SOME LEGAL CONSIDERATIONS REGARDING THE FUTURE OF SPACE GOVERNANCE

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INTRODUCTION

I'd like to thank the Dean Rusk International Law Center at the University of Georgia School of Law for the honor of inviting me to be today's keynote speaker. I am in a room with a lot of colleagues who could just as well be the keynote speaker. So being invited to be the keynote speaker here today in the presence of my esteemed colleagues is a double honor.

GOVERNANCE, NOT GOVERNMENT

Today, we're going to talk about governance, and it is important to note that we are not going to talk about government. We are talking about governance. International governance systems have been developing and evolving since the end of World War II. There is nothing like a world war and almost total destruction of most of the planet to provide incentives to revise things. What we see at the end of World War II is the emergence of new kinds of institutions and practices to govern activities that occur across international borders, but which are still under the authority of sovereign nations. One example that is relevant to space activities is the International Civil Aviation Organization (ICAO),[1] which is an aviation organization, and which also provides a model for other international activities.

Another important example is the International Telecommunications Union (ITU).[2] It was founded in 1865 and predates World War II by many years. It was established to facilitate international connectivity in communications

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[1] *See About ICAO*, INT'L CIVIL AVIATION ORG., https://www.icao.int/about-icao/Pages/default.aspx (last visited Mar. 28, 2020).

[2] *See About ITU*, INT'L TELECOMM. UNION, https://www.itu.int/en/about/Pages/default.aspx (last visited Mar. 28, 2020).

networks. After World War II, its work was expanded to allocate global radio spectrum and satellite orbits.

In later years, intergovernmental consortia were developed for various space activities and some of them were turned into commercial service providers. These include Eutelsat,[3] a European-based communications provider; Intelsat,[4] a global satellite communications provider; and, SES,[5] a satellite-based video and network provider, for example.

All of these entities demonstrate that governance across international borders is an idea that's been around for a while. What's happening today is this idea is now being considered in many, many more ways. This presentation is broken down in terms of some things to consider now and some things to consider for the short, medium, and long term.

COLD WAR ROOTS

Space and space law have Cold War roots, and from that Cold War context there is a treaty regime that codifies important legal principles but allows national governments to regulate the details. Of course, there are exceptions to this governance structure, and these exceptions are what we are dealing with now at the beginning of the twenty-first century. A lot of what has developed since the Cold War has been driven by applications—that is, how space is used. These applications include telecommunications, launch capability, remote sensing, Earth observations, and navigation. Because all of these things are critical for both civil society and national security purposes, the policy and law needed to address them can present many challenges.

Further, because these activities are largely regulated at the national level, national laws and regulations are going to promote and embody national values. As the elements of international governance are being developed, the current focus is on identifying and bringing together those national values as international commitments. The first thing to look at is the *International Space Station* (ISS)[6] and the agreement that governs it: the ISS International Governmental Agreement (IGA).[7]

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[3] *See About Eutelsat*, EUTELSAT, https://www.eutelsat.com/en/group/about-us.html (last visited Mar. 28, 2020).

[4] *See Overview,* INTELSAT, http://www.intelsat.com/about-us/overview/ (last visited Mar. 28, 2020).

[5] *See About Us*, SES, https://www.ses.com/about-us (last visited Mar. 28, 2020).

[6] *Partners Sign ISS Agreements*, NAT'L AERONAUTICS & SPACE ADMIN. (Oct. 23, 2010), https://www.nasa.gov/mission_pages/station/structure/elements/partners_agreement.html.

[7] Agreement Among the Government of Canada, Governments of Member States of the European Space Agency, the Government of Japan, the Government of the Russian Federation, and the Government of the United States of America Concerning Cooperation on the Civil International Space Station, Jan. 29, 1998, T.I.A.S. No. 12927 [hereinafter ISS International Government Agreement].

CONSIDERATIONS FOR NOW

The IGA is the definition of a successful governance agreement. It is a multilateral agreement consisting of fifteen nations, has had three iterations, and has been in force for thirty-one years. Industry and Congress are looking at the IGA now as a practical precedent for some future governance attributes.[8]

THE *INTERNATIONAL SPACE STATION* AND THE ISS INTERNATIONAL GOVERNMENTAL AGREEMENT (IGA)

A funny thing happened on the way to the space station: the Cold War ended. What had originally been announced by President Reagan in his 1984 State of the Union Address[9] as a cooperative project that would be accomplished by the United States and its allies ultimately included the successor of its Cold War adversary. In 1984 the adversary was the Soviet Union. The Soviet Union voted itself out of existence in 1991[10] and it became Russia.[11] They became Russians and for a variety of U.S. foreign policy reasons, they were brought into the IGA.

The IGA is arguably one of the most successful, underappreciated pieces of space law that there is. It governs the partners' cooperation regarding the space station and what happens on the space station. It addresses the design, development, operation, and use of a permanently inhabited civil international station for peaceful purposes.[12] It contains four important bodies of law: jurisdiction, intellectual property, torts, and criminal jurisdiction.

Another important part of the space station agreement—and a fundamental reason why it works—is the very broad cross waivers of liability it codifies.[13] At the time, it was recognized that no one had ever attempted and accomplished an *ISS* before, and to a very large degree, a lot of it was experimental.

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[8] *See, e.g.*, *Hearing: A Review of NASA's Plans for the International Space Station and Future Activities in Low Earth Orbit Before the Subcomm. on Space and Aeronautics*, 116th Cong. 3–4 (2019) (statement of Joanne Irene Gabrynowicz, Professor, Emerita, University of Mississippi), https://docs.house.gov/meetings/SY/SY16/20190710/109738/HHRG-116-SY16-Wstate-GabrynowiczP-20190710.pdf.

[9] *See Excerpt of President Reagan's State of the Union Address, 25 January 1984*, NAT'L AERONAUTICS & SPACE ADMIN. (Aug. 24, 2007), https://history.nasa.gov/printFriendly/reagan84.htm.

[10] Svetlana Savranskaya & Thomas Blanton, *The End of the Soviet Union 1991*, NAT'L SEC. ARCHIVE (Dec. 25, 2016), https://nsarchive.gwu.edu/briefing-book/russia-programs/2016-12-25/end-soviet-union-1991.

[11] *See The World Factbook: Russia*, CENT. INTELLIGENCE AGENCY (Mar. 16, 2020), https://www.cia.gov/library/publications/the-world-factbook/geos/rs.html

[12] ISS International Government Agreement, *supra* note 7, at art. 2, art. 8, art. 22.

[13] *Id.* at 11–13.

If the partners were going to sue one another, it would just get in the way of learning how to use the *ISS*. Accordingly, it was agreed that the IGA would include broad cross waivers of liability.[14]

SHORT AND NEAR-TERM CONSIDERATIONS

WHERE DOES SPACE BEGIN?

One important consideration regarding space governance is the question of where does space begin? Does that question have to be answered in order to be able to define governance and governance systems? This question has been on the agenda of the U.N. Committee on the Peaceful Uses of Outer Space Legal Subcommittee for over thirty-five years.[15] This provides some insight into how contentious this question can be. The contention arises from the fact that there is no sovereignty in space. Sovereignty is not the legal organizing principle in space as it is on Earth and in airspace.[16]

Regarding formally identifying where space begins, some nations say this question must be answered because it will facilitate more efficient space governance. Therefore, an upper limit to sovereignty is needed. Other nations say a formal delimitation between air and space is unnecessary because everything is working well now. Further, a formal upper limit to sovereignty is also unwarranted. There is also a third point of view that attempts to answer the delimitation question but only for scientific purposes. This view proposes using the Kármán line[17] as the boundary between air and space. This third position relies on being able to separate science from politics. The Kármán line is at one hundred kilometers, or sixty-two miles, above sea level.[18] It is based on a calculation by the late physicist Theodore von Kármán. The calculation demonstrates that at one hundred kilometers the atmosphere becomes too thin to support air flight.[19]

These arguments will continue to be made. However, there may be some possible movement on the Earth that might eventually be used to identify an emerging practice, if not a clear definition. At the national level, some nation-states are beginning at to at least "flirt" with the possibility of identifying

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[14] *Id.*

[15] *Working Group of the Definition and Delimitation of Outer Space of the Legal Subcommittee,* UNITED NATIONS OFFICE FOR OUTER SPACE AFFAIRS, https://www.unoosa.org/oosa/en/ourwork/copuos/lsc/ddos/index.html (last visited Mar. 28, 2020).

[16] *See* Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies, art. I & II, Jan. 27, 1967, 18 U.S.T. 2410 [hereinafter Outer Space Treaty].

[17] *See Where Is Space?*, NAT'L OCEANIC & ATMOSPHERIC ADMIN. (Feb. 22, 2016), https://www.nesdis.noaa.gov/content/where-space.

[18] *Id.*

[19] *Id.*

where space begins but for different reasons. Australia defines a "space object" as something that goes to or from beyond one hundred kilometers above sea level.[20] Denmark defines "outer space" as above one hundred kilometers, or 62 miles, above sea level.[21] The Colombian Constitution defines its "territory" as extending all the way up to the arc in the geosynchronous orbit[22] that is at 35,786 kilometers, or 22,236 miles, above the Earth's equator.

The official national position of the United States is that "defining or delimiting outer space is not necessary . . . because [n]o legal or practical problems have arisen in the absence of such a definition."[23] However, it is interesting to note that under U.S. federal tax law and the tax law and policy of some states, accountants are figuring out where space is for tax purposes. Under U.S. federal law, space is any area not within U.S. jurisdiction.[24] In California, a bill was introduced to identify "space" as sixty-two miles or more above the Earth's surface.[25] New Mexico has a tax policy that defines "space" as any location beyond 6,000 feet above the sea level.[26]

Very recently, the U.S. established space as "an independent region overseen by a new unified, geographic combatant command . . ." which begins at "100 kilometers above sea level to . . . infinity."[27]

Whether or not, or when, behavior rises to the level of custom is a complex question that involves a variety of legal and political forces. For the foreseeable future it will be worthwhile keeping track of activities and national definitions that address where space begins.

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[20] *Space Activities Act 1998* (Cth) pt 2 s 8 (Austl.).

[21] Outer Space Act Lov nr. 409 af 11.05.2016, p. 2.4.4 (Denmark) ("'Outer space' means: [s]pace above the altitude of 100km above sea level.").

[22] CONSTITUCIÒN POLÍTICA DE COLOMBIA [C.P.], art. 101 (defining part of Colombian territory as "the segment of the geostationary orbit, the electromagnetic spectrum and the space where it applies, in accordance with international law or the laws of Colombia in the absence of international regulations.").

[23] U.S. Statement, Definition and Delimitation of Outer Space and the Character and Utilization of the Geostationary Orbit, Legal Subcommittee of the United Nations Committee on the Peaceful Uses of Outer Space at its 40th Session in Vienna from April, 2001, *available at* https://2009-2017.state.gov/s/l/22718.htm.

[24] 26 C.F.R § 1.863-8 (2006).

[25] A.B. 1878, Gen. Assemb., Reg. Sess. (Cal. 2018), http://leginfo.legislature.ca.gov/faces/billTextClient.xhtml?bill_id=201720180AB1878.

[26] *Spaceport-Related Activities Gross Receipts Tax Deductions,* N.M. ECON. DEV. OFFICE, https://gonm.biz/why-new-mexico/competitive-business-climate/incentives/space-gross-receipts-tax-deductions (last visited Mar. 29, 2020).

[27] Theresa Hitchens, *SPACECOM to Write New Ops War Plan: 100km and Up*, BREAKING DEF. (Sept. 16, 2019), https://breakingdefense.com/2019/09/spacecom-to-write-new-ops-war-plan-100km-and-up/.

IS LEO AND MEO LIKE GEO?

The next consideration is whether low Earth orbit (LEO) and medium Earth orbit (MEO) will be treated like geosynchronous orbit (GEO)? GEO has been regulated at both the national and international levels for a long time. This is because in order to operate, telecommunications satellites are placed in GEO. Telecommunications was the first highly lucrative commercial space activity and continues to be highly lucrative today. Balancing the laws of physics with technological advances made it in all nations' interests to regulate GEO so it could be used efficiently, effectively, and equitably.[28]

Increasingly, LEO and MEO are being used to place more and more space objects for more and more applications. Technology is advancing so quickly that the ability to place objects in space has risen dramatically. Plans to commercialize LEO and the *ISS*[29] include activities that will increase the placement of space objects in orbit, which will consequently increase space traffic. As a result, the question arises as to if—and how—LEO is to be regulated. Will the current practice of complying with the treaty regime by regulating space-based activities at the national level be adequate to address the increase in space traffic? Or will it become necessary to delegate legal authority to an international coordination entity? Should this be the case, the international coordination entity would be analogous to the ones that regulate GEO orbital slots, radio spectrum, and aircraft. Liability and space situational awareness, which involves tracking space objects and predicting where they will be at any specific point in time, are highly relevant to these questions.

LEO and MEO governance raises the very question of whether or not an orbit is a resource itself. Issues change over time depending on technological development, but the argument that some orbits are scarce resources and therefore need to be regulated has been a part of space law debates since the 1960s. The ISS IGA recognizes that extended orbital use can present questions of resource appropriation. The *ISS* was intended to be a permanent space-based facility and it was going to be in the same orbit all that time. Therefore, the IGA provides that, "[n]othing in the [IGA] shall be interpreted as . . . a basis for asserting a claim to national appropriation."[30]

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[28] The extremely politicized environments of the various regulatory bodies often make these goals nearly impossible to achieve. That is large and complicated discussion that is beyond the scope of this talk.

[29] NAT'L AERONAUTICS & SPACE ADMIN., NASA PLAN FOR COMMERCIAL LEO DEVELOPMENT: SUMMARY AND NEAR-TERM IMPLEMENTATION PLANS (2019), https://www.nasa.gov/sites/default/files/atoms/files/commleodevt_plan_6-7-19_final1.pdf.

[30] ISS International Government Agreement, *supra* note 7, at art. 2.

MEDIUM TO LONG-TERM CONSIDERATIONS

HUMAN EXPLORATION AND RESOURCE EXPLOITATION

Exploring and using space is a very difficult—and expensive—task to undertake. For example, the only two companies founded specifically to conduct asteroid mining are out of business.[31] However, their brief existences were sufficient to catalyze a number of legal responses to the idea. Two responses were at the national level and one response was at the international level.

At the national level, domestic law regarding extracted space resources was promulgated in Luxembourg[32] and the United States.[33] Together, they present two different ways of looking at space resource extraction at the national level. Luxembourg law recognizes that extracted resources can be property. Their analog is extracting fish from the high seas on Earth. Once the fish are extracted, they acquire the status of property. The ocean can't be owned, but what is pulled out of it can be. Luxembourg also favors an approach that promotes individual rights with the collective interests of humankind. Luxembourg therefore strongly supports a multilateral approach to codifying a status to extracted space resources. It has cooperation agreements with a number of countries, including China. The U.S. position is similar to Luxembourg's in that U.S. law also recognizes that extracted space resources can be property.[34] However, unlike Luxembourg's position, there is no mention of a multilateral approach.

The U.S. and Luxembourg signed a space cooperation agreement, followed by an agreement between NASA and the Luxembourg Space Agency. The agreements address a variety of space activities including the utilization of space resources.[35]

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[31] Alan Boyle, *Bradford Space Group Buys Deep Space Industries, Shifting Focus from Asteroid Mining to Propulsion*, GEEKWIRE (Jan. 2, 2019), https://www.geekwire.com/2019/bradford-buys-deep-space-industries-shifting-focus-asteroid-mining-green-propulsion/; Alan Boyle, *Financially Strapped Planetary Resources Gets Set to Auction off Equipment at HQ*, GEEKWIRE (Aug. 7, 2018), https://www.geekwire.com/2018/planetary-resources-auction/.

[32] *See* Loi du 20 juillet 2017 sur l'exploration et l'utilisation des ressources de l'espace [Law of July 20, 2017 on the Exploration and Use of Space Resources], Mémorial A, n° 674, July 28th, 2017, art. 1 (Lux.).

[33] *See* U.S. Commercial Space Launch Competitiveness Act, Pub. L. No. 114-90, 129 Stat. 704 (2015) (codified at 51 U.S.C. § 51303).

[34] *Id.*

[35] Jeff Foust, *Luxembourg Extends Space Resources Work Through New Agreements with NASA and ESA*, SPACE NEWS (Oct. 23, 2019), https://spacenews.com/luxembourg-extends-space-resources-work-through-new-agreements-with-nasa-and-esa/.

At the international level, The Hague International Space Resources Governance Working Group was established.[36] It consists of representatives from government, civil society, industry, and academia. It was established to assess the need for a space resource governance framework. The group adopted the Building Blocks for the Development of an International Framework on Space Resource Activities.[37]

It can be expected that the legal status of extracted space resources will continue to develop over time.

LONG-TERM CONSIDERATIONS

HUMAN SETTLEMENT

Quoting Winston Churchill is appropriate here: "The further back where you look, the further forward you can see."[38] So it is worth taking a look at some historical models on Earth. This is a very long-term consideration, but the question of what law will apply to humans settling on Mars or on another celestial body somewhere certainly arises. Based on human history, what can be expected is that humans will take the law they know from the place they came; however, this body of law will not address everything that needs addressing. Humans will then begin to write their own law based on local needs and experience. The new, local law will be a combination of both bodies of law.

This can be seen in a number of historical migration epochs: the European migration to North America and the migration to Australia from England. Granted, those involved in the Australian migration were initially sent to Australia as convicted criminals; they didn't have a choice as to what law would apply, but they worked out the law once they got there. Regarding the Europeans who came to the North America, the Mayflower Compact is an excellent example of drawing on the law of their homeland to create new law as necessary.

When the people on the *Mayflower* arrived in North America, they had a patent—legal permission to settle—from the King that was applicable to what is now the modern-day Virginia area in the United States. But they had gotten

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[36] *See The Hague International Space Resources Working* Group, UNIVERSITEIT LEIDEN, https://www.universiteitleiden.nl/en/law/institute-of-public-law/institute-of-air-space-law/the-hague-space-resources-governance-working-group (last visited Mar. 29, 2020).

[37] Press Release, The Hague Int'l Working Grp., Adoption of the Building Blocks for the Development of an International Framework on Space Resource Activities (Nov. 29, 2019), https://www.universiteitleiden.nl/binaries/content/assets/rechtsgeleerdheid/instituut-voor-publiekrecht/lucht—en-ruimterecht/space-resources/press-release_hague-working-group.pdf.

[38] WINSTON CHURCHILL, CHURCHILL BY HIMSELF 577 (Richard M. Langworth ed., 2008).

lost en route and on the eve of winter they were in what is now modern-day Massachusetts. They knew they had to get off the ship to survive. They also recognized that they had no legal right to land in this area. They only had a legal right to land where the King said they could land. To solve this problem, they drafted the Mayflower Compact: they needed to have law and governance for what they were about to do and where they were about to settle. So, they wrote the law to meet their needs where they were but drew heavily on the law from where they came. The same pattern can be expected in human space settlements.

LEGAL EVOLUTION

CURRENTLY, THERE ARE MORE QUESTIONS THAN ANSWERS

There are many more questions regarding space governance than there are answers. The questions include what should be governed at the national level and what should be governed at the global level. Just like many other political issues, space politics is currently sharply divided by ideologies. The space community is like many other communities: it has its internationalists and its nationalists. There is an increasing focus on national law, norms, best practices, and soft law. There is also the recognition that existing law is applicable. With this recognition comes the question of how existing law will be developed to meet the needs of space governance.

Legal development depends on political will. At this point in time, there is little or no political will for new formal treaties. This is true not just in space, but in nearly every major issue, whether it's the environment, trade, or any other international issue. Modern treaty-making is seen by some as being too formal, too binding, and too unresponsive to the human experience in the twenty-first century. Instead of treaties, international governance is trending towards creating non-binding instruments. Since the end of World War II, there has been a proliferation of memoranda of understanding, declarations, principles, guidelines, charters, codes of practice, terms of reference, and more. They are becoming an alternative to treaties, and a majority of the cooperative agreements that are evolving tend to be bilateral agreements.

Within the overall trend of non-binding instruments as an alternative to formal treaties, there is a space-specific trend. The Inter-Agency Space Debris Coordination Committee has established space debris mitigation guidelines[39] and terms of reference.[40] The International Charter Space and Major

[39] INTER-AGENCY SPACE DEBRIS COORDINATION COMM. [IADC], IADC SPACE DEBRIS MITIGATION GUIDELINES (2007), https://orbitaldebris.jsc.nasa.gov/library/iadc_mitigation_guidelines_rev_1_sep07.pdf.

[40] INTER-AGENCY SPACE DEBRIS COORDINATION COMM. [IADC], TERMS OF REFERENCE FOR THE INTER-AGENCY SPACE DEBRIS COORDINATION COMMITTEE (1997), https://aerospace.org/sites/default/files/policy_archives/TOR%20for%20Inter-Agency%20Space%20Deb

Disasters[41] has been providing satellite data to those affected by natural or human-made disasters since 2000. There are codes of conduct against ballistic missile proliferation[42] and on the safety and security of radioactive sources.[43]

This might be a period in human history that is analogous to the 1400s, 1500s, and 1600s. The 1400s, 1500s, and 1600s marked the period in which the nation-state system and the modern treaty first emerged. It may be that 150 years from now, space law professors are going to recognize the end of the twentieth and the beginning of the twenty-first century as the period during which the new "such-and-such" system emerged.

Regarding evolving space governance, one option is no governance. This is likely for the foreseeable future. This approach could benefit early arrivals to space at the expense of those who arrive later. Fortunately, space law already recognizes and addresses this situation. In some cases, the benefits of early arrival are mitigated in order to preserve access to those benefits for later arrivals. For example, the Outer Space Treaty codifies the *res communis* principle[44] and the principle of nonexclusive rights,[45] both of which eliminate part of the incentive to arrive first.

Another possibility is common governance. Historically, the argument against common governance has been captured in Garrett Hardin's *Tragedy of the Commons*.[46] The "tragedy" is if a common resource is available to everybody, there exists little incentive to take care of the resource, thus reducing the value of the resource. Elinor Ostrom, who was awarded the 2009 Nobel Prize for economics, refuted that idea.[47] She found that primarily economic management requirements could be successful in managing a commons, which would sustain the value of the commons. Her work raises the possibility of refuting the tragedy of the commons and supports applying common governance principles to space.

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ris%20Coordination%20Committee.pdf.

[41] *About the Charter*, INT'L CHARTER SPACE & MAJOR DISASTERS, https://disasterscharter.org/web/guest/home;jsessionid=312664B52DA63E15E5C102E3E3BC201A.jvm1 (last visited Mar. 29, 2020).

[42] Press Release, General Assembly, First Comm., Hague Code of Conduct Against Ballistic Missile Proliferation Welcomed in Text Approved by Disarmament Committee, U.N. Press Release G.A./DIS/3286 (Oct. 27, 2004), https://www.un.org/press/en/2004/gadis3286.doc.htm.

[43] INT'L ATOMIC ENERGY AGENCY [IAEA], GUIDANCE ON THE IMPORT AND EXPORT OF RADIOACTIVE SOURCES IAEA/CODEOC/2004 (2005), https://www.iaea.org/publications/7227/code-of-conduct-on-the-safety-and-security-of-radioactive-sources-guidance-on-the-import-and-export-of-radioactive-sources.

[44] Outer Space Treaty, *supra* note 16, at art. II.

[45] *Id.* at art. I.

[46] Garrett Hardin, *The Tragedy of the Commons*, 162 SCIENCE 1243, 1243–48 (1968).

[47] *See Elinor Ostrom-Facts*, NOBELPRIZE.ORG, https://www.nobelprize.org/prizes/economic-sciences/2009/ostrom/facts/ (last visited Mar. 29, 2020).

In conclusion, these considerations are neither prophesies nor answers. Politics and technology will continue to influence the law and its evolution. Facts and characteristics of celestial bodies, open space, and orbits—all of which are parts of space—are not interchangeable. Neither are the systems of governance that will be applied to them. So, stay tuned; interesting things are ahead.