space and the US space policy, and that of the International Traffic in Arms Regulation (ITAR) and other export control regimes that make foreign involvement in even ordinary space research and development much more difficult. These rules apply to NASA and other government space programs almost as rigorously as they do to the private sector.

Given the above statements, carrying out this Administration's goals of expanding our cooperative efforts in space to developing regions with unstable or marginally friendly governments will be very difficult to achieve. It is not parallel to the US-Soviet cooperative programs such as Apollo-Soyuz during the Cold War because in that case two objectives were accomplished: a demonstration of peaceful uses of space and a learning experience on both sides from two accomplished space powers. It is questionable just how much advanced space or other technological capabilities exist in some of the countries being mentioned for new US cooperative space efforts.

This new policy calls for the opening-up of cooperation in many different areas of space activity including, for the first time, space transportation. (The vision of the Bush Administration specifically excluded foreign states from joint research and development efforts in transportation, although it did not preclude the purchase of existing space vehicles and services.) It is difficult to imagine that true cooperative efforts in this area will not run afoul of at least some export control issues. Although there is a provision in the new space policy for reforming export control, most agree that true implementation of those reforms will be a very difficult political accomplishment. So, with that in question, can real changes in international space cooperation occur?

Finally, there is the issue of the true purpose of international cooperation in this space policy. It is well known that the US cannot fulfill all of its space plans and programs without more funding than is currently in the budget. Is the purpose of this new initiative yet another effort to develop additional funding as a substitute for domestic government appropriations? Since additional funds for space is also one of

the major reasons for the encouragement of domestic commercial development of space capabilities, perhaps it also is a compelling reason for expanded foreign cooperation in areas that were formally off-limits.

Historically, we have always cooperated in space with other nations. And, we will continue to do so. However, expanding this to areas of technology that may involve sensitive security concerns has its own obvious problems. And expanding this to nations that either have little to offer in the areas of space capabilities or may be conduits to other nations that are on a prohibited trade list will also be difficult. It is unlikely that the DOD, the State Department, or Congress will approve. And finally, NASA's Charter and mission is

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to advance our space program and to perform research and development; it is not a foreign aid program. Cooperation in space efforts should have a clear relationship to NASA's goals. Other government programs and funding sources are available for meeting different strategic international objectives.

**Joanne Gabrynowicz:** Since 1958, cooperation has always had a prominent place in space policy and law. In the National Aeronautics and Space Act, international cooperation is declared to be a purpose of the national space program. This is foreign policy as well as space law. It is critical to recognize that since the Kennedy Administration, foreign policy—in one form or another—has always been a major driver for civil space. Sometimes the historical forces of the day required that the US compete for foreign policy reasons, sometimes they required cooperation, or some combination of both.

Which of these it was depended on the goal: in the 1960s, the US competed in the Moon race to demonstrate the superiority of US technology and to influence allies and nonaligned nations; in the 1970s, the US and the USSR cooperated in the Apollo-Soyuz Program to implement détente; from the 1980s to the present, the foreign policy rationale for the International Space Station (ISS) has morphed over time as the Cold War receded into history and was replaced by the globalization era. In the 2010s, for some segments of the program, like launch vehicles and services, the new space exploration direction suggests that business decisions are beginning to join the primarily geopolitical decisions that defined the Cold War space program. At the same time, in other activities, like the ISS operations, cooperation and foreign policy will continue to be intertwined. The potential to cooperate in prestigious space activities is a form of soft power that is increasingly effective in the globalization era geopolitical landscape. Cooperation is not necessarily less expensive. In fact, it can

be more expensive. Therefore, by itself, saving money is a poor rationale for cooperation. However, since the days of the one-nation-go-it-alone model of Apollo it has become clear that, moving forward, human and robotic space exploration will be a multinational activity. An important part of cooperation is long-term

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coordination. Implementing coordination can provide leverage for nations with smaller programs and can help identify the substantial contributions that can be made by them that are consistent with their abilities. The number of nations and space agencies that think this is possible is growing. They have established the International Space Exploration Coordination Group (ISECG) and The Global Exploration Strategy: The Framework for Coordination. Extending the life of the ISS to 2020 is a major step in providing a platform (literally) for these

nations to further develop their cooperative and coordinating activities.

Would cooperation foster stability or instability? Like so many of the questions in this discussion, specific contexts are necessary to give a definitive answer. However, when considering the relationship between cooperation and creating stability or instability in a nation or region participating in space cooperation, an important component of cooperation ought be considered: access to, and the opportunity to influence, foreign decision makers. This aspect was demonstrated in the early 1990s, when the USSR was imploding and there was great concern about its scientific personnel and nuclear capabilities migrating to enemy or terrorist nations. The mid-1980s and the early 1990s was also a time when Congressional support for the ISS was questionable and it faced numerous specific votes on whether it ought to be terminated. In 1992, the (George H.W.) Bush Administration revived US-Russia space cooperation and in 1993, the Clinton Administration announced that Russia would be invited to join the ISS as a partner, the goal being to encourage Russia to join the Missile Technology Control Regime (MTCR) and to stop ballistic missile proliferation.

The announcement that Russia would follow the MTCR was made at the same time as the announcement regarding space station cooperation. Space station cooperation enabled the US to access the decision makers in Russia for whom survival of the Russian space program was a priority. Russia joined the MTCR in 1995. After years of cost overruns, broken promises, and political battles, the ISS was built, launched and is now orbiting; Russia is still in the MTCR; and, the US has gained significant operational experience. Considering the ISS result a success, it would still be a mistake to think that what worked with Russia should—or can—be applied to the Middle East, Africa, Latin America, or any other region. These are different countries and regions with different interests, cultures, economies, and

levels of technological capability. Whether or not space cooperation will contribute to stability or instability will depend on these factors. The US, too, will have its own factors to consider: funding, regulatory regimes including the International Traffic in Arms Regulations (ITARs), industrial base needs, and, scientific and engineering goals, among others.

**Whitehead Journal:** *Do aid and technical assistance from major powers such as China, the US, and Europe enable developing countries to develop space capabilities at a faster pace, or do they increase their dependency on foreign superpowers?*

**Frans von der Dunk:** Noting that, of course, this is more of a policy issue than a legal issue, there are basic legal requirements for international cooperation, both in general documents such as the Outer Space Treaty and in particular documents such as the UN Resolution targeting remote sensing. At the same time, the UN Benefits Resolution of 1996 made it abundantly clear that the terms of any particular cooperation agreement would be completely subject to the sovereign consent of the states concerned. In other words: to the extent there was an obligation to cooperate together, this was an obligation of effort, not of result, and no state could be legally blamed if a particular cooperation would not arise. Increasingly, developing states started to realize that the best and most realistic way to profit from space through international cooperation was to bring something to the table as well. In addition to India and China, countries like Vietnam and Algeria (part of the Disaster Monitoring Constellation (DMC)) will start to focus on niche areas to develop some expertise—just like decades ago when the Netherlands developed its niche expertise in solar panels and robotic equipment.

To come back closer to the question, it is obviously a bit of both in principle; perhaps the real question is: what types of cooperation or cooperation projects would be more prone to allow developing countries to develop, and what types would be more prone to increase their dependency? Obviously, doing it on your own comes at a cost, both monetarily and in terms of time, but once you (would) succeed, you (may) reap many benefits from such autonomy, including a political, as well as an economic pay-off.

**Henry Hertzfeld:** There is no clear answer to this question for a number of reasons. First, China is part of what is termed the BRIC countries (Brazil, Russia, India, and China), those developing countries which have the best investment opportunities and which may transition into developed countries. Even though China is often regarded as a developing country in the investment world, it has become a major human space-faring country. It is also now unclear as to whether they have made that transition to a developed country in the traditional understanding. Second, some European states are clearly less developed than others, so speaking of Europe as a whole can be misleading. Third, what types of space capabilities are we talking about? Building and paying for the launch of a cubesat (a small satellite) is very

different from a deep space science probe or a geostationary telecom satellite. But, both are space capabilities as are many underlying research and development efforts and technological innovations.

Aid and technical assistance clearly have helped countries become adept in space technologies. But so have US export controls which have encouraged other countries to build their own capabilities which, arguably, they would not have if they could have purchased those advanced technologies from the US. Nonetheless, developing countries frequently have small domestic markets for space products (with the exception of India and China), and having trade and other ties to developed nations that may provide additional customers for their products.

Finally, space cannot be looked at in isolation. There are many capabilities that transcend space and have other applications. Additionally, political, security, and military technologies are interwoven with space. Nations sell and barter these technologies in response to a wide variety of stimuli; and space tends to be a smaller player in this environment.

**Joanne Gabrynowicz:** The answer to this question requires empirical research and data.<sup>1</sup> I have neither but looking at the question as a lawyer, I will say that they likely do both and whether or not they do, and to what extent, is very context dependent. To address the question, it is useful to separate aid from technical assistance. Aid comes in all forms, including money, debt forgiveness, training, etc. In the case of aid, there are likely to be terms and conditions connected to it that can be crafted to enhance the potential benefits and decrease the potential detriments to the degree that is possible. This will depend on the motives of the donor and the needs of the recipient. This will also depend on the relative bargaining power of the parties. Providing aid, by definition, implies they occupy unequal positions. On the cynical end of the analysis, one could note it is an inherently unequal situation where a Machiavellian donor will take unfair advantage of a weaker recipient. On the other end of the analysis, one could note that it is also a situation that calls for a lot of good faith, high motives, and good intentions. In all likelihood, the reality will be somewhere in the middle.

The difference between Cold War aid and globalization era aid is that with globalization era aid both the donor and the recipient are more likely to have mutual interests. During the Cold War, aid was very often based on convincing nonaligned nations to choose a side: US or USSR. This was the foreign policy force behind the Apollo program. Sometimes, fostering dependency in the recipient was an intentional part of the equation. Globalization era aid is—or ought be—based on the interconnectedness that is at the core of today's nation-state relationships. To work, this kind of aid has to be based on clearly identifying and addressing mutual interests. Space activities along these lines include implementing the Disasters Charter and providing life line telecommunications services.

In regards to technical assistance, another form of aid, it also raises the importance of culture. Technology is a cultural product as well as a scientific or

engineering one. Taking a technology produced solely in one culture and transplanting it into another and expecting it to be adapted in exactly the same way is a mistake. Similarly, thinking a transplanted technology will address a recipient's problem the same way it does in the donor country is also a mistake. To succeed practically and as a foreign policy, both the donor and recipient must take into account the cultural differences that will envelop the technology's transfer and use.

Space law is premised on international cooperation, shared benefits, and recognizing that the exploration and use of outer space should be carried on for the benefit of all peoples irrespective of the degree of their economic or scientific development. These principles were available to forge many Cold War cooperative space activities. They are still available to craft globalization era endeavors that are based on mutually beneficial common interests.

**Robert Harding:** Historically, the knife has cut both ways and in a number of cases, such help has merely been a diplomatic tactic to either curtail or keep track of a developing state's progress. Remembering the intense relationship between missile, nuclear, and space programs, we have seen that early on both the US and Soviet Union utilized assistance in these areas to curry favor from ideological and/or geopolitical partners (such as what the USSR did in early assistance to the Chinese in developing launchers or the US with Brazil during the Atoms for Peace program).

Though the Cold War has long faded, I believe there is ample evidence that this approach is alive and well. For example, while the US gave pre-revolutionary Iran its first research nuclear reactor to entice the Shah, today the US is working just as hard to prevent the development of that same nuclear power (of course, worried that it might be weaponized and loaded on an Intercontinental Ballistic Missile (ICBM)). On the other hand, privileging in space, nuclear, and missile technologies works to encourage as well, as was the case when, under the Clinton Administration, the US gave Brazil a role in producing a component for the International Space Station and denied the same role to China.

Whether such help fosters dependency I believe hinges on the relative strengths of the partners involved. For example, 30 years ago Brazil was still in the midst of economic chaos and while chaffing at US oversight, it had less of a choice. Today, as the world's ninth largest economy, Brazil has demonstrated a dramatically increased sense of independence vis-a-vis the US, such as being the only Latin American country to require visas from US citizens for travel (Cuba is not included in this calculus, for obvious reasons).

**Whitehead Journal:** *What roles do developing countries play regarding various international space treaties? Are they equal players, or are the legal rules of space dominated by countries such as the US?*

**Frans von der Dunk:** Traditionally, there was very often an attitude that space was a rich man's playground, and the developed states only defended their own interests

in keeping ahead of the rest of the world. Hence, they were suspicious of key elements of space law such as the freedom of space activities, the absence of sovereign rights to preclude one's territory from being broadcast into or remote sensed, and rules such as first come first served as they operated in the intent-to-use (ITU) context. It did not keep them from ratifying the first three space treaties in particular in considerable numbers (Outer Space Treaty, Rescue Agreement and Liability Convention were all ratified by 80 states or more altogether, including many developing ones).

Since some of the major developing countries-India, China, and Brazil in particular-started to realize that some of their specific needs, such as overcoming the telecom network gap and creating telemedicine and tele-learning could be served well by their own space venture, this attitude fundamentally shifted, and many other and smaller developing states followed suit. I have the impression that the debate on, for example, the common heritage of mankind principle-the flag of developing states' ambitions to create a kind of global solidarity-is quietly fading from prominence in the international discussions in United Nations Committee on the Peaceful Uses of Outer Space (UNCOPUOS). Whilst their numbers might give them the possibility to push through certain texts, they realize that as long as the major space powers, by now including several of the leading developing nations, do not join, any such text would be of rather limited value also in the real world. However, I find the phenomenon of such states seeking bilateral cooperation outside of the traditional space-faring nations, such as the China-Brazil and the Ukraine-Brazil bilateral treaties most interesting.

Additionally, I would not say the legal rules of space are dominated by specific countries. I think it would be more appropriate to conclude that, in the absence of the traditional (relative) coherence between the space-faring states the chances of arriving at full-fledged treaties of global acceptability have diminished. Perhaps the only exception to that is with the issue of space debris. Instead, states either seek bilateral or multilateral treaties creating direct benefits for all parties concerned (rather than dealing with overarching legal issues in a more legislative manner), or gradually move from non-binding guidelines to a UN resolution to, perhaps in the end, international customary law.

Having said that, obviously it makes a difference in all these contexts whether a major space-faring state (but this no longer is limited to the traditional space powers) agrees on a certain legal issue, or whether it concerns a much smaller state with little or no independent space capabilities.

**Robert Harding:** As has already been noted, the developing countries have largely adhered to the major space treaties. Their actions, again, have largely been predicated on their respective power and alliance positions at the time as well as their own programs and space aspirations.

At the moment, I think it is fair to say that most of the legal rules of space are still influenced and dominated by the major space powers. This is logical in the sense

that they have been the majority users of space thus far and just as has been the case in the international system as a whole, the hegemonic powers typically exert inordinate influence on the system, whether terrestrial or in space.

**Henry Hertzfeld:** First, in the UNCOPUOS there are 69 member states and membership is open to all UN member-states. Therefore, in drafting and interpreting the treaties and resolutions, each state has a voice. COPUOS works under a system of consensus, which helps to level the influence of any particular state or states. It is not just a captive forum for the largest or most powerful space-faring nations.

Second, to date, all nations that own, operate, or launch spacecraft have ratified the Outer Space Treaty, which is viewed as the 

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dominant treaty for space. Most have also ratified the other space treaties (except for the Moon Treaty). Even nations considered by some as rogue nations such as North Korea and Iran have ratified the OST, which legally binds all of the States-Party to abide by the general principles underlying these treaties. These principles include using space for peaceful purposes and the benefit of all peoples, preserving the freedom of all states to use space, agreeing not to use weapons of mass destruction in space, and agreeing not to appropriate the Moon and celestial bodies. The interpretation of some specific provisions of these treaties may differ slightly from nation to nation, but these treaties have been the backbone of public international space law for over 40 years. States that are active in space and have national space laws have incorporated those principles into their legislation.

Of greater importance than the growth of developing countries as space-faring countries in the preservation of the principles behind the treaties is the development of commercial or private space actors. It remains to be seen in the future whether and how developing countries treat private companies within their borders if those companies engage in space activities. So far, the major space-faring powers have developed sophisticated licensing and regulations to insure that private actors in space adhere to the UN treaty principles. Hopefully, new entrants will do the same in the future.

The Space Treaties are not self-enforcing, and each nation is free to implement the details in its own national laws. The most advanced system of space legislation is found in the United States. Russia also has a well-developed set of space laws. Space laws exist in many other countries including the UK, China, South Africa, the Ukraine, Australia, Japan, South Korea, India, France, and Canada. Some of these countries emphasize in their laws the types of space activities that are most prevalent

in their countries. For example, Germany and the UK have specialized in earth observation satellites and their laws have more extensive regulatory provisions concerning the licensing and oversight of remote sensing and data issues.

Often, previously existing space laws in other states heavily influences the legislation. Since states such as the US, France, and Russia have dominated the access to space for many years, their rules and regulations are very important in setting international standards for financial responsibility and for safety. As more countries develop the ability to put payloads in space, they tend to adopt similar rules. But, none are exactly the same.

There are still many parts of space law that are unsettled. International liability is one where the general rules are clearly written in the Liability Convention, but the interpretation of issues such as which state is the Launching State and the State of Registry (both being important for a determination of legal responsibility for spacecraft) can sometimes be unclear. Another area of space law that is often debated involves property rights in space. Even determining where the atmosphere of the earth ends and where space begins has never been legally settled.

International disputes on space matters have most often been settled through diplomatic channels rather than by court decisions. Therefore, judicially determined resolutions to many matters of space law have yet to be developed.

**Joanne Gabrynowicz:** The relative roles of developing and developed states are shifting as regards the space treaties. Historically, there has been a clear dichotomy between developed and developing states as regards to space: developed states were space-farers and developing states were non-space-farers. In recent years factors including a multi-polar geopolitical landscape, decreased technology costs, and increased education levels have caused a shift in the dichotomy. Some developing states are now also space-farers.<sup>2</sup> Nigeria is an excellent example of this. It began operating its first remote sensing satellite, NigeriaSat 1 as part of the Disaster Monitoring Constellation in 2003. Other new space-farers include Algeria and Brazil—and depending on the definition used for developing country—China.

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**THE RELATIVE ROLES OF DEVELOPING AND DEVELOPED STATES ARE SHIFTING AS REGARDS THE SPACE TREATIES. HISTORICALLY, THERE HAS BEEN A CLEAR DICHOTOMY BETWEEN DEVELOPED AND DEVELOPING STATES AS REGARDS TO SPACE: DEVELOPED STATES WERE SPACE-FARERS AND DEVELOPING STATES WERE NON-SPACE-FARERS.**

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No matter what the size or degree of capability of a satellite, once a country has one in orbit two legal issues are raised: ought the country become a State-Party to the various space treaties and ought it promulgate a national space law? The trend is

that newly active space-farers choose to join the treaty regime and explore the options for national space laws. Another trend is for developing country/space-farers to participate in bilateral and multilateral activities and institutions that are resulting in a new generation of agreements. Examples of these include the Disasters Charter and the Disaster Monitoring Constellation; the China-Brazil Earth Resources Satellite program; and the Asian Pacific Space Cooperation Organization. Finally, there is a little noticed, but important trend of universities around the world launching small scientific satellites on launch vehicles from major space-faring countries that are State-Parties to the treaties. In order to meet the supervisory obligations of the Outer Space Treaty, the State-Party requires the universities to sign statements that their satellites are for peaceful purposes. This includes countries like Colombia. Over time, it can be expected that these trends will add to and modify the corpus of international space law, including the treaties.

Referring to the question of equality in setting law, once again, this question begs another question: equality in reference to what? If one is considering economic, technological, or military strength, of course they are not equal. However, the fundamental aspect of the legal fiction we call sovereignty bestows equality of status to all countries. It is this equality that gives rise to the right of all<sup>3</sup> countries to participate in the international fora in which multilateral space treaties are made and to engage in rule making through the consensus process. The US and the USSR were the dominant actors in the early days of space treaty making. Nonetheless, all countries—developed and developing—were motivated by the urgency of limiting the US-USSR Cold War rivalry from extending into space. So they generally agreed with the emerging rules. In later years as experience and understanding of space activities grew—and as a few of them like satellite telecommunications—also became lucrative commercial activities, the superior economic, technological, or military strength of the developed countries, including the United States, did come to exert disproportionate influence on rule making.

It is important here to address both quantitative and qualitative influence. In general terms, advanced spacefarers exert qualitative influence. The quality of their influence is strength: economically, technologically, or militarily. In the consensus system used in the UN and elsewhere, disproportionate strength is counterbalanced by quantitative influence: sheer numbers. There are many more non-space-faring nations than there are spacefarers. They act strategically and create blocs based on their shared interests. An example of this is the Group of 77 (G-77) that was so active in the 1970s and exists today as a formal intergovernmental organization. This quantitative influence often affects the decisions and positions of the fewer, stronger countries. An example of this is found in remote sensing law. In 1984, the US wanted to commercialize its Landsat system but did not establish solely unilateral terms to do so because of agreements made regarding the nondiscriminatory access policy<sup>4</sup> in UN COPUOS.<sup>5</sup>

**Whitehead Journal:** *Given the considerable technological advancements this generation has seen,*

*do you foresee, or are there currently underway, any major technological advancements that could alter the way that governments view and conceptualize space?*

**Robert Harding:** I believe the most important technological advancement that may come to affect governments' view of space is the increasing commercialization of space because of the rapid improvement and reduction of cost of launch technology. Though I do not believe that nation-states have any serious competition in space from private commercial ventures in this generation, I can envision private enterprise assuming at least some of the lift capacity that now lies solely in the hands of nation-states. As such, just as private enterprise and production of critical goods has advantages and disadvantages (for example, electricity production) in terms of cost vs. access, the same challenge could manifest itself in space by the mid-21st century.

**Frans von der Dunk:** As a lawyer, it is somewhat risky to predict the technological future, but I would direct people to look out for new technological developments, or even the application and technology demonstration of technology already being developed, in private manned spaceflight. With a number of serious plans now nearing realization, I would find it unlikely if none of them would succeed, and, barring a major accident or series of accidents in the early stages, would thus immensely bring down the cost of going into, at the very least, sub-orbital space. If this is going to happen, we will certainly see a reappraisal by governments of the role private entrepreneurship should play in the overall space adventure. In fact, to a certain extent that is already happening, with the US following NASA COTS (commercial orbital transportation service) programs, the new Obama space policy, and even the US military is increasingly using private service providers. In Europe, the increasing dominance of the EU in the spacescape might also soon have the effect of generating more serious interest in space transportation at the private level. As a matter of fact, the UK's Virgin Galactic's second launch venue will be Kiruna in Sweden, and a Dutch consortium is aiming for a first commercial manned spaceflight from the Dutch Antilles by 2014. At the same time, the European Aeronautic Defense and Space Company, (EADS) is considering building vehicles for such purposes, and Scotland, Catalonia, and the Montpellier-region have all started to think about such adventures as well. EASA, the European Aviation Safety Administration, as a consequence is now becoming interested in some of the regulatory safety issues involved.

The main barrier here would be the leap from sub-orbital hops to sub-orbital transportation (from New York to Tokyo in 2 hours) and then to truly orbital or deep-space flight. Again, I am not a technician, but I understand that a quantum leap would be required in terms of lift-off velocity and, consequently, power. Nevertheless, if sub-orbital spaceflight takes off as suggested above, soon some brilliant private engineer might be able to achieve this next quantum leap. After all, how many people took the X prize serious, when announced in 1996, or expected a

Burt Rutan to come up with his revolutionary approaches at that time?

**Whitehead Journal:** *Finally, do you see space law and policy playing a bigger role in international relations in the near future, maintaining the same level of importance that it currently has, or even declining?*

**Robert Harding:** I would say the answer to this question is largely dependent on the structure of the international system in the near future. One of the popular current debates is whether China's rise as a world power will bring about concurrent changes in international institutions and norms to solidify and/or further China's dominance (similar to what occurred with Britain in the 19th century and the US in the 20th century). I foresee a continuance of agreements for satellite placement, overflights, and other similar practical treaties to continue for the near future. What may come under pressure for change are the earlier, and perhaps more visionary, treaties such as the Moon Treaty, which in practice is already a failed treaty since it has not been ratified by major space powers with launch capacity.

**Frans von der Dunk:** As for the international level, generally speaking there seems to be an inverse correlation between international tension on the one hand, and the need to work together and be prepared to arrive at legal agreements on the other hand; from this end I think the latest changes in the US administration and in the US space policy are certainly hopeful. Also, the realization that the laws of physics will, to a certain extent, force everyone concerned to arrive at legal or quasi-legal solutions, after all, space debris does not discriminate and may harm anyone active on outer space, is dawning on many, I think, including even the Chinese. As long as that evaluation holds true, we will therefore see a welcome development of international space law, even though likely not along the lines of widely-ratified international treaties, but more along the lines of ad hoc and bilateral, or even multilateral arrangements between like-minded states, rules of the road which may eventually develop into customary law or even the development of customary international law on its own accord.

As for the national level, we will definitely continue to see a lot of growth. As long as governments remain fully responsible and liable under international treaties, the increasing and unlikely-to-be-stopped involvement of private enterprise in outer space activities (such as the areas addressed in the question above, but also in areas such as satcoms, satellite remote sensing and unmanned space transportation) will almost inevitably lead to more and more detailed regulation at the national level of such activities. In some areas, including satcoms, this has already happened to some extent. This can be seen with the 1997 WTO Agreement to Liberalize Basic Telecoms Services, which included many satellite services as starting point. This will then also very likely lead to international regimes trying to harmonize national regimes on these issues, provide for mutual recognition systems regarding certain licenses and trying to preclude 'flags of convenience' types of situations from arising.

Generally speaking I think the future for space lawyers is quite bright!

### Notes

<sup>1</sup>It also raises important definitional issues. China commonly refers to itself as a “developing” nation. There is also important scholarship that is beyond the scope of this discussion but requires mentioning because it indicates that in the globalization era economy the very terms “developed nation” and “developing nation” are now anachronistic.

<sup>2</sup>The definition of “spacefarer” is a subject of debate within the space community. Some say that it means a nation must have an indigenous launch capability. However, this definition excludes significant space actors like Canada that has a robust space program and is a partner in the International Space Station, but has no indigenous launch capability. Others argue having a threshold capability like a data receiving station makes a nation a “spacefarer.” For the purposes of this discussion, the term is used flexibly and includes nations without their own launch capability but with other significant capabilities like designing, building and operating on-orbit satellites.

<sup>3</sup>To be more accurate: potentially all nations can participate. When UNCOPUOS was established it had 18 members. Today there are 69. The exact number in any given year has been the result of political negotiation based on many geopolitical factors that change over the years.

<sup>4</sup>See United Nations Principles Relating to Remote Sensing of the Earth from Space, GA Res. 41/65 (XLII), UN GAOR, 29 Sess., 95th Plen. Mtg., UN Doc A/RES/41/65 (1987), Principle XII.

<sup>5</sup>See H.R. Rep. No. 98-647, 98th Cong., 2d Sess. (1984) at 11.