

ARTICLES

STRUCTURING THE GOVERNANCE OF SPACE ACTIVITIES WORLDWIDE

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I. INTRODUCTION

Outer space is widely considered to be something of a global commons, an international domain outside the jurisdiction of any country¹ that “belongs to no state and is, in law, as such not subject to appropriation, though its resources are.”² This is also reflected by key provisions of the 1967 Outer Space Treaty,³ the most comprehensive convention on outer space and space activities, notably that “[o]uter space, including the moon and other celestial bodies, is not subject to national appropriation by claim of sovereignty, by means of use or occupation, or by any other means”⁴ and that “[o]uter space, including the moon and other celestial bodies, shall be free for exploration and use by all States without discrimination of any kind, on a basis of equality and in accordance with international law”⁵

The governance of such a “global commons” therefore cannot follow from the authority of a single nation. Such governance requires a foundation in international law, read effectively international treaty law. While customary international law constitutes the other primary source of international law,⁶ due to its fluidity, as long as not codified, it would be rather ill equipped to offer something like a governance structure at the required level of precision.

It is through such a structure, that the substance of any limitations to the baseline freedom of activities (“exploration and use,” in the terms of Article I of the Outer Space Treaty⁷) in outer space would be provided. The substance would come from international treaty law, such as the Outer Space Treaty itself, or in this context possibly also as coming from customary international law, general principles of international law,⁸ or any other relevant sources of international law.

¹ *Outer Space*, BLACK'S LAW DICTIONARY (10th ed. 2004).

² Bin Cheng, *Nationality for Spacecraft?*, in AIR AND SPACE L.: DE LEGE FERENDA 203, 204 (Henri Abraham Wassenbergh et al. eds., 1992).

³ Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies, *opened for signature* Jan. 27, 1969, 18 U.S.T. 2410, 610 U.N.T.S. 206 (entered into force Oct. 10, 1967) [hereinafter Outer Space Treaty]; *see also* 1 COLOGNE COMMENTARY ON SPACE LAW (Stephan Hobe et al. eds., 2009).

⁴ Outer Space Treaty, *supra* note 3, at art. II.

⁵ Outer Space Treaty, *supra* note 3, at art. I. The clause further provides for “free access to all areas of celestial bodies.”

⁶ Statute of the International Court of Justice, art. 38(1)(b). This clause is widely recognized as the most authoritative statement on the sources of international law.

⁷ Outer Space Treaty, *supra* note 3, at art. I (describing such activities in terms of “exploration and use”).

⁸ *Id.* at art. III (stating that the general principles of international law have been “imported” into space law by virtue of Article III of the Outer Space Treaty, which provides: “States Parties to the Treaty shall carry on activities in the exploration and use of

Consequently, as states are still the primary makers⁹ and breakers¹⁰ of international law, the core of the governance structure for outer space and activities conducted in that realm lies in the role that each state has to fulfill with respect to activities by other categories of legal subjects active in this “global commons,” notably intergovernmental organizations and private sector entities. That role is essentially defined by a limited set of clauses of the Outer Space Treaty, some of which have been further elaborated, notably by the 1972 Liability Convention¹¹ and the 1975 Registration Convention.¹²

II. THE STRUCTURE OF GOVERNANCE UNDER INTERNATIONAL SPACE LAW: THE PROBLEMS

The most important clause regarding the structure of governance under international space law emanates from Article VI of the Outer Space Treaty, which provides first that “States Parties to the Treaty shall bear international responsibility for national activities in outer space . . . *whether such activities are carried on by governmental agencies or by non-governmental entities*, and for assuring that national activities are carried out in conformity with the provisions set forth in the present Treaty.”¹³ In other words, states are required to ensure that private sector entities engaged in activities in outer space comply with the rules of the Outer Space Treaty, and by inference of all of international space law,¹⁴ to the extent they are “national activities” in outer space.¹⁵ Precisely for this purpose, Article VI also “require[s] authorization

outer space, including the moon and other celestial bodies, in accordance with international law . . .”).

⁹ Meaning that states are the entities which jointly create international law by agreeing to treaties and conducting themselves in such a way as to give rise to state practice and *opinio juris*, the two standard elements of customary international law.

¹⁰ Meaning that states are the entities, usually exclusively or at least predominantly, addressed by those treaties and rules of customary international law that are enjoying the rights and being subjected to the obligations flowing therefrom. *See, e.g.*, Frans von der Dunk, *International Space Law*, in HANDBOOK OF SPACE LAW 29–34, 44–47 (Frans von der Dunk & Fabio Tronchetti eds., 2015).

¹¹ Convention on International Liability for Damage Caused by Space Objects, Mar. 29, 1972, 24 U.S.T. 2389, 961 U.N.T.S. 187 (entered into force Sept. 1, 1992) [hereinafter Liability Convention].

¹² Convention on Registration of Objects Launched into Outer Space, Jan. 14, 1975, 28 U.S.T. 695, 1023 U.N.T.S. 15 (entered into force Sept. 15, 1976) [hereinafter Registration Convention].

¹³ Outer Space Treaty, *supra* note 3, at art. VI (emphasis added).

¹⁴ *Cf. id.* at art. III (“States Parties to the Treaty shall carry on activities in the exploration and use of outer space, including the moon and other celestial bodies, in accordance with international law . . .”).

¹⁵ *Id.* at art. VI.

and continuing supervision by the appropriate State” of “[t]he activities of non-governmental entities in outer space.”¹⁶

As for international organizations, Article VI furthermore provides that “[w]hen activities are carried on in outer space . . . by an international organization, responsibility for compliance with this Treaty shall be borne both by the international organization and by the States Parties to the Treaty participating in such organization.”¹⁷ Article XIII of the Outer Space Treaty, perceiving such organizations as offering a “framework” for states to conduct joint space activities, also requires that

[a]ny practical questions arising in connection with activities carried on by international intergovernmental organizations in the exploration and use of outer space . . . shall be resolved by the States Parties to the Treaty either with the appropriate international organization or with one or more States members of that international organization, which are Parties to this Treaty.¹⁸

Taken together, therefore, these clauses clarify that states always retain at least a residual responsibility for ensuring that intergovernmental organizations of which they form part will comply with international space law.

In short, states were bestowed with the task to act as supreme guardians of any relevant rules of international space law developed by them. Additionally, when or to the extent that other categories of entities were undertaking space activities, states were to be held more or less directly responsible if they somehow failed to adequately exercise this guardianship. This balance represents the cornerstone of all governance of outer space and space activities.

As for international organizations, this did not result in too many problems, partly because the amount of intergovernmental organizations truly active in outer space remained confined to more or less a handful of cases.¹⁹ On a more or less global scale this referred to INTELSAT²⁰ and INMARSAT²¹ prior to

¹⁶ *Id.*

¹⁷ *Id.*

¹⁸ *Id.* at art. XIII.

¹⁹ For an overview of their role and status, *see generally* Frans von der Dunk, *International Space Law*, in *HANDBOOK OF SPACE LAW* 269–330 (Frans von der Dunk & Fabio Tronchetti eds., 2015).

²⁰ Agreement Relating to the International Telecommunications Satellite Organization, Aug. 20, 1971, 23 U.S.T. 3813, 1220 U.N.T.S. 21 (entered into force Feb. 12, 1973) [hereinafter INTELSTAT].

²¹ Convention on the International Maritime Satellite Organization, Sept. 3, 1976, 31 U.S.T. 1, 1143 U.N.T.S. 105 (entered into force July 16, 1979) [hereinafter INMARSAT].

their privatization in the late 1990s and early 2000s,²² as well as INTERSPUTNIK²³ and INTERKOSMOS²⁴; on a regional scale this referred to ESA²⁵, EUTELSAT²⁶ (prior to its privatization in the early 2000s), EUMETSAT²⁷ and ARABSAT.²⁸ In any event where such an intergovernmental organization might be accused of violating international space law, there was no doubt that the collective member states would be held directly responsible for such behavior.

As for private enterprise, however, things turned out to be more complicated. At the time the main space treaties were drafted in the late 1960s until mid-1970s, the participation of private entities in the space sector was basically limited to manufacturing hardware for use by governmental and some intergovernmental activity in outer space, rather than going into outer space themselves.²⁹ The fairly summary set of provisions of the key UN space treaties was seen as more than sufficient to deal with such participation, and to the extent any possible fundamental extension thereof to activities in outer space was foreseen, was simply expected to be sufficient to deal with those as

²² Both operational IGOs were transformed into private operators (INTELSAT resp. INMARSAT) supervised by residual IGOs (ITSO resp. IMSO). See David Sagar & Patricia McCormick, *Inmarsat: In the Forefront of Mobile Satellite Communications*, in THE TRANSFORMATION OF INTERNATIONAL SATELLITE ORGANISATIONS: POLICY AND LEGAL PERSPECTIVES 35, 49 (Patricia McCormick & Maury Mechanick eds., 2013); Patricia McCormick, *Intelsat: Pre and Post-Private Equity Ownership*, in THE TRANSFORMATION OF INTERNATIONAL SATELLITE ORGANISATIONS: POLICY AND LEGAL PERSPECTIVES 81 (Patricia McCormick & Maury Mechanick eds., 2013).

²³ Agreement on the Establishment of the INTERSPUTNIK International System and Organization of Space Communications, Nov. 15, 1971, 862 U.N.T.S. 3 (entered into force July 12, 1972) [hereinafter INTERSPUTNIK]; SPACE LAW—BASIC LEGAL DOCUMENTS (Karl-Heinz Böckstiegel et al. eds., 2005) [hereinafter SPACE LAW].

²⁴ Agreement Concerning Cooperation in the Exploitation and Use of Outer Space for Peaceful Purposes, U.S.-U.S.S.R., May 24, 1972, 16 ILM 1 (entered into force Mar. 25, 1977) [hereinafter INTERCOSMOS].

²⁵ Convention for the Establishment of European Space Agency, May 30, 1975, 1297 U.N.T.S. 161 (entered into force Oct. 30, 1980); SPACE LAW, *supra* note 23.

²⁶ Convention Establishing the European Telecommunications Satellite Organization, *opened for signature* July 15, 1982, U.N.T.S. 1990 (entered into force Sept. 1, 1985) [hereinafter EUTELSAT]; SPACE LAW, *supra* note 23.

²⁷ Convention for the Establishment of a European Organization for the Exploitation of Meteorological Satellites, May 24, 1983, 1434 U.N.T.S. 3 (entered into force June 19, 1986) [hereinafter EUMETSAT].

²⁸ Agreement of the Arab Corporation for Space Communications, *opened for signature* Apr. 14, 1976 (entered into force July 15, 1976) [hereinafter ARABSAT]; SPACE LAW, *supra* note 23.

²⁹ *Cf.*, e.g., Edith Walter, *The Privatisation and Commercialisation of Outer Space*, in OUTER SPACE IN SOCIETY, POLITICS AND LAW 494 (C. Brünner & A. Soucek eds., Springer-Verlag/Wien 2011).

well.³⁰ Starting slowly in the early 1970s and gathering pace with leaps and bounds throughout the 1980s and beyond, the private sector did engage itself more fundamentally in space activities—notably, at first, with satellite communications and launching, and next to some extent satellite remote sensing.³¹ However specific issues with this summary system of governance became apparent even in the realm of structure.³²

The lack of a clear definition of what comprised “national” activities in outer space conducted by private enterprise, in other words of which categories of private actors any particular state would be held responsible for, in combination with the closely related but separately arranged liability for damage caused by space activities, resulted in considerable confusion.³³ Regarding responsibility itself, Article VI of the Outer Space Treaty itself only (re)established the concept of state responsibility in the particular context of outer space activities while providing for a rather vaguely defined scope thereof by way of the concept of national activities in outer space.³⁴

First, it did not provide any details with respect to the consequences in law of a state having incurred such responsibility for violation of the rules of space law. Article III—as analyzed before effectively importing general public international law into space law specifically—allows reference to the general principles of public international law regarding state responsibility. This brings up another problem.³⁵ Under those principles, three standard forms of reparation redeem a State’s responsibility: (1) *restitutio in integrum*; (2) compensation; and (3) satisfaction, in conjunction with cessation of any unlawful activities or promises to prevent recurrence in the future.³⁶ As compensation

³⁰ See, e.g., Michael Gerhard, *Article VI*, in COLOGNE COMMENTARY ON SPACE LAW 384–85 (Stephan Hobe, Bernhard Schmidt-Tedd, & Kai-Uwe Schrogl eds., BWV 2017); Arnel Kerrest & Lesley Smith, *Article VII*, in COLOGNE COMMENTARY ON SPACE LAW 359–61 (Stephan Hobe, Bernhard Schmidt-Tedd, & Kai-Uwe Schrogl eds., BWV 2017).

³¹ For instance, a private satellite operator from State A launching its satellite from State B and operating its ground station from State C would raise the issue of which of those States would be responsible for the satellite’s activities and its conformity with international space law pursuant to Article VI of the Outer Space Treaty. Presumably only State B would qualify as the “launching State,” making it liable for damage caused by that satellite pursuant to Article VII of the Outer Space Treaty and Articles I(c), II or III of the Liability Convention.

³² Outer Space Treaty, *supra* note 3.

³³ For instance, with a view to the scenario of note 31: Should State A be internationally responsible under Article VI of the Outer Space Treaty because its national entity was conducting the satellite operations, or should State B be so responsible because it also qualified as the launching State, or should State C be so responsible because the activities under scrutiny were actually conducted from its territory?

³⁴ See generally Frans von der Dunk, *International Space Law*, in HANDBOOK OF SPACE LAW 46–47 (Frans von der Dunk & Fabio Tronchetti eds., 2015) for further discussion.

³⁵ Outer Space Treaty, *supra* note 3, at art. III.

³⁶ See ILC Draft Articles on Responsibility of States for Internationally Wrongful Acts, pt. 1, art. 1, 2, 4–6, 8, 11, 12, 13, and 31, Int’l Law Comm’n, Rep. on the Work of Its Fifty-

in many cases would be the logical version of reparation for an internationally wrongful act involving damage, the result would be an overlap with the concept of liability—as liability is precisely all about compensating for damage.

Second, therefore, as the conceptual dividing line between applying responsibility per Article VI—potentially giving rise to an obligation to compensate—and applying liability per Article VII and the Liability Convention, essentially doing the same has never been properly defined.³⁷ The two concepts allocate the respective accountability quite differently. Responsibility applies for national activities in outer space where liability for cases where the state qualifies as a launching state. The result is an absence of any certainty on the precise potential legal consequences of many categories of relevant activities.³⁸

Article VII of the Outer Space Treaty, as further elaborated by the Liability Convention, establishes liability for damage caused by space objects, attributing such liability to states by way of four separately applicable criteria: “Each State Party to the Treaty that *launches or procures the launching* of an object into outer space . . . and each State Party from whose *territory or facility* an object is launched, is internationally liable for damage”³⁹

Thus, regardless of the involvement of private sector entities such as developers, owners, launch operators, or payload operators of the space objects involved, the liability under international space law always accrues to one or more states. While this also, in principle, applied to cases where intergovernmental organizations were involved, here the liability of the member states of the international organization would always prevail.⁴⁰

Third Session, U.N. Doc. A/56/10 (2001); *see generally* Int’l Law Comm’n, Rep. on the Work of Its Fifty-Third Session, U.N. Doc. A/56/10 (2001); *see also* Case Concerning the Factory at Chorzow (Ger. v. Pol.), Judgment, 1928 I.C.J. 29 (Sept. 13).

³⁷ *See* Frans von der Dunk, *Liability Versus Responsibility in Space Law: Misconception or Misconstruction?*, in PROCEEDINGS OF THE THIRTY-FOURTH COLLOQUIUM ON THE LAW OF OUTER SPACE 365–67 (AIAA) (1992).

³⁸ *Id.* at 363–71.

³⁹ Liability Convention, *supra* note 11, at art. I(c), V (emphasis added) (referring to the notion of the “launching State” could obviously give rise to more than one state being liable for the same case of damage, in which case joint and several liability applies).

⁴⁰ *Cf. id.* at art. XXII(3):

If an international intergovernmental organization is liable for damage by virtue of the provisions of this Convention, that organization and those of its members which are States Parties to this Convention shall be jointly and severally liable; provided, however, that: (a) any claim for compensation in respect of such damage shall be first presented to the organization; (b) only where the organization has not paid, within a period of six months, any sum agreed or determined to be due as compensation for such damage, may the claimant State invoke the liability of the members which are States Parties to this Convention for the payment of that sum.

With respect to private activities, however, no such clarity was provided. Given also that such liability is unlimited in principle,⁴¹ states obviously have a strong impetus to assert their system of “authorization and continuing supervision,” required anyway under Article VI of the Outer Space Treaty, over all the space activities of the private sector that could give rise to their liability being invoked on the international plane.⁴² In other words, states would likely aim at establishing a system of authorization and continuing supervision of private sector activities involved in any launch, procurement of a launch, use of territory for a launch or use of facility for a launch which would trigger their international space law liability, should an accident occur.

It is highly questionable, however, if and to what extent such private sector involvement could be classified as the “national activities in outer space . . . carried on . . . by non-governmental entities” which are targeted by Article VI. Neither Article VI, nor other relevant provisions of the space treaties have provided any clue as to what “national activities in outer space” would mean in this context.⁴³

III. THE STRUCTURE OF GOVERNANCE UNDER INTERNATIONAL SPACE LAW: THE SOLUTIONS?

Following initially rather academic debates which discussed three generic options for interpreting “national activities in outer space” for the purpose of the international responsibility of Article VI of the Outer Space Treaty,⁴⁴ it became clear that the solution to this question would have to be found in the realm of national space legislation (to be) adopted by relevant states in order to take care of their own international responsibilities and liabilities in the

Note also that as per Article XXII(1) intergovernmental organizations could only come to fall within the scope of the Liability Convention subject to three conditions all fundamentally requiring dedicated action of the member States.

⁴¹ *Id.* at art. XII:

[t]he compensation which the launching State shall be liable to pay for damage under this Convention shall be determined in accordance with international law and the principles of justice and equity, in order to provide such reparation in respect of the damage as will restore the person, natural or juridical, State or international organization on whose behalf the claim is presented to the condition which would have existed if the damage had not occurred.

⁴² Outer Space Treaty, *supra* note 3, at art. VI.

⁴³ *Id.*

⁴⁴ See also Frans von der Dunk, *The Origins of Authorisation: Article VI of the Outer Space Treaty and International Space Law*, in 6 NATIONAL SPACE LEGISLATION IN EUROPE: ISSUES OF AUTHORISATION OF PRIVATE SPACE ACTIVITIES IN THE LIGHT OF DEVELOPMENTS IN EUROPE SPACE COOPERATION 3, 7–8 (Frans von der Dunk ed., 2011), *reprinted in* SPACE CYBER AND TELECOMMS. L. PROGRAM FAC. PUBLICATIONS 1, 5–6 (2011), <https://digitalcommons.unl.edu/cgi/viewcontent.cgi?article=1068&context=spacelaw>.

context of private sector participation in space activities. Though the Outer Space Treaty itself did not provide any further guidance on the issue, a major guideline did arise with the adoption of a U.N. General Assembly (UNGA) Resolution in 2013, “Recommendations on National Legislation Relevant to the Peaceful Exploration and Use of Outer Space.”⁴⁵ In particular the Resolution provided:

The State, taking into account its obligations as a launching State and as a State responsible for national activities in outer space under the United Nations treaties on outer space, should ascertain national jurisdiction over space activities *carried out from territory under its jurisdiction and/or control*; likewise, it should issue authorizations for and ensure supervision over space activities *carried out elsewhere by its citizens and/or legal persons established, registered or seated in territory under its jurisdiction and/or control*, provided, however, that if another State is exercising jurisdiction with respect to such activities, the State should consider forbearing from duplicative requirements and avoid unnecessary burdens.⁴⁶

While UN Resolutions could provide evidence of or reflect customary international law, ultimately whether these national space obligations under the resolution constitute custom must be deduced from state practice of the relevant States Parties to the Outer Space Treaty accompanied by *opinio juris*. In other words, to constitute customary international law in this context, the scope of national space laws implementing the obligations of “authorization and continuing supervision” would be the ultimate reflection of the *opinio juris* of that State on what “national activities in outer space” of Article VI of the Outer Space Treaty really means. States, after all, would clearly focus on establishing systems of authorization and supervision in particular with regard to those private activities that they might be held responsible for on the international level under that same Article VI, and potentially the ones they might be held liable for under Article VII and the Liability Convention.⁴⁷

⁴⁵ G.A. Res. 68/74 (Dec. 11, 2013).

⁴⁶ *Id.* (emphasis added); National Legislation Relevant to the Peaceful Exploration and Use of Outer Space on the Work Conducting Under Its Multi-Year Workplan, U.N. Doc. A/AC.105/C.2/101, at 9 (2012) (echoing the concerns voiced in the quoted text from G.A. Res. 68/74).

⁴⁷ Though not formally required to do so by the Outer Space Treaty or the Liability Convention, states would likely be keen on also authorizing and continuously supervising non-governmental activities potentially giving rise to their international liability pursuant to Article VII of the Outer Space Treaty or the Liability Convention.

Currently twenty-five countries address private sector space activities by way of a system of authorization and continuing supervision.⁴⁸ In historical order, this concerned:

- **Norway** (1969), with an Act entirely focused on launching;⁴⁹
- **United States** (1970), with confirmation that the 1934 Communications Act⁵⁰ also applied to private satellite communications;⁵¹ later statutes addressed private sector launch activities (the 1984 Commercial Space Launch Act⁵²), private sector satellite remote sensing (the 1984 Land Remote-Sensing Commercialization Act⁵³), general private sector space efforts (the 1998 Commercial Space Act⁵⁴) and private sector space resource exploitation interests (Title IV of the 2015 Commercial Space Launch Competitiveness Act⁵⁵);
- **Sweden** (1982), with two pieces of national space legislation fundamentally covering all space activities *ratione materiae*;⁵⁶
- **United Kingdom** (1986), with an initial Act addressing all space activities but limited in application to activities conducted by UK

⁴⁸ The term “authorization” here is used in a general sense. Many countries and their laws and regulations refer not to “authorizations” but to “licenses,” “permissions,” “permits,” “approvals” or other terms, but they all deal with the consent of a relevant sovereign state gives to private sector entities to conduct certain space activities subject to certain conditions. For the sake of this analysis, “supervision” is conceived as merely a specific part or extension of the concept of “authorization,” since any national space law providing details on supervision of non-governmental entities’ space activities almost by definition applies those to activities to be authorized by the same regime. *See, e.g.*, I. Marboe, *National Space Law*, in HANDBOOK OF SPACE LAW 134–35 (Frans von der Dunk & Fabio Tronchetti eds., 2015).

⁴⁹ Act on Launching Objects from Norwegian Territory Etc. into Outer Space, U.N. OFFICE FOR OUTER SPACE AFFAIRS (June 13, 1969), https://www.unoosa.org/oosa/en/ourwork/spacelaw/nationalspacelaw/norway/act_38_1969E.html.

⁵⁰ Communications Act of 1934, 47 U.S.C. § 151 (1934).

⁵¹ *In the Matter of Establishment of Domestic Communication-Satellite Facilities by Nongovernmental Entities*, 22 F.C.C.2d 86, Appendix C, at 1 (1970).

⁵² Commercial Space Launch Act, Pub. L. No. 98-575, 98 Stat. 3055 (1984). Meanwhile, the Act has been repeatedly amended and is now codified as 51 U.S.C. Ch. 509—Commercial Space Launch Activities.

⁵³ Land Remote-Sensing Commercialization Act of 1984, Pub. L. No. 98-365, 98 Stat. 451 (1984). The Act was superseded by the 1992 Land Remote Sensing Policy Act, but the licensing regime essentially remained intact.

⁵⁴ Commercial Space Act of 1998, Pub. L. No. 105-303, 112 Stat. 2843 (1998).

⁵⁵ U.S. Commercial Space Launch Competitiveness Act, Pub. L. No. 114-90, 129 Stat. 704 (2015).

⁵⁶ Act on Space Activities, 1982: 963 (1982); 1 NATIONAL SPACE LEGISLATION OF THE WORLD 398 (2001); SPACE LAW—BASIC LEGAL DOCUMENTS, E.II.1–2; 36 ZLW 1, 11 (1987) [hereinafter SPACE LAW (1987)]; Decree on Space Activities, 1982:1069; 1 NATIONAL SPACE LEGISLATION OF THE WORLD 399 (2001).

nationals, and a subsequent Act partially removing that restriction;⁵⁷

- **South Africa** (1993), with an Act addressing all space activities, though making some fundamental distinctions between launch and other space activities;⁵⁸
- **Russia** (1993), with a Law covering all potential private sector space and space-related activities;⁵⁹
- **Ukraine** (1996), basically following the Russia approach in this respect;⁶⁰
- **Hong Kong** (1997), which of course strictly speaking is not a separate country; however; when it reverted back from the United Kingdom to China it was given a version of the UK Outer Space Act of 1986⁶¹ adapted to the new political situation, requiring licenses for any private space activity;⁶²
- **Australia** (1998), with an Act, in spite of its title, almost exclusively focusing on launch and re-entry activities;⁶³
- **Brazil** (2001), with a general Edict from the Brazilian Space Agency including a Regulation addressing launch activities with Brazilian involvement;⁶⁴

⁵⁷ Outer Space Act 1986, c. 38 (Eng.); 1 NATIONAL SPACE LEGISLATION OF THE WORLD 293 (2001) [hereinafter NAT'L SPACE]; SPACE LAW (1987), *supra* note 56, at E.I; 36 ZLW I, 12; Space Industry Act 2018, c. 5 (Eng.).

⁵⁸ Space Affairs Act 84 of 1993 (S. Afr.).

⁵⁹ Law of the Russian Federation on Space Activity, Aug. 20, 1993, No. 5663-1; NAT'L SPACE, *supra* note 57, at 101; *United Nations/Nigeria Workshop on Space Law, in NATIONAL LEGISLATION AND POLICY: SELECTED TEXTS 162* (2005) [hereinafter *United Nations/Nigeria Workshop on Space Law*]; Statute on Licensing Space Operations, Feb. 2, 1996, No. 104; Order of the Government of the Russian Federation on Approval of the Regulation on Licensing of Space Activity, June 14, 2002; 2 NATIONAL SPACE LEGISLATION OF THE WORLD 302 (2002) [hereinafter 2 NAT'L SPACE].

⁶⁰ Law of Ukraine on Space Activities, Nov. 15, 1996, No. 502/96-VR; NAT'L SPACE, *supra* note 57, at 36, 48; *United Nations/Nigeria Workshop on Space Law, supra* note 59; The Law of Ukraine on Licensing of Certain Types of Economic Activity, June 1, 2000, No. 1775-III; The Law of Ukraine on Insurance, Mar. 7, 1996, No. 85/96-VR.

⁶¹ G.A. Res. 68/74 (Dec. 11, 2013).

⁶² Outer Space Ordinance (1999) Cap. 523 (H.K.) (conferring licensing and other powers on the Chief Executive to secure compliance with the international obligations of the People's Republic of China with respect to the launching and operation of space objects and the carrying on of other activities in outer space); 2 NAT'L SPACE, *supra* note 59, at 403.

⁶³ *Space Activities Act 1998* (Cth) Act No. 123 (Austl.), as amended by *Space (Launches and Returns) Act 2018* (Cth) (Austl.).

⁶⁴ Administrative Edict No. 27, 20 June 2001 (Braz.), 2 NAT'L SPACE, *supra* note 59, at 377 (including Regulation regarding procedures and the definition of necessary requirements for the "request, evaluation, issuance, follow-up and supervision of licenses for carrying out and launching space activities on Brazilian territory.").

- **Belgium** (2005), with a general Law encompassing “the activities of launching, flight operations or guidance of space objects”,⁶⁵
- **Canada** (2005), with an Act and a set of Regulations dealing with satellite remote operations primarily from a security perspective,⁶⁶
- **South Korea** (2005), with legislation effectively focused on launch activities;⁶⁷
- **Netherlands** (2007), with a very similar approach to Belgium;⁶⁸
- **Germany** (2007), with a law like Canada dealing with satellite remote operations mainly from a security perspective;⁶⁹
- **France** (2008), with a law like South Africa addressing all space activities though making some fundamental distinctions between launch and other space activities;⁷⁰

⁶⁵ Law on the Activities of Launching, Flight Operations or Guidance of Space Objects of September 17, 2005 (Belg.); CHRISTIAN BRÜNNER & EDITH WALTER, *NATIONALES WELTRAUMRECHT—NATIONAL SPACE LAW: DEVELOPMENT IN EUROPE, CHALLENGES FOR SMALL COUNTRIES* 183 (2008) [hereinafter BRÜNNER & WALTER]; *United Nations/Nigeria Workshop on Space Law*, *supra* note 59, at 92.

⁶⁶ Remote Sensing Space Systems Act, S.C. 2005, c. 45 (Can.); Remote Sensing Space Systems Regulations, SOR/2007-66 (Can.).

⁶⁷ Space Development Promotion Act, Act No. 7538, May 31, 2005, *translated in* 33 J. SPACE L. 123, 175 (2007); Space Liability Act, Act No. 8852, Dec. 21, 2007; *see generally National Space Law Database*, UNITED NATIONS OFFICE FOR OUTER SPACE AFFAIRS, <https://www.unoosa.org/oosa/en/ourwork/spacelaw/nationalspacelaw/index.html> (last visited Mar. 31, 2020).

⁶⁸ Wet van 24 januari 2007, houdende regels omtrent ruimtevaartactiviteiten en de instelling van een register van ruimtevoorwerpen (Wet ruimtevaartactiviteiten), Stb. 2007, 1–2, 5 (Neth.) *translated in* United Nations Office for Outer Space Affairs, *Rules Concerning Space Activities and the Establishment of a Registry of Space Objects (Space Activities Act)* (2007), https://www.unoosa.org/oosa/en/ourwork/spacelaw/nationalspacelaw/netherlands/space_activities_actE.html; BRÜNNER & WALTER, *supra* note 65, at 202–06; *see also* Besluit van 19 januari 2015, houdende uitbreiding van de toepassing van de Wet ruimtevaartactiviteiten op het beheren van ongeleide satellieten (Besluit ongeleide satellieten), Stb. 2015, 1 (Neth.) *translated in* United Nations Office for Outer Space Affairs, *Decree of 19 January 2015 Expanding the Scope of the Space Activities Act to Include the Control of Unguided Satellites (Unguided Satellites Decree)* (2015), https://www.unoosa.org/documents/pdf/spacelaw/national/Netherlands_BZ116174A.pdf (augmenting the Space Activities Act).

⁶⁹ Satellitendatensicherheitsgesetz [SatDSiG] [Satellite Data Security Act], Dec. 1, 2007, BGBl. I at 58, ch. 2 (Ger.) *translated in* United Nations Office for Outer Space Affairs, *Act to Give Protection Against the Security Risk to the Federal Republic of Germany by the Dissemination of High-Grade Earth Remote Sensing Data (Satellite Data Security Act—SatDSiG)* (2007), <https://www.unoosa.org/documents/doc/spacelaw/national/germany-satdsigGE.doc>.

⁷⁰ Loi 2008-518 du 3 juin 2008 relative aux opérations spatiales [Law 2008-518 of June 3, 2008 on Space Operations], *Journal Officiel de la République Française* [J.O.] [OFFICIAL GAZETTE OF FRANCE], June 4, 2008, p. 9169 *translated in* 34 J. SPACE L. 453 (2008).

- **Nigeria** (2010), where an Act establishing the national space agency and providing it with competences in the area of licensing focused on remote sensing but was later augmented by draft regulations addressing the whole gamut of space activities;⁷¹
- **Austria** (2011), with a law covering all space activities comprehensively;⁷²
- **Kazakhstan** (2012), similarly with a Law covering all space activities comprehensively;⁷³
- **Indonesia** (2013), for which the same holds true;⁷⁴
- **Denmark** (2016), also with a comprehensive law;⁷⁵
- **Luxembourg** (2017), with a Law focused exclusively on space resource exploitation;⁷⁶
- **New Zealand** (2017), with a law focused on launch and related activities;⁷⁷
- **Greece** (2018), with a law of comprehensive coverage *ratione materiae*;⁷⁸ and

⁷¹ National Space Research and Development Agency Act No. (9) (2010) 97:98 O.G., A1249 (Nigeria).

⁷² AUSTRIAN FEDERAL LAW ON THE AUTHORISATION OF SPACE ACTIVITIES AND THE ESTABLISHMENT OF A NATIONAL SPACE REGISTRY [AUSTRIAN OUTER SPACE ACT] Dec. 28, 2011, U.N. OFFICE FOR OUTER SPACE AFFAIRS, available at <https://www.unoosa.org/documents/pdf/spacelaw/national/austria/austrian-outer-space-actE.pdf> (Austria).

⁷³ *Law of the Republic of Kazakhstan on Space Activities*, U.N. OFFICE FOR OUTER SPACE AFFAIRS, https://www.unoosa.org/documents/pdf/spacelaw/national/kazakhstan/528-IV_2012-01-06E.pdf (last visited Feb. 26, 2020).

⁷⁴ Law of the Republic of Indonesia on Space Activities, Nr. 21, of 6 August 2013; State Gazette of the Republic of Indonesia (2013), Nr. 133.

⁷⁵ Outer Space Act (*Lov om aktiviteter i det ydre rum*), passed by Parliament with the third treatment, May 3, 2016; Parliament Gazette, 2015–17, No. L 128.

⁷⁶ Law on the Exploration and Utilization of Space Resources (*Loi du 20 juillet 2017 sur l'exploration et l'utilisation des ressources de l'espace*); of 20 July 2017, published July 28, 2017; <http://legilux.public.lu/eli/etat/leg/loi/2017/07/20/a674/jo>. Note that currently another law is under development in Luxembourg which will address all space activities. Jeff Foust, *Luxembourg Extends Space Resources Work Through New Agreements with NASA and ESA*, SPACE NEWS (Oct. 23, 2019), <https://spacenews.com/luxembourg-extends-space-resources-work-through-new-agreements-with-nasa-and-esa/> (“The [Luxembourg Space Agency] expects to launch a venture capital fund by the end of the year, while the government will consider a new comprehensive national space law in 2020.”).

⁷⁷ Outer Space and High-Altitude Activities Act 2017 (N.Z.).

⁷⁸ Nomos (2017:4508) Adeiodótisi Diastimikón Drastiriótíton-Katachórisi sto Ethnikó Mitróo Diastimikón Antikeiménon–Ídrysi Ellinikou Diastimikou Organismou kai Loipés Diatáxeis [Licensing of Space Activities—Registration in the National Register of Space Objects—Establishment of a Hellenic Space Agency and Other Provisions] EPHEMERIS TES KYVERNESEOS TES HELLENIKES DEMOKRATIAS [E.K.E.D.] 2017, A:200 (Greece).

- **Portugal** (2019), likewise with a law of comprehensive coverage *ratione materiae*.⁷⁹

From the analysis of those twenty-five national space laws, it appears that states have overwhelmingly chosen to apply their licensing regimes to those non-governmental activities already subject to a state's jurisdiction anyway. Except for Belgium and the Netherlands, all countries with a *ratione materiae* comprehensive licensing scheme now, in principle, apply both personal and territorial jurisdiction. Except for the United States, South Africa, and France, countries do so across the board, regardless of the particular category of space activities concerned. Most of the national regimes more limited in scope *ratione materiae* also follow this approach. Thus, the proper interpretation of "national activities in outer space" is in line with UNGA Resolution 68/74. It encompasses all private sector space activities conducted from within the territorial and personal jurisdiction of the state at issue. The few exceptions must be viewed as rather idiosyncratic cases.⁸⁰

IV. CONCLUSION

From the perspective of the global governance of space activities then, at least in the scoping of national space legislation to cover state responsibility and, as appropriate, liability, a convergence of approaches can be seen, even if seemingly *ad hoc* bottom-up developments rather than by conscious design. It is by now at least axiomatic that, unless States have no private space activities at all taking place under their *aegis* and prohibited them fundamentally, they would be legally required to ensure proper integration of such activities in the system of international space law by way of national space legislation. Those States which do not have such legislation are gently urged to establish them, and the national space laws established so far show the way.

As the clause of Article VI of the Outer Space Treaty on "national activities in outer space" has almost uniformly been interpreted as including activities conducted by nationals and from national territory, in many cases extended moreover to national quasi-territory such as ships and aircraft, at least in terms of the *structure* of the governance of space activities, a rather coherent system has emerged. What remains still unresolved in this context, however, apart from the many substantive differences in content of the existing national space laws and regulations, is the complex overlap of state responsibility with state liability and the resulting differences regarding the extent to which also the latter would be fully covered through national space legislation. It still remains to be seen to which extent such lack of coherence would

⁷⁹ Decree-Law No. 16/2019 of 22 January (Port.).

⁸⁰ See generally Frans von der Dunk, *Scoping National Space Law: The True Meaning of 'National Activities in Outer Space' of Article VI of the Outer Space Treaty*, PROCEEDINGS OF THE INT'L INST. OF SPACE LAW 2019 (forthcoming 2020).

present a major obstacle to the prosperous further development of the human space endeavor for the benefit of all humankind, but this unfortunately would seem rather likely. An effective and coherent system of governance of outer space and space activities after all requires a considerable amount of coherent global will—in this case, it is not “the law” which remains the ultimate show-stopper.