

THE TROUBLE WITH WESTPHALIA IN SPACE: THE STATE-CENTRIC
LIABILITY REGIME

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ABSTRACT

What happens when a satellite owned by a private company in one state crashes into another state's satellite? International space law has an answer. The solution, however, reflects a bygone, state-centric era created by the Peace of Westphalia in 1648. A better system must meet demands of the emerging commercial space sector. The treaty framework governing state activities in outer space reflects Cold War fears. Consequently, the space liability regime favors diplomatic, cooperative dispute resolution between states. States, therefore, must sponsor private entities' claims. If the treaty process is ineffective, state responsibility and international liability fill the gaps left by the space liability regime. Today, space is increasingly crowded as commercial ventures launch into space. For them, a state-centric liability regime is ineffective. I conclude by suggesting that states back commercial ventures by subsidizing liability insurance and encourage the private sector to circumvent the treaty framework through contractual allocation of risk.

INTRODUCTION

Outer space has awed humanity for centuries. People, across the globe, turn their faces up to the night sky in wonder. Artists and musicians seek inspiration from it. Scientists, who until recently needed to look up for study, have found ways to break the chains of gravity and travel beyond our globe. With this achievement, humanity is reaching beyond the Earth's surface to place technology in space to enhance our quality of life through communicating nearly instantaneously throughout the global,¹ weather reporting,² remote

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sensing³ of the Earth's surface to better manage natural resources,⁴ and applying advances from space research and development here on Earth.⁵ The horizon is bright for humanity if space is used in a thoughtful, efficient manner. For this to happen, law must govern outer space.

Before formal space law developed, prominent international law scholars, politicians, scientists, and some science fiction authors⁶ considered how law and space would interact. This diverse collection of thinkers helped set the stage for more formal legal talks and helped cement the spirit of cooperation through the foundational legal documents enumerating outer space law.⁷ These documents, although crafted with an eye on cooperation and a brighter future, are products of the Westphalian state system. In 1648, the Peace of Westphalia created the modern foundation of international law by building international relations around organized states with geographic boundaries. Consequently, solutions must come from the state-centric international legal regime despite the focus on cooperation. This cooperative spirit must continue and evolve to become a stabilizing force that tempers national interest. A space law liability regime that embodies this will likely be more effective than one where states jealously guard their sovereignty.

In 1989, Space Services, Inc. changed the *status quo* of space law when it becomes the first private company to launch a satellite into

1. I.H. PH. DIEDERIKS-VERSCHOOR & V. KOPAL, AN INTRODUCTION TO SPACE LAW 55 (3d ed. 2008).

2. *Id.* at 53-54.

3. "Remote sensing" is the practice of observing and imaging land from above. With the advent of satellite imaging, remote sensing can cover vastly larger areas than early aircraft-based reconnaissance. *Id.* at 70.

4. Sergio Marchisio, *Remote Sensing for Sustainable Development in International Law*, in OUTLOOK ON SPACE LAW OVER THE NEXT 30 YEARS 335, 335-37 (Gabriel Lafferranderie & Daphné Crowther eds., 1997); e.g., Press Release, NASA, NASA and USAID Pledge to Advance International Development with Science and Technology (Apr. 25, 2011), available at http://www.nasa.gov/home/hqnews/2011/apr/HQ_11-123_NASA_USAID.html.

5. See GLENN H. REYNOLDS & ROBERT P. MERGES, OUTER SPACE: PROBLEMS OF LAW AND POLICY 18-22 (1989).

6. E.g., NAT SCHACHNER, SPACE LAWYER (1953). This is the story of a young, hotshot space lawyer named Kerry Dale. After a dispute with his irascible boss, Dale rockets around the solar system using his knowledge of the "star code" and brilliant legal mind to best his former boss in business and woo the boss's beautiful daughter. In the end Dale, of course, gets the girl.

7. See Jennifer Frakes, Comment, *The Common Heritage of Mankind Principle and the Deep Seabed, Outer Space, and Antarctica: Will Developed and Developing Nations Reach a Compromise?*, 21 WIS. INT'L L.J. 409, 422 (2003) ("The Outer Space Treaty was based on politics and future visions of space exploration for all mankind . . .").

orbit.⁸ Due to technological advancements in rocketry and the retirement of the Space Shuttle, even more private space actors are expected to launch payloads into space.⁹ Cooperation is increasingly important¹⁰ because outer space is becoming more cluttered as states and commercial ventures undertake other space missions and launch more satellites and space stations.

Experts estimate that of the approximately “19,000 man-made objects in orbit,” only 900 of those objects are satellites.¹¹ This junk, which includes dead satellites, paint flecks, wrenches, and other spacecraft detritus, is called “space debris” and poses a significant danger to any operation in space.¹² For example, a 0.2 millimeter in diameter paint chip caused quite a scare when it pitted the Space Shuttle Challenger’s windshield.¹³ If space debris is left unchecked, scientists worry that low Earth orbit will become unusable.¹⁴ The “Kessler effect” posits that at a certain point, a cascade of collisions will envelop Earth and close off access to certain areas of space. Debris mitigation policies, which ideally require space objects to not jettison debris and be removed from orbit at end-of-life, are not uniformly adopted by space powers.¹⁵ The United Nations, however, made a large leap forward in 2008 when the General Assembly adopted debris mitigation guidelines with the intent to limit orbital hazards.¹⁶

With more actors in space, there will be more collisions, which will lead to more claims for liability.¹⁷ These claims will present a challenge because, although international space law has a framework for

8. Andre G. DeBusschere, *Liability for Damage Caused by Space Objects*, 3 J. INT’L L. & PRAC. 97, 104 (1994).

9. See DIEDERIKS-VERSCHOOR & KOPAL, *supra* note 1, at 106; NANDASIRI JASENTULIYANA, *INTERNATIONAL SPACE LAW AND THE UNITED NATIONS* 321, 325-26 (1999); Irene Klotz, *US Looks to Private Sector as Shuttle Program Ends*, REUTERS, July 5, 2011, <http://www.reuters.com/article/2011/07/05/uk-space-shuttle-commercial-idUSLNE76404L20110705>.

10. See DIEDERIKS-VERSCHOOR & KOPAL, *supra* note 1, at 23; JASENTULIYANA, *supra* note 9, at 216.

11. Robert P. Merges & Glenn H. Reynolds, *Rules of the Road for Space?: Satellite Collisions and the Inadequacy of Current Space Law*, 40 ENVTL. L. REP. NEWS & ANALYSIS 10009, 10010 (2010); Tariq Malik, *Space Junk Around Earth on the Rise, Experts Say*, SPACE.COM (Apr. 29, 2009), <http://www.space.com/news/090429-space-debris-safety.html>.

12. See DIEDERIKS-VERSCHOOR & KOPAL, *supra* note 1, at 127; BRUCE A. HURWITZ, *STATE LIABILITY FOR OUTER SPACE ACTIVITIES* 1-3 (1992); Malik, *supra* note 11.

13. Due to the incredibly high speeds of objects in orbit, even the tiniest of debris can cause significant damages. See DIEDERIKS-VERSCHOOR & KOPAL, *supra* note 1, at 127; JASENTULIYANA, *supra* note 9, at 321-22.

14. Donald J. Kessler & Burton G. Cour-Palais, *Collision Frequency of Artificial Satellites: The Creation of a Debris Belt*, 83 J. GEOPHYSICAL RES. 1985, 2637 (1978).

15. See FRANCIS LYALL & PAUL B. LARSEN, *SPACE LAW: A TREATISE* 308-10 (2009).

16. G.A. Res. 62/217, U.N. Doc. A/RES/62/217 (Feb. 1, 2008).

17. See DIEDERIKS-VERSCHOOR & KOPAL, *supra* note 1, at 121.

assigning liability, it is a state-centric regime that does not address private actors.¹⁸ General principles of international law, however, fill the gaps left in the space liability regime. While state responsibility and international liability do much to assuage liability concerns, they are still unwieldy for private actors. Going forward, states need to balance providing recovery to victims without stifling commercial space development.

Part I of this paper discusses the development of outer space law generally. The legal documents developed concurrently with leaps of technological advancements, meaning foundational documents were drafted with the future in mind. Coupled with the intent of tempering Cold War fears, early space law documents built a highly aspirational legal framework, which lead states to draft more workable laws guided by the space treaties. Part II focuses on the liability framework established by the Outer Space Treaty and the Liability Convention. In particular, this section clarifies important terms, discusses the claim process and the different liability regimes, explains how compensation is made, and how a state limits its liability. Part III explores traditional international law principles of state responsibility and international liability, which gaps in the space treaties. Part IV then discusses how Canada used the Liability Convention to make a claim for damages caused by the crash of the Soviet Union's Cosmos 954 satellite. This is the only case where Liability Convention has been used to solve a dispute. Although the procedures were not rigorously applied, the Convention did help resolve the dispute. In conclusion, the space liability regime must change to encourage private space development. The state-centric regime serves an important purpose, but it must relax in order to allow more commercial actors to develop.

I. DEVELOPMENT OF OUTER SPACE LAW

A. *Enter Space Law*

On October 4, 1957, a beach ball sized metal sphere called Sputnik blasted into orbit and opened the eyes of the world to a new frontier of scientific and technological exploration. The 1960s were a decade of rapid advances in space technology as the United States and Soviet Union launched larger manned rockets and planned more ambitious space missions.¹⁹ Because of the rapid scientific and technological strides, the law of outer space had to develop quickly.²⁰ In response, the United Nations established the Committee on the Peaceful Uses of

18. See *id.* at 107; HURWITZ, *supra* note 12, at 153; JASENTULIYANA, *supra* note 9, at 325-26; REYNOLDS & MERGES, *supra* note 5, at 301.

19. MANFRED LACHS, THE LAW OF OUTER SPACE: AN EXPERIENCE IN CONTEMPORARY LAW-MAKING 1-3 (1972).

20. See BIN CHENG, STUDIES IN INTERNATIONAL SPACE LAW 216-17 (1997).

Outer Space (COPUOS) in 1959 to address the unique legal issues that arise from space activities.²¹ COPUOS's main goals were to promote peaceful space activities, encourage cooperation, and establish a legal regime.²²

After eight years of debate, the Committee proposed the Outer Space Treaty,²³ which laid out a general framework for governing space activities.²⁴ The treaty came into force in October 1968 and, as of January 2006, 125 states have agreed to be bound by its terms.²⁵ In 1972, COPUOS added more details to the Outer Space Treaty's liability provisions through the Liability Convention.²⁶ As of January 2006, 108 states follow the Liability Convention's regime.²⁷ To give more force to these treaties,²⁸ in 1976 the Registration Convention set up a structure for states to register and track spacecraft.²⁹

In total, five treaties govern activities in outer space,³⁰ while five General Assembly non-binding resolutions³¹ further clarify principles of international law in outer space.³² Despite the relative youth of space law, several core concepts have crystallized into customary

21. International Co-operation in the Peaceful Uses of Outer Space, G.A. Res. 1472 (XIV), ¶ 1(a)(iii)(b), U.N. Doc. RES 1472(XIV) (Dec. 12, 1959); see DIEDERIKS-VERSCHOOR & KOPAL, *supra* note 1, at 3.

22. Question of the Peaceful Use of Outer Space, G.A. Res. 1348 (XIII), U.N. Doc. RES 1348(XIII) (Dec. 13, 1958); G.A. Res. 1472 (XIV), *supra* note 21. See also DIEDERIKS-VERSCHOOR & KOPAL, *supra* note 1, at 23; JASENTULIYANA, *supra* note 9, at 2-3.

23. 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, 18 U.S.T. 205, 610 U.N.T.S. 205 [hereinafter Outer Space Treaty].

24. See DIEDERIKS-VERSCHOOR & KOPAL, *supra* note 1, at 3; REYNOLDS & MERGES, *supra* note 5, at 49. See CHENG, *supra* note 20, at 215-85, for a detailed account of the drafting of the Outer Space Treaty.

25. See DIEDERIKS-VERSCHOOR & KOPAL, *supra* note 1, at 23-24.

26. Convention on the International Liability for Damage Caused by Space Objects, Mar. 29, 1972, 24 U.S.T. 2389, 961 U.N.T.S. 187 [hereinafter Liability Convention]; REYNOLDS & MERGES, *supra* note 5, at 178.

27. See DIEDERIKS-VERSCHOOR & KOPAL, *supra* note 1, at 35.

28. DIEDERIKS-VERSCHOOR & KOPAL, *supra* note 1, at 44-45; REYNOLDS & MERGES, *supra* note 5, at 204-05.

29. Convention on Registration of Objects Launched into Outer Space, Sept. 15, 1976, 28 U.S.T. 695, 1023 U.N.T.S. 15 [hereinafter Registration Convention].

30. Treaties cover the following topics: general principles, astronaut rescue, liability, registration of space objects, and use of the Moon and other celestial bodies. Henry Hertzfeld, *The "Law of Outer Space" is at a Crossroads: Current and Future Issues in International Space Law*, 15 ILSA J. INT'L & COMP. L. 325, 328-29 (2009).

31. These resolutions discuss: basic legal principles, direct broadcasting by satellites, remote sensing, use of nuclear power sources, and how outer space benefits are to be used. See JASENTULIYANA, *supra* note 9, at 41-50.

32. See CHENG, *supra* note 20, at 150-62; Stacey L. Lowder, Comment, *A State's International Legal Role: From the Earth to the Moon*, 7 TULSA J. COMP. & INT'L L. 253, 254-57 (1999), for a thorough account of the development of space law from 1961 to the present.

international law through state practice.³³ Customary international law is state practice accepted as law.³⁴ It is a formative process where, over time, states give certain customs the force of law.³⁵ The customary international laws relating to space are that space is governed by international law;³⁶ national appropriation in space is forbidden;³⁷ space and its resources are to be used for the benefit of humanity;³⁸ states are responsible for their actions in space;³⁹ states are liable for damage;⁴⁰ and space objects have free transit over a state's "subjacent territory," meaning that a satellite may freely pass over a state's territory so long as the satellite is in orbit.⁴¹ These rules of customary law, therefore, are binding on all states.⁴²

The Outer Space Treaty was a success partly because it was drafted by blending science and jurisprudence.⁴³ Including scientists in the drafting process helped form a legal framework that incorporated technological necessities.⁴⁴ However, technological development progresses quickly and the treaty-making process is slow. Drafters of the space treaties, for example, could not have fathomed the drastic increase in commercial space activities.⁴⁵ States, therefore, must now increasingly rely these on informal principles, guided by the aspirational documents, to govern their activities.

33. See DIEDERIKS-VERSCHOOR & KOPAL, *supra* note 1, at 6, 11-12; LYALL & LARSON, *supra* note 15, at 71.

34. See DIEDERIKS-VERSCHOOR & KOPAL, *supra* note 1, at 10; 1 OPPENHEIM'S INTERNATIONAL LAW § 8, at 26 (R. Jennings & A. Watts eds., 9th ed. 1992) [hereinafter OPPENHEIM].

35. See DIEDERIKS-VERSCHOOR & KOPAL, *supra* note 1, at 11; OPPENHEIM, *supra* note 34, at 26.

36. See Outer Space Treaty, *supra* note 23, art. III.

37. See *id.* art. II.

38. See, e.g., *id.* art. I.

39. See *id.* art. VI.

40. See, e.g., *id.* art. VII; Liability Convention, *supra* note 26, arts. II, III; LYALL & LARSEN, *supra* note 15, at 71.

41. See LYALL & LARSEN, *supra* note 15, at 54. "Subjacent transit" means that, for example, satellites in orbit may freely pass over territory of a state without permission. Although seemingly necessary for effective space activities given the vast number of states a satellite in orbit transit, this legal principle is opposite of the analogy from air law. Aircraft need a state's permission to transit another sovereign's airspace. DIEDERIKS-VERSCHOOR & KOPAL, *supra* note 1, at 6; Joseph A. Bosco, *International Law Regarding Outer Space - An Overview*, 55 J. AIR L. & COM. 609, 620 (1990).

42. See DIEDERIKS-VERSCHOOR & KOPAL, *supra* note 1, at 10; V.S. Vershchetin & G.M. Danilenko, *Custom as a Source of International Law of Outer Space*, 13 J. SPACE L. 22, 23-24 (1985).

43. See Jay H. Ginsburg, *The High Frontier: Tort Claims and Liability for Damages Caused by Man-Made Space Objects*, 12 SUFFOLK TRANSNAT'L L.J. 515, 532 (1989).

44. See *id.* at 534.

45. See Frakes, *supra* note 7, at 422-23.

Space law, fundamentally, is a specialized body of law within international law.⁴⁶ Sources of space law are the same as other international law: treaties, customary international law, general principles of international law, and scholarly writing and judicial decisions.⁴⁷ However, “an automatic extension to outer space and celestial bodies of international law” would not work because international law does not address all the unique challenges posed by outer space.⁴⁸ In the 1960s and 1970s, states cobbled together a legal framework for space based on analogous principles from other specialized bodies of law, such as maritime and air law,⁴⁹ international law in general when possible,⁵⁰ and crafted new rules when not.⁵¹ For example, the concept that a state has exclusive sovereignty over its airspace⁵² was discarded in favor of allowing satellites free transit over a state’s territory.⁵³

In contrast, other *lex specialis*, notably admiralty law, developed incrementally over several centuries as trade practices formed to resolve business disputes, which were eventually formalized into modern maritime law.⁵⁴ Air law developed much faster; however, its founding documents are more specialized.⁵⁵ Regardless, no great declaration of principles paved the way for either body of law. Space law, on the other hand, started afresh at the international level with broad declarations of principles.⁵⁶

B. *Rules of the Road: Informal Law*

Despite the number of treaties and resolutions governing outer space, space law is not as formal as other areas of international law.⁵⁷

46. See DIEDERIKS-VERSCHOOR & KOPAL, *supra* note 1, at 5; LYALL & LARSEN, *supra* note 15, at 2.

47. Statute of the International Court of Justice art. 38(1), June 26, 1945, 33 U.N.T.S. 993; see DIEDERIKS-VERSCHOOR & KOPAL, *supra* note 1, at 5-7; LYALL & LARSEN, *supra* note 15, at 31-32.

48. LACHS, *supra* note 19, at 15 (internal quotation marks omitted).

49. See REYNOLDS & MERGES, *supra* note 5, at 27-28.

50. See LACHS, *supra* note 19, at 15; Hertzfeld, *supra* note 30, at 327 (listing sources and inspirations for space law principles).

51. See LACHS, *supra* note 19, at 15 n.9.

52. See Convention on International Civil Aviation art. 1, Dec. 7, 1944, 61 Stat. 1180, 15 U.N.T.S. 295 (declaring that states have exclusive sovereignty over their airspace).

53. See DIEDERIKS-VERSCHOOR & KOPAL, *supra* note 1, at 6; LYALL & LARSEN, *supra* note 15, at 54; Bosco, *supra* note 41, at 620.

54. Admiralty law grew out of technical necessities reflected by early trade law. In Britain, the complexities of admiralty law eventually led to the creation of specialized maritime tribunals. This process took centuries. Ginsburg, *supra* note 43, at 518-19.

55. See *id.* at 520-24.

56. See DIEDERIKS-VERSCHOOR & KOPAL, *supra* note 1, at 5; JASENTULIYANA, *supra* note 9, at 1.

57. Hertzfeld, *supra* note 30, at 331.

In place of international law, many space activities are governed by codes of conduct and best practice guidelines drafted by “national agencies and professional experts.”⁵⁸ Because of the law’s informality, disputes are resolved diplomatically or, for licenses or contract disputes, in national courts.⁵⁹ States, however, generally abide by international principles regarding space.⁶⁰ This informalism can be traced to the same issues that influenced early space treaties: a rapidly changing technological field and a focus on idealism in the law.

The excitement of the Space Race was tempered by the lurking fear that space was to be the next battlefield for the Cold War.⁶¹ The driving issues of the 1960s and 1970s framed the debate about space law, which is reflected in the foundational documents.⁶² Nuclear weapons were on the forefront of drafters’ minds.⁶³ Conflict in the final frontier was not out of the question. Therefore, space law documents are written with highly aspirational goals⁶⁴ such as space being the “province of mankind” and that space resources are most efficiently used when used cooperatively.⁶⁵ International cooperation is a principle found in all space treaties and statements of principles.⁶⁶ All of the space treaties were drafted within COPUOS using the consensus method. Because the treaties were not opened for signature until all the drafting states reached consensus, this encouraged compliance with the rules once the treaties entered into force.⁶⁷ Despite all states not being satisfied on every issue, space law as a whole is stronger because there are no reservations detracting from the consistency of the law.

58. Gerardine Meishan Goh, *Softly, Softly Catchee Monkey: Informalism and the Quiet Development of International Space Law*, 87 NEB. L. REV. 725, 726 (2009); see also JASENTULIYAYA, *supra* note 9, at 5-14.

59. This explains why there is so little litigation on the finer points of “space law.” See Hertzfeld, *supra* note 30, at 331.

60. See Goh, *supra* note 58, at 729-30.

61. See REYNOLDS & MERGES, *supra* note 5, at 195; Hertzfeld, *supra* note 30, at 327.

62. See REYNOLDS & MERGES, *supra* note 5, at 71; Hertzfeld, *supra* note 30, at 327.

63. See REYNOLDS & MERGES, *supra* note 5, at 71; Hertzfeld, *supra* note 30, at 327-28.

64. See Goh, *supra* note 58, at 731-32; Myres S. McDougal & Leon S. Lipson, *Perspectives for a Law of Outer Space*, 52 AM. J. INT'L L. 407, 429-30 (1958).

65. See DIEDERIKS-VERSCHOOR & KOPAL, *supra* note 1, at 23; JASENTULIYANA, *supra* note 9, at 1; Hertzfeld, *supra* note 30, at 327-28. See also, e.g., Outer Space Treaty, *supra* note 23, arts. I, II, IX (“States . . . shall conduct all their activities . . . with due regard to the corresponding interest of all other States Parties to the Treaty.”).

66. See DIEDERIKS-VERSCHOOR & KOPAL, *supra* note 1, at 23; Hertzfeld, *supra* note 30, at 327-28; Chukeat Noichim, *International Cooperation for Sustainable Space Development*, 31 J. SPACE L. 315, 324 (2005).

67. See JASENTULIYANA, *supra* note 9, at 215; Ginsburg, *supra* note 43, at 534.

II. CREATING LIABILITY IN OUTER SPACE

A. *Developing Outer Space Liability*

The United Nations Committee on the Peaceful Uses of Outer Space began exploring the problem of liability for space activities in 1958.⁶⁸ The negotiations wavered between the Soviet position that a space liability treaty would be superfluous, given liability rules existing in international law, and the desire for states without space operations to see a treaty that guaranteed prompt, equitable compensation.⁶⁹ To give COPUOS guidance on crafting a liability regime, the General Assembly passed a resolution declaring that states “bear international responsibility” for space activities and are liable for damage caused by their space activities.⁷⁰ The General Assembly’s guidance, made immediate by the first controlled landing on the Moon by the Soviet Union’s Luna-9, spurred the Soviet Union and United States into agreeing to codify basic space law principles in the Outer Space Treaty.⁷¹

Drafters also disagreed about what would qualify as “damage” for liability purposes. The dispute centered on (1) the types of protected interests, (2) the type of conduct giving rise to liability, (3) whether a different principle should govern in space and on Earth, (4) the extent of the launching state’s liability, and (5) whether joint and several liability was appropriate.⁷² The Outer Space Treaty briefly addressed several of these issues,⁷³ but not in a comprehensive manner.⁷⁴

B. *Liability Convention: Providing Further Clarification*

When the Liability Convention entered into force in 1972,⁷⁵ it expanded and clarified the Outer Space Treaty’s liability regime.⁷⁶ The

68. DIEDERIKS-VERSCHOOR & KOPAL, *supra* note 1, at 3; REYNOLDS & MERGES, *supra* note 5, at 49; Ginsburg, *supra* note 43, at 537. See generally CHENG, *supra* note 20, at 215-85 (discussing the negotiations and provisions of the 1967 Space Treaty and the 1968 Astronauts Agreement).

69. CHENG, *supra* note 20, at 289.

70. G.A. Res. 1962 (XVIII) ¶¶ 5, 8, U.N. Doc. A/RES/1962(XVIII) (Dec. 13, 1963).

71. See CHENG, *supra* note 20, at 291.

72. See Carl Q. Christol, *The Legal Common Heritage of Mankind: Capturing an Illusive Concept and Applying it to World Needs*, in 18 COLLOQUIUM ON L. OF OUTER SPACE 42, 52-53 (1976).

73. Outer Space Treaty, *supra* note 23, arts. VI, VII (establishing state responsibility for the actions of state and non-governmental entities and establishing international liability for damage in outer space, airspace, and on the surface).

74. See MORRIS D. FORKOSCH, OUTER SPACE AND LEGAL LIABILITY 49, 54 (1982).

75. Liability Convention, *supra* note 26, at 188.

76. See HURWITZ, *supra* note 12, at 10; JASENTULIYANA, *supra* note 9, at 324.

treaties generally work together.⁷⁷ When there is a conflict, however, the rules of treaty interpretation suggest that the Liability Convention supplants conflicting provisions in the Outer Space Treaty.⁷⁸ The impetus for drafting the Convention was primarily a concern for damage caused by space objects to individuals and property on Earth.⁷⁹ This focus, while understandably important, left the question of liability for damage in space unclear.⁸⁰

Understanding the liability regime for space must first start with understanding important terms used in space law. The Liability Convention establishes a claims process, which lays out a state may recover damages. Claims differ based on whether the incident happened in space or on Earth's surface. If liability attaches, the injured state is entitled to compensations. Launching states, however, can limit their liability or exonerate themselves completely if certain criteria are met.

1. Important Terminology

Before moving to what constitutes a claim under the Liability Convention, it is important to define certain terms used throughout. Space law has several important concepts on which the rest of the body of law is built.

Liability in space law is predicated on harm inflicted by a "space object."⁸¹ However, the Liability Convention inconveniently does a poor job laying out what exactly is a "space object."⁸² Under the Convention, a "space object includes component parts of a space object as well as its launch vehicle and parts thereof."⁸³ These "component parts" include anything normally regarded as components of a spacecraft; for example, cowlings from rockets, fuel tanks, an astronaut's glove, dropped

77. See DIEDERIKS-VERSCHOOR & KOPAL, *supra* note 1, at 147. *But see* HURWITZ, *supra* note 12, at 10 (noting that this is not true if all states involved are not party to both treaties).

78. This assumes that claims are brought between states party to both treaties. Vienna Convention on the Law of Treaties, art. 30(3), May 23, 1969, 1155 U.N.T.S. 331; Stanton Eigenbrodt, *Out to Launch: Private Remedies for Outer Space Claims*, 55 J. AIR L. & COM. 185, 193 (1989).

79. DeBusschere, *supra* note 8, at 100; Christopher D. Williams, *Space: The Cluttered Frontier*, 60 J. AIR L. & COM. 1139, 1157 (1995).

80. See HURWITZ, *supra* note 12, at 11; Williams, *supra* note 79, at 1157. *Cf.* REYNOLDS & MERGES, *supra* note 5, at 178 (explaining that the Liability Convention provides for liability where space objects are damaged elsewhere than on the surface of the earth).

81. Liability Convention, *supra* note 26, arts. II, III; HOWARD A. BAKER, SPACE DEBRIS: LEGAL AND POLICY IMPLICATIONS 62 (1989); DIEDERIKS-VERSCHOOR & KOPAL, *supra* note 1, at 37.

82. See CHENG, *supra* note 20, at 324-26.

83. Liability Convention, *supra* note 26, art. I(d) (internal quotation marks omitted).

wrenches, paint chips, and lost bolts.⁸⁴ Natural objects, such as meteorites, are not included in this definition.⁸⁵

It is unclear where the line is drawn between a launch vehicle space object and something else.⁸⁶ Must a space object be intended for space, or can it merely facilitate a launch? Are spacecraft built in orbit space objects? The Liability Convention leaves these questions unanswered.⁸⁷ Regardless of the definition, states cannot abandon a space object.⁸⁸ Article VIII of the Outer Space Treaty says that states “shall retain jurisdiction and control over such objects.”⁸⁹

Who can make a claim is a vestige of the Westphalian system and is defined by the treaties. In most disputes, there will be two parties: the “claimant” state and the “launching” state. Each is defined relatively specifically in space law. Taking the claimant state first, there can be three possible states: (1) the state, or its natural person, suffering damage (natural state); (2) the state in which the damage occurred (territorial state); and (3) the state whose permanent residence suffered harm (state of permanent residence).⁹⁰ Under the second and third possibilities, a state makes a claim on behalf of an individual whose state did not chose to assert its rights⁹¹—befitting a victim-oriented regime.⁹² Although the Liability Convention seems to put claimant states in the hierarchy listed, a lower-ordered state is not prohibited from making a claim.⁹³ But, if no state chooses to advance an individual’s claim, that individual has no recourse in international law.⁹⁴ However, to mitigate the negative effects of the state-centric system, the injured party may pursue a claim in municipal courts.⁹⁵

84. See DIEDERIKS-VERSCHOOR & KOPAL, *supra* note 1, at 9; HURWITZ, *supra* note 12, at 24-25; LYALL & LARSEN, *supra* note 15, at 86; Merges & Reynolds, *supra* note 11, at 10010.

85. BAKER, *supra* note 81, at 62; DIEDERIKS-VERSCHOOR & KOPAL, *supra* note 1, at 37.

86. See CHENG, *supra* note 20, at 325.

87. See *id.*; HURWITZ, *supra* note 12, at 23.

88. JASENTULIYANA, *supra* note 9, at 204-05; LYALL & LARSEN, *supra* note 15, at 67.

89. Outer Space Treaty, *supra* note 23, art. VIII.

90. Liability Convention, *supra* note 26, art. VIII. See also CHENG, *supra* note 20, at 307; LYALL & LARSEN, *supra* note 15, at 111. Consider this hypothetical: a Swiss national, legally residing in Colombia, is injured at a Kazakh spaceport by an American company’s rocket. Three states may assert a claim for this individual: Switzerland, as his national state; Kazakhstan, as the state having territorial jurisdiction over the location of the injury; and Colombia, as his state of legal permanent residence.

91. Liability Convention, *supra* note 26, art. VIII; HURWITZ, *supra* note 12, at 49-50.

92. CHENG, *supra* note 20, at 307.

93. *Id.*

94. HURWITZ, *supra* note 12, at 50. See also *Barcelona Traction, Light & Power Co. (Belg. v. Spain)*, 1970 I.C.J. 3, ¶ 70 (Feb. 5); *Nottebohm Case (Liech. v. Guat.)*, 1955 I.C.J. 4, 13 (Apr. 6); MARK WESTON JANIS & JOHN E. NOYES, *INTERNATIONAL LAW CASES AND*

The launching state is more straightforward because the definitions in the Outer Space Treaty⁹⁶ and the Liability Convention⁹⁷ have been interpreted to mean the same thing.⁹⁸ There are four possible launching states: (1) the state that launches the space object; (2) the state that procures the launching; (3) the state from whose territory the launch happens; and (4) the state from whose facilities the launch happens.⁹⁹ These definitions work if a state successfully inserts a space object into outer space. If the launch fails, however, the state remains responsible.¹⁰⁰ Drafters had seen many failed launches, which is the most dangerous part of the process, and it would be unreasonable for a failed launch to vitiate liability. A technicality would not excuse liability for any damage.¹⁰¹

Because there can be multiple states responsible for damages, they are jointly and severally liable to the victim.¹⁰² “Joint and several” liability means that victims may pursue a claim against, and recover from any one culpable state, regardless of the culpability of other states.¹⁰³ Drafters contemplated two situations giving rise to joint and several liability:¹⁰⁴ (1) when damage is caused to a third party as a result of a collision between other states’ space objects¹⁰⁵ and (2) when damage is caused by a space object with more than one launching state.¹⁰⁶ In these cases, the state paying damages may seek indemnification from the other jointly responsible state—although it is unclear how the liability is apportioned.¹⁰⁷

COMMENTARY 373 (4th ed. 2011) (explaining that individuals generally cannot assert claims under international law; that is the purview of states).

95. See Liability Convention, *supra* note 26, art. XI; HURWITZ, *supra* note 12, at 52.

96. Outer Space Treaty, *supra* note 23, art. VII.

97. Liability Convention, *supra* note 26, art. I(c).

98. See CHENG, *supra* note 20, at 309-10; LYALL & LARSEN, *supra* note 15, at 86.

99. See CHENG, *supra* note 20, at 309-10; DIEDERIKS-VERSCHOOR & KOPAL, *supra* note 1, at 35-36; LYALL & LARSEN, *supra* note 15, at 86.

100. Liability Convention, *supra* note 26, art. I(b); HURWITZ, *supra* note 12, at 20-21.

101. HURWITZ, *supra* note 12, at 20-21.

102. Liability Convention, *supra* note 26, arts. IV, V. See also CHENG, *supra* note 12, at 329; DIEDERIKS-VERSCHOOR & KOPAL, *supra* note 1, at 38; HURWITZ, *supra* note 12, at 37.

103. RESTATEMENT (THIRD) OF TORTS: APPORTIONMENT OF LIAB. § 10 (2000). See also DIEDERIKS-VERSCHOOR & KOPAL, *supra* note 1, at 36; HURWITZ, *supra* note 12, at 37.

104. See CHENG, *supra* note 20, at 328-31; JASENTULIYANA, *supra* note 9, at 36.

105. Comm. on the Peaceful Uses of Outer Space, Legal Subcomm, 9th Sess., 149th mtg. at 83, U.N. Doc. A/AC.105/C.2/SR/132-51 (July 29, 1980). This was addressed by the Liability Convention, *supra* note 26, art. IV.

106. Comm. on the Peaceful Uses of Outer Space, Legal Subcomm. Rep. on its 9th Sess., June 8 – July 3, 1970, at 8, U.N. Doc. A/AC.105/85 (July 3, 1970). This was addressed by the Liability Convention, *supra* note 25, art. V.

107. See Liability Convention, *supra* note 26, art. V; HURWITZ, *supra* note 12, at 38.

2. Making a Claim

The Liability Convention is a tool for resolving international disputes.¹⁰⁸ Consequently, as an international tool based on the Westphalian system, only states may assert claims.¹⁰⁹ Unique to space law,¹¹⁰ however, is that a state is responsible for “national activities in outer space, regardless of whether . . . those activities are conducted by government or private entities.”¹¹¹ Therefore, an injured private entity must petition its government to make a claim on its behalf.¹¹²

The space treaties encourage diplomatic solutions to disputes.¹¹³ The Outer Space Treaty calls on states to “undertake appropriate international consultations” before conducting activities that could potentially impact other states.¹¹⁴ Parties can also use dispute resolution mechanisms provided in other international organizations; for example, a dispute about spectrum allocation for space communication would be best resolved by the International Telecommunication Union.¹¹⁵ However, if there is no diplomatic solution within one year of the filing of a claim, then either state may request that a Claims Commission be formed.¹¹⁶ The process for initiating a claim¹¹⁷ and forming the Claims Commission¹¹⁸ is laid out in the Liability Convention, but the Commission operates like an arbitration tribunal.¹¹⁹ It renders an award based on international law that also takes “principles of justice and equity” into account.¹²⁰

108. The Liability Convention does not “apply to damage caused by a space object of a launching state to: (a) nationals of that state; [or] (b) foreign nationals” participating in the operation of that space object. Liability Convention, *supra* note 26, art. VII; *see also* CHENG, *supra* note 20, at 308.

109. *See* Liability Convention, *supra* note 26, art. VIII (describing how a *state* may make a claim); Eigenbrodt, *supra* note 78, at 196.

110. States traditionally bear no responsibility for the actions of nationals. *See* LYALL & LARSEN, *supra* note 15, at 66.

111. Williams, *supra* note 79, at 1153. *See* Outer Space Treaty, *supra* note 23, art. VI; IAN BROWNLIE, SYSTEM OF THE LAW OF NATIONS: STATE RESPONSIBILITY (PART I) 165-66 (1983); DIEDERIKS-VERSCHOOR & KOPAL, *supra* note 1, at 36.

112. *See* DIEDERIKS-VERSCHOOR & KOPAL, *supra* note 1, at 36, 107-08; JASENTULIYANA, *supra* note 9, at 325-26.

113. *See* DIEDERIKS-VERSCHOOR & KOPAL, *supra* note 1, at 40; JASENTULIYANA, *supra* note 9, at 220; LYALL & LARSEN, *supra* note 15, at 112.

114. *See* Outer Space Treaty, *supra* note 23, art. IX; JASENTULIYANA, *supra* note 9, at 218.

115. *See* JASENTULIYANA, *supra* note 9, at 216-17.

116. *See* Liability Convention, *supra* note 26, art. XIV; LYALL & LARSEN, *supra* note 15, at 112.

117. *See* Liability Convention, *supra* note 26, arts. VIII-X.

118. *See id.* arts. XV-XX.

119. *See id.* art. XII; LYALL & LARSEN, *supra* note 15, at 112; Eigenbrodt, *supra* note 78, at 198-99.

120. Liability Convention, *supra* note 26, art. XII. *See also* LYALL & LARSEN, *supra* note 15, at 113.

However, awards are “recommendatory” unless the parties agree to be bound by them.¹²¹

If a party needs more certainty than the Liability Convention’s claims process can provide, the treaty structure allows injured parties to assert claims in other venues.¹²² Injured parties do not need to exhaust municipal remedies before asserting a claim under the Liability Convention, although they may not simultaneously pursue a claim in multiple venues.¹²³ This is consistent with the Liability Convention’s victim-oriented approach.¹²⁴

3. Location Matters: The Different Liability Schemes

The extent to which a state is responsible for damage depends on where the damage occurred. If the damage was done on the Earth’s surface or in airspace, a state is held absolutely liable for damage.¹²⁵ If damage is done in outer space, including on celestial bodies, the state is liable under a fault-based regime.¹²⁶

i. Earth-based Damage

If a space object causes damage “on the surface of the earth or to aircraft in flight,” the launching state is absolutely liable for damage.¹²⁷ Article II of the Liability Convention addresses the drafters’ concern for damage done on Earth’s surface—the standard is clear and responsibility is relatively easy to determine.¹²⁸ Additionally, the absolute liability standard reflects the ultra-hazardous nature of space activities.¹²⁹ This doctrine of “dangerous things” properly puts the burden of ensuring safety on the launching state because of the complex nature of launches, the difficulty third parties have avoiding a launched

121. See Liability Convention, *supra* note 26, art. XIX(2); DIEDERIKS-VERSCHOOR & KOPAL, *supra* note 1, at 40-41.

122. For example, the injured party can use dispute resolution mechanisms provided in other treaties, arbitration, or domestic courts. See Liability Convention, *supra* note 26, arts. IX, XI; JASENTULIYANA, *supra* note 9, at 216-17; HURWITZ, *supra* note 12, at 75.

123. See Liability Convention, *supra* note 26, art. XI(1); HURWITZ, *supra* note 12, at 52.

124. See HURWITZ, *supra* note 12, at 10, 84 n.19, 207; Bosco, *supra* note 41, at 617.

125. Liability Convention, *supra* note 26, art. II.

126. *Id.* art. III.

127. *Id.* art. II.

128. See DeBusschere, *supra* note 8, at 100; Williams, *supra* note 79, at 1157. Cf. REYNOLDS & MERGES, *supra* note 5, at 49 (explaining that negotiators did not know what to expect from space activities; therefore, planning a legal regime to govern unexpected events could lead to incomplete law).

129. See DIEDERIKS-VERSCHOOR & KOPAL, *supra* note 1, at 37; JASENTULIYANA, *supra* note 9, at 35 n.40; LYALL & LARSEN, *supra* note 15, at 108; Ginsburg, *supra* note 43, at 516.

space object, and because the launching state can best control the circumstances surrounding launch.¹³⁰

ii. Space-based Damage

If damage, however, occurs “elsewhere than on the surface of the earth to a space object,” the launching state is liable only if the damage is the state’s fault.¹³¹ Fault-based liability places the burden on states to avoid collisions in orbit.¹³² This assumes states have a mutual interest in protecting their space assets as well as the technological capability to take preventative measures.¹³³ Some satellites, however, cannot perform collision avoidance maneuvers and others are too small to easily track.¹³⁴ Unlike the doctrine of “dangerous things,” the risks are potentially easier to control in space. Although some space objects can neither be tracked nor moved, states are more likely to be able to avoid damage.¹³⁵ To establish liability through space law, a claimant must show (1) that the space object belongs to the responsible state and (2) the damage was “caused by” that space object.¹³⁶

4. Fault and Causation

First, the space object must be attributable to a particular launching state, which requires that the space object be identified.¹³⁷ But the Liability Convention does not provide a method to identify the state responsible for the errant space object.¹³⁸ The Registration Convention, however, is part of the legal structure that facilitates the finding of fault by requiring states to register their space objects so that the objects can be identified later, should a collision occur.¹³⁹ However, neither the Outer Space Treaty nor the Liability Convention base liability on whether a space objects listed in the registry.¹⁴⁰ Assuming the space object causing the damage is identified and the launching

130. See DIEDERIKS-VERSCHOOR & KOPAL, *supra* note 1, at 37; HURWITZ, *supra* note 12, at 28, 30; LYALL & LARSEN, *supra* note 15, at 108.

131. Liability Convention, *supra* note 26, art. III.

132. See HURWITZ, *supra* note 12, at 34.

133. *Id.*

134. See LYALL & LARSEN, *supra* note 15, at 297.

135. See HURWITZ, *supra* note 12, at 34.

136. See JASENTULIYANA, *supra* note 9, at 202.

137. See Outer Space Treaty, *supra* note 23, art. VIII (stating that space objects remain under the jurisdiction and control of the launching state).

138. JASENTULIYANA, *supra* note 9, at 326.

139. See Registration Convention, *supra* note 29, art. IV; DIEDERIKS-VERSCHOOR & KOPAL, *supra* note 1, at 44-45; Ginsburg, *supra* note 43, at 544.

140. DIEDERIKS-VERSCHOOR & KOPAL, *supra* note 1, at 46; JASENTULIYANA, *supra* note 9, at 326-27.

state is at fault, it is then responsible for the damage. If there is no fault, liability does not attach.¹⁴¹

Proposals to include a broad definition of damage, however, were rebuffed.¹⁴² Some scholars argue it is improper to read liability for indirect damages into the treaties because indirect damages are not tied directly to the event creating liability.¹⁴³

However, identifying the launching state of a space object is extremely difficult.¹⁴⁴ First, these international space registries are neither up to date nor consolidated.¹⁴⁵ States often fail to register older space objects or smaller component parts.¹⁴⁶ Second, some space objects are extremely small and cannot be tracked.¹⁴⁷ Debris or trash, for example, is often far too small to track. Yet, as with the Space Shuttle Challenger's windshield, tiny debris can cause significant damage, especially to astronauts on spacewalks.¹⁴⁸ If the party responsible for damage cannot be identified, liability cannot be assigned.¹⁴⁹

After the responsible state has been identified, the state must then be found liable for causing the damage. The problem with the space law liability regime is that there is no standard of care against which a state's conduct can be measured.¹⁵⁰ This is a fundamental flaw in the Liability Convention¹⁵¹ because fault cannot be measured without the yardstick of standard of care.¹⁵² Several theories, however, have been put forward.¹⁵³

One proposal suggests that fault should be based on a state's objective intent because liability for a breach merely restates

141. See HURWITZ, *supra* note 12, at 36; DeBusschere, *supra* note 7, at 102-03.

142. Aldo Armando Cocca, *From Full Compensation to Total Responsibility*, 27 COLLOQUIUM ON L. OF OUTER SPACE 157, 158 (1984).

143. See, e.g., Edward R. Finch, Jr., *Outer Space Liability: Past, Present, and Future*, 14 INT'L LAW. 123, 126 (1980).

144. Williams, *supra* note 79, at 1158.

145. See LYALL & LARSEN, *supra* note 15, at 89.

146. See JASENTULIYANA, *supra* note 9, at 327.

147. See Merges & Reynolds, *supra* note 11, at 10010.

148. BAKER, *supra* note 81, at 11.

149. See HURWITZ, *supra* note 12, at 36.

150. See BAKER, *supra* note 81, at 84; JASENTULIYANA, *supra* note 9, at 323; Williams, *supra* note 79, at 1159-60.

151. See BAKER, *supra* note 81, at 84; Williams, *supra* note 79, at 1159-60.

152. See Robert F. Stamps, *Orbital Debris: An International Agreement is Needed*, 32 COLLOQUIUM ON L. OF OUTER SPACE 152, 154 (1990) ("In order to establish whether a State is at fault for a collision . . . there must first be an accepted standard of care for traffic in outer space, and a breach of that standard of care.")

153. For example, Nandasiri Jasentuliyana, the Director of the United Nation's Office for Outer Space Affairs and President of the International Institute of Space Law, has called for an expert panel to develop appropriate standards for space activities. See JASENTULIYANA, *supra* note 9, at 208.

international law.¹⁵⁴ If fault attached at an objective breach of international law, a state would be free to act however it wanted to, unless there is an international law prohibiting the act.¹⁵⁵ The “reasonableness” of a state’s action, on the other hand, is predicated on the foreseeability of the damage.¹⁵⁶ Given the difficulty of tracking satellites and the environmental uncertainties in space, it is difficult to foresee all circumstances when a space object can be damaged.¹⁵⁷ As it stands now, adjudicators will have to find analogies in other areas of international law and municipal law to determine the appropriate standard of care.¹⁵⁸

Another argument, however, centers on causation. In order for fault to attach, there must be a causal connection between a state’s action and the damage suffered.¹⁵⁹ Scholars argue the “caused by” language in the Liability Convention merely requires a connection between the accident and the damage.¹⁶⁰ This conforms with the liability structure laid out by the German American Mixed Claims Commission after World War I. Under international law “it matters not how many links there may be in the chain of causation . . . provided there is no break in the chain” and the loss can be traced “link by link” to the wrongful action.¹⁶¹ Allowing causation to flow through a series of related links from the initial proximate cause is befitting a victim-oriented recovery regime.¹⁶²

Another model comes from the Permanent Court of Arbitration. In 2011, the Court created Optional Rules for Disputes Relating to Outer Space Activities, which parties may use to resolve outer space disputes.¹⁶³ Article 27 establishes that each party has the burden of

154. See BROWNLIE, *supra* note 111, at 38-40.

155. See S.S. Lotus (Fr. v. Turk.), 1927 P.C.I.J. (ser. A) No. 10, at 44 (Sept. 7); see also Ginsburg, *supra* note 43, at 537.

156. See CARL Q. CHRISTOL, MODERN INTERNATIONAL LAW OF OUTER SPACE 96 (1982).

157. Cf. S.E. Doyle, *Reentering Space Objects: Facts and Fiction*, 6 J. SPACE L. 107, 110 (1978) (describing the inherent difficulties in predicting a dead satellite’s trajectory).

158. See FORKOSCH, *supra* note 74, at 81; JASENTULIYANA, *supra* note 9, at 208.

159. Carl Q. Christol, *International Liability for Damage Caused by Space Objects*, 74 AM. J. INT’L L. 346, 361 (1980).

160. CHRISTOL, *supra* note 156, at 97.

161. Administrative Decision No. II (U.S. v. Ger.), 7 R.I.A.A. 23, 29-30 (Ger.-U.S. Mixed Claims Comm’n 1923), available at http://untreaty.un.org/cod/riaa/cases/vol_VII/23-32.pdf.

162. See Christol, *supra* note 159, at 351.

163. PCA Adopts New Rules of Procedure, PERMANENT CT. OF ARB. (Dec. 6, 2011), http://www.pca-cpa.org/shownews.asp?nws_id=323&pag_id=1261&ac=view.

proving their own claims.¹⁶⁴ This requirement grants tribunals “broad discretion” to determine claims “in light of justice and equity.”¹⁶⁵

5. Compensation

Space law operates under the principle of full, restorative compensation.¹⁶⁶ Article XII of the Liability Convention declares that compensation will be determined according to international law and principles of justice and equity.¹⁶⁷ The reparation will restore the damaged person, entity, or state “to the condition which would have existed if the damage had not occurred.”¹⁶⁸ This article reiterates¹⁶⁹ the rule of customary international law articulated in the *Chorzow Factory* case.¹⁷⁰

The nature and extent of recoverable damages, however, has not been precisely determined. Direct damage is recoverable.¹⁷¹ However, indirect damage—lost profit or mental suffering—is not expressly mentioned in the Convention.¹⁷² Some argue that indirect damages can be recovered through proximate causation.¹⁷³ International tribunals and agreements have allowed indirect damages, so long as the damage can be attributed to the state’s wrongful act.¹⁷⁴ Others, however, note that it is best to use a direct damage model because the connection between the wrongful act and the indirect damage is often too tenuous.¹⁷⁵ Additionally, the Liability Convention provides no clear guidance and a staggering amount of indirect damage could potentially be attributed to a state.¹⁷⁶ For example, in 2005, Canada expressed

164. Permanent Court of Arbitration, OPTIONAL RULES FOR ARBITRATION OF DISPUTES RELATING TO OUTER SPACE ACTIVITIES, art. 27, available at http://www.pca-cpa.org/showfile.asp?fil_id=1774.

165. Christol, *supra* note 159, at 361.

166. See Ginsburg, *supra* note 43, at 540-41.

167. Liability Convention, *supra* note 26, art. XII.

168. *Id.*

169. See DIEDERIKS-VERSCHOOR & KOPAL, *supra* note 1, at 38-39; Eigenbrodt, *supra* note 78, at 194-95.

170. Chorzow Factory Case (Ger. v. Pol.), 1928 P.C.I.J. (ser. A) No. 17, at 47 (Sept. 13) (“[R]eparation must, as far as possible, wipe out all the consequences of the illegal act and re-establish the situation which would, in all probability, have existed if that act had not been committed.”).

171. See DIEDERIKS-VERSCHOOR & KOPAL, *supra* note 1, at 38-9; HURWITZ, *supra* note 12, at 13-14.

172. See HURWITZ, *supra* note 12, at 12-14; REYNOLDS & MERGES, *supra* note 5, at 188.

173. See CHENG, *supra* note 20, at 323. This includes “loss of profits, interruption of business activities, reasonable costs for repairs or medical expenses, loss of services of a third party, or other damages.” See Ginsburg, *supra* note 43, at 539-40.

174. See, e.g., Trail Smelter Arbitration (U.S. v. Can.), 3 R.I.A.A. 1905 (Trail Smelter Arb. Trib., 1938 & 1941). See also HURWITZ, *supra* note 12, at 16-18.

175. See HURWITZ, *supra* note 12, at 16.

176. DIEDERIKS-VERSCHOOR & KOPAL, *supra* note 1, at 38-39; Eigenbrodt, *supra* note 78, at 195 (explaining that, while indirect damages are recoverable in the United States,

concern that a Titan IV rocket booster launched from Cape Canaveral would fall near an oil platform in Newfoundland. Evacuating the platform would have been an arduous process, costing \$250 million. If the spent booster did not hit the platform, the Liability Convention would not apply. If, however, the booster hit the platform, it is unclear whether Canada could claim lost profits. The uncertainty of what constitutes damages under the space liability regime counsels parties seeking more certainty to resort to municipal law.¹⁷⁷

6. Limiting Liability and Exoneration

The Liability Convention generally does not allow parties to exonerate themselves from properly attributed absolute liability.¹⁷⁸ Although this situation has yet to arise, the Liability Convention allows a state to reduce its liability when the injured state acted recklessly and contributed to the damage.¹⁷⁹ In order to exonerate itself from absolute liability, the launching state must show that the damage “resulted either wholly or partially from gross negligence or from an act or omission done with the intent to cause damage on the part of the claimant State.”¹⁸⁰ This blurs the line between absolute and fault-based liability by allowing the launching state to reduce its liability because of the claimant’s negligence.¹⁸¹ However, this exemption is tempered by Article VI(2), which forbids exoneration if the launching state acted contrary to international law.¹⁸² These rare situations where a state can limit its liability again reflect the Liability Convention’s victim-oriented recovery scheme.¹⁸³

III. SPACE LAW LIABILITY V. INTERNATIONAL LAW LIABILITY

Space law, unlike space objects, does not operate in a vacuum. The space treaties are not universally accepted and the nuances of liability claims have not become customary international law binding on all states. Nor do they address every dispute that may arise in outer space. The space treaties, however, added to an already established

the Soviet Union measured damages based on “societal costs such as hospitalization, schools, and State pensions rather than personal loss.”)

177. See Eigenbrodt, *supra* note 78, at 196; Ginsburg, *supra* note 43, at 540.

178. Liability Convention, *supra* note 26, art. VI. See DIEDERIKS-VERSCHOOR & KOPAL, *supra* note 1, at 38; LYALL & LARSEN, *supra* note 32, at 110.

179. Liability Convention, *supra* note 26, art. VI; DIEDERIKS-VERSCHOOR & KOPAL, *supra* note 1, at 38; FORKOSCH, *supra* note 74, at 81; HURWITZ, *supra* note 11, at 40.

180. Liability Convention, *supra* note 26, art. VI(1); DIEDERIKS-VERSCHOOR & KOPAL, *supra* note 1, at 38.

181. HURWITZ, *supra* note 12, at 41.

182. Liability Convention, *supra* note 26, art. VI(2) (mentioning specifically the United Nations Charter and the Outer Space Treaty as sources of international law). See DIEDERIKS-VERSCHOOR & KOPAL, *supra* note 1, at 38.

183. See HURWITZ, *supra* note 12, at 40; Bosco, *supra* note 41, at 617.

framework for solving international disputes. In this sense, the space treaties are built on top of the more established, yet less precise, Westphalian state system.

This section outlines the general international law on state responsibility and international liability, which fill the gaps left by the space liability regime. It then discusses the major difference between the general international law and space law liability regimes. Finally, the section tries to answer the question of which regime states should use.

A. *Liability Under International Law*

There are two different concepts governing restitution for injury to other states: state responsibility and international liability. Both deal with compensating the victim for harm, but they are triggered in different ways. Unfortunately, the concepts of responsibility and liability have often been confused and switched.¹⁸⁴ When the International Law Commission (ILC) debated state responsibility, they discussed “[i]nternational liability for injurious consequences arising out of acts not prohibited by international law.”¹⁸⁵ This, as Brownlie points out, was inappropriate because state responsibility deals only with wrongful acts.¹⁸⁶ The ILC, however, did not resolve this confusion until 2001.¹⁸⁷ Consequently, the space treaties seemingly use “liability” and “responsibility” interchangeably.¹⁸⁸ This confusion is exacerbated because French and Spanish, two official languages of the United Nations, use the same word to describe both concepts.¹⁸⁹

The simplest way to distinguish these concepts is to note that state responsibility arises due to a breach of an international obligation. International liability, on the other hand, arises when one state harms another; no breach of a duty is necessary. State responsibility is tied to a wrongful act of state; liability is triggered by harm.

184. See Frans G. von der Dunk, *Liability Versus Responsibility in Space Law: Misconception or Misconstruction?*, in 34 COLLOQUIUM ON THE L. OF OUTER SPACE 363, 363 (1991).

185. BROWNLIE, *supra* note 111, at 49 (internal quotation marks omitted).

186. See *id.* at 49-50.

187. See JAMES CRAWFORD, *THE INTERNATIONAL LAW COMMISSION'S ARTICLES ON STATE RESPONSIBILITY* 75-76 (2002).

188. See BROWNLIE, *supra* note 111, at 50; HURWITZ, *supra* note 12, at 148-49; von der Dunk, *supra* note 184, at 363.

189. See HURWITZ, *supra* note 12, at 148; von der Dunk, *supra* note 184, at 363. French and Spanish, both official United Nations languages, use “responsabilité” and “responsabilidad,” respectively, to capture the idea of state responsibility and international liability.

1. State Responsibility

State responsibility is a law of obligations.¹⁹⁰ It holds states responsible for “internationally wrongful acts” done against another state or its citizens.¹⁹¹ This allows an injured state to protect its citizens from abuses by other states.¹⁹² In order for state responsibility to arise, the responsible state must commit an internationally wrongful act that is properly attributable to the breaching state.¹⁹³ An internationally wrongful act is either an act or omission attributable to a state under international law or a breach of a state’s international obligation.¹⁹⁴

An act is attributable to a state only if the act was committed by the state or has the state’s authorization.¹⁹⁵ Private acts are almost never attributable to states.¹⁹⁶

The breach of an international duty, properly attributed to a state, triggers the secondary obligation to make reparations for injury caused by the breach.¹⁹⁷ Reparation follows the *Chorzow* principle,¹⁹⁸ which seeks to wipe away the harm caused by the responsible state.¹⁹⁹ Reparation can, theoretically, be made in three ways: first, as state can undo the wrong that caused the injury;²⁰⁰ if that is not possible, monetary compensation is an acceptable substitute;²⁰¹ finally, if the harm is non-monetary, satisfying the injured party by way of apology or official recognition will count as reparation.²⁰²

190. See CRAWFORD, *supra* note 187, at 77; Sompong Sucharitkul, *State Responsibility and International Liability Under International Law*, 18 LOY. L.A. INT’L & COMP. L.J. 821, 828 (1996); von der Dunk, *supra* note 184, at 363.

191. See BROWNLIE, *supra* note 111, at 23; von der Dunk, *supra* note 184, at 363.

192. See Sucharitkul, *supra* note 190, at 823.

193. See BROWNLIE, *supra* note 111, at 36; CRAWFORD, *supra* note 187, at 81; von der Dunk, *supra* note 184, at 363.

194. See *United States Diplomatic and Consular Staff in Tehran, Judgment (U.S. v. Iran)*, 1980 I.C.J. Rep. 3, ¶¶ 61-68 (May 24) (holding that states can incur responsibility for an individual’s acts if the state fails to exercise “due care” in preventing private acts that breach an international obligation); BROWNLIE, *supra* 111, at 30; CRAWFORD, *supra* note 187, at 81; von der Dunk, *supra* note 184, at 363-64.

195. See *United States Diplomatic and Consular Staff in Tehran (U.S. v. Iran)*, 1980 I.C.J. Rep. 3, ¶ 80; BROWNLIE, *supra* note 111, at 36; CRAWFORD, *supra* note 187, at 94, 100; von der Dunk, *supra* note 184, at 364.

196. BROWNLIE, *supra* note 111, at 165; von der Dunk, *supra* note 184, at 364.

197. CRAWFORD, *supra* note 187, at 201; Sucharitkul, *supra* note 190, at 825.

198. CRAWFORD, *supra* note 187, at 201-02; von der Dunk, *supra* note 184, at 364.

199. *Factory at Chorzow (Ger. v. Pol.)*, 1928 P.C.I.J. (ser. A) No. 17, at 29 (Sept. 13).

200. BROWNLIE, *supra* note 111, at 210-12; von der Dunk, *supra* note 184, at 364.

201. BROWNLIE, *supra* note 111, at 222-24; von der Dunk, *supra* note 184, at 364.

202. BROWNLIE, *supra* note 111, at 208-09; von der Dunk, *supra* note 184, at 364.

2. International Liability

International liability arises when a state injures an entity beyond its jurisdiction through an act that is not internationally wrongful.²⁰³ This rule is an offshoot of state responsibility,²⁰⁴ which forbids states from actively harming their neighbors and requires states to prevent harm in neighboring territories.²⁰⁵ States are required to exercise “due care” to prevent such harm.²⁰⁶ This standard, however, is poorly defined and rings hollow because it is not adequately defined.²⁰⁷ The ILC, when debating international liability, did not address the standard of care and tied liability to harm; therefore, if harm occurs, the duty has been violated.²⁰⁸ Therefore, a state can be liable for acts that are, subjectively, not its fault.²⁰⁹

If a state is held liable for damage, it must pay compensation for that damage.²¹⁰ This differs from state responsibility’s “reparation” because compensation merely requires that the liability be removed by repairing the damage—there is no requirement to put the individual in the same place he would be had the harm not occurred and no punitive damages.²¹¹ Holding a wrongdoer responsible for harm inflicted, however, is ultimately a good thing because it deters states from acting in a way that could harm another state.

B. Distinctions Between Space and Standard Liability

International law provides a general scheme for recovering for an international wrong. The space liability regime was built on top of this structure. Both, however, are products of a state-centric regime. The Soviet Union, for example, thought the international legal structure in place was sufficient to govern space activities. Drafters, however, decided a specific regime would better serve the needs of states in space. State responsibility and international liability, however, still linger in the background to fill gaps left by the space treaties.

203. See CRAWFORD, *supra* note 187, at 75-76; Sucharitkul, *supra* note 190, at 828.

204. See HURWITZ, *supra* note 12, at 149; Special Rapporteur, *Preliminary Report on the International Liability for Injurious Consequences Arising Out of Acts Not Prohibited by International Law*, ¶¶ 19-21, U.N. Doc. A/CN.4/344 (1980).

205. See, e.g., Trail Smelter Arbitration (U.S. v. Can.), 3 R.I.A.A. 1938, 1963-65 (Trail Smelter Arb. Trib. 1938 & 1941); Corfu Channel (U.K. v. Alb.), 1949 I.C.J. 4, 22 (Apr. 9).

206. HURWITZ, *supra* note 12, at 147; von der Dunk, *supra* note 184, at 365.

207. See BROWNLEE, *supra* note 111, at 49-50.

208. See HURWITZ, *supra* note 12, at 151; von der Dunk, *supra* note 184, at 365.

209. See von der Dunk, *supra* note 184, at 365.

210. *Id.* at 364.

211. N.L.J.T. Horbach, *The Confusion About State Responsibility and International Liability*, 4 LEIDEN J. INT'L L. 47, 51-53 (1991); von der Dunk, *supra* note 184, at 364.

Adapting to the needs of space, the liability regime crafted by the Outer Space Treaty and the Liability Convention is different in two important ways.²¹²

First, under international space law, states are responsible for the actions of their nationals.²¹³ The standard state-centric international law regime does not usually hold states responsible for their nationals.²¹⁴ This unique requirement, however, is logical when considering the nature of what space law is trying to regulate. Space activities are inherently dangerous.²¹⁵ Because of this, and the state-centric nature of international law, states regulate private national actors.²¹⁶ Additionally, this liability scheme should be considered in the light of the times when it was drafted. When scholars began addressing space liability in the late 1950s, private space actors were not on the drafters' minds.²¹⁷

Second, a state need not exhaust all domestic remedies before asserting a claim under the Liability Convention.²¹⁸ Traditional international law, on the contrary, requires that a party exhaust all domestic remedies before resorting to an international tribunal.²¹⁹ In space law, a claimant state can elect to pursue claims in the launching state's municipal courts.²²⁰ However, the claimant cannot seek "double damages" by trying to recover damages for the same harm in different tribunals.²²¹ This suggests that, although a claimant may try to recover in multiple venues, it could not pursue parallel claims.²²²

C. Which Regime Governs Space Claims?

States potentially have four avenues to pursue a claim for damages in space: (1) the Liability Convention, (2) the Outer Space Treaty, (3)

212. LYALL & LARSEN, *supra* note 15, at 111.

213. Outer Space Treaty, *supra* note 23, art. VI; DIEDERIKS-VERSCHOOR & KOPAL, *supra* note 1, at 36; Williams, *supra* note 79, at 1153.

214. BROWNLIE, *supra* note 111, at 165; LYALL & LARSEN, *supra* note 15, at 66.

215. DIEDERIKS-VERSCHOOR & KOPAL, *supra* note 1, at 37; JASENTULIYANA, *supra* note 9, at 35 n.40; LYALL & LARSEN, *supra* note 15, at 108; Ginsburg, *supra* note 43, at 516.

216. *E.g.*, Commercial Space Launch Act, 51 U.S.C. § 50901(a)(7) (2010); *see* JASENTULIYANA, *supra* note 9, at 404-05; LYALL & LARSEN, *supra* note 15, at 104-05; *see also* Ginsburg, *supra* note 43, at 528-32 (discussing the development of U.S. space law and the processes for holding private actors responsible).

217. *See* REYNOLDS & MERGES, *supra* note 5, at 49-50; DeBusschere, *supra* note 8, at 103.

218. Liability Convention, *supra* note 26, art. XI(1); HURWITZ, *supra* note 12, at 52.

219. LYALL & LARSEN, *supra* note 15, at 111.

220. Liability Convention, *supra* note 26, art. XI(2); *see* LYALL & LARSEN, *supra* note 15, at 111.

221. *See* LYALL & LARSEN, *supra* note 15, at 111.

222. *See id.*

standard recovery proceedings under international law, and (4) municipal courts.²²³ Which regime, therefore, governs?

There is no requirement that states resolve disputes through the space treaties.²²⁴ Some scholars argue that because the Outer Space Treaty and the Liability Convention are *lex specialis* developed to deal exclusively with space liability claims, those treaties should provide the only remedy for claims for damage by space objects.²²⁵ The International Law Commission's Articles on State Responsibility suggest a specialized regime of international law controls as to the exclusion of general international law.²²⁶ This rationale makes sense, given the space liability regime addresses unique situations in space.

This argument, however, disregards the cooperative nature of space law. The space treaties do not preclude parties from using other venues²²⁷ and, in fact, encourage diplomatic solutions to disputes.²²⁸ Only after diplomacy fails does the Claim Commission process begin.²²⁹ Because only states may bring a claim under the space liability regime,²³⁰ having other avenues for relief recognizes the weaknesses in the Westphalian system and promotes the victim-oriented nature of space liability by allowing a non-state victim to recover even if the state elects not to make a Liability Convention claim.²³¹ Therefore, it is best to permit victims to use any of the four recovery avenues.

IV. SPACE LIABILITY IN PRACTICE

De-orbiting space debris is no longer a rare occurrence. Fortunately, given the vastness of the oceans, most detritus falls harmlessly into the seas.²³² In 1979, the United States had a close call when Skylab fell remarkably close to Esperance, a small town eastern Australia.²³³ Anticipating damages and in accordance with treaty requirements, NASA prepared to respond to damage claims; however, it

223. *See id.* at 66-67.

224. HURWITZ, *supra* note 12, at 75; *cf.* DIEDERIKS-VERSCHOOR & KOPAL, *supra* note 1, at 147.

225. *See* CRAWFORD, *supra* note 187, at 306-08; Eigenbrodt, *supra* note 78, at 201.

226. *See* CRAWFORD, *supra* note 187, at 306.

227. *See* Liability Convention, *supra* note 26, arts. IX, XI; JASENTULIYANA, *supra* note 9, at 216-17; HURWITZ, *supra* note 12, at 75; LYALL & LARSEN, *supra* note 15, at 111.

228. *See* Liability Convention, *supra* note 26, art. XIV ("If no settlement of a claim is arrived at through diplomatic negotiations as provided in Article IX . . ."); DIEDERIKS-VERSCHOOR & KOPAL, *supra* note 1, at 40; JASENTULIYANA, *supra* note 9, at 220; LYALL & LARSEN, *supra* note 15, at 112.

229. *See* Liability Convention, *supra* note 26, art. XIV.

230. *See id.* art. VIII (describing how a *state* may make a claim); Eigenbrodt, *supra* note 78, at 196.

231. *See* HURWITZ, *supra* note 12, at 10, 207; Bosco, *supra* note 41, at 617.

232. *See* LYALL & LARSEN, *supra* note 15, at 117.

233. *Id.*

received none.²³⁴ The closest “liability” was a light-hearted A\$400 fine for littering issued by a small Australian town.²³⁵ However, as the skies become more crowded, debris will become more of a danger and the Liability Convention will no doubt be put to the test.²³⁶

A. *Liability Convention Claim: Cosmos 954*

The Liability Convention has been used, officially, only once. On January 23, 1978, the Soviet Union’s Cosmos 954 satellite fell from orbit and crashed into a remote area of northwestern Canada.²³⁷ The satellite’s nuclear power source used 65 kilograms of radioactive material, which survived reentry and scattered over the crash area. Canada conducted a massive clean-up operation that swept 124,000 square kilometers for radioactive material.²³⁸ Although the Soviet Union offered to assist the clean-up, Canada refused assistance and later submitted a claim to recover clean-up and recovery costs using the Liability Convention and general international law.²³⁹ Couching the demand in Article II terms, Canada invoked the Soviet Union’s responsibility as the launching state to compensate harm incurred.²⁴⁰

The process began diplomatically, as the Liability Convention intends.²⁴¹ The two states fought over the amount of compensation and mitigating circumstances, but eventually reached an agreement in 1981.²⁴² The Soviet Union paid Canada C\$3,000,000 as a “full and final settlement.”²⁴³ This agreement, however, did not acknowledge Soviet liability.²⁴⁴

Staunch advocates of a separate, clear space liability regime would not be happy with this result. The Liability Convention provides the

234. *Id.*

235. The United States government, incidentally, never paid the fine. Ian O’Neill, *Celebrating July 13, “Skylab-Esperance Day”*, DISCOVERY NEWS, July 14, 2009, <http://news.discovery.com/space/celebrating-july-13-skylab-esperance-day.html>.

236. See DIEDERIKS-VERSCHOOR & KOPAL, *supra* note 1, at 141; Merges & Reynolds, *supra* note 11, at 10010.

237. Eigenbrodt, *supra* note 78, at 200.

238. Ginsburg, *supra* note 43, at 546-47.

239. See Canada’s Claim Against the Union of Soviet Socialist Republics for Damage Caused by Soviet Cosmos 954, Annex A, ¶¶ 14-20, Jan. 23, 1979, 18 I.L.M. 899 [hereinafter Canada Claim]; Ginsburg, *supra* note 43, at 547.

240. See Canada Claim, *supra* note 239, Annex A, ¶ 14; Ginsburg, *supra* note 43, at 548.

241. See Canada Claim, *supra* note 239, Annex A, ¶¶ 4-12; Ginsburg, *supra* note 43, at 548.

242. See DIEDERIKS-VERSCHOOR & KOPAL, *supra* note 1, at 42; Ginsburg, *supra* note 43, at 548.

243. Protocol on Settlement of Canada’s Claim for Damages Caused by “Cosmos 954”, Can.-U.S.S.R., art. 2 Apr. 2, 1981, 20 I.L.M. 689 [hereinafter Cosmos Protocol]. See Ginsburg, *supra* note 43, at 548-49.

244. See Cosmos Protocol, *supra* note 243, art. 1; Eigenbrodt, *supra* note 78, at 200.

framework for initiating the claims process, but the parties did not follow the Convention's one-year claims initiation process.²⁴⁵ Because the Claims Commission was not activated, there were no mechanisms that facilitated recovery; Canada had to actively pursue relief, which some argue is contrary to the purpose of having a liability separate regime.²⁴⁶ However, international space law does not provide a clear process for prosecuting a space liability claims. The treaties merely provide guidance on how claims should be made and what a state is potentially responsible for. International cooperation, emphasized by the Article IX requirement that claims be submitted through diplomatic channels, was upheld.²⁴⁷ In the end, this dispute was solved; the Soviet Union compensated Canada for the harm incurred.²⁴⁸ Even though the process was not exact, the Liability Convention served its purpose by facilitating negotiations that led to a solution.²⁴⁹

CONCLUSION: THE RISE OF THE PRIVATE SPACE ACTOR

Space science constantly advances; ideas unimagined in 1967 are now feasible, which create unanticipated issues not addressed by the treaties. This will challenge the Westphalian underpinnings of international space law. For example, there are no treaty provisions specifically addressing commercial ventures.²⁵⁰ Space tourism is just over the horizon²⁵¹ and, now that the Space Shuttle is retired, NASA will rely on other states and the private sector for launch capabilities.²⁵² Questions of liability, insurance, and regulation are just a few issues that need to be resolved.²⁵³ Problems like debris removal in orbit demonstrate the lack of enforceable legal obligations.²⁵⁴

The current space liability regime was based on a state-centric model and designed for a world where outer space was dominated by the United States and the Soviet Union.²⁵⁵ The treaties made states

245. See DIEDERIKS-VERSCHOOR & KOPAL, *supra* note 1, at 42; Eigenbrodt, *supra* note 78, 201-02.

246. See FORKOSCH, *supra* note 74, at 12-13 (decrying the Liability Convention for promoting a "self-help" regime).

247. See Liability Convention, *supra* note 26, art. IX; DIEDERIKS-VERSCHOOR & KOPAL, *supra* note 1, at 42.

248. See Cosmos Protocol, *supra* note 243, art. I-II; DIEDERIKS-VERSCHOOR & KOPAL, *supra* note 1, at 42.

249. See Eigenbrodt, *supra* note 78, at 202.

250. Hertzfeld, *supra* note 30, at 330.

251. Tiffany Gabbay, *Richard Branson Wants to Take You into Outer Space*, BUSINESS INSIDER (July 5, 2011), http://articles.businessinsider.com/2011-07-05/lifestyle/30023363_1_space-travel-zero-gravity-spaceport.

252. See DIEDERIKS-VERSCHOOR & KOPAL, *supra* note 1, at 121; Klotz, *supra* note 9.

253. See DIEDERIKS-VERSCHOOR & KOPAL, *supra* note 1, at 121-22; Hertzfeld, *supra* note 30, at 330.

254. See Goh, *supra* note 58, at 737; Merges & Reynolds, *supra* note 11, at 10010.

255. See Debusschere, *supra* note 8, at 103.

responsible for damage because states had deep enough coffers to pay the extraordinary costs for a space-related disaster.²⁵⁶ Today, however, outer space is increasingly crowded with other states and many private actors.²⁵⁷ States are still jointly and severally liable for satellite networks owned and operated by multinational corporations.²⁵⁸ The state-centric regime is increasingly unworkable for private entities. While more accessible for companies, general international law principles do not provide the accessibility commercial ventures need.

Because of this, states are beginning to actively support commercial space ventures. Many states require private companies to secure insurance to protect both the company and the state from liability.²⁵⁹ The United States' Commercial Space Launch Act, for example, requires commercial ventures to obtain liability insurance.²⁶⁰ If the statutorily mandated insurance coverage is unavailable, the "maximum liability insurance available on the world market at a reasonable cost" is sufficient.²⁶¹ Liability insurance for space activities, however, is always expensive and sometimes cannot be obtained.²⁶² And because of the Westphalian structure, it is states that are ultimately liable for damage under the space treaties. Consequently, national space policies must balance protecting the state from liability with unnecessarily chilling domestic commercial space ventures.²⁶³

Government, however, may underestimate the ingenuity of business. Perhaps "lawyers' fascination with liability issues" overly emphasizes the importance of an international legal regime.²⁶⁴ Commercial ventures, such as Richard Branson's Virgin Galactic and Elon Musk's SpaceX, see a future in space. Already, companies are finding ways to resolve disputes extra-judicially by contracting around liability issues.²⁶⁵ Companies insert cross-waivers of liability, whereby each party agrees to bear its own risk.²⁶⁶ When something goes awry,

256. See Christol, *supra* note 159, at 348.

257. See JASENTULIYANA, *supra* note 9, at 321; Merges & Reynolds, *supra* note 11, at 10010.

258. See DIEDERIKS-VERSCHOOR & KOPAL, *supra* note 1, at 107; Debusschere, *supra* note 8, at 104-05.

259. See DIEDERIKS-VERSCHOOR & KOPAL, *supra* note 1, at 113-14; JASENTULIYANA, *supra* note 9, at 404-05. The following states require some form of insurance in their municipal space codes: Australia, Russia, South Africa, Sweden, United Kingdom, and the United States. See LYALL & LARSEN, *supra* note 15, at 114-16.

260. 51 U.S.C. § 50914 (2012).

261. *Id.* § 50914(a)(3). The statutory minimums are \$500,000,000 for third parties' damage and loss claims and \$100,000,000 for damage or loss to the Government.

262. See LYALL & LARSEN, *supra* note 15, at 114.

263. See *id.* at 115.

264. REYNOLDS & MERGES, *supra* note 5, at 187.

265. LYALL & LARSEN, *supra* note 15, at 33.

266. DIEDERIKS-VERSCHOOR & KOPAL, *supra* note 1, at 115.

the contract pulls the dispute into municipal court.²⁶⁷ This, at least, gives parties some certainty about the law governing the dispute. Business will not let an imperfect treaty structure hinder space development.

States cannot completely withdraw from liability disputes in space, given the state-centric structure of international law and the huge sums of money potentially involved in damage. However, states should continue to foster commercial development by requiring companies to have substantial liability insurance. In exchange for that protection, the state would back the company in the international arena. This protects the state from the brunt of liability while allowing companies to resolve disputes through international channels.

²⁶⁷. See, e.g., *Martin Marietta Corp. v. Int'l Telecomm. Satellite Org.*, 978 F.2d 140, 141 (4th Cir. 1992).