

Adapting the ISS Code of Conduct to Form the Foundation of Astrolaw

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ABSTRACT

Three decades ago, Dr. J. Henry Glazer, onetime Chief Counsel for NASA Ames, proposed the establishment of a body of astrolaw. “The direct subjects of Space Law are sovereign nations”¹ he observed. The four widely ratified space treaties contain principles and guidelines designed to govern the activities of State. Conversely, the direct subjects of astrolaw would be natural and legal persons in space. In Dr. Glazer’s view, “astrolaw focuses not upon space as a legal regime, but upon space as a place.”² Our evolution into a spacefaring species, with single and then multiple human communities off-Earth, is a human necessity. Assuring the sustainability and success of

1. Quoted in ROBINSON & WHITE, JR., *infra* note 13.
2. *Id.*

those communities requires the development of guidelines and principles that recognize space as a place, and not a legal regime.

We are experiencing a paradigm shift in how activities are conducted in space. Space actors are no longer just governments. And soon, humans in space will not all be government employees or contractors. Elon Musk has promised to send a spacecraft of civilians around the Moon, and more than one company is exploring the establishment of a private space station for use as a hotel. Not only will we have civilian tourists in space, we will have civilian workers to cater to their needs. Addressing on-orbit torts and crimes through the current space treaty regime would lead to jurisdictional absurdities and even diplomatic morass.

This Article proposes that the advent and proliferation of space tourism should be the main frame from which we, as a society and global community, consider the regulation of extraterrestrial human civilization. The presentation advocates for the establishment of a Code of Conduct containing principles and guidelines designed to govern the activities and behavior of humans in space. The Code will be loosely modeled on the Code of Conduct for the Space Station Crew developed pursuant to the International Space Station Intergovernmental Agreement. However, rather than the individual remaining the responsibility of his or her national or sponsoring government, the individual shall be responsible for his or her own actions. This Article outlines the substantive terms of the Code of Conduct which, the author proposes should be adopted by national governments and implemented through national regulatory regimes.

Establishing a Code of Conduct will lay the foundation for a universal law, astrolaw, in anticipation of the commonality of humans living, working and vacationing in space. It will support and sustain the success of extraterrestrial human communities. It will help prevent unnecessary conflict that may, because of State responsibility for nationals in space, easily rise to diplomatic crisis. And it will thwart the threat of dystopian tyranny on these private pockets of human civilization. Finally, it will assure the safety of the hardy souls that venture into space as private citizens and work responsibly to develop international guidelines that will prevent disasters, without stifling commercial industry, innovation and exploration.

I. INTRODUCTION

It is difficult to contemplate a more fitting paradigm of a heterotopia than a human communal existence on a spacecraft. In medicine, heterotopia is defined as “misplacement or displacement,” the occurrence of something

where it is abnormal.³ In the hostile environment of space, the fundamental right of an individual to breathe cannot exist naturally as it does here on Earth. As such, a human presence in space is certainly aberrant. Thus, it is perhaps not surprising that, the laws that exist to regulate, or at least guide, human activity in outer space are directed not at individuals but at sovereign nations. This State-centric legal regime has performed admirably for more than fifty years. The approximately 570 humans that have ventured into Earth's orbit and beyond have been sent there as agents of their sovereign nations or under the authority of a sponsoring government.⁴ In particular, individuals who reside on the International Space Station (ISS), even for a short period of time, are the responsibility of their government, or of a sponsor government,⁵ and are required to abide by a code of conduct negotiated and executed by the sovereign partners in the facility.⁶

These government-sponsored spacefarers can expect company very soon. This author agrees with Al Globus that human migration off of our home planet will begin with private space stations.⁷ Globus “sees the process beginning with private space stations, similar in scale to today’s International Space Station, some of which could be space hotels. Those would be followed by ever-larger settlements in low orbit around the Earth, then located farther out.”⁸ A number of companies are developing extended space tourism

3. *Heterotopia, Heterotopia*, DICTIONARY.COM, <http://www.dictionary.com/browse/heterotopia> [<https://perma.cc/223Q-PJZB>] (last visited Sept. 9, 2019).

4. *Astronaut/Cosmonaut Statistics*, WORLDSPACEFLIGHT.COM, <https://www.worldspaceflight.com/bios/stats.php> [<https://perma.cc/RD9S-U5R2>] (last visited Sept. 9, 2019).

5. See Carla Sharpe and Fabio Tronchetti, *Legal Aspects of Public Manned Spaceflight and Space Station Operations*, in HANDBOOK OF SPACE LAW 648–49 (Franks von der Dunk et al. eds., 2015).

6. See generally Agreement Concerning Cooperation on the Civil International Space Station, Can.-ESA-Japan-Russ-U.S., art. 11, Jan. 29, 1998, 1998 U.S.T. LEXIS 212 [hereinafter ISS Agreement]; see also ESA Press Release No. 23-2001, W. Michael Hawed, ISS MCB Chairman, Decision Paper on Russian Aviation and Space Agency (Rosaviakosmos) Request for MCB Approval of Exemption to Fly Mr. Dennis Tito Aboard the April 2001 Soyuz 2 Taxi Flight to the International Space Station (ISS) (Apr. 24, 2001), http://www.esa.int/Our_Activities/Human_and_Robotic_Exploration/International_Space_Station/International_Space_Station_partners_grant_flight_exemption_for_Dennis_Tito [<https://perma.cc/35RF-AGM8>].

7. Corey S. Powell, *Jeff Bezos Foresees a Trillion People Living in Millions of Space Colonies. Here's What He's Doing to Get the Ball Rolling*, NBC NEWS (May 15, 2019), <https://www.nbcnews.com/mach/science/jeff-bezos-foresees-trillion-people-living-millions-space-colonies-here-ncna1006036> [<https://perma.cc/62NL-GTUH>].

8. *Id.* Another interesting comparison can be made to Antarctica. “In the 1990s, there were about 5,000 tourists visiting Antarctica each year.” Maham Abedi, *Antarctica Keeps Attracting Visitors – And it may be ‘Last-Chance Tourism,’* GLOBAL NEWS (Mar. 10, 2018), <https://globalnews.ca/news/4072700/antarctica-tourism-climate-change/> [<https://perma.cc/8FB9-ABNT>] (“Between April 2016 and 2017, 44,376 travellers [sic] came to the continent.”). Wealthy tourists will likely be responsible for this kind of growth in space tourism as well. The difference, of course, is that while Antarctica is an exotic

projects, to the existing ISS, to private, commercial space stations and even in spacecraft destined for lunar orbit.⁹ Axiom Space aims to host continuous ten-day “missions” to ISS as early as 2021.¹⁰ Indeed:

NanoRacks has laid out a roadmap for creating orbital outposts from recycled rocket upper stages. Orion Span has its own plan to send a hotel habitat into orbit by as early as 2022. And Bigelow Aerospace, which already has two uncrewed modules in orbit, has created a separate company to operate expandable space stations.¹¹

Applying the body of international law considered to be “space law” to decidedly human, non-governmental activities produces a muddle of uncertainty. What rules should apply? What courts are competent to hear claims? And, most importantly, what rights do humans have when in space? These uncertainties are compounded by a space treaty regime that imposes liability at the State level for damages caused by private actors. Diplomacy may be effective, but it does not create the legal precedents necessary to provide a certainty upon which to base future decisions. The heterotopias in space need the architecture of law to, among other things: ensure the safety and freedom of the hardy souls that venture into space as private citizens; prevent unnecessary conflict, which may, because of State responsibility for nationals in space, easily rise to diplomatic crisis; and provide legal certainties around which commercial space actors can plan. The need for a uniform construct of law is made even more acute given that what happens in space will almost undoubtedly affect humankind as

destination that offers adventure and excitement, the lure of space is, in part, in its infinite horizon. An individual can cross the continent of Antarctica but the mystery of space may, literally, never end.

9. See Powell, *supra* note 7; SpaceX is also planning a tourist flight destined for lunar orbit. In 2018, the company announced that it would fly “a coterie of artists” around the Moon “as early as 2023. . .” Mike Wall, *SpaceX Will Fly a Japanese Billionaire (and Artists, Too!) Around the Moon in 2023*, SPACE.COM (Sept. 18, 2018) <https://www.space.com/41854-spacex-unveils-1st-private-moon-flight-passenger.html> [<https://perma.cc/W6R7-L5T5>].

10. Dianna Wray, *Who Will Build the First Commercial Space Station?*, HOUSTONIA (Oct. 28, 2019), <https://www.houstoniamag.com/articles/2019/10/28/who-will-build-the-first-commercial-space-station> [<https://perma.cc/GS5F-L436>].

11. Alan Boyle, *Axiom Space Offers Space Station Vacations Starting in 2020, for \$55 Million*, GEEKWIRE (June 13, 2018), <https://www.geekwire.com/2018/axiom-space-offers-space-station-vacations-starting-2020-cool-55-million/> [<https://perma.cc/Z2PT-98R2>].

a whole as space accidents can “change the Earth’s environment, pollute the atmosphere and produce incalculable effects on life.”¹²

This Article proposes that the advent and proliferation of private space stations should be the mainframe from which we, as a society and global community, consider the adoption of fundamental principles of “astrolaw”¹³ that will nurture and protect extraterrestrial human civilization. In support of this proposal, the Article will first review the current outer space law regime and the application of that regime to private space activities, with a focus on the private operation of a space station for purposes of tourism. It will continue with the submission of three realistic scenarios which will highlight the gaps and uncertainties currently inherent to the regulation of private human residency in space. Finally, the Article proposes the fundamental principles that should be captured as an international baseline for astrolaw. After all:

[t]he achievement of our human imperative—and of the global and interplanetary constitutions necessary for its realization—will be one of the most monumentally delicate, difficult long-term projects ever undertaken by a human civilization. A poor beginning will seriously threaten its achievement.¹⁴

II. CURRENT “SPACE LAW”

A. “Space Law”

It is technically incorrect to assert that there is a “legal vacuum” in and beyond orbit. What exists in reality is a framework governing sovereign space activities. A framework with a glaring and yawning gap—a vast legal uncertainty in respect of what laws will apply to private actors, in particular, to private entities that operate stations in space. The norms that govern State activities in space are grounded in international law. However, the launch of Sputnik 1, Earth’s first artificial satellite in 1957, goaded discussions about the need to more specifically regulate the exploration and use of outer space.¹⁵ Tremendous credit must be given to the diplomats from around the globe tasked with both understanding the

12. MANFRED LACHS, THE LAW OF OUTER SPACE: AN EXPERIENCE IN CONTEMPORARY LAW-MAKING 113 (Tanja L. Masson-Zwaan et al. eds., Brill Nijhoff 2010) (1972).

13. “Astrolaw contemplated the practice of law *in* outer space . . . The direct subjects of Space Law are sovereign nations; the direct subjects of Astrolaw are natural and legal persons in space . . . Astrolaw focuses not upon space as a legal regime, but upon space as a place.” GEORGE S. ROBINSON & HAROLD M. WHITE, JR., ENVOYS OF MANKIND: A DECLARATION OF FIRST PRINCIPLES FOR THE GOVERNANCE OF SPACE SOCIETIES 147 (quoting J. Henry Glazer) (Smithsonian Inst. Pr. 1986).

14. *Id.* at 150.

15. Steve Garber, *Sputnik and the Dawn of the Space Age*, NASA History (Oct. 10, 2007), <https://history.nasa.gov/sputnik/> [<https://perma.cc/BDZ8-WQLF>].

implications of humankind's ability to reach space and working in the shadow of a Cold War to ensure international cooperation and, more importantly, peace in outer space.¹⁶ As the Soviet Ambassador to the United Nations (UN) stated in 1966,

Man's penetration of outer space and the activity of States in exploring its peaceful uses confronted the United Nations with serious problems. The question arose whether outer space, the moon and other planets were to become an area of peace and international co-operation or were to be used by the forces of aggression for purposes inimical to the interests of peace-loving people.¹⁷

In December 1958, the UN, "recognizing the common interest of mankind in outer space and recognizing that it [wa]s the common aim that outer space should be used for peaceful purposes only," established an *ad hoc* Committee on the Peaceful Uses of Outer Space (COPUOS).¹⁸ COPUOS was made a permanent body of the UN in 1959.¹⁹

Under the auspices of COPUOS a quintet of international conventions were negotiated and ratified, including the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies (OST),²⁰ the Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into Outer Space (Rescue Agreement),²¹ the Convention on the International Liability for Damage Caused by Space Objects (Liability Convention),²² the Convention on the Registration of Objects Launched into Outer Space (Registration Convention),²³ and the Agreement Governing the Activities

16. *See id.*

17. Comm. on the Peaceful Uses of Outer Space, Legal Subcomm., Summary Record of the Fifty-Seventh Meeting, U.N. Doc. A/AC.105/C.2/SR.57 at 8 (July 12, 1966).

18. G.A. Res. 1348 (XIII), Question of Peaceful Use of Outer Space, at 5–6 (Dec. 13, 1958).

19. G.A. Res. 1472 (XIV), International Cooperation in the Peaceful Uses of Outer Space, at 5–6 (Dec. 12, 1959).

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

21. Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into Outer Space, *opened for signature* Apr. 22, 1968, 672 U.N.T.S. 119 [hereinafter Rescue Agreement].

22. Convention on the International Liability for Damage Caused by Space Objects, *opened for signature* Mar. 29, 1972, 961 U.N.T.S. 187 [hereinafter Liability Convention].

23. Convention on the Registration of Objects Launched into Outer Space, *opened for signature* Jan. 13, 1975, 1023 U.N.T.S. 15 [hereinafter Registration Convention].

of States on the Moon and Other Celestial Bodies (Moon Agreement).²⁴ The Moon Agreement is not widely ratified.²⁵ Thus, an understanding of the obligations and responsibilities of “space law,” such as it is, requires review of the four remaining treaties.

B. State Parties Are Responsible for Private Activity

I. Responsibility: A Compromise

Had the Soviet Union fully prevailed in the space negotiations, the question of a private space station would be moot: in its first proffered draft of basic principles, the Soviet Union, the nation responsible for putting the first man in space, sought to limit the exploration and use of outer space “solely and exclusively”²⁶ to State. It was a stance that many analysts attribute to the Soviet’s communist ideology that made the government “squarely against any private activities in most economically relevant areas of society.”²⁷ Despite the fact that the Soviet Union and the United States were the only space actors at the time, the United States, self-styled “champion of free-enterprise,” was opposed to prohibiting private enterprise in space, no matter how far-fetched an idea it must have seemed at the time.²⁸ The first Declaration of Principles approved by the UN in December 1963 (the 1963 Declaration) does not prohibit the activities of private entities in space, nor does it purport to directly regulate such entities.²⁹ Instead, it proposes a regime of responsibility and supervision, making State accountable for the activities of their civilian citizens in

24. Agreement Governing the Activities of States on the Moon and Other Celestial Bodies, *opened for signature* Dec. 18, 1979, 1363 U.N.T.S. 3 [hereinafter Moon Agreement].

25. Only 18 States have ratified the Agreement. See Comm. On the Peaceful Uses of Outer Space, Status of Int’l Agreements Relating to Activities in Outer Space as at 1 Jan. 2019, U.N. Doc. A/AC.105/C.2/2019/CRP.3 (2019), https://www.unoosa.org/documents/pdf/spacelaw/treatystatus/AC105_C2_2019_CRP03E.pdf [<https://perma.cc/M2AN-46PX>].

26. *Union of Soviet Socialist Republics: Draft Declaration of the Basic Principles Governing the Activities of States Pertaining to the Exploration and Use of Space*, U.N. Doc. A/AC.105/L.02 (Sept. 10, 1962).

27. F.G. von der Dunk, *The Origins of Authorization: Article VI of the Outer Space Treaty and International Space Law*, 69 SPACE, CYBER, AND TELECOMM. L. PROGRAM FAC. PUB. 1, 1 (2011).

28. *Id.*; see generally, U.S. CONG., OFFICE OF TECHN. ASSESSMENT, OTA-BP-ISC-41, SPACE STATIONS AND THE LAW: SELECTED LEGAL ISSUES – BACKGROUND PAPER, DOCUMENTS ON OUTER SPACE LAW, PAPER 12, 19–20 (1986) [hereinafter BACKGROUND PAPER].

29. G.A. Res. 1962 (XVIII), Declaration of Legal Principles Governing the Activities of States in the Exploration and Use of Outer Space (Dec. 13, 1963) [hereinafter 1963 Declaration].

outer space.³⁰ The responsibility can be broken down into three duties as follows:

- (1) States bear international responsibility for national activities in outer space, whether carried on by governmental agencies or by non-governmental entities;
- (2) [states must assure that such national activities] are carried on in conformity with the principles set forth in the . . . Declaration; (3) the activities of non-governmental entities in outer space shall require authorization and continuing supervision by the State concerned.³¹

2. *The Responsibility Compromise Enshrined by Treaty*

Of course, a UN Resolution, while an admirable expression of intent is neither binding nor enforceable.³² Again, to the credit of the 1960s diplomatic force, and the pragmatic leadership of the Cold War antagonists—the United States and the Soviet Union—who also happened to be the primary space actors at the time, COPUOS undertook the task of developing binding law.³³ The Outer Space Treaty (OTS) is well-recognized as the culmination of eight years of “earnest effort to articulate and define general standards of behavior that should govern states in the use of outer space and celestial bodies.”³⁴

While the preliminary U.S. draft of the proposed treaty did not include the State responsibility provision of the 1963 Declaration,³⁵ the Soviet Union’s draft offered language substantially comparable to the 1963 Declaration, confirming national responsibility for “national activities in outer space . . . whether such activities are carried on by governmental agencies or by non-governmental bodies corporate.”³⁶ Mimicking the 1963 Declaration language, the Soviet Union draft further stipulated that the “activities of

30. *See id.*

31. *Id.* ¶ 5.

32. Articles 10 and 14 of the UN Charter refer to General Assembly resolutions as “recommendations.”

33. *See supra* notes 19–23 and accompanying text.

34. *Treaty on Outer Space: Hearing Before the U.S. Senate Comm. on Foreign Relations*, 19th Cong. 3 (1967) (statement of Dean Rusk, Sec’y of State).

35. Permanent Rep. of the United States of America to the U.N., Letter dated June 16, 1966 from the Permanent Rep. of the United States of America addressed to the Chairman of the Comm. on Peaceful Uses of Outer Space, U.N. Doc. A/AC.105/32 (June 17, 1966).

36. Permanent Rep. of the USSR to the U.N., Letter dated June 16, 1966 from the Permanent Rep. of the USSR to the U.N. addressed to Secretary-General, U.N. Doc. A.AC.105/C.2/L.13 (July 11, 1966).

non-governmental bodies corporate in outer space shall require authorization and continuing supervision by the State concerned.”³⁷

The United States did not object to the Soviet Union’s proffered language on this point; however, it did raise concern that “the words ‘non-governmental bodies corporate’ should be replaced by the words ‘non-governmental entities,’ since in U.S. jurisprudence the term ‘bodies corporate’ implied a limitation.”³⁸ Following this submission, the Soviet Union clarified that it intended the OST to cover any “group of persons or an organization duly recognized as such in accordance with national legislation.”³⁹ Ultimately, the wording agreed upon by the working group for what is now Article VI of the OST includes: (1) “international responsibility” for “national activities” of “non-governmental entities,”⁴⁰ a term both the United States and the Soviet Union sought to be defined as broadly as possible; (2) the requirement that States assure that all national activities, including those carried out by non-government entities, are “carried out in conformity with the provisions” of the OST,⁴¹ and (3) the stipulation that all activities by non-governmental entities require “authorization and continuing supervision by the appropriate State.”⁴² In short, the OST is clear that international law applies to State activities in space and that States are responsible for at least some of the actions of their national citizens.⁴³ Therefore, private actions are regulated by international law and the treaties to which a private person’s State government has adhered.

C. Understanding the Obligations of Actors in Space

Obligations of actors in space and their liability for activities in space arise under general international law such as Articles VI and VII of the Outer Space Treaty, the Liability Convention, the Registration Convention, and the Rescue Convention.⁴⁴ Understanding how these international laws relate to each other is key to understanding how human activity in space can be policed and to understanding what laws will affect efforts to seek compensation and avoid unjust enrichment in the wake of accidents.

37. *Id.*

38. U.N. COPUOS, 5th Sess., at 12, U.N. Doc. A/AC.105/C.2/SR.66 (Oct. 21, 1966).

39. *Id.* at 4, U.N. Doc. A/AC.105/C.2/SR.67.

40. Outer Space Treaty, *supra* note 20, at art. VI.

41. *Id.*

42. *Id.*

43. *See id.*

44. *See e.g.*, *supra* notes 19–23 and accompanying text.

1. General International Law

It is well-recognized under international law that States have direct responsibility for their own acts, including the “acts of [their] officials acting in their official capacity.”⁴⁵ While a State is not

directly responsible for injuries caused to foreign states or their nationals by the acts of private persons, whether nationals or non-nationals, [it] owes at all times a duty towards other States to use due diligence in accordance with the prevailing international standard to prevent, suppress and repress any violations of their rights, including those of their nationals, taking place in areas subject to its effective jurisdiction, any by whomsoever committed. . .⁴⁶

2. Article VI of the OST

Article VI of the OST goes beyond “due diligence” and makes States directly responsible for private activities in space.⁴⁷ As noted above, the OST has three specific requirements.⁴⁸ First, States parties to the OST “shall bear international responsibility for national activities in outer space . . . whether such activities are carried on by governmental agencies or by non-governmental entities.”⁴⁹ Second, parties must assure that activities by private entities are “carried out in conformity with the provisions set forth in the present [OST].”⁵⁰ Third, parties must subject any such activities to authorization and continuing supervision.⁵¹ The practical result is that all non-governmental space activities are “assimilated to governmental space activities.”⁵² In other words, “every thing [*sic*] that is done by . . . non-governmental entities is deemed to be an act immutable to the State as if it were its own act, for which it bears direct responsibility.”⁵³ It is, as Bin Cheng describes it, an “almost revolutionary” innovation introduced into international law.⁵⁴ Indeed, Article VI of the OST has a much broader

45. Bin Cheng, *Article VI of the 1967 Space Treaty Revisited: “International Responsibility”, “National Activities”, and “The Appropriate State”*, 26 J. OF SPACE L. 7, 11 (1998).

46. *Id.* at 11–12.

47. See F.G. von der Dunk, *supra* note 27, at 4.

48. Outer Space Treaty, *supra* note 20, at art.VI.

49. *Id.*

50. *Id.*

51. *Id.*

52. Cheng, *supra* note 45, at 14–15.

53. *Id.* at 15.

54. *Id.*; see also FRANCIS LYALL & PAUL B. LARSEN, *SPACE LAW: A TREATISE* 60 (2nd ed. 2018).

reach than the liability provisions in either Article VII of the OST or in the Liability Convention.⁵⁵ That said, each State party is only “*internationally* responsible,” suggesting that States parties do not “bear *domestic* responsibility vis-à-vis its own nationals or their property.”⁵⁶

3. *Article VII of the OST, the Liability Convention and the Registration Convention*

Under Article VII of the OST and under the Liability Convention, State parties are “absolutely liable” for damage to another State party “caused by [their] space object on the surface of the earth or to aircraft in flight.”⁵⁷ But, and this is important in respect of private space stations,

[i]n the event of damage being caused elsewhere than on the surface of the earth to a space object of one launching State or to persons or property on board such a space object by a space object of another launching State, the latter shall be liable only if the damage is due to its fault or the fault of persons for whom it is responsible.⁵⁸

Thus, while Article VII of the OST and the Liability Convention address damage caused by space objects only, it can be said that Article VI of the OST imposes liability on States for any other damages that may arise in respect of public or private activities in space.⁵⁹ Notably, the Liability Convention reinforces the Article VI notion that States are responsible for the activities of private entities as State liability arises in respect of anyone or entity “for whom it is responsible.”⁶⁰ The use of the word “responsible” here clearly ties back to the concept of States bearing “international responsibility” for the activities carried out by non-governmental entities.⁶¹

In elaborating on the notion of which State is the “responsible” or “appropriate” State, Article VII of the OST, the Liability Convention and the Registration Convention introduce the concept of “the launching State” and place liabilities and obligations upon it.⁶² The launching State can be: (1) the State “which launches” the object, (2) the State which procures the launch of the object, (3) the State from whose territory the object is

55. Cheng, *supra* note 45, at 15.

56. BACKGROUND PAPER, *supra* note 28, at 26.

57. Liability Convention, *supra* note 22, at art. II.

58. *Id.* art. III.

59. The English version of the OST uses the term “responsibility” in Article VI and “liability” in Article VII. While the significance of this word choice may be debated, the “Chinese, French, Russian and Spanish texts do not make such a distinction and use the same term ‘responsible’ or its equivalent” in both articles. Cheng, *supra* note 45, at 10.

60. Liability Convention, *supra* note 22, at art. III.

61. Outer Space Treaty, *supra* note 20, at arts. VI–VII.

62. *Id.*; Liability Convention, *supra* note 22, at art. VII.

launched, or (4) the State from whose facility the object is launched.⁶³ Furthermore, the Liability Convention is clear that there can be more than one launching State and, that in such an instance, all launching States are jointly and severally liable for damage caused by the space object.⁶⁴ Additionally, a “[s]tate from whose territory or facility a space object is launched shall be regarded as a participant in a joint launching.”⁶⁵ While these categories appear relatively straightforward, there is some question as to what it means to “procure” a launch.⁶⁶ For example, if an entity manufactures items intended solely for space, can it be assumed that such entity will inevitably “procure” a launch thereby making its national government a launching States?

Like Article VI of the OST, the Liability Convention seems to exclude domestic responsibility or liability.⁶⁷ Article VII of the Liability Convention indicates that it “shall not apply to damage caused by a space object of a launching State to: (a) nationals of that launching State; [and] (b) foreign nationals during such time as they are participating in the operation of that space object from the time”⁶⁸

D. Interpreting the Obligations

While it is undeniable that States parties are responsible and liable for the activities of even their nongovernmental entities, the depth and breadth of that responsibility remains open to interpretation.

1. “National Activities”

Under Article VI of the OST, for example, States parties are only internationally responsible for “national activities.”⁶⁹ But what constitute national activities? Frans von der Dunk has summarized the three main schools of thought.⁷⁰ First, and most all-encompassing, is the “nationalist”

63. See Liability Convention, *supra* note 22, at art. I(c); Registration Convention, *supra* note 23, at art. I(a).

64. Liability Convention, *supra* note 22, at art. 5(3).

65. *Id.*

66. Outer Space Treaty, *supra* note 20, at art. VII.

67. *Id.*; see also Liability Convention, *supra* note 22, at art. VI.

68. *Id.* art. VII.

69. Outer Space Treaty, *supra* note 20, at art. VI.

70. F.G. von der Dunk, *supra* note 27, at 5.

theory which takes the “adjective ‘national’ to refer to the noun ‘national’”⁷¹ and, as such, interprets “national activities” to mean “activities of nationals.”⁷² A second school of thought seeks to reconcile Article VI and Article VII of the OST and interprets the concept of national activities to include anything in respect of a space object for which that State may be considered a launching State.⁷³ In a similar vein, some argue that national activities should refer to the State of registry as that State pursuant to the Registration Convention.⁷⁴ However, this suggests that a State could avoid responsibility simply by failing to register its space object. The third theory focuses on the “authorization and continuing supervision” provision of Article VI of the OST “against a background of international law.”⁷⁵ Using this approach, national activities refer to activities over which a State has the legal tools to exert control, usually through territorial or personal jurisdiction.⁷⁶ Expanding on this concept, Bin Cheng suggests that national activities include any activity that may be considered within a State’s territorial, quasi-territorial, or personal jurisdiction.⁷⁷ The effect of this interpretation will almost certainly mean that more than one State will have “responsibility” over certain accidents or events. Such jurisdictional conflicts would be handled under current terrestrial public and private international law.⁷⁸

2. States Must Assure Conformity with OST Only?

Article VI of the OST clearly indicates that States parties must assure “national activities are carried out in conformity with the provisions” of the OST and of international law.⁷⁹ The provisions of the OST require that exploration and use be carried out “for the benefit and interests of all countries”⁸⁰ and “in accordance with international law.”⁸¹ As Bin Cheng

71. *Id.* at 5–6.

72. *Id.* at 6; *see also* Cheng, *supra* note 45, at 22.

73. F.G. von der Dunk, *supra* note 27, at 6.

74. Cheng, *supra* note 45, at 20. The Registration Convention requires that “when a space object is launched into earth orbit or beyond, the launching State shall register the space object by means of an entry in an appropriate registry which it shall maintain.” Registration Convention, *supra* note 23, at art. II(1).

75. F.G. von der Dunk, *supra* note 27, at 6.

76. *Id.* at 7.

77. Cheng, *supra* note 45, at 23–24. Territorial jurisdiction would cover events within the relevant State’s territory. Quasi-territorial jurisdiction would cover spacecraft and objects of a State’s registry, and personal jurisdiction would cover individual and corporate nationals.

78. F.G. von der Dunk, *supra* note 27, at 6; *cf.* Cheng, *supra* note 45, at 25 (discussing methods of solving jurisdictional conflicts).

79. Outer Space Treaty, *supra* note 20, at art. VI.

80. *Id.* art. I.

81. *Id.* art. III.

points out, “[m]ore difficult is the question whether the international responsibility of the States Parties extends to . . . failures to comply with rules of private law . . . or criminal law.”⁸² Article VI indicates that States parties bear “international responsibility.”⁸³ Does this mean responsibility only for violations of international public law, or does it mean States are “responsible directly to one another in respect of their non-governmental activities,”⁸⁴ whether violations are of international law or private law?

3. Authorization and Continuing Supervision

As with the other terms discussed, there is no definition in the OST of what to authorize or continually supervise a non-governmental entity in space means.⁸⁵ Clearly, this burden is somewhat more than the due diligence each State owes the other to prevent violation or suppression of rights. Moreover, given the terms of the OST, failure to properly authorize and supervise could induce direct State liability in addition to liability incurred for the private entity activity itself.⁸⁶ Many spacefaring nations have promulgated licensing and regulatory regimes in order to meet their Article VI authorization and supervision requirements.⁸⁷ To date, no State has been formally charged with failing to meet this burden.⁸⁸

82. Cheng, *supra* note 45, at 17.

83. Outer Space Treaty, *supra* note 20, at art. VI.

84. Cheng, *supra* note 45, at 17.

85. See generally Outer Space Treaty, *supra* note 20, at art. VI.

86. See Cheng, *supra* note 45, at 13–14.

87. For example, “[c]ountries like the United States, the United Kingdom, the Russian Federation, Sweden, France, South Africa, and South Korea have already adopted specific laws and regulations that govern all or most space activities carried out from their territories or by their citizens. China, Germany, Canada and Japan have passed a few specific laws and also have made some necessary modifications to relevant existing general laws in order to extend their application to space activities.” RAM JAKHU, ED., NATIONAL REGULATION OF SPACE ACTIVITIES vii (2010). Further to this end, the United Nations Office for Outer Space Affairs launched a “Space Law for New Space Actors” initiative that will “offer UN Member States tailored capacity building to facilitate their drafting of national space legislation. . .” Press Release, *United Nations Office for Outer Space Affairs Signed an Agreement with the Government of Luxembourg to Launch new “Space Law for New Space Actors,”* (Nov. 13, 2019), <http://spaceref.com/news/viewpr.html?pid=54919> [<https://perma.cc/8CHR-9S44>].

88. The author has found no instances in which Article VI has been asserted in any legal claims and there are no international court opinions offering guidance in respect of the interpretation of this Article; see generally Frans G. von der Dunk, *The Origins of Authorisation: Article VI of the Outer Space Treaty and International Space Law*, Space, Cyber, and Telecommunications Law Program Faculty Publications, Digital Commons,

4. *The Appropriate State Party*

A related question that also generates high levels of uncertainty is, which country constitutes “the Appropriate State Party”⁸⁹ that must authorize and supervise? Interestingly, this particular wording was changed from the wording in the 1963 Declaration which placed the supervisory burden on “the State concerned.”⁹⁰ Whether this is significant or not is difficult to say. Equally equivocal is the use of the singular and definite article “the” in both versions of the provision. Arguably, this suggests that only one State is ever required to undertake authorization and supervision and, as a result, only one State can bear international responsibility for a space object. There has been much discussion about this singularity.⁹¹ However, given the liability provisions contained in Articles VI and VII of the OST, as well as the Liability and Registration Conventions, these discussions are moot.

First, both the Registration Convention and the Liability Convention place additional burdens on each State, which suggests that there will often be more than one “Appropriate State Party.” Indeed, every launching State can be considered “appropriate.” Secondly, given that “national activities” for which a State party bears international responsibility may include any activity by a national of that State or over which the State may have some control through personal jurisdiction, it seems there are many opportunities to be labelled as “appropriate.” Ultimately, it is unlikely that a State will be sued for lack of authorization and supervision in and of itself. Such a case would likely only arise in the instance that damage has occurred, and then it will be much more important to determine whose “national activity” caused the damage. Certainly, additional restitution may be sought for failure to properly authorize or supervise and thus, it is in the best interest of any State party with any spacefaring nationals to authorize and properly supervise the entity or individual engaging in the space activity. However, the responsibility and potential liability of a State party does not depend solely upon whether or not it is the “appropriate” State.

14 (2011), <https://digitalcommons.unl.edu/cgi/viewcontent.cgi?article=1068&context=spacelaw> [<https://perma.cc/XE32-6FE8>] (discussing Article VI and explaining the exact scope of international responsibility in which any state carries the key clause as being a State’s main concern in terms of implementing the authorization requirement and coverage all situations regarding international liability).

89. Outer Space Treaty, *supra* note 20, at art. VI.

90. 1963 Declaration, *supra* note 29, at ¶ 5.

91. See Cheng, *supra* note 45, at 26; F.G. von der Dunk, *supra* note 27, at 8.

5. *Liability as State of Registry*

Article VIII of the OST also contributes to the uncertainty: the provision explains that States parties retain jurisdiction and control of objects—and personnel thereof—launched into outer space if have been entered into their national registry.⁹² While “ownership” of objects launched into outer space is not affected by their presence in outer space, “jurisdiction and control” seems to require the existence of a registry. In addition, Article VIII speaks in respect of personnel related to objects on their registry.⁹³ Does this cover space tourists? If an American citizen seeks to visit a space object registered in Japan, who has jurisdiction and control over that citizen? What if the American citizen is placed on Japan’s space registry? Is that person considered to be under the control of Japan, making Japan and not the individual’s nation of citizenship responsible? Can a State avoid liability for a space object by failing to register it?

6. *Obligated to Rescue?*

A final area of uncertainty directly relevant to the operation of a private space station arises in respect of the humans in space themselves. The “States Parties to the [OST] shall regard astronauts as envoys of mankind in outer space and shall render to them all possible assistance.”⁹⁴ But just what is an astronaut? The Rescue Agreement seems to broaden the obligation to rescue by requiring States to “render all necessary assistance” to “the personnel of a spacecraft.”⁹⁵ However, the Rescue Agreement only applies to “personnel” who have landed on Earth, and it is silent in respect to human actors in orbit.⁹⁶ States are obligated to rescue and “safely and promptly” return both astronauts and “personnel of spacecraft” if they are found in their territory or in the high seas.⁹⁷ But on-orbit, States are only obligated to assist astronauts. Moreover, the OST is silent as to what such on-orbit assistance might mean. Does it require a State to procure a launch to rescue astronauts in space?⁹⁸

92. Outer Space Treaty, *supra* note 20, at art. VIII.

93. *Id.*

94. *Id.* art. V.

95. Rescue Agreement, *supra* note 21, at art. II.

96. *See id.*

97. *Cf. id.*; *see also* Outer Space Treaty, *supra* note 20, at art. V.

98. Article V of the OST states that “astronauts of one State Party shall render all possible assistance to the astronauts of other States Parties.” Outer Space Treaty, *supra*

Francis Lyall has explored the question of who qualifies as an astronaut at some length.⁹⁹ As he points out, a rule of treaty interpretation “is that you interpret the meaning of a term as it was understood at the time the treaty was entered into.”¹⁰⁰ In 1967, an “astronaut was a highly trained State-employed professional, and not simply anyone who might go into space.”¹⁰¹ Similarly, “personnel” suggests that such an individual has “official duties and responsibilities.”¹⁰²

U.S. law also makes a distinction between spaceflight “crew” and spaceflight “participant.” “The requirements for ‘tourist flight’ crew are rigorous while those for ‘participants’ are [focused on] good health coupled with rudimentary training [regarding] safety and escape procedures.”¹⁰³ Are States parties obliged to rescue or return to space the tourist with only rudimentary training and a clean bill of health? It is unclear. Writing in 1972, well before the germ of space tourism existed, Manfred Lachs asserted that tourists should be accorded the same status as personnel and astronauts, but even then, Lachs recognized that “greater clarification of the law on [this] subject will be necessary.”¹⁰⁴

E. Treaty Obligations of Private Space Actors

Having established that private space activities are within the purview of the OST, and presuming that the State of citizenship of the traveling entity is a signatory of the treaty, what obligations does this confer on private space actors and on the governments, which must exercise “continuing supervision?” The OST lists three fundamental principles. First, “freedom [exists] in the exploration and use of outer space.”¹⁰⁵ Second, there is no

note 20, at art. V; This implies two things: first, that rendering “all possible assistance” is something less than “safe and prompt return; second, that such assistance is only required of other astronauts in orbit.” This leaves a gap in respect of both artificial intelligence and obligations of terrestrial. It is also rather telling that the Rescue Agreement itself does not contemplate on-orbit assistance at all; Rescue Agreement, *supra* note 21, at arts. 1 & 2; see Francis Lyall, *Who is an astronaut? The Inadequacy of current international law*, ACTA ASTRONAUTICA 66, 1613, 1615 (2010).

99. See, e.g., *id.*

100. *Id.* at 1613.

101. *Id.*

102. *Id.* at 1614.

103. *Id.* (citing 14 C.F.R. § 460.51 (2019)); see also Carla Sharpe, *Legal Aspects of Public Manned Spaceflight and Space Station Operations the Military Uses of Outer Space*, in HANDBOOK OF SPACE LAW, *supra* note 5, at 648 (“any feasible definition of ‘astronaut’ would seem to require . . . an element of training and selection . . .”).

104. Lachs, *supra* note 12, at 67.

105. Outer Space Treaty, *supra* note 20, at art. I(2); see also Lyall & Larsen, *supra* note 54, at 59.

national sovereignty in space or over celestial bodies.¹⁰⁶ Third, activities in outer space must be carried out “in accordance with international law.”¹⁰⁷ Beyond these principles, the OST prohibits a number of activities, including: placing in orbit “any objects carrying nuclear weapons or any other kinds of weapons of mass destruction;”¹⁰⁸ installing nuclear weapons or any other kinds of weapons of mass destruction “on celestial bodies;”¹⁰⁹ establishing “military bases, installations and fortifications”¹¹⁰ on celestial bodies; testing “any type of weapons and the conduct of military maneuvers on celestial bodies.”¹¹¹ In addition, all space actors must conduct their activities “with due regard to the corresponding interests of all other States Parties to the Treaty”¹¹² and avoid harmful contamination of the space environment or any adverse changes to “the environment of the Earth.”¹¹³

F. *When the Little Things Go Wrong*

While the OST does not provide for an enforcement or dispute resolution mechanism, the Liability Convention requires that claims between States be made through “diplomatic channels.”¹¹⁴ Should diplomatic efforts fail, the parties “shall establish a Claims Commission”¹¹⁵ made up of three members: one chosen by each party and the third, the Chairman, chosen jointly by the parties.¹¹⁶ If the parties cannot agree on the Chairman within four months, then either party may request the Secretary-General of the United Nations to appoint one.¹¹⁷ Interestingly, the Liability Convention

106. Outer Space Treaty, *supra* note 20, at art. II; *see also* Lyall & Larsen, *supra* note 54, at 59–60.

107. Outer Space Treaty, *supra* note 20, at art. III.

108. *Id.* art. IV.

109. *Id.*

110. *Id.*

111. *Id.*

112. *Id.* art. IX.

113. *Id.*

114. Liability Convention, *supra* note 22, at art. IX. To date, only one claim has been pursued under the auspices of the Liability Convention. In 1978, the then-Soviet Union’s Cosmos 954 satellite, which carried a nuclear reactor on board re-entered the Earth’s atmosphere, breaking up and scattering debris over Canadian territory. For damages “proximately caused by the intrusion of the satellite and deposit of debris,” Canada received a payment of \$C3 million. Settlement of Claim between Canada and the Union of Soviet Socialist Republics for Damage Caused by “Cosmos 954” (Released on Apr. 2, 1981).

115. Liability Convention, *supra* note 22, art. XIV

116. *Id.* art. XV.

117. *Id.*

allows the damaged State to pursue “local remedies”¹¹⁸ while simultaneously presenting a formal diplomatic claim. The damaged State may also pursue a claim “in the courts or administrative tribunals or agencies of a launching State.”¹¹⁹ However, if a claim is first filed in the launching State (as opposed to seeking local remedies domestically), it cannot also be pursued diplomatically.¹²⁰

The Liability Convention also provides for joint and several liability amongst the defending launching States.¹²¹ Thus, whenever two or more States jointly launch a space object, they are jointly and severally liable, allowing the damaged State to seek the entire compensation due from any or all of the launching States.¹²² The Convention makes clear, that for purposes of establishing joint and several liability, the “State from whose territory or facility a space object is launched shall be regarded as a participant in a joint launching.”¹²³ Therefore, the Convention’s delineation lays a heavy burden on the launch service provider and the State whom launch is made a space object.

The Liability Convention also makes possible potential damages claims against States by non-nationals.¹²⁴

If the State of nationality [fails to file] a claim, another State may, in respect of damage sustained in its territory by any natural or juridical person, present a claim to a launching State.¹²⁵ [Additionally, if] neither the State of nationality nor the State in whose territory the damage was sustained has presented a claim or notified its intention of presenting a claim, another State may, in respect of damage sustained by its permanent residents, present a claim to a launching State.¹²⁶

The Liability Convention is rampantly ambiguous: Among other things, can the argument be made that non-governmental entities are agents of the relevant State, acting in an official capacity because they are engaged in “national activities” thus opening States up to tort liability for failure

118. *Id.* art. XI(1).

119. *Id.* art. XI(2).

120. *Id.*; Article XI offers an interesting construct. The first paragraph allows for a diplomatic claim to be made while “local remedies” are pursued. However, the second paragraph clarifies that a claim is pursued “in the courts or administrative tribunals or agencies of a launching State,” then a claim under the Liability Convention cannot be made. Should a “local remedy” be sought outside of a launching State and a judgement delivered, the claiming party would still likely have to engage in diplomatic or judicial measures in a launching State in order to enforce said judgment. Thus, the utility of permitting a local action at the same time as a claim under the Convention appears to be lacking.

121. *Id.* art. V.

122. *Id.*

123. *Id.* art. V(3).

124. *Id.* art. VIII.

125. *Id.* art. VIII(2).

126. *Id.* art. VIII(3).

to supervise a negligent actor? Can criminal acts be considered “national activities?” Does the labeling of an act as a “national activity” preclude a lawsuit directly against the private entity? Is a vendor “procuring” a launch if it makes an object intended for space? Are human beings “space objects?” The illustrative scenarios set out below highlight these ambiguities and the current space law regime’s inability to resolve the ambiguities efficiently.

III. THE PRIVATE SPACE STATION: A SPACE OF UNCERTAINTY

Accidents on-orbit happen and any manner of mishaps befalling space station tourists or employees can be imagined. The scenarios posited will share the same background. Assume a company formed under U.S. laws purchases a private space station with multiple modules and components.¹²⁷ Vendors in the United Kingdom (UK), South Africa, China, and Israel supply equipment and materials. The U.S. government authorizes the U.S. company, hereinafter referred to as Space Hotel Inc. or SHI to operate its private space station as a space hotel.¹²⁸ SHI launches the modules that will make up the hotel at different times via different launch service providers from the United States, the European Union (EU), and Russia. The launches take place from locations in New Zealand, Russia, and at sea. In each case, SHI has negotiated with the manufacturers and has registered each module on the U.S. Registry of objects launched into outer space.¹²⁹ Once SHI assembles the space station, SHI sends three personnel, one manager and two junior staff, to crew the space station and welcome up to seven guests at a time. The personnel have year-long shifts on the station after they are

127. Currently, Axiom Space, Inc., and Bigelow Aerospace, LLC, are the most vociferous about operating commercial space stations and are both registered in the United States. *See generally* AXIOM SPACE, <http://axiomspace.com> [<https://perma.cc/LU6P-PQ3J>] (last visited Nov. 21, 2019); BIGELOW AEROSPACE, <http://bigelowaerospace.com> [<https://perma.cc/9XNL-SUKA>] (last visited Nov. 21, 2019); Lee Billings, *Who Will Build the World’s First Commercial Space Station?*, SCI. AM. (May 26, 2017), <https://www.scientificamerican.com/article/who-will-build-the-world-s-first-commercial-space-station/> [<https://perma.cc/JK35-NQM2>].

128. At this time, no U.S. law specifically deals with the operation of a commercial space station, however, for purposes of this scenario, we will assume the United States has established comprehensive licensing procedures.

129. The United States Department of Transportation, Federal Aviation Administration, gathers the registration information of each manufacturer. *See* 14 C.F.R. § 417.19 (2019). The Registry is then maintained by the United States Department of State Office of Space and Advanced Technology. *See generally* Space and Advanced Technology, U.S. DEP’T ST., <https://2009-2017.state.gov/e/oes/sat/> [<https://perma.cc/3FSE-65X4>] (last visited Sept. 13, 2019).

trained and housed near a spaceport in the United States. Guests, who must undergo three days of orientation at the U.S. spaceport, may be launched from the United States or Curaçao and stay aboard the space station hotel for ten-day stays. Crew will also launch from either the United States or Curaçao.

A. An Object Made in Space

1. Setting the Scene

On board Mir Space Station, on May 13, 1995, U.S. astronaut Norm Thagard “was doing deep knee-bends, using a device with elastic straps, when one end of a strap slipped off his foot and flew up and hit him hard in the right eye.”¹³⁰ “Even small amounts of light caused him pain, and using the eye was ‘like looking at the world through gauze.’”¹³¹ Luckily, an ophthalmologist at Mission Control-Moscow prescribed steroid drops—which had been stowed as part of Mir’s medical kit.¹³² Thagard’s eye healed successfully and caused no further issues during his assignment on Mir.¹³³

Using this fact pattern, assume that rather than a government astronaut, the injured party is an employee of SHI. Further assume that as part of his duties, this employee was “loaned” to a UK company to carry out manufacturing experiments on the space hotel, using UK instruments. The injury occurred while the employee was handling an object made by the UK device. The “object” that caused the damage, then, was made in space. A U.S. launch service provider launched the manufacturing device from New Zealand, the module containing the device was manufactured in Israel and launched from French Guiana by a European Union launch service provider. The device which caused the damage is registered on the UK register. The employee is a citizen of Thailand who, when on Earth, resides in the United States. Assume that the injury is more severe: the eye bleeds and swells. The injured employee is not evacuated for eight days because SHI declined to launch a transport earlier than scheduled though it had the ability and window to do so. When the employee returns to Earth, it is determined that the eye is lost. Had expert medical attention been administered within twenty-four hours, his eye could have been saved.

130. *NASA-1 Norm Thagard: An Ending and a Beginning*, (Mar. 14-July 7, 1995), <https://history.nasa.gov/SP-4225/nasa1/nasa1.htm> [<https://perma.cc/HZ4G-7XU8>].

131. *Id.*

132. *Id.*

133. *See id.*

2. Potential Liability

An advocate for the unfortunate Thai employee has to take into account several factors. Considering the costs to the injured, the plaintiff's lawyer would seek to invoke Article VI of the Liability Convention to try to pass the costs onto the Thai government, i.e., to reach the deeper pockets of the defending governments. The attorney needs to first determine whether an object made in space is in fact a "space object" for the purposes of determining whether the Liability Convention applies. While "space object" is not defined, liability attached to damage caused by a space object flows from the concept of the "Launching State."¹³⁴ If an object was made in space, it was not launched.¹³⁵ Does this mean no liability attaches?

Under the Liability and Registration Conventions, the object is an extension of the device manufactured by the UK and the Thai government may present a claim on behalf of its "natural person" against any one or all of the following "Launching States" based on different theories:

- Claim against the UK because the UK is (1) the registered owner of the space object that produced the object that caused the damages, (2) the State that "procured" the launch of the space object responsible for the damage under the theory that by making equipment meant for space, a company must automatically be procuring a launch for that equipment;
- Claim against Israel, the state that procured the launch of the module in which the object that caused the damage was produced;
- Claim against the United States, the state that launched the space object which produced the object that caused damage;
- Claim against New Zealand, the territory from where the UK equipment that produced the object from which damage resulted was launched;
- Claim against the EU, the group of states that launched the module in which the object causing the damage was made; and
- Claim against French Guiana, the territory from where the module was launched.

134. Outer Space Treaty, *supra* note 20, at arts. VI–VII; Liability Convention, *supra* note 22, at art. VII.

135. Outer Space Treaty, *supra* note 20, at arts. VII–VIII.

However, as noted above, Article VII of the Liability Convention indicates that the Convention shall not apply to damage caused by a space object of “a launching State to: . . . foreign nationals during such time as they are participating in the operation of that space object from the time of its launching . . . until its descent.”¹³⁶ Thus, if the object is a U.S. object, Thailand may not be able to make a claim against the United States. But does this preclude claims against the other launching States? Does it open the door for the plaintiff to seek action against the private entity directly? Or is Thailand also precluded from bringing any claims since its citizen was “participating in the operation” of the U.S. space hotel? In this scenario, the employee was actually “participating in the operation” of a UK object. Which “operation” will be considered paramount?

The Liability Convention is clear that when damage occurs on-orbit, the launching State shall be liable “only if the damage is due to . . . the fault of persons for whom it is responsible.”¹³⁷ However, launching States are jointly and severally liable for any damage caused.¹³⁸ While New Zealand may be absolved as a matter of fault, under Article V of the Convention it remains jointly and severally liable as the territory from where the equipment was launched. Thus, New Zealand, French Guiana, and the United States can be held joint and severally liable for the issues caused from the UK equipment manufacturer and or from SHI, the company that oversaw the installation of the equipment. Is this true even though claims cannot be made against the United States through the Convention or the OST?

The complexities continue when considering Article VI of the OST. An advocate for the injured Thai employee will no doubt argue that given the provision’s negotiating history, and the Soviet Union’s stance that there should be no private activities in space, “national activities” include all activities of any entity in space. Then what activity caused the damage? The manufacturing of the object? The object itself? Or the operation of a space hotel in which the device was housed? Is conducting an experiment in this manner a national activity? In any case, under Article VI of the OST both the United States and the UK allegedly did not satisfy their authorization and continuing supervision burden when they failed to ensure that the equipment met proper safety standards. Does this open the United States and the UK up to liability separately from the burden imposed by its responsibility for the activities of SHI? What if it is determined that the crew member was contributorily liable—does this negate all claims?

Both the OST and the Liability Convention are silent as to what “damages” may be claimed. The Space Law Committee of the International Law

136. Liability Convention, *supra* note 22, at art. VII.

137. *Id.* art. III.

138. *Id.* art. V.

Association maintains that the definition of “damage” embodied in the Liability Convention “is one of the widest, to date, in the field of international law.”¹³⁹ It covers “loss of life, personal injury or other impairment of health; or loss of or damage to property of States or of persons[.]”¹⁴⁰ Will the United States and, or the UK be liable for lost wages, emotional damages, pain and suffering? Can the UK and Thailand be liable to the United States for loss of the services of the crew member? Article IV of the Liability Convention States that if a third party is affected by a collision, the two States involved in the collision “shall be jointly and severally liable to the third State.”¹⁴¹ Allegedly, the space object of the UK, the exercise device, collided with the space object of Thailand, the crew member, causing damage to SHI. Or is Thailand absolved because its citizen was participating in the operation of SHI?

And what about a rescue? If the “personnel of a spacecraft” is interpreted to be the same as an “astronaut,” then Article V of the OST requires that the astronauts of one State party, “in carrying on activities in outer space . . . shall render all possible assistance” to astronauts of other States parties.¹⁴² This language has no qualifier. It is simply the duty of the astronauts of States parties to render assistance to other astronauts as part of their space activity.¹⁴³ What does “all possible” mean? Did the other SHI employees, particularly the manager, have the obligation to force SHI to launch the retrieval spacecraft earlier than originally scheduled? Do these responsibilities carry forward to the State that is authorizing and supervising? Do other States with launch capabilities have an obligation to extract the employee? What if it means they will lose a valuable seat that a space tourist had paid for? Does the Thai individual have a claim against all spacefaring nations?

3. *Where to File Suit and What Law to Apply?*

The Liability Convention “grants neither rights nor responsibilities to the private sector.”¹⁴⁴ However, private parties may pursue local remedies even as diplomatic steps are taken. And if a State declines to make diplomatic

139. Comm. on the Peaceful Use of Outer Space, Repr. of the Legal Subcomm. on Its Fifty-Fourth Session, at 4, A/SC.105/C.2/2015/CRP.25 (Apr. 22, 2015).

140. Liability Convention, *supra* note 22, at art. I(a).

141. *Id.* art. IV(1).

142. Outer Space Treaty, *supra* note 20, at art. V.

143. *See id.*

144. BACKGROUND PAPER, *supra* note 28, at 22.

overtures, private parties may sue in the national courts¹⁴⁵ of the launching State. An underlying question is who to sue? If a private actor is conducting a “national activity” can that entity be sued privately at all? Or must all claims be made against the launching State? Can a private lawsuit be brought against a launching State only in that launching State? Does Article VI of the OST allow States to be sued anywhere for their failure to properly “authorize and continually supervise?”

Here, the UK manufacturer of the device could be liable for negligence and perhaps even strict product liability under the laws of most nations. The SHI employee could sue in the UK. Since the space station is a registered U.S. space object, the damage is considered to have occurred on U.S. territory; additionally, since the crew members train and reside in the United States while on Earth, the United States is likely the most appropriate venue—if the Liability Convention does not preclude such a suit. Can the UK defendant also be sued in the United States, or does the plaintiff have to file two separate lawsuits? The UK could argue that, as a launching State, it can only be sued in its own courts, and thus claim that the *forum non conveniens* would apply if the manufacturing company has no presence in the United States.

B. Human Error

1. Setting the Scene

On July 16, 2013, Italian astronaut Luca Parmitano’s “helmet began filling with water just after venturing outside of the [ISS] . . . Eventually, the water filled his eyes, ears, nose and part of his mouth, making it difficult to breathe.”¹⁴⁶ Parmitano is a well-trained astronaut.¹⁴⁷ Rather than panicking, Parmitano managed to make it safely back to the airlock “using just memory,” even though he struggled to see or communicate and was unable to hear anything.¹⁴⁸ His helmet had filled with about one-and-a-half liter of water.¹⁴⁹ The suit had leaked a week earlier, but Parmitano and his fellow spacewalker attributed the cause to “a leaky drink bag” and did not report the issue to NASA.¹⁵⁰

145. Liability Convention, *supra* note 22, at art. XI(2).

146. Miriam Kramer, *Spacesuit Leak That Nearly Drowned Astronaut Could Have Been Avoided*, SPACE (Feb. 26, 2014), <https://www.space.com/24835-spacesuit-water-leak-nasa-investigation.html> [perma.cc/YV9R-W2LU].

147. *See id.*

148. *Id.*

149. *Id.*

150. *Id.*

Using this fact pattern, replace Parmitano with a space tourist. The tourist, like Parmitano, is a citizen of and resides in Italy. Assume that a prior tourist had complained of wetness in the spacesuit, manufactured in Malaysia, and launched by the United States at sea. However, the SHI worker, a citizen of Iceland, dismissed the complaint and failed to adequately inspect the suit. Untrained, the tourist panics and causes damage to the space station hotel airlock, part of the module sourced from China and launched by Russia, while trying to return to the station. The tourist does not suffer physical injury, but the emotional scars are indelible. Damages would include the actual cost to repair and the income lost for the time that the station must be shut down to make the repair.

2. *Potential Liability*

Whether an individual, here the Icelandic crew member, is treated as a “space object” for purposes of State liability needs to be determined. Relying upon the Liability Convention, Italy may pursue a claim against:

- China, the State that procured the launch of the module which caused the damage;
- Russia, the launch service provider of the module and territory from where the module launched;
- the United States, the launch service provider and operator of the space station, and the State that has control of the platform at sea from where the spacesuit was launched.

Malaysia is not a party to the Liability Convention or the Registration Convention and, thus, can only be required to participate in State level negotiations pursuant to general principles of international law.¹⁵¹

If the Italian space tourist is a “foreign national . . . participating in the operation of [the] space object,”¹⁵² would the United States be absolved, leaving the other launching State liable? Or does “participating in the operation” mean the participant has no recourse at all? Did the tourist actually suffer damage for purposes of the Liability Convention if no physical harm occurred?

Damage lies only if fault is proven. However, all the launching State remain jointly and severally liable. Here, the citizen of Iceland who failed

151. See *supra* note 25.

152. Liability Convention, *supra* note 22, at art. VII.

to inspect the spacesuit is at fault. Is the individual's failure a "national activity" for which Iceland is responsible? Or is the fault with the United States? Does the United States face liability independent of its responsibility for SHI for failure to adequately supervise the negligent employee? Should Italy decline to bring a claim, can the United States bring a claim on the theory that the damage occurred on its territory? But did it? Did the accident occur outside the airlock, or in the module when the crew member failed to inspect the spacesuit? Can Italy, or Italy and Malaysia, be held internationally responsible to the United States for damage to the airlock caused by its citizen (if an individual can be considered space object) and the "Malaysian spacesuit?" Can Curaçao, which is the territory the panicking tourist was launched from, be held jointly and severally liable for the activities of the tourist? Is panicking a "national activity" for which a State may be held responsible? Could Italy, in this instance be liable for not properly authorizing and supervising its citizen? What level of authorization and supervision should be required of States over their human citizens, whether they are tourists or employees? The Liability Convention allows for State exoneration if "the damage has resulted either wholly or partially from gross negligence or from an act or omission done with intent to cause damage on the part of a claimant State."¹⁵³ Can panic be considered gross negligence with intent to do damage on the part of the Italian tourist?

Furthermore, what if the Italian tourist had dislodged a piece of the space station that later caused damage to a third-party space object? Would Italy and the United States be jointly and severally liable for the damage that resulted when the Italian tourist collided with the space station?

3. Where to File Suit and What Law to Apply?

Here again, claims are based on negligence. Since the space station is a registered U.S. space object, the damage would be deemed to have occurred on U.S. territory. Additionally, the crew members train and reside in the United States, thus likely making the United States the most appropriate venue, if the Liability Convention does not preclude suit. The injured tourist could sue the United States or SHI for failure to properly supervise the employee, the Malaysian company under product liability laws, and perhaps China or the Chinese company for providing a faulty airlock. The damage itself occurred outside the space station, so no territory may be implicated, though arguably the damage occurred in the module where the suit was stored when the employee failed to inspect, bringing the accident into U.S. territory. Moreover, SHI and the Chinese company that provided the module may countersue for damage to the airlock.

153. *Id.* art. VI.

C. Catastrophic Collision

1. Setting the Scene

“Since its launch in 1998, [ISS] has had to maneuver out of the way of debris 22 times.”¹⁵⁴ “[T]he ISS crew has had to jump in Soyuz for protections (it’s less likely that debris will hit the relatively small, hidden capsule)” four times since 1998.¹⁵⁵ Luckily, the ISS has been spared a catastrophic debris collision until now. A private space station may not be so lucky, and indeed, given the Kessler Syndrome,¹⁵⁶ collision is likely inevitable. To borrow from a scenario proposed by Professor Lyall, what if the South African module of the space hotel is “punctured and loses pressure with the result that there is enough air to sustain the life of some, but not all, until rescue”?¹⁵⁷ The hotel manager (from the United States) determines that chances of survival increase dramatically if two people were to make the ultimate sacrifice. The survivors (guests are from India, Russia, and the United States) tell authorities that the two junior crew members (from Iceland and Thailand) voluntarily agreed to be jettisoned into space so that the others might survive. Back on Earth, authorities suspect that the two crew members were forced to their death.

2. Public Liability?

Under the Liability Convention, the State responsible for the owner of the space object which caused the damage will be liable, if ownership and fault can be determined. While this determination may be difficult, especially if the space object has not been properly registered with the UN or in a national registry, “States possessing monitoring and tracking facilities shall respond to the greatest extent feasible to a request . . . for assistance under

154. Katie M. Palmer, *ISS Crew Prepares to Evacuate in Real-Life Gravity Scare*, WIRED (July 16, 2015), <https://www.wired.com/2015/07/iss-crew-prepares-evacuate-real-life-gravity-scare/> [perma.cc/EF2L-C283].

155. *Id.*

156. Donald J. Kessler & Burton G. Cour-Palais, *Collision Frequency of Artificial Satellites: The Creation of A Debris Belt*, 83 J. GEOPHYSICAL RES. A6, 2637 (1978) (“Because many of these satellites are in orbits which cross one another, there is a finite probability of collisions between them. Satellite collisions will produce a number of fragments, some of which may be capable of fragmenting another satellite upon collision, creating even more fragments. The result would be an exponential increase in the number of objects with time, creating a belt of debris around the earth.”).

157. Lyall, *Who is an astronaut?*, *supra* note 98, at 1616.

equitable and reasonable conditions in the identification of the object.”¹⁵⁸ Should responsibility be determined, the United States could make a claim for damages. Should the damaging State also be liable for the deaths of the two crew members, regardless of whether they chose or were forced to sacrifice themselves? For the pain and suffering of those guests and crew that survived? And should the United States, India and Russia be held jointly and severally liable for the decision, by citizens for whom they are responsible, to sacrifice the junior crew members? Do the crew members have a right to life when air is scarce? Are the tourists “space objects?” If so, Curaçao would also be jointly and severally liable as the territory from where the tourist, or objects, were launched. Is being a tourist a “national activity” that requires authorization and continuing supervision? Or are all the tourists and crew members “participating in the operation” of the space object? If so, none of them could make a claim against the United States.

3. *Where to File Suit and What Law to Apply?*

There is certainly opportunity for tort liability in this scenario. The passengers would no doubt sue the United States and, or, SHI, the South African manufacturer of the damaged module, and the owner of the space object which caused the damage to the space station hotel, if identifiable. They could bring their suit in the United States, the domicile of SHI, in India, in Russia, or in South Africa. Given that SHI maintains a training facility in the United States, and the remaining crew member is a U.S. citizen, there may be adequate contacts to maintain a claim in U.S. court. There may also be the opportunity for criminal prosecution in some jurisdictions.¹⁵⁹ Given that the station is a US registered object, U.S. law would likely apply.

D. Absurd?

These scenarios represent simple examples of how private individuals may take their first steps in space. The Earth’s past spacefarers have been “physically fit individuals . . . operating on a temporary basis in a very hostile environment for almost solely scientific and exploratory purposes.”¹⁶⁰ Moreover, the “credentials for being there were an extraordinarily high level of technical training, self-discipline, and the natural ability to handle

158. Registration Convention, *supra* note 23, at art. VI.

159. See Lyall & Larsen, *supra* note 54, at 129–30 for a fascinating glimpse of this question—whether it is a crime to murder one for the sake of the greater good.

160. Martin Menter & T. Stephen Cheston, *Space Stations and Habitats*, 72 PROC. ANN. MEETING AM. SOC’Y INT’L L. 270, 270 (1978).

crises with cool logic.”¹⁶¹ While hotel and factory personnel may be trained, the foundational qualification for tourists will most certainly be financial, not physical, ability. Thus, the number and severity of accidents will likely increase as the pool of space participants become less well-trained. As space stations get larger and embrace manufacturing and larger work forces, the amount and complexity of accidents is poised to grow too.

Imagine the added complexity if SHI was a joint venture with partners from multiple nations. Space is expensive. It would not be unrealistic to imagine space actors from several nations working together to create a hotel or factory. Anxious to keep control of their own property, each venture partner could plausibly want to register their own modules, meaning hotel guests and crew would be subject to possibly two or more sovereign territories as they enjoy their holiday or go about their workday. As the diversity of private space actors continues to grow, these fact patterns will become increasingly “absurd” making every on-orbit accident a potential diplomatic disaster with resulting negotiations monopolizing civil servants and State funds.

As our space civilization grows, intentional crimes must also be considered. After all, it “is extremely doubtful that a major move into space will bring about a moral regeneration of our species, so that we would live and work with each other in Eden-like harmony.”¹⁶² What happens when a food supply is intentionally contaminated, a physical assault or theft occurs on board, personal items are stolen or destroyed, or valuable equipment is vandalized?¹⁶³ Basically, every commercial space operator that transports or houses humans—and the State that authorize them, the State that have citizens that contribute to them, and the State whose citizens provide launch services and facilities—will have to be prepared to defend themselves in any court in the world applying local rules. Outcomes will vary and have little precedential effect.

161. *Id.*

162. *Id.* at 275.

163. Indeed, the media heralded “The World’s First Space Crime” amid claims that an astronaut on board the ISS allegedly improperly accessed the bank account of estranged partner. Brandon Specktor, *The World’s First Space Crime May Have Occurred on the International Space Station Last Year*, LIVESCIENCE (Aug. 27, 2019) <https://www.livescience.com/anne-mcclain-space-crime.html> [<https://perma.cc/7F6Y-7EVY>]. In this case, if a crime is found to have occurred, the ISS Agreement makes clear that the United States would have the right to exercise criminal jurisdiction over its own personnel. And given that all parties involved were U.S. citizens, no international jurisdiction questions would arise. ISS Agreement, *supra* note 6, at art. 22.

Neil Hosenball, onetime General Counsel for the U.S. National Aeronautics and Space Administration, and head of the U.S. delegations to the Legal Subcommittee of COPUOS, once cautioned that when it comes to space, we must not allow “‘hyperlexus’—a pathological condition caused by an overacting lawmaking organ . . . [to] become virulent among space lawyers.”¹⁶⁴ Certainly this is not an unfounded concern. However, in order for space to grow with equality, efficiency, and safety, outcomes in respect of claims for damages that happen in space and liabilities for those damages should not be allowed to hijack diplomacy and should not be subject to such uncertainty or variety.

Finally, discovery costs must also be considered. In each of the scenarios, or any situation in which fault must be alleged, costs could be exorbitant if experts from all the companies involved want the opportunity to inspect the on-orbit damage. Such prohibitive costs may result in quicker settlements. They could also be a boon to manufacturers of space equipment sued by plaintiffs who cannot afford proper investigation.

E. Space is Power

Of course, life onboard the private space station could be managed and administered pursuant to contracts negotiated between the private parties. However, this is hardly ideal, and could provide a poor foundation upon which to base the laws of future on-orbit, Moon or asteroid outposts. The dangers are threefold. First, from a litigation standpoint, the diligent plaintiff’s lawyer will consider all avenues toward compensation for injury and will challenge the contracts signed by space tourists and space employees as contracts of adhesion, tying up valuable court and company time. Second, the plaintiffs who will initially include wealthy individuals¹⁶⁵ who may hold great sway over government officials, will want to have claims filed at the State level to reduce legal costs and fees. This makes it an almost certainty that on-orbit slip-and-falls will become subject to diplomatic negotiation, wasting taxpayer money and bureaucratic time. Third, forum shopping, whether at the U.S. State level or at the international level will be rampant. While such activity will assure a steady income for the motions practitioner, it will also assure lengthy, costly court battles. This will drain the resources of both plaintiffs who may not possess necessary funds and companies that should be spending their money on-orbit rather than in court.

164. *Id.* at 276–77.

165. A trip to space currently costs \$250,000, indicative of the high financial hurdle that will determine space tourism. Matthew Smith, *Commercialized Space and You*, HARV. UNIV. (June 11, 2018), sitn.hms.harvard.edu/flash/2018/commercialized-space-and-you/ [<https://perma.cc/LS3D-VXGU>].

Ultimately, the body of jurisprudence related to space law will likely end up mired in conflict of law and choice of law rather than addressing substantive issues.

But there is a much more important reason to be concerned. Reliance on contract law will give tremendous power to the corporate entities and could result in rampant despotism in these private pockets of civilization. This phenomenon is not new. The “company town” is “a planned community owned or controlled by a single company.”¹⁶⁶ Company towns are especially prevalent where corporations seek to exploit natural resources in remote areas.¹⁶⁷ To attract and retain a workforce, corporations “build accommodations and provide[] basic services such as health care, education and recreational facilities for workers and their families.”¹⁶⁸ Company towns (some of which still exist on Earth) run the gamut from “satanic mills” to “industrial edens.”¹⁶⁹ The logic behind the former model is that “[b]usiness exists to make a profit, not coddle employees [and that s]ociety as a whole benefits most when enterprises are cost-effective, productive, and profitable.”¹⁷⁰ The latter model, the industrial eden, is driven by paternalism and the ideal that companies will “share their bounty with workers and their families.”¹⁷¹ Both extremes are forms of labor control, and exhibit a troubling “watchfulness toward the citizenry on the part of company overlords.”¹⁷² Furthermore, when one considers that “company towns” formed on private space stations are precursors to colonies headed for the Moon and other celestial bodies, one can only be reminded of the exploitative practices of Colonial imperialists.¹⁷³

166. OLIVER J. DINIUS ET AL., *COMPANY TOWNS IN THE AMERICAS I* (Oliver J. Dinius et al. eds., 2011).

167. *Id.*

168. *Id.* at 2.

169. See HARDY GREEN, *THE COMPANY TOWN* (Basic Books, 2010) (analyzing of the emergence of company towns and their role in shaping the American economy).

170. *Id.* at 5.

171. *Id.*

172. GREEN, *supra* note 169, at 5; DINIUS, *supra* note 166, at 3, 14.

173. “The legitimacy of colonialism has been a longstanding concern for political and moral philosophers in the Western tradition. At least since the Crusades and the conquest of the Americas, political theorists have struggled with the difficulty of reconciling ideas about justice and natural law with the practice of European sovereignty over non-Western peoples.” Margaret Kohn & Kavita Reddy, *Colonialism*, STAN. ENCYCLOPEDIA OF PHIL. (May 9, 2006, updated Aug. 29, 2017), <https://plato.stanford.edu/entries/colonialism/> [<https://perma.cc/Y3PE-KWNN>].

In 1966, French philosopher Michel Foucault theorized that “the anxiety of our era has to do fundamentally with space.”¹⁷⁴ It is not just the concern that we are running out of space on Earth, “but also . . . knowing what relations of propinquity, what type of storage, circulation, marking, and classification of human elements should be adopted in a given situation in order to achieve a given end.”¹⁷⁵ For this reason, Foucault argues, space itself is power.¹⁷⁶ Though Foucault warned that it would be foolish to strive for utopia,¹⁷⁷ he also reminds us that while communities may exist in the void of space and within the gaps of space law, they are not in and of themselves void.¹⁷⁸ They are, instead, bundles of relations that will benefit from explication and illumination.¹⁷⁹ In other words, while law may not exist, any time two or more humans interact relationships are built. Communities develop around those relationships. Understanding and recording the norms that govern the relationships will help those communities thrive and expand. The private space stations and on-orbit manufacturing facilities planned for the coming decade are sites in which bundles of relations such as we are accustomed to here on Earth are “simultaneously represented, contested and inverted.”¹⁸⁰ Continuing the fiction that all acts in space are State acts distorts the environment in which they take place. Similarly, allowing corporations to usurp the fundamentals of space law with financially perverted paternalism hurtles space toward freedom-stripping fiefdoms. These are conditions and traditions that will ultimately corrupt what most philosophers would consider inalienable rights and provide a poor foundation from which to spread humanity to space.

IV. TERMS AND PROVISIONS GOVERNING SPACE STATION OPERATION INCLUDING THE RIGHTS AND OBLIGATIONS OF SPACEFARERS (FIRST EDITION)

Keeping Foucault’s admonitions in mind, the first step toward the governance of human behavior in space is to describe, define and develop norms in respect of the relationships therein. To distribute “power” evenly while protecting basic human rights, norms must be set to guide the overlapping

174. MICHEL FOUCAULT, *Des Espaces Autres* [*Of Other Spaces: Utopias and Heterotopias*] 2 ARCHITECTURE/MOUVEMENT/CONTINUITÉ 46 (1984) (Fr.), translated in Jay Miskowiec, *Of Other Spaces*, DIACRITICS 22, 23 (1986).

175. *Id.*

176. Miskowiec, *supra* note 174, at 22.

177. According to Foucault, it can never be utopia, because “[u]topias are sites with no real place . . . [t]hey present society itself in perfected form . . . [and] are fundamentally unreal.” *Id.* at 24.

178. *Id.* at 23.

179. *Id.* at 23–24.

180. *Id.*

interrelations between the crew, the tourists (or workers) and the operators of the space stations. Given the scenarios¹⁸¹ previously discussed, the new norms must: (1) affirm the basic rights of all spacefarers and make them equal under the law; (2) eliminate the uncertainty for both private companies and governments regarding responsibility and liability; (3) guide disputes into the same or similar venues so that a uniform body of jurisprudence may develop in respect of outer space liabilities; and (4) implement a code of conduct which acknowledges that human behavior in space must take into account the realities of the environment and be harmonized to assure safety and security. The first development of what will surely be an evolving set of rules must also account for the State monopoly of space and work to transition slowly to an actual body of astrolaw.

A. Cruise in Space?

The concept of creating internationally accepted rules for specific and isolated places is not exceptional. Aircraft, commercial spaces that populate our skies, are subject to rules promulgated pursuant to the Convention on International Civil Aviation¹⁸² ratified by 191 States. Known as the Chicago Convention, the agreement, among many other things, established the International Civil Aviation Organization, a specialized agency of the UN to create rules ensuring that “international civil aviation may be developed in a safe and orderly manner.”¹⁸³ Similar regimes have been implemented to protect the safety and security of the millions of people each year who board cruise ships, pockets of civilization floating, hopefully with bliss, in international waters. The International Convention on the Safety of Life at Sea¹⁸⁴ (SOLAS), ratified by 162 States, aims to protect individuals who travel on such ships “by regulating vessel construction and stability, firefighting systems, safety equipment, radio communications, safe navigation procedures, vessel management and carriage of cargo.”¹⁸⁵ Similarly, the International

181. See discussion, *supra* Section III.

182. See generally Convention on International Civil Aviation, Dec. 7, 1944, 61 Stat. 1180, 15 U.N.T.S. 295.

183. *History of the ICAO*, ICAO TECH. COOPERATION, <https://www.icao.int/secretariat/TechnicalCooperation/Pages/history.aspx> [<https://perma.cc/W5RH-GRP6>] (last visited Nov. 9, 2019).

184. See generally International Convention for the Safety of Life at Sea (SOLAS) No. 18961, Nov. 1, 1974, 1184 U.N.T.S. 278.

185. *Hearing on a Review of Cruise Ship Safety and Lessons Learned from the Costa Concordia Accident Before the Subcomm. on Coast Guard and Mar. Transp., H. Comm.*

Convention on Standards of Training, Certification, Watchkeeping for Seafarers,¹⁸⁶ (STCW) signed by 161 State, establishes “basic requirements on training, competence, testing, and certification of seafarers based on their duties aboard a vessel.”¹⁸⁷ Each of these conventions offer good examples of how the international community can and must work together to adopt minimum industry standards intended to keep humans of all nationalities safe.

However, while they guarantee the safety of the equipment, some of these conventions fail to uniformly or adequately protect the rights of the passengers. In aviation, State have agreed to certain rules covering everything from what a ticket should look like to how much a passenger should be entitled to receive in the case of an accident.¹⁸⁸ But at sea, this is not so clear. The legal regime governing private activities on cruise ships has been described as an “intricate web of treaties, laws, regulations, and industrial practices intended to protect lives, rights, and property in the maritime realm.”¹⁸⁹ Obtaining compensation or justice for an accident or crime at sea “may be determined by the nationality of those involved, the ship’s national registry, or its exact location at the time of the incident.”¹⁹⁰ Indeed, “even attorneys find it difficult to navigate the complex jurisdictional boundaries, statutory definitions, treaty provisions, maritime traditions, and fine-print liability disclaimers.”¹⁹¹ Even so, cruise ships, while moveable and sometimes finding themselves in very isolated places, do dock and remain physically bound to terrestrial law, and to the protection of individual rights recognized by customs and laws. This cannot be said of a space in orbit.

While the commercial space industry may be too nascent for the establishment of comprehensive safety guidelines, it is not too early to establish the foundation upon which such regulations may be promulgated. And it can never be too early to recognize fundamental human rights. Following is a rudimentary proposal for the development of spacefaring terms and provisions,

on Transp. and Infrastructure, 112th Cong. 3 (2012) (Memorandum from Staff, Subcomm. on Coast Guard and Mar. Transp.) [hereinafter *Costa Concordia Hearing*].

186. International Convention on Standard of Training Certification and Watchkeeping for Seafarers No. 23001, July 17, 1978, 136 U.N.T.S. 190.

187. *Costa Concordia Hearing*, *supra* note 185, at 4.

188. *Convention for the Unification of Certain Rules for International Carriage by Air*, art. 21–22, May 28, 1999, 2242 U.N.T.S. 309, 356–57 [hereinafter *Montreal Convention*]. Of course, much uncertainty remains, but the effort to create uniformity is a giant step in the right direction.

189. *Hearing on Int’l Mar. Sec. II: Law Enf’t, Passenger Sec. and Incident Investigation on Cruise Ships Before the Subcomm. on Nat’l Sec. Emerging Threats, and Int’l Relations*, 119th Cong. 1 (2006) (statement of Chris Shay, Chairman of Subcomm. on Nat’l, Emerging Threats, and Int’l Relations).

190. *Id.*

191. *Id.*

intended not for immediate implementation, but rather to encourage debate and discussion of this important topic. While the temptation to populate these provisions with details exists, the overarching goal is not to micromanage the operations of private space stations. It is to provide a base standard by which all space stations are managed to: (1) protect human rights; (2) reduce dispute complexities; and (3) offer a foundation from which a future human space civilization may grow and thrive. Terms are also kept general in order to ease international acceptance and adherence whether by international treaty or national regulation.

B. Basic Rights of Spacefarers

In 1985, the Director of the U.S. Smithsonian Institution's National Air and Space Museum decided "that a project should be undertaken to determine which of the values and principles of the Constitution could, or indeed must, be applied to American citizens in outer space communities."¹⁹² Over the course of two conferences, held in December 1986 and November 1987, the participants formulated a "Declaration of First Principles for the Governance of Outer Space Societies" (First Principles).¹⁹³ While the document has not become "a pattern for further study and development in schools, universities, professional associations, and citizen groups throughout the country,"¹⁹⁴ it does provide an example of how one might entrench the most basic of terrestrial rights into space society.

Since the remit of the project was to determine which provisions of the U.S. Constitution ought to be applied to outer space, the document provides an American-centered perspective.¹⁹⁵ The preamble soars loftily, "harkening back to the struggle by [the US] founding fathers as they drafted their young nation's Constitution."¹⁹⁶ It is peppered with words and concepts from the U.S. Constitution, the U.S. Declaration of Independence and U.S. jurisprudence like "life, liberty . . . equal protection . . . fundamental freedoms [and]

192. George S. Robinson, *Re-examining our Constitutional Heritage*, 3 HIGH TECH. L.J. 81, 81 (1988) [hereinafter *First Principles*]. The Steering Committee for the project was made up of the following individuals: U.S. Supreme Court Justice William J. Brennan, U.S. Senator John H. Glenn, U.S. Congressman Dan Fuqua, Walter Cronkite and Richard Dreyfuss.

193. *Id.*; see also generally ROBINSON & WHITE, JR., *ENVOYS OF MANKIND*, *supra* note 13.

194. *First Principles*, *supra* note 192, at 86.

195. *Id.*

196. *Id.* at 88.

inalienable rights.”¹⁹⁷ It is also aggressively ambitious in speaking of space colonies that will be emancipated from Earth.

To gain wide acceptance, the conceptual frame of the author’s proposed “Terms and Provisions Governing Space Station Operation Including the Rights and Obligations of Spacefarers” (Space Station Terms and Provisions)¹⁹⁸ must focus on the immediate realities, and should draw not from the U.S. Constitution, but from the Universal Declaration of Human Rights (Universal Declaration).¹⁹⁹ It should also be tailored to recognize the unique environment of a space station. Most importantly, the Space Station Terms and Provisions must recognize that a balance will need to be struck between the safety of the space and the rights of the humans who occupy it. Thus, the Space Station Terms and Provisions²⁰⁰ preamble should:

- Recognize that “the inherent dignity and . . . the equal and inalienable rights of all members of the human family [are] the foundation of freedom, justice and peace”²⁰¹ on the Earth and in outer space;
- Confirm that human beings in outer space “shall enjoy freedom of speech and belief and freedom from fear and want has been proclaimed as the highest aspiration of the common people;”²⁰²
- Reaffirm “faith in fundamental human rights, in the dignity and worth of the human person and in the equal rights of all members of humanity;”²⁰³
- Recognize that “the imperatives of community safety and individual survival within the unique environment of outer space must be guaranteed in harmony” with the inherent dignity and the equal and inalienable rights to freedom, justice and peace afforded to all members of the human family;²⁰⁴ and
- Recognize that in order to achieve these ends, there must be established, in respect of space stations, a clear chain of command in outer space as well as a clear relationship between ground and on-orbit management.²⁰⁵

197. *Id.*

198. *See generally* Space Station Terms and Provisions, *infra* Appendix.

199. G.A. Res. 217A (III), U.N. Doc A/810, Universal Declaration of Human Rights, at 71 (1948) [hereinafter Universal Declaration].

200. The proposed preliminary Space Station Terms and Provisions are set forth in total in the Appendix hereto.

201. *Id.* at Preamble (quoting the Universal Declaration, *supra* note 199, at Preamble).

202. *Id.*

203. Space Station Terms and Provisions, *infra* Appendix.

204. *Id.*

205. *Id.*

The Space Station Terms and Provisions must next delineate its scope and applicability and several terms need to be defined.

First, while no agreement currently exists with respect to the definition and delimitation of outer space,²⁰⁶ the scope of the Space Station Terms and Provisions should be clear. It is proposed that “outer space” be defined, solely for purposes of these Terms and Provisions, as the area that extends beyond the distance of 100 kilometers above Earth’s mean sea level.²⁰⁷ The Space Station Terms and Provisions may borrow from the U.S. Congress Office of Technology Assessment, which defines “space station” as “an object or a collection of objects (attached or free-flying) which is in an intentional, long-duration earth orbit and is, at least in part, habitable.”²⁰⁸ A “space station operator” may be defined as any owner of a space station that operates the space station, i.e., who uses, causes to use, or authorizes the use of the space station, and any representative thereof.²⁰⁹

In defining “spacefarer,” the Space Station Terms and Provisions must lay to rest any debate about the definition of astronaut. As Manfred Lachs recognized in 1972, definitions in the Rescue Convention and OST notwithstanding, “all persons aboard a space vehicle should share a common legal status.”²¹⁰ The Space Station Terms and Provisions should make this clear. Thus, a “spacefarer” could mean any human in outer space who shall be accorded all the rights and responsibilities contained in the Space Station Terms and Provisions and those afforded to “astronauts” and “personnel of a spacecraft” pursuant to the OST and the Rescue Agreement. While this definition goes beyond the bounds of a space station dweller or visitor, it is important to identify the “spacefarer” as broadly as possible to set a precedential foundation of human rights for all future space travelers and inhabitants.

Given the primary goal of the Space Station Terms and Provisions is to preserve human rights in space, the first article should adopt and extend the Universal Declaration²¹¹ to all spacefaring humans as a general matter.

206. See Bhavya Lal & Emily Nightingale., *Where is Space And Why Does That Matter?*, EMBRY-RIDDLE AERONAUTICAL U. SPACE TRAFFIC MGMT. CONF. (Nov. 5, 2014), <https://commons.erau.edu/cgi/viewcontent.cgi?article=1052&context=stm> [<https://perma.cc/S3XR-6NRE>].

207. Space Station Terms and Provisions, *infra* Appendix. See *id.*

208. BACKGROUND PAPER, *supra* note 28, at 16.

209. 14 C.F.R. § 161.5 (2019).

210. Lachs, *supra* note 12, at 67.

211. Universal Declaration, *supra* note 199.

C. Liability and the Concept of the Launching State

Having confirmed the human rights of spacefarers, the Space Station Terms and Provisions must tackle the relationship between the spacefarer, the space station operator and the State. An initial inclination is to replicate the model of the International Space Station, a shining example of a successful heterotopia where diverse individuals from multiple countries live and work together for months at time in a small and enclosed space, surrounded by a vacuum. If the ISS had a constitution, it would be the Intergovernmental Agreement²¹² which “was the outcome of years of negotiations.”²¹³ Like the OST, the Liability and Registration Conventions, and the Rescue Agreement, the ISS Agreement imposes responsibilities and obligations at the State level.²¹⁴ For this reason, the overarching Intergovernmental Agreement itself is not an appropriate model for a private space station. For example, the ISS Agreement provides that each partner shall register its modules and equipment as space objects, effectively retaining full control of them even as they are assembled into the greater whole.²¹⁵ This vivisection of the whole cannot be permitted for private space operators. At the same time, a wholesale abandonment of the concept of State liability for private space activity is premature.

At this early stage, the reality is that States must and will work closely with their nationals to properly authorize (i.e., license) and supervise space activities. The goal of the Space Station Terms and Provisions is to do what the OST and Liability Convention do not: identify only one “appropriate State” responsible.²¹⁶ Thus, regardless of their origin, the operator of the space station must be the registered owner of every module, component and piece of equipment on the space station.²¹⁷ Further, the State responsible for the space station operator must agree to accept all the liability imposed on separate launching States by the joint and several liability provisions contained in Article V of the Liability Convention.²¹⁸ While this agreement cannot override a treaty obligation of any State, evidence of such agreement will go far, both diplomatically and in court, to direct aggrieved parties and prevent frivolous lawsuits. Note this would cover only the on-orbit damage,

212. ISS Agreement, *supra* note 6.

213. Sharpe & Tronchetti, *supra* note 5, at 631.

214. ISS Agreement, *supra* note 6, at art. 7.

215. *Id.* arts. 6, 7, 16.

216. Paul Stephen Dempsey, *Accidents & Injuries in Air Law* 7 (2008), <https://www.mcgill.ca/iasl/files/iasl/Titans.pdf> [<https://perma.cc/NNQ8-AG84>].

217. ISS Agreement, *supra* note 6, at art. 11.

218. *Id.* art. 22(1).

not damage on Earth or during launch, and it would obviate the need for a cross-waiver of liability as set forth in the ISS Agreement.²¹⁹

Agreements in which modules or component parts intended for use in a space station are transferred pursuant to cross-border arrangements should be acknowledged by the relevant State governments. The State should agree up front that the operation of a space station, and all the activities related thereto, including, without limitation, negligent and criminal actions, are “national activities” for which the State is responsible.²²⁰ While this may seem to place a heavy burden on the receiving State, it is simply a part of the safety due diligence a State should owe to conduct before licensing a space station operator or its employees.

D. Jurisprudence

The third goal of the Space Station Terms and Provisions is to limit possible court venues for litigation. This is a tricky proposition because, for example, there is no reason a Chinese space station operator trying to attract Chinese spacefarers should agree to be governed by or to submit to the exclusive jurisdiction of U.S. courts, and vice versa. However, if private companies include identical provisions regarding their spacefaring customers within their contracts, then courts around the world will be interpreting the same language and will be able to borrow from, or openly criticize, court decisions from other jurisdictions. Though the decisions may not have precedential value over one another, it is not unusual for courts to acknowledge and comment on other decisions, thus contributing to global discourse and ultimately bringing global interpretation one step closer to uniformity.

A good example of this trend is the jurisprudence spawned by the Convention for the Unification of Certain Rules for International Carriage by Air (the Montreal Convention).²²¹ With 126 State parties, many opportunities exist for courts to interpret differently the definition of the word “accident.”²²² Struggling to determine when to characterize an event as an accident for purposes of the Montreal Convention, the Australian High Court took notice of U.S. decisions (which have no authority in Australia) and “rebuked the U.S. Supreme Court.”²²³ While this might seem a far cry from uniformity,

219. *Id.* art. 16.

220. Space Station Terms and Provisions, *infra* Appendix, at art. II.

221. *See generally* Montreal Convention, *supra* note 188.

222. *Id.*

223. Dempsey, *supra* note 216.

the fact that many jurisdictions are in the position of considering the exact same language, and that they are willing to comment upon, if not accept the lead from, other courts, is one step towards harmony. Therefore, State should require all space station operators to accede to the Space Station Terms and Provisions and include them verbatim in their contracts with employees and passengers. Additionally, the Space Station Terms and Provisions themselves should require that the spacefarers and the space station operators submit to the jurisdiction of the Space Station's State of registry.

E. Code of Conduct

A considerable amount of thinking and negotiation has already gone into the code of conduct that should govern the behavior of humans aboard a space station. However, the Code of Conduct for International Space Station Crew (ISS Code) is built on the idea that each individual is the responsibility of his or her national or sponsoring government.²²⁴ Indeed, Article 22 of the ISS Agreement assures that each State “may exercise criminal jurisdiction over personnel in or on any flight element who are their respective nationals.”²²⁵ This concept should not crossover to cover private space stations.

Spacefarers should not be considered “space objects” for which their citizen States are responsible.²²⁶ Instead, they should be considered private citizens that acknowledge, accept and submit to the civil and criminal jurisdiction of the State responsible for the space station they are joining or visiting.²²⁷ Thus, effectively, the spacefarers, and not the private companies that operate space objects, will truly be the first private citizens in space over whom no government shoulders the burden of liability. Jurisdiction aside, the spacefarers will generally be bound by any terms in their contracts with space station operators.²²⁸ However, the Space Station Terms and Provisions must assure that such rules have the goal of maintaining “a harmonious and cohesive relationship among [spacefarers] and an appropriate level of mutual confidence and respect through an interactive, participative, and relationship-oriented approach which duly takes into account”²²⁹ the unique circumstances of their existence in space. Again, in the interest of creating as broad a scope as possible, the Space Station Terms and Provisions, inasmuch as they regulate the behavior of spacefarers, should apply for

224. ISS Agreement, *supra* note 6, at art. 11; *see also* 14 C.F.R. § 1214.403(I)(B).

225. ISS Agreement, *supra* note 6, at art. 22.

226. Space Station Terms and Provisions, *infra* Appendix, at art. III.

227. *Id.*

228. *Id.* arts. III, IV.

229. 14 C.F.R. § 1214.403II(B).

the entire duration of a space voyage including, as in the ISS Code of Conduct, “preflight, on-orbit, and post flight activities (including launch and return phases).”²³⁰

A most important aspect of the ISS Code of Conduct is the command structure. Unlike in a hotel on earth, even a simple accident on a space station can lead to destruction and death. The fact that space station visitors will not receive the training current astronauts are required to endure emphasizes the need for authority. Indeed, any risky activity undertaken by a tourist—hot air ballooning, safari camping, white water rafting, and skydiving come to mind—requires a submission by that tourist to a certain level of authority. Thus, the provisions of the ISS Code of Conduct regarding the ISS Commander can be adopted almost verbatim in the Space Station Terms and Provisions, including the appointment of a flight director.²³¹ As provided in the ISS Code of Conduct, the commander will be the “highest authority” on the space station.²³² Her primary mission will be to ensure the safety and security of the space station as well as harmony among the spacefarers.²³³ The ultimate authority and responsibility will rest with a flight director based on the ground.²³⁴ Borrowing directly from the ISS Code of Conduct, the commander’s main responsibilities would be to: (1) conduct operations in or on the space station as directed by the flight director; (2) direct and oversee the activities of the spacefarers to ensure safety and security; (3) fully and accurately inform the flight director, in a timely manner, of the space station configuration, status, commanding, and other operational activities on-board (including off-nominal or emergency situations); (4) maintain order; (5) ensure spacefarer safety, health and well-being, including spacefarer rescue and return; and (6) take all reasonable action necessary for the protection of the space station elements, equipment, or payloads.²³⁵

Accordingly, during all phases of on-orbit activity, the commander, consistent with the authority of the flight director, shall have the authority to use any reasonable and necessary means to fulfill her responsibilities.²³⁶ This authority extends to: (1) the space station elements, equipment, and payloads; (2) the spacefarers; (3) activities of any kind occurring in or on

230. § 1214.403I(B).

231. See Space Station Terms and Provisions, *infra* Appendix, at art. IV.

232. § 1214.403I(B)(1).

233. Space Station Terms and Provisions, *infra* Appendix, at art. IV.

234. *Id.*

235. *Id.*; see also § 1214.403III(A)(2)(b).

236. Space Station Terms and Provisions, *infra* Appendix, at art. IV.

the space station; and (4) data and personal effects in or on the space station where necessary to protect the safety and well-being of the spacefarers and the space station elements, equipment, and payloads.²³⁷ Any matter outside the commander's authority shall be within the purview of the flight director.²³⁸ Incidentally, both the station commander and the flight director should be duly licensed, initially by the State of registry, but ultimately, pursuant to international standards.²³⁹

F. Implementation

Ideally, nations would come together to establish formal guidelines and principles to responsibly incubate and nurture every aspect of our new space economy. However, this seems unlikely, at least in the short term. It is recommended in the meantime that nations adopt the Space Station Terms and Provisions as part of their national regulations, require each space station operator to abide by its provisions, and include the Space Station Terms and Provisions as part of their private contracts. In addition, State should require that launch service providers refuse to launch humans to a space station unless the Space Station Terms and Provisions have been included in contractual arrangements. Barring that, it is urged that potential space station operators take the lead in adopting these provisions as part of their contractual arrangements, a move that will improve certainty, as well as safety.

G. The Space Station Terms and Provisions in Action

Applying the Space Station Terms and Provisions to the scenarios yields far simpler results than the current regime.

1. An Object Made in Space

Recalling that Article XI of the Liability Convention permits natural or juridical persons to pursue a claim in a launching State,²⁴⁰ under the Space Station Terms and Provisions, the employee injured by the object made in space in our first scenario would be able to bring a claim in U.S. court against the United States. The United States would be considered both the launching State and the "appropriate State" responsible for the national activities of the U.S. space station as well as for damages caused by the U.K. machinery and the object made by the U.K. machinery registered

237. *Id.*

238. *Id.*

239. *Id.*

240. Liability Convention, *supra* note 22, at art. XI.

with the United States. Damages would be determined under American product liability laws, thus highlighting the need for the United States to require high levels of both accident insurance and safety measures.

Because spacefarers will be afforded the same status as astronauts, while the question of a State's obligations in respects to rescuing an astronaut will not be resolved, the spacefarer's equal status with an astronaut will be confirmed.

2. Human Error

In the case of the leaking spacesuit, the emotionally injured tourist would also bring a claim in U.S. court against the United States. The United States would be considered the "launching State." Pursuant to the Space Station Terms and Provisions, the United States should agree that negligent activity may be considered a "national activity," and the negligent employee would be considered an agent of the space station operator. Damages would be determined pursuant to U.S. law. The space station operator would not be able to seek damages against Italy, but it could proceed directly against the tourist.

3. Catastrophic Collision

In the case of a collision, the damage done to the space station from the third-party object would still be subject to the Liability Convention. The question of wrongful death would be litigated against the United States who would have accepted all activity as national activity, pursuant to U.S. law.

In short, revisiting the scenarios under the proposed Space Station Terms and Provisions does not miraculously resolve all the issues, but it removes the civil claims from the diplomatic table and keeps the litigation in one jurisdiction where jurisprudence and precedents may start to build. Moreover, it keeps private entities and State fully aware of their responsibilities and obligations, allowing them to plan accordingly with relevant and specific insurances, inspections, background checks and licenses. And it affords real protection for the safety, security and freedom of spacefarers.

V. CONCLUSION: LET'S NOT THREATEN OUR ACHIEVEMENT

Today, human presence in space is aberrant. But humans are “exploratory, migratory animal[s]”²⁴¹ and outer space offers the next natural point of our evolutionary journey. As we contemplate migration to the stars, we have to consider the vehicles—the space—we will inhabit. We have worked hard to adapt to the hostility of the environment and overcome the natural sense of displacement it engenders. However, we have not yet addressed the reality of human, as opposed to State, activity in space. We are poised to spread humans into orbit and beyond. While the progress will be slow, and will start with tourists, history has taught us that rules are required to prevent exploitation and oppression. Unfortunately, our current State-centric space law regime is not intended to serve a private space faring force. Agreeing on a baseline of rules, such as those proposed by the Space Station Terms and Provisions, which govern both individual behavior and the relations between the individual, the corporate entity and the State, is a baby step on a path toward relieving State of responsibility for private actors, recognizing human rights in space, and developing a robust and fair body of astrolaw. Here on Earth, we struggle to defend “the inherent dignity and . . . the equal and inalienable rights of all members of the human family.”²⁴² We cannot allow the vacuum of space to become an excuse for the reversal of the gains our imperfect civilization has made as it has matured. We must work to spread humanity with humans in all our on-orbit and off-world heterotopias and enshrine in those spaces the power to prevent dystopia.

241. BEN R. FINNEY, FROM SEA TO SPACE 105 (Massey Univ. Press 1992).

242. Universal Declaration, *supra* note 199, at Preamble.

VI. APPENDIX

TERMS AND PROVISIONS GOVERNING SPACE STATION OPERATION INCLUDING THE RIGHTS AND OBLIGATIONS OF SPACEFARERS (SECOND EDITION)

PREAMBLE:

1. Recognizing that the inherent dignity and the equal and inalienable rights of all members of the human family are the foundation of freedom, justice and peace on the Earth and in outer space;
2. Confirming that human beings in outer space shall enjoy freedom of speech and belief and freedom from fear and want, which have been proclaimed as the high aspiration of the common people;
3. Reaffirming faith in fundamental human rights, in the dignity and worth of the human person and in the equal rights of all members of humanity;
4. Recognizing that the imperatives of community safety and individual survival within the unique environment of outer space must be guaranteed in harmony with the inherent dignity and the equal and inalienable rights of all members of the human family to freedom, justice and peace; and
5. Further recognizing that in order to achieve these ends, there must be established, in respect of space stations, a clear chain of command on-orbit as well as a clear relationship between ground and on-orbit management.

NOW THEREFORE, Space Station Operators and Spacefarers do hereby agree to accept and apply the terms and provisions as hereinafter set forth.

DEFINITIONS:

For purposes of these Terms and Provisions,

“Outer Space” shall mean the area that extends beyond the distance of 100 kilometers above Earth’s mean sea level. For purposes of clarity, it is reiterated that this definition is intended solely for the purposes of these Terms and Provisions.

“Space Station” shall mean an object or a collection of objects (attached or free-flying) which is in an intentional, long-duration earth orbit and is, at least in part, habitable.

“Space Station Operator” shall mean any owner of a space station that operates the space station, i.e., uses, causes to use, or authorizes the use of the space station and any representative of thereof.

“Spacefarer” shall mean any human in outer space and shall be accorded all the rights and responsibilities contained herein and afforded to “astronauts” and “personnel of a spacecraft” pursuant to the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies, and the Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into Outer Space (the Outer Space Treaty).

ARTICLE I:

The fundamental values embodied in the United Nations Universal Declaration of Human Rights shall apply to all spacefarers.

ARTICLE II:

The Space Station Operator avers that the State responsible for its actions has agreed to maintain jurisdiction and control of every space object, including every module and component part included as part of or within the Space Station and any object manufactured on the Space Station.

The Space Station Operator further avers that the State responsible for its actions has agreed to accept responsibility and liability as the sole Launching State as such term is defined in the Convention on the International Liability for Damage Caused by Space Objects and the Convention on Registration of Objects Launched into Outer Space.

The Space Station Operator avers that the State responsible for its actions has agreed that all activities related to the operation of the Space Station, including, without limitation, negligent or criminal acts of the Space Station Operator or any agent thereof, and that occur within and/or the vicinity of the Space Station are deemed to be “national activities” for which the State is responsible pursuant to Article VI of the Outer Space Treaty.

ARTICLE III:

This Article III sets forth the standards of conduct applicable to all Spacefarers during preflight, on-orbit and post-flight activities (including launch and return phases):

- A. It is recognized and agreed that the Spacefarer is in space as a private citizen and is not the responsibility of his or her citizen government.

- B. Spacefarers conduct shall be such as to maintain a harmonious and cohesive relationship among Spacefarers and an appropriate level of mutual confidence and respect through an interactive, participative, and relationship-oriented approach which duly takes into account the unique circumstances of their shared existence and survival in space.
- C. Spacefarers shall be subject to such other rules and regulations as may be applied by the Space Station Operator so long as the same do not violate the spirit or letter of these Terms and Provisions.
- D. Spacefarers agree at all times to submit to the authority of the Station Commander as set forth in Article IV below.

ARTICLE IV:

- A. A duly licensed Flight Director, based on the ground, shall have ultimate responsibility for the operation of the Space Station and shall be in charge of the direction of real time operations at all times.
- B. A duly licensed Station Commander shall be identified for every phase of the spacefarer's journey. This Station Commander shall be subject to the provisions of Article III above and report to, and operate under the direction of, the Flight Director.
- C. The Station Commander is responsible for and will seek to maintain a harmonious and cohesive relationship among the Spacefarers and an appropriate level of mutual confidence and respect through an interactive, participative, and relationship-oriented approach which duly takes into account the unique environment of the Space Station.
- D. The Station Commander is the highest authority among the Spacefarers on the Space Station responsible for the safety of the Spacefarers and the protection of the Space Station elements and equipment.
- E. The Station Commander's main responsibilities are to: (1) conduct operations in or on the Space Station as directed by the Flight Director; (2) direct and oversee the activities of the Spacefarers to ensure safety and security; (3) fully and accurately inform the Flight Director, in a timely manner, of the Space Station configuration, status, commanding, and other operational activities on-board (including off-nominal or emergency situations);

(4) maintain order; (5) ensure Spacefarer safety, health and well-being including Spacefarer rescue and return; and (6) take all reasonable action necessary for the protection of the Space Station elements, equipment, or payloads.

- F. During all phases of on-orbit activity, the Station Commander, consistent with the authority of the Flight Director, shall have the authority to use any reasonable and necessary means to fulfill his or her responsibilities. This authority, which shall be exercised consistent with the provisions of Article III and this Article IV extends to: (1) the Space Station elements, equipment, and payloads; (2) the Spacefarers; (3) activities of any kind occurring in or on the Space Station; and (4) data and personal effects in or on the Space Station where necessary to protect the safety and well-being of the Spacefarers and the Space Station elements, equipment, and payloads. Any matter outside the Station Commander's authority shall be within the purview of the Flight Director.

ARTICLE V:

Each of the Spacefarer and the Space Station Operator avers that the Spacefarer and the Space Station Operator has received the advice of independent legal counsel and has read and understood all of these Terms and Provisions.

ARTICLE VI:

Each of the Spacefarer and the Space Station Operator agree to submit to the jurisdiction of the State in which the Space Station is registered in respect of all disputes and matters whatsoever arising under, in connection with or incident to travel to and residence on the Space Station.