1. An introduction to international space law and space laws of the United States

INTRODUCTION

Outer space. There is no clear line as to where it starts, and there is no indication that it ever ends. Outer space is beyond the limits of any one nation’s jurisdiction, yet all nations rely on outer space for their economies, banking, agriculture, tourism, navigation, and public health. Outer space has fascinated humans for millennia, and ancient civilizations ranging from the Chinese,1 to the ancient Egyptians,2 to the Mayans,3 were proficient in engineering and astronomy and demonstrate fascination with, and detailed knowledge of, celestial bodies.

Outer space also offers a unique perspective on humanity’s role in the universe, answering profound questions that humans have asked for millennia as well as raising new questions that humans have not yet thought to ask.

While outer space is immeasurable,4 the regions of outer space on which humankind most depends are finite. As vast as outer space is, given our level

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1 Chinese astronomers constructed the Taosi Observatory in China more than 4,000 years ago. It was only discovered about 2003–2004. See, Jia Bi Wu et al., Astronomical Function and Date of the Taosi Observatory, 52 Sci. China Series G: Physics, Mechanics & Astronomy 151–158.

2 Abu Simbel Temple, built about 3,200 years ago on the Nile River, was designed so that the sun illuminated the face of King Ramses II deep in the temple twice each year – on the date of his birth and on the date of his coronation. Joshua J. Mark, Abu Simbel, World Hist. Encyclopedia (May 9, 2018), https://www.worldhistory.org/Abu_Simbel/.

3 You can still see current references to the 2,000+-year-old Olmec-Mayan Long Count Calendar on monuments in Central America. The Maya Calendar System, Smithsonian Museum Am. Indian (2021), https://maya.nmai.si.edu/sites/default/files/resources/The%20Maya%20Calendar%20System.pdf.

4 Although many people claim that the universe is infinite, it is more accurate to describe it as ever expanding. As far as we know, the universe has been expanding for about 13.8 billion years – therefore, since it’s not infinitely old, it is not infinitely big. For another fun fact, because the universe is expanding, the objects we can see from
of technological development and the laws of physics – and setting aside (for now) their intrinsic value – only certain regions in space are of current practical use to humankind. These uses include telecommunications, weather forecasting, advances in science and technology, navigation, and defense. Unfortunately, many of those regions in space are facing risks from overcrowding, radio frequency interference, and space debris. To ensure that outer space remains useful to humans, as well as for reasons of national security and economic prosperity, countries have agreed on various international laws to govern outer space. Efforts to create such laws began in the 1960s, though space flight began a few years earlier. A short synopsis of outer space exploration and outer space law are provided below.

**EARLY SPACE FLIGHTS**

The modern history of space flight began during the Second World War. In Nazi Germany, a team of rocket scientists, including Wernher von Braun, began working on a new weapons delivery system that used rockets instead of planes. Their work culminated in the creation of the V-2 rocket. The project did not gain traction until August 1941, but then it became one of Germany’s top technological and engineering priorities. This development began an entirely new weapons delivery system, one that did not need to endanger the lives of pilots or plane crews. With an altitude range of 88 kilometers, a V-2 rocket entered the mesosphere during its flight path.

After World War II ended in Europe, both the United States of America (U.S.) and the Union of Soviet Socialist Republics (U.S.S.R.) acquired hardware from the V-2 project, and many of the scientists involved in the German program moved to those countries to work on their military and nascent space programs. For example, Wernher von Braun went on to become the chief

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5 As of 2018, approximately 20,000 pieces of debris larger than 10 centimeters in size (about the size of a baseball) and 900,000 pieces of approximately 1 centimeter are orbiting the earth. Given the high velocity at which matter travels in outer space, a collision with a 10-centimeter piece of debris would completely destroy a satellite. https://cosmosmagazine.com/space/using-asteroid-science-to-track-space-debris.


7 The mesosphere is a layer of Earth’s atmosphere. It is directly above the stratosphere and extends from about 50 to 85 km (31 to 53 miles) above our planet. The Mesosphere, UCAR (2021), https://scied.ucar.edu/learning-zone/atmosphere/mesosphere.
architect of the National Aeronautics and Space Administration’s (NASA) Saturn V program, which enabled the U.S. to beat the U.S.S.R. in landing humans on the Moon.\(^8\)

Although spaceflight research continued after World War II, there was not much need for law in outer space before the launch of the first artificial satellite, Sputnik 1, into orbit by the U.S.S.R. on October 4, 1957.\(^9\)

Prior to Sputnik, the question of outer space law remained mostly in the realm of academics and intellectuals, who sought to institute space laws before space capabilities were established. The U.S. perspective was to allow technological achievements to dictate best practices. In the 1950s, U.S. President Dwight D. Eisenhower walked a fine line between appeasing both the intellectuals and the military. Eisenhower largely agreed with the intellectuals and promoted peace in outer space through his speeches; but in his actions, he conceded to the military. In his 1957 State of the Union Address, he said, ‘[o]ur continuing negotiations in this field [of outer space] are a major part of our quest for a confident peace in this atomic age.’\(^10\) By utilizing outer space as a conduit through which there would be peace between the U.S. and the U.S.S.R., Eisenhower was hoping to prevent a ‘nuclear Pearl Harbor’ with the U.S.S.R.

The U.S.’s attitude towards outer space regulation changed when the U.S.S.R. launched Sputnik 1. The launch of Sputnik 1 created consternation among many across the globe. Sputnik 1 was the first move in the Space Race, and it was followed quickly by competition between the U.S.S.R. and the U.S. to achieve increasingly complex space capabilities. Essentially overnight, the international image of the U.S.S.R. changed. The U.S.S.R. exercised global leadership in the field of space exploration. And three months later, they did it again – this time, Sputnik 2 launched a dog, ‘Laika,’ into outer space.

Other nations generally did not initiate space-related activities until considerably later. In Europe, for example, the idea of setting up a space agency was born in 1958, and the two agencies that would later become what we now know as the European Space Agency (ESA), were not established until 1962: the European Launch Development Organisation (ELDO), which had the mission of developing launch systems, and the European Space Research

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8. Saturn V rockets, which were launched 13 times, carried 24 humans to the Moon, the only humans to venture beyond low Earth orbit. *Saturn V Rocket, Cradle of Aviation Museum & Educ. Ctr.* (2021), https://www.cradleofaviation.org/history/history/saturn-v-rocket.html.

9. Sputnik 1 operated for about three weeks before its batteries died, after which it orbited Earth for about two more months. After that, Earth’s gravity pulled it back down towards the planet, and it burned up in the atmosphere.

Organisation (ESRO), to develop spacecraft. ESRO’s first successful satellite launch did not take place until 1968, while NASA was getting ready to land the first human on the Moon, a feat that they achieved only a year later.

Synopsis of Sixty Years of U.S. Space Exploration

The U.S.’s Sputnik moment
While Sputnik’s launch marked the beginning of the ‘Space Age,’ it also marked the beginning of U.S. space exploration. The fact that the U.S.S.R. was able to launch a satellite before the U.S. created a serious national concern that the U.S. may be vulnerable to a nuclear missile attack due to its inferior scientific and technological capabilities. This galvanizing realization is often referred to as the U.S.’s ‘Sputnik moment,’ a term now commonly used to describe a rapid national response that quickly mobilizes major policy change as opposed to a response of inaction or incremental policy change.

The U.S.’s immediate response to its ‘Sputnik moment’ laid the foundation for its space programs. Within 10 months after Sputnik’s launch, the 85th Congress and the Eisenhower Administration:

• established the Senate Special committee on Space and Astronautics, and the House Select committee on Science and Astronautics – the first time since 1892 that both the House and Senate created standing committees on an entirely new subject,
• established the National Aeronautics and Space Administration (NASA) through the National Aeronautics and Space Act,
• established the Defense Advanced Research Projects Agency (DARPA) within the Department of Defense (DOD) through DOD Directive 5105.15 and National Security – Military Installations and Facilities,
• increased appropriations for the National Science Foundation to $134 million, nearly $100 million higher than the previous year, and
• passed the National Defense Education Act to reform elementary, secondary, and postsecondary science and mathematics education and provide incentives for American students to pursue science, technology, engineering, and mathematics (STEM) postsecondary degrees via fellowships and loans.

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14 Id. at 3.
15 Id. at 2.
Less than a week after NASA’s creation, Project Mercury, the U.S.’s first human spaceflight program, was officially approved on October 7, 1958. Project Mercury’s goal was to put a man into Earth orbit and return him safely, which the Mercury capsule did on February 20, 1962, when astronaut John Glenn made three orbits around the Earth.

In the early 1960s, the Eisenhower Administration conceived the Apollo program as a follow-up to Project Mercury. However, the Apollo program was not taken seriously until the U.S.S.R. launched cosmonaut Yuri Gagarin, who became the first person to fly in space on April 12, 1961. The following month, President Kennedy addressed a joint session of Congress saying that the U.S. should commit itself to achieving the goal, before this decade is out, of landing a man on the Moon and returning him safely to the Earth.

Apollo’s mission of landing humans on the Moon by the end of 1969 involved the largest commitments of resources ever made by any nation in peacetime. From 1960 to 1973, the program cost the U.S. nearly $24 billion, or approximately $283 billion when adjusted for inflation, employed around 400,000 Americans and was supported by over 20,000 industrial firms and universities. Among many noteworthy events of the Apollo program, the landing of humans on the Moon in 1969 stands out as a singular achievement in both U.S. and world history.

After the Apollo program ended in the 1970s, the U.S. introduced the Space Shuttle program in 1981. The five Space Shuttles flew a total of 135 missions, launched numerous scientific and technological missions, and were essential to the construction of the International Space Station (ISS). The ISS is governed by an international treaty, often referred to as the ‘IGA,’ which is short

20 Deborah D. Stine, Cong. Research Serv., RL 34645, The Manhattan Project, the Apollo Program, and Federal Energy Technology R&D Programs: A Comparative Analysis (June 30, 2009).
23 Id.
for the Intergovernmental Agreement. As of the date of writing, 243 individuals from 19 countries have visited the ISS, which has been continuously occupied since November 2000. The crew of six people live and work while traveling at a speed of five miles per second (about 18,000 mph), orbiting Earth about every 90 minutes. In 24 hours, the space station makes 16 orbits of Earth, traveling through 16 sunrises and sunsets. This microgravity laboratory has hosted more than 2,700 research investigations from researchers in more than 103 countries.

In this 60-year period, nine countries have developed the ability to reach outer space: U.S.S.R./Russia, U.S., France, Japan, China, India, Israel, Iran and North Korea. Together, these countries have launched more than 8,900 satellites. About 5,000 of those remain in orbit, and of those 5,000, approximately 2,787 are functional.

THE DEVELOPMENT OF SPACE LAW

Between Sputnik’s launch in 1957 and today, space law has seen progressive development.

**United Nations Committee on the Peaceful Uses of Outer Space (COPUOS)**

In 1958, one year after Sputnik 1, the United Nations (UN) created an Outer Space Affairs Division. That was later transformed into the Office of Outer Space Affairs, now located in Vienna, Austria. Also in 1958, the UN convened a Committee on the Peaceful Uses of Outer Space (COPUOS), which was made a permanent committee of the UN General Assembly one year later and still functions. COPUOS has been the primary source for the drafting of international space law.

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The UN Outer Space Treaties

COPUOS began drafting a series of UN General Assembly resolutions in the early 1960s regarding outer space, culminating in what crystallized in 1967 as the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies (Outer Space Treaty, or OST).27 More than 100 States are party to the OST,28 including all major spacefaring nations. The OST is the primary international legal instrument governing activities in outer space. This Treaty also provides the impetus for most nations around the world to draft their own domestic space laws and regulations.

The Treaty establishes several fundamental principles:

- the exploration and use of outer space shall be carried out for the benefit and in the interests of all States and shall be the province of all humankind;
- outer space shall be free for exploration and use by all States;
- outer space is not subject to national appropriation by claim of sovereignty, by means of use or occupation, or by any other means;
- States shall not place nuclear weapons or other weapons of mass destruction in orbit or on celestial bodies or station them in outer space in any other manner;
- the Moon and other celestial bodies shall be used exclusively for peaceful purposes;
- astronauts shall be regarded as the envoys of humankind;
- States shall be responsible for national space activities whether carried out by governmental or nongovernmental entities;
- States shall be liable for damage caused by their space objects; and
- States shall avoid harmful contamination of space and celestial bodies.

Chapter 3 examines the terms of the Outer Space Treaty in detail. The OST was followed by four additional space law treaties over the next 13 years. These instruments, discussed in Chapter 4, expound upon and provide greater details of the principles laid out in the OST. The four additional treaties are


28 The list on the status of international agreements relating to activities in outer space is compiled and distributed by the United Nations Office for Outer Space Affairs, available online at https://www.unoosa.org/oosa/en/ourwork/spacelaw/treaties/status/index.html.
concerned with the rescue and return of astronauts and objects; the liability of launching states; the registration of spacecraft; and the Moon.

**Other Relevant Law**

Apart from these five space law treaties (also sometimes referred to as the core space law treaties), customary international law, and UN ‘soft law’ are also relevant to space law, as are several bilateral and multilateral treaties and other agreements. At the domestic level, national space laws and regulations also exist pertaining to space-related activities. The domestic laws of the U.S. are discussed extensively in the second half of this book.

**Terrestrial law applicable to outer space**

One of the most important (and often overlooked) articles of the Outer Space Treaty is Article III. That article requires States Parties to carry out the exploration and use of outer space ‘in accordance with international law, including the Charter of the United Nations….’ Article III confirms that international law applies to activities in outer space, just as it does to activities on Earth. Examples of international law that apply *mutatis mutandis* in outer space include the principle of *pacta sunt servanda*, humanitarian law or the ‘laws of armed conflict,’ human rights, and international environmental law. International humanitarian law (also sometimes referred to as the laws of war) thus applies in space, even apart from the UN Charter, which gives a new perspective on the Universal Declaration of Human Rights. Elements

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29 Agreement on the Rescue of Astronauts, the Return of Astronauts, and the Return of Objects Launched into Outer Space (1968), 672 U.N.T.S. 119; 19 U.S.T. 7570.


33 *Mutatis mutandis* is a Latin phrase found in the field of law that means, more or less, ‘changing those things that need to be changed.’ So, a maxim may be applicable to a certain situation, but it just may need to be tweaked a bit to fit the circumstances. There is no specific English equivalent, so it is used in its Latin form and italicized.

34 *Pacta sunt servanda* is another Latin phrase used in international law to mean ‘agreements are binding.’ This is a fundamental principle that forms the basis for all international law. In general, it means that States (meaning countries) must perform the obligations they agree to in Treaties and must do so in good faith. See, e.g., I.I Lukashuk, *The Principle Pacta Sunt Servanda and the Nature of Obligation Under International Law*, 83 AM. J. INT’L L. 513–518 (1989).
of international environmental law also apply to outer space activities, such as: Principle 21 of the Stockholm Declaration on the Human Environment regarding transboundary harm, the principle of common but differentiated responsibilities, the principle of intertemporal law, and intergenerational equity. These are just a few examples: other areas of international law also are applicable to outer space activities through the terms of Article III.

**United Nations General Assembly resolutions**

Since 1980, the UN General Assembly has adopted four Declarations of Principles on space matters. Three have had significant effect. These deal with remote sensing (1986), use of nuclear power sources in space (1992), and space benefits (1996). A 1982 resolution on direct broadcasting satellites has

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35 Stockholm Declaration Principle 21 provides: ‘States have, in accordance with the Charter of the United Nations and the principles of international law, the sovereign right to exploit their own resources pursuant to their own environmental policies, and the responsibility to ensure that activities within their jurisdiction or control do not cause damage to the environment of other States or of areas beyond the limits of national jurisdiction.’ Stockholm Declaration on the Human Environment, Principle 21, Dec. 15, 1972, A/RES/2994.

36 See, 1992 Rio Declaration on Environment and Development, Principle 7, June 6, 1992, UN Doc. A/Conf. 151/126, 31 ILM 874: ‘States shall co-operate in a spirit of global partnership to conserve, protect and restore the health and integrity of the Earth’s ecosystem. In view of the different contribution to global degradation, States have common but differentiated responsibilities. The developed countries acknowledge the responsibility they bear in the international pursuit of sustainable development in view of the pressures their societies place on the global environment and of the technologies and financial resources they command.’

37 The principle of intertemporal law provides that, in questions involving the environment (at least), new norms of international law must be taken into account even with respect to continuing activities governed by existing international agreements. Gabčikovo-Nagymaros Project, Hungary v. Slovakia, Judgment, 1997 I.C.J. Rep. 88, ¶ 140 (Sep. 25, 1997).

38 The principle of intergenerational equity or intergenerational justice refers to the preservation of natural resources and the environment (here, the space environment) for the benefit of future generations. See, Edith Brown Weiss, *In Fairness to Future Generations*, Am. U. Int’l. L. Rev. 8, 19–26 (1992).

39 Principles relating to remote sensing of the Earth from outer space, GA Res. 41/65 (Dec. 3, 1986).


had little substantive effect. Beyond these adopted resolutions, the General Assembly has adopted a series of hortatory resolutions making clarifications and recommendations on the existing treaties. Despite these resolutions’ non- legally binding nature, spacefaring States have generally acted in accordance with their provisions.

International Telecommunications Union

Other international law relevant to outer space is found in the International Telecommunications Union (ITU). The ITU is a separate intergovernmental organization with a wide-ranging portfolio including regulating radio-frequency spectrum and satellite orbits. The ITU’s Radio Regulations are the key procedures for regulating how satellites and ground stations communicate. The ITU Radio Regulations comprise thousands of pages of detailed international agreement for using the radio-frequency spectrum. They are discussed more fully in Chapter 9, which addresses telecommunications.

Bilateral and multilateral agreements

Additionally, since 1979, bilateral and multilateral international agreements have also moved to the forefront of space law. An important example is the 1998 International Space Station (ISS) Intergovernmental Agreement (IGA), which has 15 States Parties and established the legal framework for cooperation on the ISS.

This framework was further expanded by bilateral memoranda of understanding, various implementing arrangements, and numerous contractual agreements. There are thousands of other binding and nonbinding bilateral and multilateral agreements ranging from international agreements enabling individual space missions, to others creating working groups or collabora-
tion on specific issues (e.g., the Inter-Agency Space Debris Coordination Committee).46

SPACE LAWS OF THE UNITED STATES

To implement the international obligations undertaken pursuant to the Outer Space Treaties, the U.S. has drafted domestic laws and regulations to implement its internationally legally binding commitments into its domestic legal system. Article VI of the OST requires States to authorize and supervise the activities of their nationals in outer space.

The U.S. supervises the activities of its nationals in outer space through a combination of statutes and regulations. Congress passes federal laws which empower various agencies to elaborate and provide greater details of those laws through their agency-level regulations.47

There are numerous federal statutes that govern activities in outer space. For example, the Commercial Space Launch Competitiveness Act (CSLCA), which governs commercial space launch and reentry activities, is examined in Chapter 7.48 Other statutes examined in greater detail in this book include the Land Remote-Sensing Policy Act, which governs commercial remote-sensing regulations by the Department of Commerce’s National Oceanic and Atmospheric Administration (NOAA) and the 1934 Communications Act, which created the Federal Communications Commission (FCC), discussed in Chapters 8 and 9, respectively.

These various statutes authorize regulations that are found in the Code of Federal Regulations (CFR) and dictate the process for obtaining U.S. licenses to conduct space activities from the FAA, NOAA and FCC. U.S. space activities are also overseen by NASA and the Department of Defense (DOD), neither of which regulate commercial activities, though they do promulgate regulations governing their own activities. As will be examined in Chapter 5, U.S. agencies can only do that which they are specifically authorized to do by Congress. U.S. agency regulations easily exceed tens of thousands of pages.49 Our hope is that this volume will help you digest some of the relevant organic

46 There is no central ‘repository’ of all these international agreements; individual States and space agencies maintain their own files. NASA alone has concluded several thousand agreements in its 60-year history, more than 800 of which are active as of this writing.
47 This is elaborated more fully in Chapter 5.
48 See e.g., 51 U.S.C. §§ 50902–50923.
49 In one recent rulemaking procedure, an agency’s proposed rule was over 700 pages. See, Streamlined Launch and Reentry License Requirements, 85 Fed. Reg. 79566 (Dec. 10, 2020).
statutes and their related implementing regulations governing various space activities.

LOOKING TO THE FUTURE

Space-related investment and activities were dominated by States for the first several decades of space exploration, and States continue to be active. As of 2022, several States are planning major activities in space, including robotic and human visits to the Moon, visits to Mars, mineral exploitation of asteroids and other celestial bodies, and military activities. In addition to major players in space such as China, France, Germany, Italy, India, Japan, Russia, and the U.S., numerous other States are increasingly active in space, including New Zealand, Israel, Nigeria, South Africa and Mexico.

Private activities in space are playing an increasingly important role. Such activities have existed since the early 1960s, when private enterprises conducted experiments on State-launched satellites, or operated satellites on behalf of governments, but the nature and number of commercial activities are expanding dramatically. Private enterprises are involved in: launching satellites for States and for themselves; supplying and carrying personnel and cargo to the ISS; creating and operating communications systems in space, including constellations of thousands (or tens of thousands) of small satellites; contracting to take tourists into space, including around the Moon; contracting to survey the Moon’s surface on behalf of States; and attempting or planning to exploit mineral resources on asteroids and the Moon.

These developments are also driving a debate about the need for new laws for outer space. Those who see a clear need note that all five space treaties described above assume that space is dominated by States rather than also engaged in by private entities – a situation that is rapidly evolving. They further note that there are lacunae (gaps) in space law because of technological progress that was unforeseen (and unforeseeable) when the OST entered into force over 50 years ago and the sheer increase in the number and types of space activities. Questions exist regarding the legality of, or liability associated with, certain outer space activities, both present and future, how to resolve conflicting claims to resources and how disputes may best be resolved. Examples of issues about which legal norms could be useful include: ownership of resources such as water or mineral resources on the Moon; asteroid mining; space tourism; private companies (as contrasted with States) launching rockets; hotels in space; criminal law in space; piracy in space; one-way trips to Mars; rights to intellectual property created in space; settlement of disputes between rival resource-gathering entities (whether private or State-owned); governance of human settlements in space; extradition; military operations in space; protection of historical or natural sites such as the site of the first human
landing on the Moon; inorganic or organic pollution of celestial bodies; and, of course, other environmental concerns of the types that arise everywhere humans go.

In addition to expanding the principles contained in existing space treaties, several other areas of law provide possible models that can serve as starting points for addressing these questions. These models include the Antarctic regime,\textsuperscript{50} the Law of the Sea, and the International Telecommunications Union. Only time will tell what details emerge as the outer space legal regime evolves.

What does seem certain is that, because outer space is beyond any State’s national jurisdiction, future international agreements will be required to address issues such as these, as well as questions humans have yet to imagine. Being or becoming a ‘space lawyer’ will be fascinating for many years to come.

STRUCTURE OF THIS BOOK

As suggested by the title, this book has two main areas: international space law; and space laws of the United States. The first part of this book provides a general overview of most international space law with which a practitioner should be familiar. It discusses the primary space law treaties; the treaty-making process in the United Nations; and many of the bilateral and multilateral legal agreements. The second part of the book addresses the space laws of the United States. The U.S. has more extensive legislation and regulation than all other countries on Earth (perhaps even put together). This book will address both the statutes (created by Congress) and the regulations (created by the U.S. executive branch agencies) regarding governmental and commercial spaceflights.

What makes this book different from all other books about space law, however, is that it is written by two space law practitioners for the space law practitioner (and aspiring practitioners). One of the book’s authors has worked as a lawyer at NASA Headquarters for more than 20 years practicing international space law for a living; the other author has worked for leading ‘new space’ companies (including SpaceX), practiced law on Capitol Hill, and worked in the White House Office of Management and Budget (OMB). Both authors understand how space law functions on the international level as well as how Washington works. In addition, the two authors have more than 20 years’ combined experience teaching space law.

\textsuperscript{50} See, \textit{e.g.}, Antarctic Treaty (1961), 402 U.N.T.S. 71; 12 U.S.T. 794.
One goal of this book is to serve as a practitioner’s guide. When, one day, a client walks in and asks what they might need to do to get a license to launch an object into outer space, or what to do when an object in outer space has fallen upon them, this book will serve as a roadmap for the answer. To effectuate that goal, meet Ruth. Ruth is a junior attorney working at a nameless, but well-heeled, law firm in Washington, D.C. On a chapter-by-chapter basis, Ruth’s interactions with her senior partner at the law firm, friends, and family will involve legal research assignments, curious scenarios, and friendly banter regarding the laws that govern space-related activities. Ruth will inspire both law students and space law practitioners who need to research the answers to Space Law questions raised by their clients. Armed with this book, space law practitioners should be able to answer clients’ space law questions at least as well as Ruth does.