# An Interactional Analysis of Efforts to Expand the Space Regime

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ABSTRACT

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This thesis responds to ongoing efforts by scholars, states, and non-state organizations to expand the legal regime governing outer space and celestial bodies. I refer to this regime as the 'space regime.' My primary research question is: would an expanded space regime be effective in guiding and controlling behavior in space? In Chapter 1, I elaborate the space regime and the efforts to expand that regime. In Chapter 2, I describe the interactional approach and its particular relevance to the space regime. The interactional approach posits that a regime will generate a sense of legal obligation among the regime's subjects if it is based on shared understandings, satisfies eight criteria of legality, and sustained by a practice of legality. These three elements are then applied to core aspects of the space regime. Chapter 3 examines the shared understandings regarding the need for normativity in space. Chapter 4 tests the space regime's cornerstone, the Outer Space Treaty, against eight criteria of legality. Chapter 5 then uses those same criteria to analyze the practice of legality within an essential space regime institution, the International Telecommunications Union. The conclusions reached are that there is a shared understanding regarding the need for normativity in space but that the Outer Space Treaty, and the practice within the International Telecommunications Union, only partially satisfy the criteria of legality. In the concluding Chapter 6, I outline how this inhibits the space regime's legality, and I offer pragmatic remedies to improve the space regime's ability to generate a sense of obligation.

Cette thèse répond aux efforts continus des universitaires, des États et des organisations non étatiques pour élargir le régime juridique régissant l'espace extra-atmosphérique et les corps célestes. Je ferai référence à ce régime sous le terme « space regime ». Ma principale question de recherche est la suivante : un space regime élargi serait-il efficace pour guider et contrôler les comportements dans l'espace? Dans le 1<sup>er</sup> chapitre, je décris le space regime et les efforts déployés pour continuer son développement. Dans le 2<sup>e</sup> chapitre, je décris l'approche internationale et sa pertinence particulière pour le régime spatial. L'approche internationale part du principe qu'un régime suscitera un sentiment d'obligation légale chez les sujets de ce régime s'il est : fondé sur des conceptions communes, satisfait aux huit critères de légalité et est soutenu par une pratique de légalité. Ces trois éléments sont ensuite appliqués aux aspects essentiels du *space regime*. Le 3<sup>e</sup> chapitre examine les connaissances communes concernant le besoin de normativité dans l'espace. Le 4<sup>e</sup> chapitre met à l'épreuve la pierre angulaire du régime spatial, soit le Traité sur l'espace, en l'opposant aux huit critères de légalité. Ensuite, le  $5^{e}$  chapitre utilise ces mêmes critères pour analyser la pratique de la légalité au sein d'une institution essentielle du régime spatial, soit l'Union internationale des télécommunications. J'en conclus qu'il existe une compréhension commune de la nécessité de la normativité dans l'espace, mais que le Traité sur l'espace et la pratique de l'Union internationale des télécommunications ne répondent que partiellement aux critères de légalité. Finalement, au 6<sup>e</sup> chapitre, j'explique en quoi cela nuit à la légalité du *space regime* et je propose des solutions pragmatiques pour améliorer la capacité du régime spatial à générer un sentiment d'obligation.

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#### A Congested, Contested and Competitive Domain

The year is 2022. Twelve people have walked on the Moon. All those people have been white men. And all those white men were from a single country – the United States.<sup>1</sup> This inequality persists: today, space is effectively closed to all but a handful of space-faring states.<sup>2</sup> And this situation is not changing, despite increasing non-state space activity. In 2021, 67% of total private investment in space ventures went to companies in the United States.<sup>3</sup> And nearly half of the U.S. share went to just one company: Space Exploration Technologies Corporation, better known as 'SpaceX.'<sup>4</sup> I make these comments not to begrudge the Apollo astronauts or their achievements. Nor do I lament SpaceX's technical advances – or their key role in increasing access to space by lowering launch costs.<sup>5</sup> But these simple facts illustrate the evident inequality in the exploration and use of space.

This inequality is longstanding. In its early years, space access was a duopoly between the United States and the Soviet Union.<sup>6</sup> Today, only three states are capable of human spaceflight: the United States, Russia, and China.<sup>7</sup> And less than 20 states have an independent launch capability.<sup>8</sup> This inequality starkly contrasts with international space law's foundational

<sup>&</sup>lt;sup>1</sup> See generally: Sarah Loff, "The Apollo Missions", (1 February 2019), online: *National Aeronautics and Space Administration* <a href="http://www.nasa.gov/mission\_pages/apollo/missions/index.html">http://www.nasa.gov/mission\_pages/apollo/missions/index.html</a>. See also: Kim Lyons, "NASA Seeks to Put First Person of Color on the Moon in Artemis Mission", (9 April 2021), online: *The Verge* <a href="https://www.theverge.com/2021/4/9/22375899/nasa-first-person-of-color-artemis-mission-moon-woman">http://www.theverge.com/2021/4/9/22375899/nasa-first-person-of-color-artemis-mission-moon-woman</a>.

<sup>&</sup>lt;sup>2</sup> Cassandra Steer, "Who Has the Power? A Critical Perspective on Space Governance and New Entrants to the Space Sector" (2020) 48:3 Ga J Int'l & Comp L 751 at 753.

<sup>&</sup>lt;sup>3</sup> Start Up Space: Update on Investment in Commercial Space Ventures (Alexandria, Virginia: BryceTech, 2021).

<sup>&</sup>lt;sup>4</sup> Ibid.

<sup>&</sup>lt;sup>5</sup> Jeff Matthews, "The Decline of Commercial Space Launch Costs", (2022), online: *Deloitte Consulting LLP* <<u>https://www2.deloitte.com/us/en/pages/public-sector/articles/commercial-space-launch-cost.html</u>>.

<sup>&</sup>lt;sup>6</sup> Stephan Hobe, Space Law, 1st ed (München: Verlag C.H. Beck, 2019) at 34.

<sup>&</sup>lt;sup>7</sup> Adam Gadd, "The US Cooperates With Russia in Space. Why Not China?", (30 September 2021), online: *The Diplomat* <a href="https://thediplomat.com/2021/09/the-us-cooperates-with-russia-in-space-why-not-china/">https://thediplomat.com/2021/09/the-us-cooperates-with-russia-in-space-why-not-china/</a>.

<sup>&</sup>lt;sup>8</sup> Steer, *supra* note 2 at 753.

instrument, the Outer Space Treaty.<sup>9</sup> Of the United Nations' 193 Member States, 113 have ratified the Outer Space Treaty and a further 23 have signed it<sup>10</sup> – far exceeding the number of space-faring states. The interest of non-space faring states in the Outer Space Treaty is likely due, at least in part, to the promise of Article I. This article states that space exploration and use "shall be carried out for the benefit and in the interests of all countries, irrespective of their degree of economic or scientific development and "shall be the province of all [hu]mankind."<sup>11</sup>

Ensuring that space remains the province of all humankind is one of the most complex regulatory challenges imaginable. Space presents enormous scientific and commercial opportunities. But it also encompasses threats to national security,<sup>12</sup> the Earth's environment,<sup>13</sup> and human well-being.<sup>14</sup> These opportunities and threats arise in a tense political, defense, and economic context. This tense context is aggravated by space being a place of physical extremes. Satellites in low Earth orbit travel at over 28,000 kilometers per hour.<sup>15</sup> Daily temperatures on the Moon vary between -130° and 120° Celsius.<sup>16</sup> And the vacuum of space renders it inherently hazardous to human life.<sup>17</sup> Overall, space has many attributes of a collective action problem, akin

<sup>10</sup> Status of International Agreements Relating to Activities in Outer Space as at 1 January 2022, A/AC.105/C.2/2022/CRP.10 (Vienna: Committee on the Peaceful Uses of Outer Space, 2022).

<sup>11</sup> Outer Space Treaty, art 1.

<sup>12</sup> See generally, from a U.S. perspective: *Challenges to Security in Space*, DIA\_E\_00039\_A (Washington, D.C.: United States Defense Intelligence Agency, 2022).

<sup>13</sup> European Space Agency, "Threats from Space", (2022), online:

 $< https://www.esa.int/Science_Exploration/Space_Science/Space_for_you/Threats_from_space>.$ 

<sup>14</sup> Ibid.

<sup>15</sup> "Types of Orbits", (30 March 2020), online: European Space Agency

<https://www.esa.int/Enabling\_Support/Space\_Transportation/Types\_of\_orbits>...

<sup>16</sup> "Lunar Reconnaissance Orbiter: Temperature Variation on the Moon", (27 May 2014), online: *National Aeronautics and Space Administration* 

<sup>&</sup>lt;sup>9</sup> Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies, 27 January 1967, 610 UNTS 205 (entered into force 10 October 1967) [hereinafter Outer Space Treaty].

<sup>&</sup>lt;a href="https://lunar.gsfc.nasa.gov/images/lithos/LROlitho7temperaturevariation27May2014.pdf">https://lunar.gsfc.nasa.gov/images/lithos/LROlitho7temperaturevariation27May2014.pdf</a>>.

<sup>&</sup>lt;sup>17</sup> Primarily due to decompression and resulting ebullism, and secondarily due oxygen deprivation and resulting hypoxia. See: Mark Springel, "The Human Body in Space: Distinguishing Fact from Fiction", (30 July 2013), online: *Harvard University: Science in the News* <a href="https://sitn.hms.harvard.edu/flash/2013/space-human-body/">https://sitn.hms.harvard.edu/flash/2013/space-human-body/</a>>.

to climate change.<sup>18</sup> Like climate change, space is "dizzying in its complexity, daunting in its implications, and multifaceted in a way that eludes easy categorization."<sup>19</sup> As such, it presents truly universal challenges, with implications that extend well beyond Earth and far across time.

How can we meet the complex regulatory challenge posed by space? The Outer Space Treaty suggests that space can only be managed by broad-based international co-operation. Reflecting this necessity, the word 'co-operate' appears seven times in the Outer Space Treaty<sup>20</sup> – more than other important concepts such as 'liability,' 'military,' 'scientific,' or 'jurisdiction.' In particular, Article IX calls upon states parties to "be guided by the principle of co-operation and mutual assistance" when exploring and using "outer space, including the Moon and other celestial bodies."

This call has gone unheard. The reality is that space exploration and use is not carried out for the benefit and interests of all humankind. Rather, space is increasingly "congested, contested, and competitive."<sup>21</sup> And the complex international and national legal regime governing outer space – which I refer to generally as the 'space regime' – appears to be the law of begrudging co-existence rather than enthusiastic co-operation. As detailed below, there are growing calls to expand the space regime to meet the challenges of today and of the future.

In essence, these efforts – whether formally binding or not – aim to expand the space regime. In general, the argumentation used in favor of expanding the space regime is highly persuasive: human activity in space is increasing rapidly; the gaps in the regime are hard to deny. The development of formally non-binding instruments is a particularly realistic option, given the current political impasse between the leading space powers<sup>22</sup> – a situation that preceded Russia's

<sup>&</sup>lt;sup>18</sup> Steven R Brechin, "Climate Change Mitigation and the Collective Action Problem: Exploring Country Differences in Greenhouse Gas Contributions" (2016) 31:S1 Sociological Forum 846–861.

<sup>&</sup>lt;sup>19</sup> Jutta Brunnée & Stephen J Toope, *Legitimacy and Legality in International Law: An Interactional Account* (Cambridge: Cambridge University Press, 2010) at 126.

<sup>&</sup>lt;sup>20</sup> Twice in the Preamble, and one count in each of Articles I, III, IX, X, XI.

<sup>&</sup>lt;sup>21</sup> David Kuan-Wei Chen, Ram S Jakhu & Steven Freeland, "'War in Space' Would be a Catastrophe. A Return to Rules-Based Cooperation is the Only Way to Keep Space Peaceful", online: *The Conversation* <http://theconversation.com/war-in-space-would-be-a-catastrophe-a-return-to-rules-based-cooperation-is-the-onlyway-to-keep-space-peaceful-150947>. See also: James Clay Moltz, *Crowded Orbits: Conflict and Cooperation in Space* (New York: Columbia University Press, 2014).

<sup>&</sup>lt;sup>22</sup> Steer, *supra* note 2 at 756.

further invasion of Ukraine (but is amplified by it). However, in this thesis, I do not investigate the specific merits of these efforts to expand the space regime. Rather, in this paper I seek to problematize efforts to expand the space regime. As such, my primary research question is: would an expanded space regime be effective in guiding and controlling behavior in space? The importance of this question is that it targets the core assumption that underpins efforts to expand the space regime. This assumption is that a new treaty or norm will resolve the challenges we face in space – if only such a treaty or norm could be agreed upon.

To respond to the primary research question, I rely on the interactional theory of international law developed by Jutta Brunnée and Stephen J. Toope. This theoretical approach<sup>23</sup> posits that "three inter-related elements" – namely, "shared understandings, criteria of legality, and a practice of legality" – are "crucial to generating ... a sense of commitment among those to whom law is addressed."<sup>24</sup> Only when all three elements are met "can we imagine agents feeling obliged to shape their behaviour in the light of the promulgated rules."<sup>25</sup> This is because the combination of these three elements produces norms perceived as legitimate and legal. Norms that enjoy legitimacy and legality generate a sense of obligation among participants in the system.<sup>26</sup> And, as Brunnée and Toope note, "[i]nternational lawyers should care about obligation because obligation is the value-added of law."<sup>27</sup> This is because obligation is, from the interactional perspective, a particularly effective means of guiding and controlling behavior – or, in the specific case of the space regime, ensuring the co-operation required to realize space exploration and use as the province of all humankind, rather than the province of whoever gets there first.

Space law scholars have not embraced the interactional approach (so far). Indeed, space law scholarship has historically eschewed theoretical perspectives, other than a traditional

<sup>&</sup>lt;sup>23</sup> By 'theoretical approach', I simply mean a grouping of principles, statements or insights that provide a way of thinking about law, norms, and regimes.

<sup>&</sup>lt;sup>24</sup> Jutta Brunnée & Stephen J Toope, "Interactional International Law: An Introduction" (2011) 3:2 Int'l Theory
307–318 at 308. See generally: Brunnée & Toope, *supra* note 21.

<sup>&</sup>lt;sup>25</sup> Brunnée & Toope, *supra* note 21 at 41.

<sup>&</sup>lt;sup>26</sup> *Ibid* at 130.

<sup>&</sup>lt;sup>27</sup> Brunnée & Toope, "Interactional International Law", *supra* note 93 at 77.

international legal positivism, the New Haven School's policy-oriented jurisprudence<sup>28</sup> or Manfred Lach's legal realist approach.<sup>29</sup> Theoretical approaches to space law can be resisted on the grounds that space activities are a fundamentally practical endeavor. From this premise, it could be argued that their legal analysis should be similarly practical.

Without engaging on the validity of this argument, the prior aversion to theoretical approaches is changing. Critical space regime scholars such as Steer,<sup>30</sup> Cristian van Eijk,<sup>31</sup> Natalie Treviño,<sup>32</sup> and Edythe Weeks<sup>33</sup> have developed new approaches to the space regime that foreground its biases, discredit its claims to neutrality, and reveal aspects of it as self-contradictory, biased, intentional indeterminate and ultimately exclusionary. Similarly, comparative studies between the space regime and the other branches of international law have attracted various commentators, notably Steven Freeland and Danielle Ireland-Piper regarding the space regime's intersection with international human rights law.<sup>34</sup>

Further, the application of traditional international law doctrines has been recast in the space context. Melissa Durkee explores how, by virtue of Article VI of the Outer Space Treaty, "the actions of private space companies" are attributed to states, thereby becoming evidence of state practice.<sup>35</sup> The principal consequence of this "attributed lawmaking" is that private companies

<sup>31</sup> Cristian van Eijk, "Unstealing the Sky: Third World Equity in the Orbital Commons" (2022) 47:1 Air & Space L 25.

<sup>&</sup>lt;sup>28</sup> See, e.g., Myers S McDougal, Harold D Lasswell & Ivan A Vlasic, *Law and Public Order in Space* (New Haven: Yale University Press, 1963).

<sup>&</sup>lt;sup>29</sup> Manfred Lachs, *The Law of Outer Space: An Experience in Contemporary Law-Making* (Leiden: Martinus Nijhoff Publishers, 1972).

<sup>&</sup>lt;sup>30</sup> Cassandra Steer, "The Province of all Humankind' – A Feminist Analysis of Space Law" in Melissa de Zwart & Stacey Henderson, eds, *Commercial and Military Uses of Outer Space* (Singapore: Springer Singapore, 2021)
169. See also: Steer, *supra* note 2.

<sup>&</sup>lt;sup>32</sup> Natalie B Treviño, "The Cosmos is Not Finished", (2020), online: *University of Western Ontario* <a href="https://ir.lib.uwo.ca/etd/7567">https://ir.lib.uwo.ca/etd/7567</a>>.

<sup>&</sup>lt;sup>33</sup> Edythe Weeks, *Outer Space Development, International Relations and Space Law: A Method for Elucidating Seeds* (Newcastle-upon-Tyne: Cambridge Scholars Publishing, 2012).

 <sup>&</sup>lt;sup>34</sup> Steven Freeland & Danielle Ireland-Piper, "Space Law, Human Rights and Corporate Accountability" (2022)
 26:1 UCLA J Int'l L Foreign Aff 1–34.

<sup>&</sup>lt;sup>35</sup> Melissa J Durkee, "Interstitial Space Law" (2019) 97 Wash U L Rev 423 at 428–429.

have and will develop the space regime "by advancing the legal principles of their choice – to legislators, investors, and the popular press, and with their actual rocket launches."<sup>36</sup> Durkee argues that "the building blocks for customary international law are already forming in this area, and doing so in an underappreciated manner."<sup>37</sup>

Despite these critical and doctrinal advancements, the field generally remains undertheorized. Yet the space regime's complexity renders it particularly amenable to theoretical exposition. As such, the secondary objective of this thesis is to demonstrate further the value of theoretical approaches to the space regime. Indeed, such a theoretical approach is necessary here, given that this thesis's subject is the space regime writ large. Examples will be drawn from all aspects of this complex regime, including national legislation, international treaties, non-binding instruments, technical standards, and institutional practices.

Before I describe these calls and these challenges, this term – 'space regime' – requires some unpacking. For the purposes of this thesis, Stephen Krasner's definition of 'regime' is applicable. As such, I use the word 'regime' to mean "[a] set of implicit or explicit principles, norms, rules, and decision-making procedures around which actor expectations converge in a given area of international relations."<sup>38</sup> Such regimes, as Andreas Hasenclever *et al* explain, "are intended to remove specific issue-areas ... from the sphere of self-help behaviour." <sup>39</sup> This is achieved by "creating shared expectations about appropriate behaviour and by upgrading the level of transparency in the issue-area" such that states (and other actors) can "cooperate with a view to reaping joint gains in the form of additional welfare or security."<sup>40</sup> The space regime, therefore, denotes a whole system of international, national, and local rules, practices, customs, and

<sup>&</sup>lt;sup>36</sup> *Ibid* at 428.

<sup>&</sup>lt;sup>37</sup> *Ibid* at 429.

<sup>&</sup>lt;sup>38</sup> Stephen D Krasner, ed, *International Regimes*, Cornell Studies in Political Economy (Ithaca, New York: Cornell University Press, 1983) at 2.

<sup>&</sup>lt;sup>39</sup> Andreas Hasenclever, Peter Mayer & Volker Rittberger, "Integrating Theories of International Regimes" (2000) 26:1 Rev Int'l Stud 3–33 at 3.

<sup>&</sup>lt;sup>40</sup> Ibid.

 $usages^{41}$  – in short, a collection of norms – that should facilitate the co-operation envisioned in the Outer Space Treaty.

This regime is the subject of this thesis. Various salient features of this regime will be explained and explored throughout this thesis as and when they arise. However, there are two important points to clarify at this early juncture. First, international law continues to apply to states throughout outer space and on celestial bodies. This principle is affirmed by Article III of the Outer Space Treaty. This article provides that

"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, including the Charter of the United Nations, in the interest of maintaining international peace and security and promoting international co-operation and understanding."

As such, there is no legal vacuum in space; it is not the "Wild West."<sup>42</sup> Rather, states are as bound by international law in space as they are on Earth, on the high seas, or in international airspace.

The second preliminary point is that states bear international responsibility for the actions of their nationals in space – without needing to rely on customary concepts of attribution.<sup>43</sup> This

<sup>&</sup>lt;sup>41</sup> Jill Stuart treats each of the treaties governing outer space activities as constituting a distinct "outer space regime," such that there is a collection of "outer space regimes." See: Jill Stuart, "Regime Theory and the Study of Outer Space Politics", (30 September 2013), online: *Global Policy Journal* 

<sup>&</sup>lt;https://www.globalpolicyjournal.com/blog/30/09/2013/regime-theory-and-study-outer-space-politics>. This more granular approach is useful for exploring regime formation. But as this thesis responds to varied proposals for new treaties and norms, a wholistic approach is more appropriate.

<sup>&</sup>lt;sup>42</sup> David Kuan-Wei Chen, "New Ways and Means to Strengthen the Responsible and Peaceful Use of Outer Space" (2020) 48:3 Ga J Int'l & Comp L 661 at 663.

<sup>&</sup>lt;sup>43</sup> As James Crawford explains, "the general rule is that conduct attributed to the State … is [only] that of its organs of government, or of others who have acted under the direction, investigation or control of those organs." See: James R Crawford, "State Responsibility" in *Max Planck Encyclopedia of Public International Law* (Oxford University Press, 2006). A corollary of this rule is that the conduct of private persons is not generally attributable to a state. See: Alexander Kees, "Responsibility of States for Private Actors" in *Max Planck Encyclopedia of Public International Law* (Oxford University Press, 2011).

point requires further exposition; as Bin Cheng notes, it represents a "fundamental innovation"<sup>44</sup> in international law. The role of non-state actors in exploring and using space was a topic of intense debate between the United States and the Soviet Union in the early 1960s. This debate arose while the United States and the Soviet Union were negotiating the Outer Space Treaty's predecessor instrument, the *Declaration of Legal Principles Governing the Activities of States in the Exploration and Uses of Outer Space* ("Legal Principles Declaration").<sup>45</sup>

The Soviet Union argued that states should only perform space activities.<sup>46</sup> Non-state actors were to be excluded entirely from all space activities. Unsurprisingly, the United States disagreed. As Frans von der Dunk summarizes:

"true to its communist ideology, [the Soviet Union] was squarely against any private activities in most economically-relevant areas of society, but certainly so in an area of such strategic concern as outer space. By contrast, the United States throughout its existence has usually presented itself as the champion of private enterprise, an approach also transpiring in its space policies."<sup>47</sup>

A negotiated compromise was reached and articulated in Paragraph 5 of the Legal Principles Declaration and further formalized in Article VI of the Outer Space Treaty. Article VI imposes "international responsibility" on States for "national activities in outer space, including the moon and other celestial bodies, whether such activities are carried on by governmental agencies or by non-governmental entities." <sup>48</sup> States are also required to "assure" that these "national activities are carried out in conformity with the provisions set forth in the [Outer Space] Treaty." In addition, "[t]he activities of non-governmental entities in outer space, including the moon and

<sup>&</sup>lt;sup>44</sup> Bin Cheng, "Article VI of the 1967 Space Treaty Revisited: 'International Responsibility', 'National Activities', and 'The Appropriate State'" (1998) 26:1 J Space L 7–32 at 14.

<sup>&</sup>lt;sup>45</sup> General Assembly Resolution 1962 (XVIII) of 13 December 1963 (Adopted without vote).

<sup>&</sup>lt;sup>46</sup> Gennady Zhukov & Yuri Kolosov, *International Space Law*, 2nd ed, translated by Boris Belitzky (Moscow: Statut Publishing House, 2014) at 65–66.

<sup>&</sup>lt;sup>47</sup> Frans G von der Dunk, "Chapter One: The Origins of Authorisation: Article VI of the Outer Space Treaty and International Space Law" in *National Space Legislation in Europe: Issues of Authorisation of Private Space Activities in the Light of Developments in European Space Cooperation* Studies in Space Law (The Netherlands: Koninklijke Brill NV, 2011) 3 at 3.

<sup>&</sup>lt;sup>48</sup> Outer Space Treaty, art VI.

other celestial bodies, shall require authorization and continuing supervision by the appropriate State Party to the Treaty."<sup>49</sup>

The impression was thereby created of "private activity but public responsibility."<sup>50</sup> The prevailing view<sup>51</sup> is that Article VI means that "states are responsible for national activities and the activities of their nationals in outer space ... [and] ... are under a duty to authorize and a continuing duty to supervise such activities."<sup>52</sup> Given this responsibility and duty, as well as the liability that states can face under Article V of the Outer Space Treaty and the Liability Convention,<sup>53</sup> some states have specifically extended the application of their national laws to space. These national laws include comprehensive space laws,<sup>54</sup> to govern space activities generally, as well as national laws that address single space-related issues.<sup>55</sup>

Bringing these two preliminary points together, the impression created by Articles III and VI is that of a comprehensive legal arrangement across both axes: horizontal (i.e., between states) and vertical (i.e., between states and their nationals). Furthering this impression, the space regime includes other treaties that expand on the Outer Space Treaty. More specifically: Article V, concerning astronauts, is elaborated in the Rescue Agreement.<sup>56</sup> Article VII, concerning liability for damage, is addressed in the Liability Convention. And Article VIII, concerning space

<sup>54</sup> See, for example, Australia's *Space (Launches and Returns) Act 2018*, available at: <https://www.legislation.gov.au/Details/C2021C00394>.

<sup>&</sup>lt;sup>49</sup> Ibid.

<sup>&</sup>lt;sup>50</sup> Dunk, *supra* note 33 at 5.

<sup>&</sup>lt;sup>51</sup> This view has on occasion been challenged. See: *Testimony of Laura Montgomery before the Committee on Science, Space and Technology on 23 May 2017* (Washington, D.C.: United States Senate, 2017).

<sup>&</sup>lt;sup>52</sup> Francis Lyall & Paul B Larsen, *Space Law: A Treatise*, 2nd ed (Routledge, 2017) at 64.

<sup>&</sup>lt;sup>53</sup> Convention on the International Liability for Damage Caused by Space Objects, 29 March 1972, 961 UNTS
187 (entered into force 1 September 1972) [hereinafter Liability Convention].

<sup>&</sup>lt;sup>55</sup> See, for example, the Spanish legislation governing space object registration: *Royal Decree 278/1995, dated* 24th February 1995, establishing in the Kingdom of Spain of the Registry foreseen in the Convention adopted by the United Nations General Assembly on 2nd November 1974, available at:

<sup>&</sup>lt;a href="https://www.unoosa.org/oosa/en/ourwork/spacelaw/nationalspacelaw/spain/royal\_decree\_278\_1995E.html">https://www.unoosa.org/oosa/en/ourwork/spacelaw/nationalspacelaw/spain/royal\_decree\_278\_1995E.html</a>.

<sup>&</sup>lt;sup>56</sup> Agreement on the Rescue of Astronauts, the Return of Astronauts, and Return of Objects Launched into Outer Space, 22 April 1968, 672 UNTS 119 (entered into force 3 December 1968) [hereinafter Rescue Agreement].

object registration, is further developed in the Registration Convention.<sup>57</sup> In addition, the Moon Agreement restates and expands upon the Outer Space Treaty in the specific lunar context.<sup>58</sup>

The space regime's apparent comprehensiveness means that it is often analogized to the welldeveloped regimes that govern international aviation and the high seas. Whether or not these analogies are justified is debatable: Elizabeth Mendenhall argues that these analogies mislead by glossing over the unique aspects of outer space and the space regime.<sup>59</sup> However, as Lauryn Hallet explains:

"the aim of analogies [in space law] ... is not to take the Law of the Sea at face value and copy and paste it onto space law, but to make an empirical analysis of similar circumstances, because such an analysis is not yet possible for many space problematics, and the object of the exercise is to anticipate and prevent challenges."<sup>60</sup>

Such analogies can therefore be additive to our understanding. But direct comparisons between the space regime and other adjacent regimes are problematic. This is because the space regime invariably pales in the comparison. It cannot be denied that neither the Outer Space Treaty nor the other space treaties are as comprehensive as the *Convention on International Civil Aviation*<sup>61</sup> or the *United Nations Convention on the Law of the Sea* ("**UNCLOS**").<sup>62</sup> Turning to the space regime's institutional aspects, the primary focal points are the United Nations

<sup>59</sup> Elizabeth Mendenhall, "Treating Outer Space Like a Place: A Case for Rejecting Other Domain Analogies" (2018) 16:2 Astropolitics 97–118.

<sup>60</sup> Lauryn Hallet, "Rise of Mega Constellations: A Case to Adapt Space Law Through the Law of the Sea" in Annette Froehlich, ed, *Legal Aspects Around Satellite Constellations* (Cham: Springer International Publishing, 2021) 179 at 180.

<sup>&</sup>lt;sup>57</sup> Convention on Registration of Objects Launched into Outer Space, 6 June 1975, 1023 UNTS 15 (entered into force 15 September 1976) [hereinafter Registration Convention].

<sup>&</sup>lt;sup>58</sup> Agreement Governing the Activities of States on the Moon and Other Celestial Bodies, 18 December 1979, 1363 UNTS 3 (entered into force 11 July 1984), art 1(1) [hereinafter Moon Agreement]. The Moon Agreement is also relevant to other celestial bodies within the solar system, "other than the Earth, except insofar as specific legal norms enter into force with respect to any of these celestial bodies." See: Moon Agreement, art 1(1).

<sup>&</sup>lt;sup>61</sup> Convention on International Civil Aviation, 7 December 1944, 15 UNTS 295 [hereinafter Chicago Convention].

<sup>&</sup>lt;sup>62</sup> Convention on the Law of the Sea, 10 December 1982, 1833 UNTS 397 [hereinafter UNCLOS].

Committee on the Peaceful Uses of Outer Space ("**COPUOS**") and its secretariat the United Nations Office of Outer Space Affairs ("**UNOOSA**"). But neither COPUOS nor UNOOSA cannot match the power wielded by the International Civil Aviation Organization ("**ICAO**")<sup>63</sup> or the International Maritime Organization.<sup>64</sup>

Even the International Telecommunication Union ("**ITU**"), often viewed as the most effective component of the space regime,<sup>65</sup> plays a predominantly coordinating role.<sup>66</sup> The ITU is the United Nations specialized agency responsible for coordinating the international management of the radio-frequency spectrum and satellite orbits on which most space activities depend. The ITU's coordination activities are underpinned by the *Constitution of the International Telecommunication Union* ("**ITU Constitution**"), which provides that:

"radio frequencies and any associate orbits . . . are limited natural resources and that they must be used rationally, efficiently and economically, in conformity with the provisions of the Radio Regulations, so that countries or groups of countries may have equitable access to those orbits and frequencies, taking into account the special needs of the developing countries and the geographical situation of particular countries."<sup>67</sup>

However, as Ram Jakhu explains, despite its vitally important role the ITU does not "possess any mechanism nor power of enforcement nor imposition of sanctions against the violators of its

<sup>&</sup>lt;sup>63</sup> "About ICAO", (2022), online: *International Civil Aviation Organization* <a href="https://www.icao.int/about-icao/Pages/default.aspx">https://www.icao.int/about-icao/Pages/default.aspx</a>. {Citation}

<sup>&</sup>lt;sup>64</sup> "Introduction to IMO", (2022), online: *International Maritime Organization* <a href="https://www.imo.org/en/About/Pages/Default.aspx">https://www.imo.org/en/About/Pages/Default.aspx</a>.

<sup>&</sup>lt;sup>65</sup> Ram S Jakhu & Joseph N Pelton, eds, *Global Space Governance: An International Study*, 1st ed, Space and Society (Cham: Springer International Publishing, 2017) at 35. See also Icho Kealotswe-Matlou, "The Rule of Law in Outer Space: A Call for an International Outer Space Authority" in Cassandra Steer & Matthew Hersch, eds, *War and Peace in Outer Space* (Oxford: Oxford University Press, 2020) 91 at 104.

<sup>&</sup>lt;sup>66</sup> See generally: Ram S Jakhu, "Regulatory Process for Communications Satellite Frequency Allocations" in Joseph N Pelton, Scott Madry & Sergio Camacho-Lara, eds, *Handbook of Satellite Applications* (New York, NY: Springer, 2016) 1.

<sup>&</sup>lt;sup>67</sup> Constitution of the International Telecommunication Union, 22 December 1992, 1825 UNTS 3 (entered into force 1 July 1994) art 44(2) [hereinafter ITU Constitution].

rules and regulations."<sup>68</sup> In light of the above, the space regime is described as "underdeveloped"<sup>69</sup> and full of "gaps."<sup>70</sup> More specifically, it is often perceived as insufficient in the face of present and future challenges:<sup>71</sup> a 2019 headline from the *Economist* simply states that "*Space Law is Inadequate for the Boom in Human Activity There*."<sup>72</sup> This boom has given rise to significant challenges in space. Consider the following examples.

First, space debris<sup>73</sup> proliferates in near-Earth space, polluting the space environment and jeopardizing space access and assets.<sup>74</sup> The uncontrolled re-entry of space debris also threatens lives on Earth.<sup>75</sup> Second, the enduring perception of space as a military domain – the "ultimate high ground"<sup>76</sup> – creates stronger and stronger pressures for states to test and deploy weapons in space. To this end, the United States Space Force was established in 2019<sup>77</sup> – and, as Cassandra

<sup>71</sup> See generally: Lorenzo Gradoni, "What on Earth is Happening to Space Law?", (31 July 2018), online: *EJIL: Talk!* <a href="https://www.ejiltalk.org/what-on-earth-is-happening-to-space-law-anew-space-law-for-anew-space-race/">https://www.ejiltalk.org/what-on-earth-is-happening-to-space-law-anew-space-law-for-anew-space-race/</a>.

<sup>72</sup> The Economist, "Space Law is Inadequate for the Boom in Human Activity There", online: <a href="https://www.economist.com/international/2019/07/18/space-law-is-inadequate-for-the-boom-in-human-activity-there">https://www.economist.com/international/2019/07/18/space-law-is-inadequate-for-the-boom-in-human-activity-there</a>. Furthering the negative impression, the article is tagged on the *Economist*'s website under the heading "Lawless Wastes."

<sup>73</sup> As Jack Beard summarizes, "[s]pace debris consists of all manner of 'junk' left in space, including defunct satellites, rocket stages used in previous launches, nose cones, pay- load covers, shrouds, bolts, solid propellant slag, space activity cast-aways, deterioration fragments (peeled paint, etc.) and fragments from exploding batteries, fuel tanks, and collisions." See: Jack Beard, "Soft Law's Failure on the Horizon: The International Code of Conduct for Outer Space Activities" (2017) 38:2 U Pa J Int'l L 335 at 340.

<sup>74</sup> Martha Mejía-Kaiser, "Space Law and Hazardous Space Debris" in *Oxford Research Encyclopedia of Planetary Science* (Oxford University Press, 2020).

<sup>75</sup> Denise Chow, "Russian Rocket Part to Make Uncontrolled Re-Entry Toward Earth", (5 January 2022), online: *NBC* <a href="https://www.nbcnews.com/science/space/russian-rocket-15-abbruzzese-rcna11093">https://www.nbcnews.com/science/space/russian-rocket-15-abbruzzese-rcna11093</a>.

<sup>76</sup> Benjamin S Lambeth, *Mastering the Ultimate High Ground: Next Steps in the Military Uses of Space* (California: RAND Corporation, 2003).

<sup>77</sup> Chelsea Gohd, "Everyone wants a Space Force — but Why?", (11 September 2020), online: *Space.com* <a href="https://www.space.com/every-country-wants-space-force.html">https://www.space.com/every-country-wants-space-force.html</a>.

<sup>&</sup>lt;sup>68</sup> Ram S Jakhu, *Dispute Resolution under the ITU Agreements* (Colorado: Secure World Foundation, 2012).

<sup>&</sup>lt;sup>69</sup> Christopher 'Kip' Hale, "Are We a Bigger Problem Than We Realize?" (2022) 20:1 J Int'l Crim Just 293–312 at 305.

<sup>&</sup>lt;sup>70</sup> Katherine Latimer Martinez, "Lost in Space: An Exploration of the Current Gaps in Space Law" (2021) 11:2 Seattle Journal of Technology, Environmental & Innovation Law 321.

Steer notes, "[i]f the United States is attempting to gain dominance in space, we cannot expect China or Russia to withhold from the same attempt."<sup>78</sup> Third, commercial competition is increasing. The current space era – often referred to as 'NewSpace'<sup>79</sup> – is characterized by the increasing commercialization of space activities. This commercialization means that private entities, "driven by entrepreneurs using equity funding," are increasingly predominant in space.<sup>80</sup> Many of these entities are racing to build large constellations of communications satellites in low Earth orbit – so-called 'megaconstellations.'<sup>81</sup> These constellations monopolize our limited supply of radio-frequency spectrum and satellite orbits and adversely impact Earth-based professional astronomy,<sup>82</sup> citizen science,<sup>83</sup> and indigenous knowledge systems.<sup>84</sup>

These challenges arise from strong and likely irresistible political, economic, and technological trends. Yet the space regime's seeming inability to respond to these challenges perpetuates the view that space is the province of whoever gets there first, rather than the province of all humankind. As such, the space regime has attracted significant criticism.<sup>85</sup> More

<sup>80</sup> Walter Peeters, "Evolution of the Space Economy: Government Space to Commercial Space and New Space" (2021) 19:3 Astropolitics 206–222 at 208.

<sup>81</sup> Matt Weinzierl & Mehak Sarang, "The Commercial Space Age Is Here" *Harvard Business Review* (12 February 2021), online: <a href="https://hbr.org/2021/02/the-commercial-space-age-is-here">https://hbr.org/2021/02/the-commercial-space-age-is-here</a>.

<sup>82</sup> Tereza Pultarova, "International Astronomical Union Launches New Center to Fight Satellite Megaconstellation Threat", (7 February 2022), online: *Space.com* <a href="https://www.space.com/iau-center-protect-astronomy-megaconstellation-threat">https://www.space.com/iau-center-protect-astronomy-megaconstellation-threat</a>>.

<sup>83</sup> Megan Perks, "The Impact of Mega-Constellations on Astronomy", online: <https://staffblogs.le.ac.uk/physicsastronomy/2021/08/05/the-impact-of-mega-constellations-on-astronomyzooniverse-project/>.

<sup>84</sup> Becky Ferreira, "SpaceX's Satellite Megaconstellations Are Astrocolonialism, Indigenous Advocates Say", (5 October 2021), online: *Vice* <a href="https://www.vice.com/en/article/k78mnz/spacexs-satellite-megaconstellations-are-astrocolonialism-indigenous-advocates-say">https://www.vice.com/en/article/k78mnz/spacexs-satellite-megaconstellations-are-astrocolonialism-indigenous-advocates-say</a>.

<sup>85</sup> See, e.g., Gradoni, *supra* note 57.

<sup>&</sup>lt;sup>78</sup> Cassandra Steer, "Global Commons, Cosmic Commons: Implications of Military and Security Uses of Outer Space" (2017) 18:1 Geo J Int'l Aff 9 at 13.

<sup>&</sup>lt;sup>79</sup> See, e.g., Kendall Russell, "Evolving Cybersecurity in the NewSpace Era", (21 March 2018), online: *Satellite Today* <a href="http://interactive.satellitetoday.com/via/april-2018/evolving-cybersecurity-in-the-newspace-era/">http://interactive.satellitetoday.com/via/april-2018/evolving-cybersecurity-in-the-newspace-era/</a>. See also Stéphane Heinrich et al, "Space Sustainability in the NewSpace Era: No NewSpace without GreenSpace" (2022) J Space Safety Engineering.

specifically, calls for expanding the space regime – primarily through new treaties, amendments of existing treaties,<sup>86</sup> or even an "International Outer Space Authority"<sup>87</sup> – have long featured in the specialist space regime literature. Yet non-binding instruments on limited and specific issues have been the primary driver of the space regime since the perceived failure of the Moon Agreement. This perception arises because neither the United States nor the Soviet Union ratified that treaty in 1979. Since then, more comprehensive or binding instruments have faced an uphill battle: a European initiative for an international code of conduct for space activities has stalled,<sup>88</sup> as have Chinese and Russian efforts to conclude a treaty regarding the weaponization of space,<sup>89</sup> and nascent efforts within the United States and Canada to conclude a space preservation treaty.<sup>90</sup>

More recently, U.S. think tanks have embraced these efforts to expand the space regime. In March 2021, the Carnegie Endowment for International Peace released an article concluding that "[t]he only way to effectively govern state and commercial space activities is to settle on and

<sup>87</sup> Kealotswe-Matlou, *supra* note 51.

<sup>88</sup> Rajeswari Pillai Rajagopalan, "Fresh Calls for Space Security Governance Measures Unlikely to Yield Results", (19 April 2021), online: *Observer Research Foundation* <a href="https://www.orfonline.org/research/fresh-calls-for-space-security-governance-measures-unlikely-to-yield-results/">https://www.orfonline.org/research/fresh-calls-for-space-security-governance-measures-unlikely-to-yield-results/</a>. See also: Steer, *supra* note 2 at 757. For a critical perspective on this code, see: Beard, "Soft Law's Failure on the Horizon", *supra* note 59.

<sup>89</sup> Letter dated 2008/02/12 from the Permanent Representative of the Russian Federation and the Permanent Representative of China to the Conference on Disarmament addressed to the Secretary-General of the Conference transmitting the Russian and Chinese texts of the draft "Treaty on Prevention of the Placement of Weapons in Outer Space and of the Threat or Use of Force against Outer Space Objects" introduced by the Russian Federation and China (United Nations, 2008) UN Doc. CD/1839. See also Steer, *supra* note 2 at 757.

<sup>90</sup> Paul Meyer, "Arms Control in Outer Space: Mission Impossible or Unrealized Potential?", (October 2020), online: *Canadian Global Affairs Institute* 

<a href="https://www.cgai.ca/arms\_control\_in\_outer\_space\_mission\_impossible\_or\_unrealized\_potential">https://www.cgai.ca/arms\_control\_in\_outer\_space\_mission\_impossible\_or\_unrealized\_potential</a>>.

<sup>&</sup>lt;sup>86</sup> Francesco Gaspari & Alessandra Oliva, "The Consolidation of the Five UN Space Treaties into One Comprehensive and Modernized Law of Outer Space Convention: Toward a Global Space Organization" in George D Kyriakopoulos & Maria Manoli, eds, *The Space Treaties at Crossroads* (Cham: Springer International Publishing, 2019) 183. See also: Promit Chatterjee, "Legality of Anti-Satellites Under the Space Law Regime" (2014) 12:1 Astropolitics 27–45 at 40–41.

abide by common norms or rules," and that "[w]ithout new [binding] governance agreements, problems related to debris, heavy orbital traffic, and harmful interference will only intensify."<sup>91</sup>

The following month, the Atlantic Council released a paper titled *The Future of Security in Space: A Thirty-Year US Strategy.*<sup>92</sup> This paper concludes that "[t]he international law of space, centered on the [Outer Space Treaty], is outdated and insufficient for a future of space in which economic activity is primary."<sup>93</sup> As such, its central recommendation is the development of an entirely new, comprehensive treaty to replace the Outer Space Treaty.<sup>94</sup>

Six months later, the Woodrow Wilson International Center for Scholars released a paper on space governance that calls for a global space regulator with lawmaking powers.<sup>95</sup> The paper concludes that "[o]f the many challenges facing global space governance … none can be addressed without reinstating intergovernmental bodies with the ability to develop an effective outer space regime."<sup>96</sup>

This flurry of think tank activity coincided with developments within the United Nations. Upon a proposal from the United Kingdom, in December 2021, the United Nations General Assembly adopted a resolution convening an open-ended working group on reducing space threats ("**Space Threats Working Group**").<sup>97</sup>

The Space Threats Working Group's mandate expressly includes:

<sup>96</sup> Ibid.

<sup>&</sup>lt;sup>91</sup> Benjamin Silverstein & Ankit Panda, *Space is a Great Commons: It's Time to Treat It as Such* (Washington, D.C.: Carnegie Endowment for International Peace, 2021).

<sup>&</sup>lt;sup>92</sup> *The Future of Security in Space: A Thirty-Year US Strategy*, by Clementine G Starling et al (Washington, D.C.: Atlantic Council, 2021).

<sup>&</sup>lt;sup>93</sup> *Ibid* at 20.

<sup>&</sup>lt;sup>94</sup> *Ibid* at 61.

<sup>&</sup>lt;sup>95</sup> Sophie Goguichvili et al, *The Global Legal Landscape of Space: Who Writes the Rules on the Final Frontier?* (Washington, D.C.: Wilson Center, 2021).

<sup>&</sup>lt;sup>97</sup> See: UN Doc. A/RES/76/231. The resolution voting record was as follows: Yes: 150; No: 8; Abstentions: 7; Non-Voting: 28. Both China and Russia voted against the resolution, together with Cuba, North Korea, Iran, Nicaragua, Syria, and Venezuela.

"making recommendations on possible norms, rules and principle of responsible behaviours relating to threats by States to space systems, including ... how they would contribute to the negotiation of legally binding instruments, including on the prevention of an arms race in outer space."<sup>98</sup>

In addition to these calls for new binding treaties, the development of non-binding instruments has gained momentum. On October 13, 2020, the Administrator of the U.S. National Aeronautics and Space Administration ("**NASA**")<sup>99</sup> and the representatives of eight other space agencies signed the *Artemis Accords* ("**Accords**").<sup>100</sup> Initiated, drafted, and promoted by the United States, the Accords are a non-binding, "political commitment" – so-called 'soft law'<sup>101</sup> – intended to "increase the safety of operation, reduce uncertainty, and promote the sustainable and beneficial use of space for all humankind."<sup>102</sup> Then, in July 2021, U.S. Secretary of Defense Lloyd Austin signed a memo pledging the Department of Defense to follow five "tenets of responsible behavior in space."<sup>103</sup> And on 18 April 2022, U.S. Vice President Kamala Harris announced a moratorium on (further) destructive anti-satellite weapons ("**ASAT**") tests – and that the United States "seeks to establish this [moratorium] as a new international norm for responsible behavior in space."<sup>104</sup>

<sup>100</sup> The original signatories were representatives from Australia, Canada, Italy, Japan, Luxembourg, the United Arab Emirates, the United Kingdom, and the United States. Bahrain, Brazil, Columbia, France, Israel, Mexico, New Zealand, Poland, South Korea, Romania, Singapore, Saudi Arabia, Ukraine, and the Isle of Man have since signed.

<sup>101</sup> For a critical view on space regime soft law, see: Beard, "Soft Law's Failure on the Horizon", *supra* note 59.

<sup>102</sup> Jack Wright Nelson, "The Artemis Accords and the Future of International Space Law", (2020), online: *American Society of International Law* <a href="https://www.asil.org/insights/volume/24/issue/31/artemis-accords-and-future-international-space-law">https://www.asil.org/insights/volume/24/issue/31/artemis-accords-and-future-international-space-law</a>.

<sup>103</sup> Namely, "[o]perate in, from, to, and through space with due regard to others and in a professional manner; [l]imit the generation of long-lived debris; [a]void the creation of harmful interference; [m]aintain safe separation and safe trajectory; [c]ommunicate and make notifications to enhance the safety and stability of the domain." See: *Tenets of Responsible Behavior in Space*, Memorandum, by United States Department of Defense (Washington, D.C.: The Pentagon, 2021).

<sup>104</sup> Bryan Bender, "U.S. Vows Not to Conduct Anti-Satellite Tests", (18 April 2022), online: *Politico* <a href="https://www.politico.com/news/2022/04/18/u-s-vows-no-anti-satellite-tests-00026144">https://www.politico.com/news/2022/04/18/u-s-vows-no-anti-satellite-tests-00026144</a>.

<sup>&</sup>lt;sup>98</sup> See: UN Doc A/RES/76/231 at 3[5(c)]. The Space Threats Working Group is due to submit a report to the General Assembly in September 2023.

<sup>&</sup>lt;sup>99</sup> Ibid.

Chapter 2 addresses this complexity and the benefits of an interactional approach to the space regime. In Chapters 3, 4 and 5, I then interrogate specific aspects of the space regime in line with Brunnée and Toope's three inter-related elements. More specifically, in Chapter 3, I explore the shared understanding regarding the need for the space regime. In Chapter 4, I test the space regime's foundational instrument – the Outer Space Treaty – against the criteria of legality. I then use the same criteria in Chapter 5 to examine whether the space regime is sustained by a continuous effort to realize all the criteria of legality. The example chosen for this examination is the practices and procedures within the ITU (which I will refer to generally as 'ITU practice').

The conclusions reached in this thesis are somber. While there is a shared understanding regarding the need for normativity in space, the Outer Space Treaty only partially satisfies the eight criteria of legality. Further, ITU practice is not readily accessible, and there is a fundamental contradiction between the ITU's equitable ideals and its 'first come, first serve' practice. These conclusions do not mean that the space regime, the Outer Space Treaty, or the ITU are not successful, nor that they should not be celebrated. But these conclusions do suggest that while the space regime is likely viewed as legitimate, the legality that it does enjoy is being inhibited. As such, the sense of obligation that it generates is unlikely to be sustained over time.

In light of the primary research question,<sup>105</sup> these somber conclusions could potentially be used to support efforts to expand the space regime. This is because the conclusions reached do not mean that efforts to expand the space regime are bound to fail. Nor does it mean that such efforts will not bear fruit over time. But, as I argue in the concluding Chapter 6, the findings do suggest that we should closely question the assumption underlying these efforts. More specifically, we should challenge the idea that the space regime's inability to respond to the challenges we face in space will necessarily be remedied by expanding the regime. This is because a regime that is unable to sustainably generate a sense of obligation among its subjects does not need expansion; it needs repair. In short: not more law, but better use of the law we have.

As such, I argue that priority should be given to enhancing and sustaining legality within the space regime rather than expanding it. Otherwise, efforts to conclude further treaties may come to naught: such treaties may be, as the song goes, mere "words" that "slip across the universe"

<sup>&</sup>lt;sup>105</sup> That is, would an expanded space regime be effective in guiding and controlling behavior in space?

without "chang[ing] [the] world."<sup>106</sup> In this respect, this thesis resonates with two key insights from the interactional approach. First, that formally binding law-making does not necessarily enhance legality.<sup>107</sup> Second, that the "hard work of international law" is not negotiating and concluding a regime.<sup>108</sup> Rather, it is the day-to-day work of sustaining that regime or norm over time.

Before proceeding further, three caveats are necessary. First, there is not always a clear distinction between the interactional approach's three elements. As such, the three elements are best construed as lines of inquiry that share similar themes but with different focuses. The practical result is that there is overlap between Chapters 2, 3 and 4. However, I have endeavored to show how the focus changes when looking at shared understandings, as opposed to the criteria and practice of legality.

The second caveat is that the interactional approach permits various levels of analysis. For example, Brunnée and Toope use the approach like a telescopic lens: they analyze the broad international regime relating to climate change, as well as specific instruments and norms within that regime.<sup>109</sup> Similarly, in this thesis I focus on the space regime, but attention will also be given to specific instruments and norms within that regime. To avoid having to write 'norms and regimes' throughout, the usage of word 'norm' should generally be read in this thesis as including 'regime' (and vice-versa). Distinctions between norms and regimes will be made as necessary.

My final caveat is that the space regime, like any complex international regime, has aspects that work well, and aspects that do not work as well. In a non-exhaustive study such as this, I have attempted to ensure that the aspects of the regime chosen for analysis are broadly representative. I readily concede that focusing on different aspects could lead to different conclusions. Nonetheless, even if the conclusions reached here do not hold for every aspect of the space regime, then they at least appear to apply to key parts of it.

<sup>&</sup>lt;sup>106</sup> John Lennon & Paul McCartney, "Across the Universe" on *Let It Be* (London: Universal Music Group, 1970).

<sup>&</sup>lt;sup>107</sup> Brunnée & Toope, *supra* note 21 at 201.

<sup>&</sup>lt;sup>108</sup> *Ibid* at 352.

<sup>&</sup>lt;sup>109</sup> *Ibid* at 126.

#### **CHAPTER 2**

#### The Interactional Approach to the Space Regime

#### A. Introduction

What is the interactional approach to the space regime, and what are the benefits of this approach? In this Chapter, I respond to these preliminary questions. I have structured this Chapter as follows. In Section B, I outline the interactional approach's three elements of shared understandings, criteria of legality, and practice of legality. In Section C, I argue that the interactional approach is particularly suited to space regime analysis because it embraces the space regime's inherent pluralism, is not impeded by the stark ideological differences among space powers, and does not insist on a strict delineation between binding and non-binding norms. Section D then offers a final comment on the fundamentally pragmatic orientation of the interactional approach.

#### **B.** Three Elements

The interactional approach is an inquiry into how norms can attract not just social adhesion, but rather how they can generate a sense of obligation such that they become legal norms – or 'law.' Obligation is crucial because it is obligation that enables what Philip Allott describes as the "threefold social function" of law.<sup>110</sup> First, "[1]aw carries the structures and systems of society through time."<sup>111</sup> This carriage is facilitated by the commitment to those structures and systems that is engendered by obligation. Second, "[1]aw inserts the common interest of society into the behavior of society-members."<sup>112</sup> This is achieved through the sense of duty that arises from obligation, even for those society-members who may not share that common interest. Third, "[1]aw establishes possible futures for society, in accordance with society's theories, values and

<sup>&</sup>lt;sup>110</sup> Philip Allott, *The Health of Nations: Society and Law Beyond the State* (New York: Cambridge University Press, 2002) at 290.

<sup>&</sup>lt;sup>111</sup> *Ibid*.

<sup>&</sup>lt;sup>112</sup> *Ibid*.

purposes."<sup>113</sup> It is much easier to predict future actions if a strong sense of obligation *vis-à-vis* established norms can be seen amongst relevant actors; in particular, actors will be able to pursue their purposes and organize their interactions through law.

A norm that generates obligation will generally do so because it satisfies the interactional approach's three elements.<sup>114</sup> First, a norm must be grounded in shared understandings. A norm that is so grounded enjoys legitimacy. Second, a norm must satisfy the eight criteria of legality. A norm that complies with these criteria enjoys legality. Third, a norm must be supported by a practice of legality. A norm that does so will be sustained over time. The meaning of each element will be demonstrated in this thesis via application to the space regime in Chapters 3, 4 and 5. However, it is useful to further contextualize each element now to better understand their subsequent application.

The first element, shared understandings, draws heavily upon constructivist international relations theory. Such theory, as Sarina Theys explains, "sees the world, and what we can know about the world, as socially constructed."<sup>115</sup> As such, it emphasizes, per Brunnée and Toope, that "[t]here is no possibility of simply imposing significant social change by fiat in the absence of some degree of social consensus."<sup>116</sup> Rather, from an interactional perspective, "legal norms can *only* arise in the context of social norms based on shared understandings."<sup>117</sup> The essential shared understanding is that there is a need for normativity:<sup>118</sup> that is, there is a shared understanding regarding the need for norms in relation to a particular area of human activity. If this understanding is shared by relevant actors, then those norms will be considered legitimate.

Who precisely the relevant actors are will invariably change according to the regime under analysis. This consideration highlights the significant growth in the number of relevant actors in

<sup>&</sup>lt;sup>113</sup> *Ibid*.

<sup>&</sup>lt;sup>114</sup> Brunnée & Toope, *supra* note 21 at 94.

<sup>&</sup>lt;sup>115</sup> Sarina Theys, "Constructivism" in Stephen McGlinchey, Rosie Walters & Christian Scheinpflug, eds, *International Relations Theory* (Bristol: E-International Relations, 2017) 36.

<sup>&</sup>lt;sup>116</sup> Brunnée & Toope, *supra* note 21 at 32.

<sup>&</sup>lt;sup>117</sup> Jutta Brunnée, "Sources of International Environmental Law: Interactional Law" in Samantha Besson & Jean D'Aspremont, eds, *The Oxford Handbook on the Sources of International Law*, 1s ed (Oxford: Oxford University Press, 2017) 960 at 963. My emphasis.

<sup>&</sup>lt;sup>118</sup> Brunnée & Toope, *supra* note 21 at 350.

the space regime. When the Outer Space Treaty was opened for signature on 27 January 1967, states were the relevant space actors – indeed, in practice, it was just the United States and the Soviet Union. Over the years, more states gained space capabilities.<sup>119</sup> Some states pooled their resources to create international organizations, such as the European Space Agency ("ESA"). And, slowly but surely, commercial enterprises began to engage in space activities – first in conjunction with states or as contractors, now with increasing independence. As such, the range of relevant actors for the space regime presently includes, as Durkee summarizes, "classic space powers, new entrants, and non-space faring nations, as well as civilian space agencies, national militaries, and commercial [entities]."<sup>120</sup> All these actors constitute the space regime's subjects for this thesis's purposes.<sup>121</sup>

However, even if all these relevant actors share an understanding regarding a norm, this does not mean that the norm – while legitimate – will enjoy legality. This is because "[m]any social norms exist that never reach a threshold of legal normativity."<sup>122</sup> Rather, legitimate social norms must then be translated into legal commitments. The typical method for achieving this is to locate those legitimate social norms within a formal source of law. The classic formulation of

<sup>&</sup>lt;sup>119</sup> Hobe, *supra* note 6 at 34.

<sup>&</sup>lt;sup>120</sup> Melissa J Durkee, "The Future of Space Governance" (2020) 48:3 Ga J Int'l & Comp L 711 at 712.

<sup>&</sup>lt;sup>121</sup> Despite the increasing diversity among space actors, it is important to keep in mind that government contracts remain central to many private space companies. For example, SpaceX had an estimated \$1.2 billion in revenue in 2020. The overwhelming majority of this revenue – US\$847,990,951 – came from a single source: NASA. See: "SpaceX Financials", (2021), online: *Craft.co* <a href="https://craft.co/spacex/financials">https://craft.co/spacex/financials</a>. Of course, NASA's share fluctuates over time. Nonetheless, it is essential to keep in mind when analyzing the space regime that, for the most part, non-state actors in space remain deeply entwined with their respective states. However, this persistent entanglement is not contrary to Durkee's attributed lawmaking theory in space. See: Durkee, *supra* note 105 at 480. On the contrary, this entanglement may accelerate attributed lawmaking. This is because states and non-state actors can use each other to promote the norms, or interpretations of norms, that they wish to see take root. A prime example of this NASA's contracting of a commercial space enterprise to acquire "rocks from the Moon" for a peppercorn of US\$1 in order to establish precedent for such activity. See: Justin Harper, "NASA to Pay Company \$1 to Collect Rocks from Moon", *BBC News* (4 December 2020), online: <a href="https://www.bbc.com/news/business-55170788>">https://www.bbc.com/news/business-55170788></a>.

<sup>&</sup>lt;sup>122</sup> Brunnée & Toope, *supra* note 21 at 351.

these sources derives from Article 38(1) of the *Statute of the International Court of Justice*,<sup>123</sup> which provides that the International Court of Justice ("**ICJ**"):

"shall apply ... international conventions, whether general or particular, establishing rules expressly recognized by the contesting states; international custom, as evidence of a general practice accepted as law; the general principles of law recognized by civilized nations; [and] subject to the provisions of Article 59,<sup>124</sup> judicial decisions and the teachings of the most highly qualified publicists of the various nations, as subsidiary means for the determination of rules of law."

This formulation is increasingly debated.<sup>125</sup> And space regime scholarship has introduced some important refinements: notably, Bin Cheng's concept of "instant" customary international law arising from specific United Nations General Assembly resolutions relating to space,<sup>126</sup> as well as Durkee's attributed lawmaking theory. However, the interactional approach places little weight on defining the exact sources of law, or any proposed hierarchy thereof. This is because, as Brunnée and Toope explain, "what distinguishes legal norms from other types of social norms is not form or pedigree."<sup>127</sup> Rather, the distinguishing feature of legal norms is their adherence to eight criteria of legality.

<sup>&</sup>lt;sup>123</sup> Statute of the International Court of Justice, as annexed to Charter of the United Nations, 26 June 1945, Can TS 1945 No 7.

<sup>&</sup>lt;sup>124</sup> Article 59 states that "[t]he decision of the [ICJ] has no binding force except between the parties and in respect of that particular case."

<sup>&</sup>lt;sup>125</sup> See generally Samantha Besson & Jean D'Aspremont, eds, *The Oxford Handbook on the Sources of International Law*, 1st ed (Oxford: Oxford University Press, 2017).

<sup>&</sup>lt;sup>126</sup> Bin Cheng, "United Nations Resolutions on Outer Space: 'Instant' International Customary Law?" (1965)
5:23 Indian J Int'l L 35. For a critical view on 'instant' customary international law, see Prosper Weil, "Towards Relative Normativity in International Law?" (1983) 77:3 Am J Int'l L 413–442 at 435.

<sup>&</sup>lt;sup>127</sup> Brunnée & Toope, *supra* note 21 at 351. This contrasts with Weil's views on soft law. Weil accepts that whether a rule is "hard" or "soft" does not affect its "normative character." However, he sees the proliferation of "soft" norms as "not help[ing] [to] strengthen the international normative system." See: Weil, *supra* note 129 at 415.

These criteria were first identified by Lon Fuller, who identified them as "the principles of law's inner morality"<sup>128</sup> towards which a system of rules should strive.<sup>129</sup> I summarize them as follows. First, legal norms must be general. Second, they must be promulgated. Third, they must be prospective. Fourth, legal norms must be clear. Fifth, they must not be contradictory. Sixth, they must not demand the impossible. Seventh, they must remain relatively constant. Eighth, there must be congruence between the legal norm and its administration – that is, the actions of officials and other relevant persons that operate under the law.

On Fuller's account, a true "legal system" arises when all eight criteria are upheld to at least some degree with that system.<sup>130</sup> He concedes that they may not be perfectly realized in every situation but argues that they are nonetheless important goals to work toward. As Kristen Rundle explains, it is only a legal system's "*total failure* to meet these eight principles" that will result in something that is not, in Fuller's view, properly considered to be a legal system at all.<sup>131</sup>

Brunnée and Toope expand on Fuller's ideas and posit that "adherence to the criteria of legality facilitates interaction on the basis of mutual respect and reciprocity and, therefore, [at the international level] fosters the commitment of states and other actors to their joint enterprise."<sup>132</sup> Conversely, a norm that fails to satisfy one or more of these criteria will be commensurately less likely to guide and control behavior. This is because that norm may be viewed in accordance with the criteria of legality that it fails to satisfy. For example, a norm that demands the impossible may be viewed as aspirational (or maddening). A retroactive norm could be viewed as unjust; same for an unpromulgated norm. A non-general norm may be seen as arbitrary, while a non-constant norm may strike its objects as capricious. As such, a norm's failure to satisfy one

<sup>&</sup>lt;sup>128</sup> Lon L Fuller, *The Morality of Law*, 1st ed (New Haven: Yale University Press, 1964) at 182. This description famously attracted critique from HLA Hart, who questioned how they could be moral when they appeared to be entirely instrumental. See Frank Lovett, "Lon Fuller, The Morality of Law" in Jacob T Levy, ed, *The Oxford Handbook of Classics in Contemporary Political Theory* (New York: Oxford University Press, 2015).

<sup>&</sup>lt;sup>129</sup> Kristen Rundle, "'Fuller's Internal Morality of Law': Fuller's Internal Morality of Law" (2016) 11:9Philosophy Compass 499–506 at 500.

<sup>&</sup>lt;sup>130</sup> Fuller, *supra* note 131 at 39.

<sup>&</sup>lt;sup>131</sup> Rundle, "'Fuller's Internal Morality of Law", *supra* note 132 at 500.

<sup>&</sup>lt;sup>132</sup> Brunnée & Toope, *supra* note 21 at 76.

or more of the criteria of legality degrades the perceived legality of that norm in the eyes of its subjects.

To take stock: a norm endowed with legitimacy, derived from shared understandings, and legality, derived from satisfying the eight criteria of legality, will be a legal norm. Such norms generate obligation, which is, from the interactional perspective, a particularly effective means of guiding and controlling behavior.<sup>133</sup> However, a legal norm will not be effective unless it is sustained over time. This leads us to the third element of the interactional approach: the practice of legality. This element directs us to consider the day-to-day application of the norm, by reference to the eight criteria of legality outlined above. A legal norm that is not regularly applied in line with these criteria will fade over time; ultimately, it is likely to be destroyed.<sup>134</sup> Importantly, this dimension recognizes that norms do simply appear in the world, fully formed and fully effective. Rather, they must be built and implemented over time. As such, this third element adds an important temporal dimension to the interactional approach.

# C. Benefits of an Interactional Approach to the Space Regime

I have already outlined the traditional resistance to theoretical approaches in much space regime scholarship. Indeed, the positivist pull on space law scholarship has been particularly strong – likely because, as Brunnée and Toope note, "positivism promises easy intelligibility: law can be found, defined, and labelled."<sup>135</sup> This may be oversimplifying positivism's appeal: more modern positivist approaches hardly promise such easy intelligibility. Indeed, they often

<sup>&</sup>lt;sup>133</sup> Fuller's initial exposition was somewhat different but aligned. As Kristen Rundle explains, under the Fuller's conception "the legal subject's moral obligation to obey law only arises in the first place in response to, or in anticipation of, the law-giver's corresponding effort to create and maintain a workable legal order within which she might be able to live her life." Satisfying the eight criteria of legality is indicative of such "corresponding effort." See: Kristen Rundle, *Forms Liberate: Reclaiming the Jurisprudence of Lon L. Fuller* (Oxford: Hart, 2012) at 89.

<sup>&</sup>lt;sup>134</sup> Brunnée & Toope, *supra* note 21 at 355. This aligns with Robert Cover's view regarding the "interpretative commitments ... of officials and of others [that] do determine what the law means and what law shall be:" Robert M Cover, "The Supreme Court, 1982 Term" (1983) 97:1 Harv L Rev 4 at 7.

<sup>&</sup>lt;sup>135</sup> Brunnée & Toope, *supra* note 21 at 10.

concede that the arguments made are just that – arguments, that may or may not reflect what judges, states, officials, or other relevant actors ultimately decide.

Nonetheless, the prospects of intelligibility are attractive when dealing with a realm as strange and as distant as space. As such, much space law scholarship seeks to build on the various treaties' often terse provisions, to construct a more precise legal framework comprising definitive rules that clearly state the conduct required, authorized, or proscribed. This approach has significant merit. It has been used to great effect by Cheng, among others, to clarify, elaborate and navigate the many gaps in the space regime.<sup>136</sup> And, as will be discussed in Chapter 4, the Outer Space Treaty suffers from a lack of clarity that positivist analysis can potentially remedy. But positivism has less to say about the primary research question for this thesis: would an expanded space regime be effective in guiding and controlling behavior in space?

By contrast, the interactional approach is particularly well-suited to responding to this question. This is because the interactional approach embraces the space regime's inherent pluralism, is not impeded by the stark ideological differences among space powers, and does not insist on a strict delineation between binding and non-binding norms. Overall, it is a valuable approach to illustrate the space regime's possibilities and limitations. I expand on each of these points below.

## 1. Embraces the space regime's pluralism

The interactional approach is broadly pluralist in orientation. This is unsurprising: the interactional approach is a modern theoretical approach, and legal pluralism is, as Paul Schiff Berman explains, "the reality underlying the work of any scholar or policymaker who seeks to address the contestation among norm-generating communities, the interaction of legal

<sup>&</sup>lt;sup>136</sup> See, for example, Cheng, *supra* note 30. See also Bin Cheng, "Definitional Issues in Space Law: 'Space Objects', 'Astronauts', and Related Expressions" in *Studies in International Space Law* (Oxford : New York: Oxford University Press, 1997) 492.

authorities, or [how] norms seep across territorial borders and are used, transformed, or contested locally."<sup>137</sup>

Other than a short conference paper from 2011,<sup>138</sup> I have not identified space regime scholarship that embraces this pluralist reality. The reluctance to engage with legal pluralism specifically likely arises from the space regime's orientation toward the international. Space regime scholarship has long neglected the local practices that are so often the focus of legal pluralist scholarship – what Brian Tamanaha describes as "community laws," being the "institutions of social intercourse within communities"<sup>139</sup> and the "body of rules [that] people utilize in their daily social interaction[s]."<sup>140</sup> Even those works that focus on national space legislation – including my own<sup>141</sup> – tend to do so from the perspective that national law is nested within a hierarchically superior international space law.

I have already outlined the somewhat diminished (albeit still financially important) role of the state in modern space activities. The further this role diminishes, the more it compels a pluralistic approach to the space regime. This is because, as René Provost explains, that while "positivism warrants a narrow focus on state-driven normativity" legal pluralism "explodes the limits of our conception of law to encompass forms of normativity beyond those connected to the state in any way."<sup>142</sup>

<sup>&</sup>lt;sup>137</sup> Paul Schiff Berman, "Understanding Global Legal Pluralism: From Local to Global, from Descriptive to Normative" in Paul Schiff Berman, ed, *The Oxford Handbook of Global Legal Pluralism* (Oxford: Oxford University Press, 2020) xiv at 4.

<sup>&</sup>lt;sup>138</sup> Eduard van Asten, "Legal Pluralism in Outer Space" in Mark J Sundahl & V Golpalakrishnan, eds, *New Perspectives on Space Law: Proceedings of the 53rd IISL Colloquium on The Law of Outer Space* (Paris: International Institute of Space Law, 2011) 116.

<sup>&</sup>lt;sup>139</sup> Brian Z Tamanaha, *Legal Pluralism Explained: History, Theory, Consequences* (New York: Oxford University Press, 2021) at 13.

<sup>&</sup>lt;sup>140</sup> *Ibid*.

<sup>&</sup>lt;sup>141</sup> Jack Wright Nelson, "A Practitioner's Guide to Hong Kong's Outer Space Ordinance" (2019) 68:3 German J Air and Space L 387–411.

<sup>&</sup>lt;sup>142</sup> René Provost, *Rebel Courts: The Administration of Justice by Armed Insurgents* (New York: Oxford University Press, 2021) at 12.

Consider the operation of the International Space Station ("**ISS**"). The world's most expensive human-made object<sup>143</sup> is also one of its most legally pluralistic. The ISS is governed under an intergovernmental agreement ("**ISS Agreement**")<sup>144</sup> between the United States, Russia, Japan, Canada, and the member states of the ESA. Under the ISS Agreement, these entities retain "jurisdiction and control" over the modules they provide.<sup>145</sup> As such, inventions that take place in these modules are deemed to occur within the territory of these entities.<sup>146</sup> However, criminal jurisdiction over ISS crew follows the nationality of the alleged perpetrator, regardless of which module they are in.<sup>147</sup>

The ISS' pressurized modules are owned by three different states (the United States, Russia, and Japan) and ESA. As I write these words, seven crew are on board the ISS as *Expedition* 67 – three Americans, three Russians and one Italian.<sup>148</sup> Accordingly, as these astronauts and cosmonauts float through the ISS, they can pass through four different jurisdictions for intellectual property purposes, all the while remaining subject to the criminal jurisdiction of their home states. The analogy is imperfect, but there is an interesting historical parallel: the ISS' pluralism is reminiscent of the pluralism that prevailed in medieval Europe, where, as Andrea Bianchi notes, "[j]urisdictional rules depended on ... the status of the person, or the subject matter, or both."<sup>149</sup>

But a unique feature of the space regime is that there is no territorial sovereignty in space whatsoever. This is unlike the oceans, which are dotted with islands, territorial seas, and Exclusive Economic Zones. It is also unlike international airspace, which is divided into "Flight

<sup>&</sup>lt;sup>143</sup> "Most Expensive Man-Made Object", online: Guinness World Records

<sup>&</sup>lt;https://www.guinnessworldrecords.com/world-records/most-expensive-man-made-object>.

<sup>&</sup>lt;sup>144</sup> *International Space Station Intergovernmental Agreement*, COPUOS, Rep of the Legal Subcomm on Its Fifty-Second Session, U.N. Doc. A/AC.105/C.2, at 3 (2013) art 1, Jan. 29, 1998, TK UNTS TK [hereinafter ISS Agreement].

<sup>&</sup>lt;sup>145</sup> ISS Agreement, art 5(2).

<sup>&</sup>lt;sup>146</sup> ISS Agreement, art 21.

<sup>&</sup>lt;sup>147</sup> ISS Agreement, arts 5 and 22.

<sup>&</sup>lt;sup>148</sup> Mark Garcia, "Expedition 67", (28 March 2022), online: *National Aeronautics and Space Administration* <a href="http://www.nasa.gov/mission\_pages/station/expeditions/expedition67/index.html">http://www.nasa.gov/mission\_pages/station/expeditions/expedition67/index.html</a>.

<sup>&</sup>lt;sup>149</sup> Andrea Bianchi, *International Law Theories: An Inquiry into Different Ways of Thinking*, 1st ed (New York: Oxford University Press, 2016) at 228.

Information Regions" by ICAO<sup>150</sup> (and punctuated by less recognized, but still important areas such "Air Defense Identification Zones,"<sup>151</sup> or "Naval Exclusions Zones"<sup>152</sup> that also affect airspace). It is also unlike Antarctica, which has not widely recognized sovereignties but claimed ones.<sup>153</sup> As such, the ISS' pluralism is compelled by the limited, extraterrorial jurisdiction that states can exercise over their spacecraft under the Outer Space Treaty<sup>154</sup> and the personal jurisdiction that they can exercise over their nationals under general international law.

Similar pluralisms can be found in other space activities, including non-crewed activities. Consider the launch of a commercial telecommunications satellite. This will involve local rules governing the spaceport, national rules regarding rocket launches and payloads, and the international responsibility and liability of involved states.<sup>155</sup> Complex contractual arrangements must be finalized prior to launch. This will involve satellite procurement and launch services agreements, telemetry, tracking and control agreements, as well as the insurance policies that cover a satellite's pre-launch, launch, and in-orbit phases.<sup>156</sup> The preference for project financing of satellite projects further complexifies these arrangements,<sup>157</sup> as lenders seek broad security

<sup>152</sup> Daryl A Mundis, "The Law of Naval Exclusion Zones", (2008), online: *London School of Economics and Political Science* <a href="http://etheses.lse.ac.uk/842/>">http://etheses.lse.ac.uk/842/></a>.

<sup>153</sup> Claims have been made by Argentina, Australia, Chile, France, New Zealand, Norway, and the United Kingdom. Some parties to the Antarctic Treaty do not recognize any territorial claims and others have reserved the right to make a claim. See generally: "Antarctic Territorial Claims", (14 April 2016), online: *Australian Antarctic Program* <a href="https://www.antarctica.gov.au/about-antarctica/law-and-treaty/history/antarctic-territorial-claims/">https://www.antarctica.gov.au/about-antarctica/law-and-treaty/history/antarctic-territorial-claims/</a>.

<sup>154</sup> Jakhu & Pelton, *supra* note 51 at 123.

<sup>155</sup> Primarily under the Outer Space Treaty and the Liability Convention. See: Outer Space Treat, art VI and Liability Convention, art III.

<sup>156</sup> Jack Wright Nelson, "NewSpace, Old Problems: Asset-Based Satellite Financing in the Asia-Pacific" (2021) Singapore J Legal Studies 354–382 at 360.

<sup>157</sup> Roy Goode, Official Commentary on the Convention on International Interests in Mobile Equipment and Protocol Thereto on Matters Specific to Space Assets (Rome: UNIDROIT, 2013) at 158.

<sup>&</sup>lt;sup>150</sup> "Flight Information Regions", (2022), online: *International Civil Aviation Organization* <a href="https://www.icao.int/nacc/pages/firs.aspx">https://www.icao.int/nacc/pages/firs.aspx</a>>.

<sup>&</sup>lt;sup>151</sup> See generally: Peter A Dutton, "Caelum Liberum: Air Defense Identification Zones Outside Sovereign Airspace" (2009) 103:4 Am J Int'l L 691–709. See further Jinyuan Su, "The Practice of States on Air Defense Identification Zones: Geographical Scope, Object of Identification, and Identification Measures" (2019) 18:4 Chinese Journal of International Law 812–835.

packages.<sup>158</sup> These contractual arrangements are invariably governed by different national laws, as well as international standards relating to financing and insurance.<sup>159</sup>

Further, as Gérardine Goh Escolar explains:

"regulations and standards pertaining to satellite communications have been promulgated by international standard-setting organizations. These standards ... deal with the nuts-and-bolts of launching, maintaining, and operating a satellite communication system. Further nuances of the international regulation of satellite communications are added by the activities of international satellite operators and multinational satellite consortia."<sup>160</sup>

Getting to space also requires navigating through airspace, thereby triggering the application of national and international air law.<sup>161</sup> And, once the satellite is operational, the ground stations that transmit signals to and receive signals from the satellite can be stationary or mobile, located anywhere in the world.<sup>162</sup> Control over the satellite can even be effected through cloud-based and globally distributed tracking, telemetry and control services, such that satellite control can change jurisdiction multiple times throughout the day.<sup>163</sup>

With respect to both the ISS and commercial telecommunication satellites, the traditional focus on "official lawmaking bodies" would invariably miss what Berman describes as "the potent power of non-state lawmaking."<sup>164</sup> In particular, a complex bartering system has developed with respect to the ISS, whereby the ISS partners trade everything from air to water to

<sup>&</sup>lt;sup>158</sup> Nelson, "NewSpace, Old Problems", *supra* note 159 at 354.

<sup>&</sup>lt;sup>159</sup> This situation will attract a further layer of complexity if and when the *Protocol to the Convention on International Interests in Mobile Equipment on Matters Specific to Space Assets* enters into force. See generally: Sanam Saidova, *Security Interests under the Cape Town Convention on International Interests in Mobile Equipment* (Oxford: Hart Publishing, 2020).

 <sup>&</sup>lt;sup>160</sup> Gérardine Goh Escolar, "Satellite Communications: Regulatory, Legal, and Trade Issues" in Joseph N Pelton,
 Scott Madry & Sergio Camacho-Lara, eds, *Handbook of Satellite Applications* (New York: Springer, 2016) 1 at 3.
 <sup>161</sup> Ibid.

<sup>&</sup>lt;sup>162</sup> See generally Nelson, "NewSpace, Old Problems", *supra* note 159.

<sup>&</sup>lt;sup>163</sup> See, e.g., "AWS Ground Station", online: *Amazon Web Services, Inc* <a href="https://aws.amazon.com/ground-station/">https://aws.amazon.com/ground-station/</a>>.

<sup>&</sup>lt;sup>164</sup> Berman, *supra* note 140 at 2.

launches amongst themselves.<sup>165</sup> Moreover, mission controllers within the lead agencies – NASA and its Russian counterpart Roscosmos – have reportedly developed internal practices to insulate themselves from broader geopolitical tensions between the United States and Russia.<sup>166</sup>

Non-official lawmaking is also pivotal for commercial satellites. Standards established by engineering organizations are of primary importance, as are arrangements developed within industry-specific regulatory entities – primarily the ITU. While the ITU is further described in Chapter 5, I note for the time being that the ITU's membership includes 193 Member States but also "some 900 companies, universities, and international and regional organizations."<sup>167</sup> Representatives from all these diverse entities meet periodically for World Radiocommunication Conferences,<sup>168</sup> where together they develop the highly technical rules, standards and procedures needed to manage the utilization of radio-frequency spectrum and satellite orbits – providing an example of a diverse transnational epistemic community.<sup>169</sup>

But some space actors have seized upon the lack of territorial sovereignty in space as leaving the door open to non-state sovereignties. This argument was first tentatively made by Stephen Gorove<sup>170</sup> but roundly rejected by other writers.<sup>171</sup> Nevertheless, elements within the commercial space industry have taken up a similar position. Consider SpaceX's bold assertion, in the terms and conditions for their 'Starlink' satellite service, that Mars is a "free planet" and that "no Earth-based government has authority or sovereignty over Martian activities."<sup>172</sup> Accordingly,

<https://www.itu.int:443/en/about/Pages/default.aspx>.

<sup>&</sup>lt;sup>165</sup> Rosario Avveduto, "Past, Present, and Future of Intellectual Property in Space: Old Answers to New Questions" (2019) 29:1 Wash Int'l L J 203 at 225.

<sup>&</sup>lt;sup>166</sup> Joey Roulette, "NASA-Russia Alliance Is Shaken by Events on Planet Earth", online:
<https://www.nytimes.com/2021/12/27/science/russia-nasa-spacex-asat.html>. Whether these practices can weather
Russia's invasion of Ukraine remains to be seen.

<sup>&</sup>lt;sup>167</sup> International Telecommunications Union, "About ITU", (2022), online:

<sup>&</sup>lt;sup>168</sup> See generally: "World Radiocommunication Conferences", (2022), online: *International Telecommunications Union* <a href="https://www.itu.int:443/en/ITU-R/conferences/wrc/Pages/default.aspx">https://www.itu.int:443/en/ITU-R/conferences/wrc/Pages/default.aspx</a>.

<sup>&</sup>lt;sup>169</sup> Peter M Haas, "Introduction: Epistemic Communities and International Policy Coordination" (1992) 46:1 International Organization 1–35.

<sup>&</sup>lt;sup>170</sup> Stephen Gorove, "Interpreting Article II of the Outer Space Treaty" (1968) 37:3 Fordham L Rev 349.

<sup>&</sup>lt;sup>171</sup> Jakhu & Pelton, *supra* note 51 at 393.

<sup>&</sup>lt;sup>172</sup> "Starlink", online: *Starlink Pre-Order Agreement* < https://www.starlink.com>.
SpaceX asserts that any disputes "will be settled through self-governing principles, established in good faith, at the time of Martian settlement."<sup>173</sup>

There is little value in engaging with this bold assertion at the international level, given that these terms and conditions apply between private entities.<sup>174</sup> That these "self-governing principles" will effectively be SpaceX's principles is clear; that SpaceX would become sovereign is implied. But SpaceX's assertion does appear to echo two central pluralist themes. First, that law "has no necessary connection to or relationship with state or sovereignty."<sup>175</sup> To this end, it underscores a point made by Brunnée and Toope: "that law is not a product that is manufactured in centralized, hierarchical systems and merely distributed to social actors for consumption."<sup>176</sup> Rather, those social actors are "active agents" in the "continuing enterprise of lawmaking."<sup>177</sup>

SpaceX's assertion also highlights how the prospect of non-state law can "open[] new grounds, fuel[] new hope, and create[] a sense of potential for transformation and change."<sup>178</sup> To this end, as Berman explains, assertions such as SpaceX's "tend to seep into consciousness, such that the mere existence of these commands, whether enforced or not, may sometimes alter the power dynamics or options placed on the table in policy discussions."<sup>179</sup> Bawaka Country<sup>180</sup> recognizes this, and offers a strident critique, based primarily on Australian Indigenous ontologies.<sup>181</sup> This critique focuses of the presumptions underlying SpaceX's proposed 'Martian settlement.'

<sup>&</sup>lt;sup>173</sup> *Ibid*.

<sup>&</sup>lt;sup>174</sup> A state could conceivably sign up for the Starlink service, and thereby agree to these terms and conditions. However, this would still only be an agreement between a state and a private entity.

<sup>&</sup>lt;sup>175</sup> Tamanaha, *supra* note 142 at 148.

<sup>&</sup>lt;sup>176</sup> Brunnée & Toope, *supra* note 21 at 55.

<sup>&</sup>lt;sup>177</sup> Ibid.

<sup>&</sup>lt;sup>178</sup> Bianchi, *supra* note 152 at 227.

<sup>&</sup>lt;sup>179</sup> Berman, *supra* note 140 at 3.

<sup>&</sup>lt;sup>180</sup> A writing collective including the land, water, human, fauna, flora, rocks, thoughts, and songs that comprise the Yolŋu homeland in North East Arnhem Land, Australia. See: Sarah Wright et al, "Co-Becoming Bawaka: Towards a Relational Understanding of Place/Space" (2016) 40:4 Progress in Human Geography 455–475.

<sup>&</sup>lt;sup>181</sup> A Mitchell et al, "Dukarr Lakarama: Listening to Guwak, Talking Back to Space Colonization" (2020) 81 Political Geography 102218.

## They argue that

"NewSpace entrepreneurs, modernist states, academics and scientific establishments ... see what they call 'outer space' as a new frontier, source of power and site of capital accumulation. These colonial cosmologies of space assume that there are no people or other beings Indigenous to 'outer space,' and that there is no life there to harm. They see 'outer space' as separate from earth, as a site where harmful effects of extraction can be externalized ... [yet] we know ... that 'outer space' is the ancestral domain of many Indigenous cultures, of diverse Aboriginal nations through Australia, of many First Nations throughout the world, and indeed of many diverse non-Indigenous cultures in every continent."<sup>182</sup>

This raises the important question of how various societal groups (as well as other private space actors) will respond to SpaceX's plans, should they come to pass. Some may well view SpaceX's settlement as trespass or heresy. Others may want to join them – but then find that their ideals for Mars are not shared by their fellow settlers.<sup>183</sup> Ultimately, in the absence of sovereignty, conflict, competition, or collaboration among various non-state actors becomes much harder to predict as they construct or deny "quasi-sovereignties."<sup>184</sup>

Space is not necessarily unique in this regard. As Philipp Dann and Julia Eckert note, normgenerative interactions between "actors such as international organizations, corporations, epistemic communities, and social movements, as well ... processes that leave behind formal locations of lawmaking for a wide array of settings, has been a central feature of globalization since the 1980s."<sup>185</sup> But this tendency is particular strong with respect to the space regime: as Durkee explains, private space actors "are articulating norms that may come to have legal

<sup>&</sup>lt;sup>182</sup> *Ibid* at 2.

<sup>&</sup>lt;sup>183</sup> Igor Levchenko et al, "Mars Colonization: Beyond Getting There" (2019) 3:1 Global Challenges 1800062. These themes have been thoroughly explored in science fiction. See, e.g., Kim Stanley Robinson, *Red Mars* (New York: Bantam Books, 1993).

<sup>&</sup>lt;sup>184</sup> Cf Lauren Benton, "From International Law to Imperial Constitutions: The Problem of Quasi-Sovereignty, 1870-1900" (2008) 26:3 Law and History Review 595–619.

<sup>&</sup>lt;sup>185</sup> Philipp Dann & Julia Eckert, "Norm Creation beyond the State" in Marie-Claire Foblets et al, eds, *The Oxford Handbook of Law and Anthropology* (Oxford: Oxford University Press, 2020) at 1. Particularly in light of projects such as Copenhagen Suborbitals, a non-commercial organization that aims to launch a crewed rocket from the high seas. "Copenhagen Suborbitals", online: <a href="https://copenhagensuborbitals.com/">https://copenhagensuborbitals.com/</a>>.

valence not because those norms are produced by official lawmakers, but simply because they are being articulated and publicized and acted upon."<sup>186</sup>

Accordingly, the space regime is pluralistic not just because the term encompasses local, national, and international laws, and both binding rules and non-binding rules. It is pluralistic because it contains a series of overlapping, functional normative orders *and* a wide range of state and non-state actors that shape it.<sup>187</sup> It is a domain of relative, rather than absolute, authorities – a situation emphasized by the lack of territorial sovereignties in space. Understanding these orders and actors is essential to understanding the space regime in practice.<sup>188</sup>

Given the pluralist reality of the space regime, and the growing role played by non-state actors, the interactional approach is well-suited to examining this regime. In particular, the interactional approach recognizes the reality that non-state actors are increasingly norm-generating: this approach "supports the participation of a range of non-state actors in productive power, thereby recognizing a reality of contemporary legal discourse."<sup>189</sup> As such, this framework can "accommodate[] both the continuing pre-eminence of states in the international legal system and the rise of non-state actors"<sup>190</sup> – a situation that aptly describes the modern space regime. Broadly, the interactional approach helps us to make sense of existing patterns of participation in international law-making where norms, although formally sanctioned by states alone, in fact are influenced strongly by a diversity of actors.<sup>191</sup>

<sup>&</sup>lt;sup>186</sup> Durkee, *supra* note 105 at 478.

<sup>&</sup>lt;sup>187</sup> Frédéric Mégret, "International Law as a System of Legal Pluralism" in Paul Schiff Berman, ed, *The Oxford Handbook of Global Legal Pluralism* (Oxford: Oxford University Press, 2020) 531 at 533.

<sup>&</sup>lt;sup>188</sup> Cf Provost, supra note 145 at 4.

<sup>&</sup>lt;sup>189</sup> Brunnée & Toope, *supra* note 21 at 85.

<sup>&</sup>lt;sup>190</sup> *Ibid* at 8.

<sup>&</sup>lt;sup>191</sup> *Ibid* at 36.

# 2. Does not demand ideological agreement

In line with its embrace of the pluralist reality of the space regime, the interactional framework does not "demand the promulgation of a specific set of liberal values."<sup>192</sup> As such, it is better suited to the space domain than policy-oriented approaches such as the New Haven School. The "view from New Haven"<sup>193</sup> is that law is a process,<sup>194</sup> a means of implementing policy,<sup>195</sup> and even a "legitimate form of social engineering."<sup>196</sup> To this end, the New Haven School is interested in "how international law actually operates, how it affects decisions, interacts with municipal law, and shapes norms."<sup>197</sup> As such, it is a fundamentally outcome-oriented jurisprudence.<sup>198</sup>

Historically, the New Haven School has had a particularly close connection with the space regime. This connection arises due to Myres McDougal's co-authorship, with Harold Lasswell and Ivan Vlasic, of one of the first space regime treatises: *Law and Public Order in Space*.<sup>199</sup> This lengthy work – part of a broader series on world public order – was published in 1963. It exhaustively analyzes the various social and political factors impacting the pre-Outer Space Treaty space regime. The touchstone for this analysis is the New Haven School's

<sup>196</sup> Bianchi, *supra* note 152 at 95.

<sup>&</sup>lt;sup>192</sup> *Ibid* at 82. Such a demand would, following Weil, invariably involve "a negation of th[is] inherent pluralism." See: Weil, *supra* note 129 at 441.

<sup>&</sup>lt;sup>193</sup> W Michael Reisman, "The View from the New Haven School of International Law" (1992) 86 Proc Am Soc Int'l L Annu Meet 118–125.

<sup>&</sup>lt;sup>194</sup> Bianchi, *supra* note 152 at 94.

<sup>&</sup>lt;sup>195</sup> Policy being defined generally within the New Haven School as "the making of important decisions which affect the distribution of values." See: Harold D Lasswell & Myers S McDougal, "Legal Education and Public Policy: Professional Training in the Public Interest" (1943) 52:2 Yale L J 203–295 at 207.

<sup>&</sup>lt;sup>197</sup> Janet Koven Levit, "Bottom-Up International Lawmaking: Reflections on the New Haven School of International Law" (2007) 32 Yale J Int'l L 393 at 394.

<sup>&</sup>lt;sup>198</sup> Reisman, *supra* note 196 at 122.

<sup>&</sup>lt;sup>199</sup> McDougal, Lasswell & Vlasic, *supra* note 97.

conceptualization of law as a process by which human dignity – posited as a universal value – can be promoted.<sup>200</sup>

Of particular relevance to this thesis is how the New Haven School foregrounds the close association between human dignity and freedom. I note here that the first sentence of the *Universal Declaration of Human Rights* provides that "recognition of the inherent *dignity* … of all members of the human family is the foundation of *freedom* … in the world."<sup>201</sup> Similarly, McDougal, Lasswell and Vlasic explain that in the space domain "[t]he conception of *human dignity* with which we associate ourselves seeks to sustain *freedom* … by holding the use of coercion within the narrowest practical limits."<sup>202</sup>

However, with respect to the space regime, such an outcome-oriented jurisprudence – and the focus on human dignity and freedom (however laudable these values may be) – seems misplaced given the political impasse in space. Efforts to expand the space regime invariably concede this political reality. But rather than dwell on these political realities, the interactional approach encourages consideration of what might be called 'legal realities.' Is the regime legitimate? Does it enjoy legality? Is it maintained in practice? Overall, does it generate obligation?

By asking these questions, the interactional approach enables us to look beyond over-hasty explanations for the space regime's challenges as being solely attributable to the lack of shared values between space actors. It is not outcome-oriented (like New Haven); it is introspective – and this constitutes the core difference between the two perspectives. As such, an interactional approach facilitates understanding of both the opportunities *for* and limits *to* law-making under conditions of deep diversity<sup>203</sup> – such conditions being exactly what we find today in the space domain.

<sup>&</sup>lt;sup>200</sup> Hengameh Saberi, "Yale's Policy Science and International Law: Between Legal Formalism and Policy Conceptualism" in Anne Orford, Florian Hoffmann & Martin Clark, eds, *The Oxford Handbook of the Theory of International Law*, 427th–451st ed (Oxford: Oxford University Press, 2016) at 429. See also McDougal, Lasswell & Vlasic, *supra* note 97 at 157.

<sup>&</sup>lt;sup>201</sup> Universal Declaration of Human Rights, GA Res 217A (III), UNGAOR, 3rd Sess, Supp No 13, UN Doc A/810 (1948) 71, preamble.

<sup>&</sup>lt;sup>202</sup> McDougal, Lasswell & Vlasic, *supra* note 97 at 149.

<sup>&</sup>lt;sup>203</sup> Brunnée & Toope, *supra* note 21 at 82.

## 3. Focuses on obligation, not provenance

In line with its embrace of pluralism, the interactional approach places little value on traditional dyads such as 'binding / non-binding,' 'public / private,' and 'national / international.'<sup>204</sup> Instead, the focus is on the ability to generate obligation, regardless of specific form or provenance. This is because "[n]either form nor hierarchy of norms can produce obligation in and of themselves."<sup>205</sup> Rather, the interactional approach pays "[c]lose attention to the interactional processes that generate legitimacy and concomitant fidelity" as this is "a far more promising strategy to create international law."<sup>206</sup>

This resonates with another key pluralist insight: that reality structures law, but also that law structures reality. This is because "law has an impact not merely (or perhaps even primarily) because it keeps us from doing what we want. Rather, law changes what we want in the first place."<sup>207</sup> Efforts to expand the space regime are at risk of focusing only on the first, unidirectional projection: that our present space reality (replete with challenges) means we need more space law (to meet those challenges). But this neglects the bidirectional nature of the relationship between law and reality. It overlooks the possibility that it is our current space regime that engenders the reality we wish to avoid – in turn illustrating the possibility of using the space regime we have in order to create the reality we desire.

As such, the interactional approach is well-suited to consider the various efforts to expand the space regime. As outlined in Chapter 1, these efforts include the development of both binding and non-binding norms, with input from both states and non-state actors. Overall, the interactional approach encourages us to look past state-centric hierarchies and traditional delineations and instead engage with the various orders and actors that together – in all their 'messiness' – comprise the space regime.

<sup>&</sup>lt;sup>204</sup> This reflects the reality that, as Frédéric Mégret notes, law exists on a continuum from the local to the international: there is "a far greater continuum between the domestic and the international than was traditionally thought to be possible or even desirable." See: Mégret, *supra* note 190 at 553.

<sup>&</sup>lt;sup>205</sup> Brunnée & Toope, *supra* note 16 at 77.

<sup>&</sup>lt;sup>206</sup> Brunnée & Toope, *supra* note 16 at 77.

<sup>&</sup>lt;sup>207</sup> Berman, *supra* note 140 at 14.

# **D. Final comment**

In this Chapter, I have outlined the interactional approach's three elements, and argued that the space regime provides fertile ground for an application of this approach. While this Chapter has been oriented towards legal theory, my final comment is that the interactional approach ultimately "articulate[s] a *pragmatic* view of how international law is created and maintained."<sup>208</sup> It is fundamentally a practical approach that "provides concrete guidance in seizing opportunities for effective law-making and also shows when law-making attempts are likely to fail."<sup>209</sup> To this end, the interactional analysis in the next three Chapters is sobering. The picture painted is not one of a robust space regime. Nonetheless, a better understanding of the regime's weaknesses is necessary before attempts are made to expand that regime.

<sup>&</sup>lt;sup>208</sup> Brunnée & Toope, *supra* note 21 at 17. My emphasis.

<sup>&</sup>lt;sup>209</sup> *Ibid*.

# **CHAPTER 3**

## Shared Understandings

# A. Introduction

Is the space regime grounded in the shared understandings? In this Chapter, I respond to this question. Recall that, from an interactional perspective, regimes must be based on shared understandings to enjoy legitimacy. However, constraints of time and space preclude considering the entirety of the space regime's stock of shared understandings. Instead, in Section B, I examine the primary shared understanding that all regimes require: the shared understanding regarding the need for normativity. With respect to the space regime, this is the shared understanding that space should not be a lawless and ungoverned domain. I argue that there is such a shared understanding, and that its existence is best demonstrated by the vitality of the space regime's people and places – in other words, the space regime's transnational community. However, as described in Section C, this shared understanding is challenged by the near-term fragmentation of the space regime that will accompany United States – Russia decoupling.

# B. The need for the space regime

The space regime's progressive evolution, and its persistence over time, suggests that there is a shared understanding regarding the need for the space regime. Indeed, it may seem facile to inquire whether there is a shared understanding regarding the need for a particular legal regime when that legal regime is clearly operational. In such circumstances, common sense strongly suggests that the need for the regime is at least shared amongst the regime's participants, even if they may disagree on the actual norms that comprise that regime. Nonetheless, there is significant value in examining the shared understanding regarding the need for the space regime. More specifically, such an examination focuses our attention on the people and places that are instrument to that regime.

The importance of people and places is often forgotten during regime analysis. Instead, the focus is often on the instruments that form the regime's parameters. With respect to shared understandings, a focus on instruments may lead us to the argument that the broad membership

of the Outer Space Treaty demonstrates that there is a broadly shared understanding regarding the need for the space regime. After all, if no such shared understanding existed, then why would these states sign on to the treaty?

This argument fails from an interactional perspective. Inclusiveness and representativeness are essential to the interactional approach.<sup>210</sup> As such, it could be pointed out that the ratifying parties and signatories do not represent every state – let alone the fact that many space actors, being non-states, cannot sign the Outer Space Treaty (which is only open to states).<sup>211</sup> There are 193 United Nations Member States. As such, more than 50 Member States have neither signed nor ratified. This diverse group includes Andorra, Cambodia, Grenada, Serbia, Timor-Leste, and Zimbabwe.<sup>212</sup> Overall, the ratification status of the Outer Space Treaty in raw numbers tell us little about the shared understandings that may or may not underpin the space regime. However, it does invite consideration of why more than 50 states have refrained from ratification<sup>213</sup> – and how these states may view efforts to expand the space regime.

Even universal membership of the Outer Space Treaty would be insufficient to conclude that there is a shared understanding regarding the need for normativity in space.<sup>214</sup> After all, an inforce, universally-ratified treaty can still be a 'paper tiger' – that is, entirely ineffective in enabling and guiding interactions among states and other international actors.<sup>215</sup> Further,

<sup>213</sup> The reasons why some states have elected to remain outside the Outer Space Treaty undoubtedly vary. But a key reason may be the simplest one: the Outer Space Treaty largely restates the principles set out in the Legal Principles Declaration. Given that the Legal Principles Declaration was adopted without a vote by the United Nations General Assembly in 1963, it may be that some states view accession to the Outer Space Treaty as unnecessary (rightly or wrongly). Indeed, some scholars view the Outer Space Treaty as predominantly representing customary international law. See: Ram S Jakhu & Steven Freeland, "The Relationship between the Outer Space Treaty and Customary International Law" (2016) 59 Proc Int'l Inst Space L 183. In particular, Articles I, II, VI and VII are generally viewed as unchallenged. The apparently customary status of the Outer Space Treaty's provisions may further suggest to non-signatories that they need not accede to the Outer Space Treaty.

<sup>214</sup> Brunnée & Toope, *supra* note 21 at 142.

<sup>215</sup> *Ibid* at 73.

<sup>&</sup>lt;sup>210</sup> *Ibid* at 196.

<sup>&</sup>lt;sup>211</sup> Outer Space Treaty, art XIV(1).

<sup>&</sup>lt;sup>212</sup> See: UN Doc A/AC.105/C.2/2022/CRP.10 (28 March 2022).

participation in the space regime is entirely possible without ratifying the Outer Space Treaty<sup>216</sup> – a further example of what Andrew Friedman generally describes as "compliance with ratification."<sup>217</sup> As such, it cannot be inferred from the fairly widespread and longstanding membership of the Outer Space Treaty that there is a shared understanding regarding the need for space regime.

Indeed, such an inference would be particularly problematic given the Outer Space Treaty was negotiated by a small circle of states. Following an extensive review of the Outer Space Treaty's *travaux préparatoires*, van Eijk finds that

"[t]he US and USSR negotiated nearly all of the [Outer Space Treaty] bilaterally and in secret during the second half of 1966. The US then consulted the UK, Canada, Australia, and France ... and then a select group [of states] which *excluded* Egypt, Morocco, Sierra Leone, Chad, and India.<sup>218</sup> This effectively prevented the Global South from meaningful contribution to the [Outer Space Treaty] – changes to the pre-negotiated draft required both [American and Soviet] approval."<sup>219</sup>

This manner of lawmaking is not only inequitable; it is highly problematic from an interactional perspective. As Brunnée and Toope note, "[i]f the imbalance of power between [treaty] parties is great, if there is no real opportunity for negotiations, and if no mutual sense of duty is evident, then states have not really created a treaty at all."<sup>220</sup> Rather, they "have merely

<sup>&</sup>lt;sup>216</sup> An example of this Guatemala. Having neither signed nor ratified the Outer Space Treaty, Guatemala launched its first satellite – Quetzal-1 – from the Japanese module on the ISS on 28 April 2020. Guatemala then transmitted the relevant information regarding Quetzal-1 to United Nations Secretary-General for inclusion on Register of Objects Launched into Outer Space. See: UN Doc. A/AC.105/INF/440 (5 November 2020).

 <sup>&</sup>lt;sup>217</sup> Andrew Friedman, "Compliance without Ratification: Using International Law in Non-Binding Scenarios"
(2021) Hors-série RQDI, available at: <a href="https://www.sqdi.org/wp-content/uploads/137-157-HSSC-6">https://www.sqdi.org/wp-content/uploads/137-157-HSSC-6</a> Friedman intégré-1.pdf>.

<sup>&</sup>lt;sup>218</sup> Additional exclusions were Sweden, Lebanon, and Iran. Brazil was, however, consulted and successfully negotiated the inclusion of "irrespective of their degree of economic or scientific development" in Article I. See: van Eijk, *supra* note 101.

<sup>&</sup>lt;sup>219</sup> *Ibid* at 32. See further: Weeks, *supra* note 103.

<sup>&</sup>lt;sup>220</sup> Brunnée & Toope, *supra* note 21 at 40–41.

acted in the form of treaty."<sup>221</sup> In such circumstances, "[t]he 'participation' of many other states in law-making is often merely formal; there is no real inclusion, no engagement."<sup>222</sup> Unfortunately, this aptly describes the Outer Space Treaty's law-making process. Nor does the existence of the other space treaties provide sufficient evidence of a shared understanding regarding the need for normativity in space. While the Rescue Agreement, the Liability Convention, the Registration Convention, and the Moon Agreement had broader input than the Outer Space Treaty, such input was still far from universal.

Barton Beebe provides a related perspective.<sup>223</sup> He posits that the space regime's "Golden Age" – the period from 1967 to 1979 that saw the conclusion of the Outer Space Treaty, the Rescue Agreement, the Liability Convention, the Registration Convention, and the Moon Agreement – was, in fact, a fundamentally reactionary development. Under the guise of extending the rule of law to space, he argues that the development of the space regime was primarily driven by lawyers' desire to protect their privileged position in an increasingly scientific age.<sup>224</sup> To support his argument, Beebe reconstructs the lively discourse at lawyers' conferences and within law faculties that followed the launch of the first artificial satellite, the Soviet Union's *Sputnik*, in 1957. He posits a sociological fact: that lawyers feared a decline in their relative prestige in the space age.

Beebe's analysis suggests that there was no shared understanding regarding the need for normativity during the regime's early years. Rather, it appears there was a shared understanding among lawyers that they needed to secure their prestige (and their jobs). As such, neither the widespread (albeit non-universal) ratification of the Outer Space Treaty, nor the existence of the other space treaties, nor even the enthusiasm of the space regime's Golden Age, appears conclusive as to the shared understanding regarding the need for normativity in space.

However, Beebe's analysis perhaps overstates the role of lawyers, thus neglecting the broader transnational community surrounding the space regime. Such communities, as Emanuel Adler explains, "cut across state boundaries and mediate between states, individuals, and human

<sup>&</sup>lt;sup>221</sup> Ibid.

<sup>&</sup>lt;sup>222</sup> *Ibid* at 73.

<sup>&</sup>lt;sup>223</sup> Barton Beebe, "Law's Empire and the Final Frontier: Legalizing the Future in the Early Corpus Juris Spatialis" (1999) 108 Yale L J 1737–1774.

<sup>&</sup>lt;sup>224</sup> *Ibid* at 1741.

agency, on [the] one hand, and social structures and systems, on the other."<sup>225</sup> These communities are often both the source and repository of shared understandings. However, as Brunnée and Toope note, these transnational communities do not necessarily share a common goal.<sup>226</sup> Indeed, such communities are often riven by internal disputes and rivalries. Fortunately, "[i]t is not necessary to have a morally cohesive 'community' before lawmaking is possible." <sup>227</sup> And despite their disagreements, transnational communities generally share an understanding of what they are doing, and why they are doing it.<sup>228</sup>

Accordingly, the existence of a broad and strong transnational community supporting the space regime would indicate that there is a shared understanding (at least within that community) of that support, and the reasons for that support. After all, while there may be other reasons to support a regime,<sup>229</sup> it is reasonable to infer that the primary reason why a transnational community would support a regime is because they share an understanding of the need for that regime.<sup>230</sup>

Is there a broad and strong transnational community supporting the space regime? I argue that there is. First and foremost, the space regime engages a wide range of people. Alongside government space lawyers, diplomats and officials, the space regime also engages academic space lawyers, commercial space lawyers, and legal professionals in cognate fields, including space insurance, financing, regulatory engineering, and lobbying. These people have their own longstanding, international professional association, the International Institute of Space Law,<sup>231</sup> as well as local bar associations and interest groups.<sup>232</sup>

<sup>&</sup>lt;sup>225</sup> Emanuel Adler, *Communitarian International Relations: The Epistemic Foundations of International Relations* (London: Routledge, 2005) at 15.

<sup>&</sup>lt;sup>226</sup> Brunnée & Toope, *supra* note 21 at 44.

<sup>&</sup>lt;sup>227</sup> Ibid.

<sup>&</sup>lt;sup>228</sup> *Ibid* at 13. Adler, *supra* note 228 at 11.

<sup>&</sup>lt;sup>229</sup> For example, compulsion, strategic alignment or what might be called 'optics' – that is, public perception of state behavior.

<sup>&</sup>lt;sup>230</sup> This inference is based on the simple intuition that a person or entity is unlikely to support a regime, particular over the long term, unless they perceive that there is a need for that regime.

<sup>&</sup>lt;sup>231</sup> International Institute of Space Law, "About Us", (2022), online: <a href="https://iisl.space/">https://iisl.space/</a>>.

<sup>&</sup>lt;sup>232</sup> See, e.g., American Bar Association, "Forum on Air & Space Law", (2022), online:

<sup>&</sup>lt;https://www.americanbar.org/groups/air\_space/>.

These people are then brought together in various places – sometimes physical, sometimes virtual. Universities worldwide maintain research and teaching institutes dedicated to the space regime.<sup>233</sup> National space agencies typically have dedicated space law centers – such as the China National Space Administration's Space Law Center.<sup>234</sup> Conference occur throughout the year, most notably the Colloquium on the Law of Outer Space that takes place at each annual International Astronautical Congress.<sup>235</sup>

The locus of this community is easily identifiable: COPUOS. First established in 1958 as an *ad hoc* United Nations committee, COPUOS has long served, as Annette Froehlich notes, "as a central platform for international cooperation in the field of outer space activities."<sup>236</sup> As the "focal point for international cooperation" in relation to space, COPUOS is engaged in diverse issues including space debris, the use of nuclear power sources in space, global navigation satellite systems, safe orbital operations, and planetary defense.<sup>237</sup>

In 1959 (when COPUOS became a permanent committee of the United Nations), COPUOS membership stood at 24 states. It now includes exactly 100 states, with all regions represented.<sup>238</sup> But what makes COPUOS transnational, rather than merely international, is that it includes an ever-increasing number of non-state observer entities. Presently numbering over 40, these

<sup>234</sup> Space Law Center of China National Space Administration Established, by Aerospace China, 4 (Beijing, 2017).

<sup>237</sup> *Ibid* at 14.

<sup>&</sup>lt;sup>233</sup> United Nations Office of Outer Space Affairs, "Directory of Educational Opportunities in Space Law", (2020), online:

<sup>&</sup>lt;https://www.unoosa.org/documents/pdf/spacelaw/eddir/EducationOpportunitiesinSpaceLaw2020.pdf>.

<sup>&</sup>lt;sup>235</sup> International Institute of Space Law, *supra* note 234.

<sup>&</sup>lt;sup>236</sup> Annette Froehlich, Vincent Seffinga & Ruiyan Qiu, "The Development of the Mandates of the Committee on the Peaceful Uses of Outer Space (COPUOS) and the Conference on Disarmament (CD) and the Collaboration Between the Forums" in Annette Froehlich & Vincent Seffinga, eds, *The United Nations and Space Security* (Cham: Springer International Publishing, 2020) 29.

<sup>&</sup>lt;sup>238</sup> "COPUOS Membership Evolution", online:

<sup>&</sup>lt;https://www.unoosa.org/oosa/en/ourwork/copuos/members/evolution.html>.

entities are accredited to COPUOS, participate in and present during COPUOS meetings, and are generally engaged with the various aspects of the committee's work.<sup>239</sup>

However, it remains to be seen if and how COPUOS will accommodate private entities. Currently, the observers at COPUOS are primarily international organizations, industry associations, and scientific entities.<sup>240</sup> No commercial space enterprise is an observer in its own right, and I have not identified any public records suggesting that any have applied for observer status. Nonetheless, many commercial space enterprises remain deeply entwined with their respective states.<sup>241</sup> To return to the example of SpaceX, they can count on having their opinions heard in COPUOS through the public input mechanisms of the United States Government.<sup>242</sup> This entanglement may loosen over time so as to warrant separate representation. Nonetheless, it presently appears that, despite not having commercial space enterprises as stand-alone observers, COPUOS represents the focal point of the space regime's transnational community.

Together, these actors use COPUOS to pursue diverse – and often competing – objectives. They share no common outlook regarding all aspects of the space regime. But what these diverse actors have in common is that all speak the space regime's scientific and legal language.<sup>243</sup> Indeed, in some sense they are forced to speak this language by COPUOS' consensus process of

<sup>239</sup> "COPUOS Observers", online: <https://www.unoosa.org/oosa/en/ourwork/copuos/members/copuos-observers.html>.

<sup>240</sup> Current observer entities include the European Union, the International Air Transport Association, the International Law Association, the African Association of Remote Sensing of the Environment, the International Organization of Standardization, and the Square Kilometre Array Observatory. Current observer entities include the European Union, the International Air Transport Association, the International Law Association, the African Association of Remote Sensing of the Environment, the International Organization of Standardization, and the Square Kilometre Array Observatory. See: *Ibid*.

<sup>241</sup> See comments at footnote 121.

<sup>242</sup> See, for example, the public input request relating to the Long-Term Sustainability Guidelines. See: United States Department of State, "Notice 11630: Seeking Private Sector Written Input on Implementation of the 21 Guidelines for the Long-Term Sustainability of Outer Space Activities", (8 July 2022), online: *Solicitation for Federal Register* <https://www.state.gov/remarks-and-releases-bureau-of-oceans-and-international-environmentaland-scientific-affairs/notice-11630-seeking-private-sector-written-input-on-implementation-of-the-21-guidelinesfor-the-long-term-sustainability-of-outer-space-activities/>.

<sup>243</sup> Cf Brunnée & Toope, supra note 16 at 143–144, making the same point in relation to the climate regime.

decision-making.<sup>244</sup> "Consensus," Philip Allott explains, "means that, instead of adopting treat[ies] [or other] texts by majority voting, negotiation continues until there is no further significant opposition to a text."<sup>245</sup> As Steer notes, the size of COPUOS' current membership means that reaching consensus on new issues is very difficult.<sup>246</sup> Similarly, Allott notes that the negotiations resulting in UNCLOS – which also adopted a consensus procedure – were "prolonged," "intense" and "painful."<sup>247</sup> But he also notes a redeeming feature of this consensus process: "it initiates the task of mutual education which is the essence of participation in a society."<sup>248</sup> This is because, "in a consensus system … all members of society must take steps to learn the situation, interests, aspirations, and attitudes of all other members."<sup>249</sup> As such, "[t]o win support, to reduce opposition, to adjust and mediate and reconcile, it is necessary to have an understanding of the real positions of all other participants."<sup>250</sup> And to do this effectively in the context of the space regime, they must speak the space regime's scientific and legal language.

By speaking this language, participants evidence an understanding of the unique physical and legal environment of space and an appreciation of the main negotiating and policy issues. And through other actions – by attending or dialing into COPUOS meetings in Vienna each year, giving presentations, participating in debates, and even holding side events – they all evidence the vitality of the space regime's transnational community.<sup>251</sup>

To take stock: the deep involvement of people in the space regime, the proliferation of places dedicated to studying and implementing this regime, and the broad-based engagement of various space actors with COPUOS suggests the existence of a strong and broad space regime transnational community. As such, it is reasonable to infer that this transnational community has

<sup>&</sup>lt;sup>244</sup> Steer, *supra* note 2 at 756.

<sup>&</sup>lt;sup>245</sup> Philip Allott, "Making the New International Law: Law of the Sea as Law of the Future" (1985) 40:3 Int'l J 442–460 at 443.

<sup>&</sup>lt;sup>246</sup> Steer, *supra* note 2 at 756.

<sup>&</sup>lt;sup>247</sup> Allott, "Making the New International Law", *supra* note 248 at 448.

<sup>&</sup>lt;sup>248</sup> *Ibid*.

<sup>&</sup>lt;sup>249</sup> Ibid.

<sup>&</sup>lt;sup>250</sup> *Ibid*.

<sup>&</sup>lt;sup>251</sup> Cf Brunnée & Toope, supra note 21 at 22.

a shared understanding regarding the need for normativity in space, thereby satisfying the first element of the interactional approach.

# C. Decoupling and fragmentation

The vitality of the space regime's transnational community is an important source of strength for the regime. However, there are challenges on the horizon for this community. Specifically, how will the community, and its central pillar COPUOS, respond to the ongoing decoupling of the U.S. and Russian space programs?

To answer this question, it is necessary to look back over the space regime's historical development. I divide this development into four stages.<sup>252</sup> The first stage stretched from the early 1950s to 1967. The key space regime instruments during this first stage were policy declarations from the space superpowers, the United States and the Soviet Union. These declarations were gradually formalized in a series of General Assembly resolutions.<sup>253</sup> The most notable among these was the Legal Principles Declaration. This declaration was the first substantive General Assembly resolution regarding international space law. Yet it was negotiated privately by the United States and the Soviet Union, building upon a series of bilateral agreements between NASA and the Soviet Academy of Sciences.<sup>254</sup> The final draft of the Legal Principles Declaration was then submitted by the United States and the Soviet Union to COPUOS for endorsement and comment – but not amendment. Given this seeming *fait accompli*, the French COPUOS delegation welcomed the draft to COPUOS "from the secluded places in which it was negotiated," commended the "spirit of compromise demonstrated by its

<sup>&</sup>lt;sup>252</sup> Such divisions are ultimately arbitrary, but nonetheless have explanatory power. For alternative divisions see Froehlich, Seffinga & Qiu, *supra* note 225 dividing this historical development into three sections; and Chen, *supra* note 25 at 674, dividing the space regime's history into segments lasting approximately two decades.

<sup>&</sup>lt;sup>253</sup> Cassandra Steer, "Sources and Law-Making Processes Relating to Space Activities" in *Routledge Handbook of Space Law* (New York: Routledge, 2016) 1 at 20 (explaining that "[s]pace law started out as soft law").

<sup>&</sup>lt;sup>254</sup> See: UN Doc A/5482 (26 August 1963).

authors," but lamented "that their concern for preserving the equilibrium of their edifice" made them fearful that "the moving of a single comma might lead to its collapse."<sup>255</sup>

Alongside these resolutions, and the establishment of COPUOS as an *ad hoc* committee in 1958, this first stage also saw the conclusion of the *Treaty Banning Nuclear Weapon Tests in the Atmosphere, in Outer Space and Under Water*, signed on 5 August 1963 ("**Partial Test Ban Treaty**"). This treaty forbids its parties from conducting, permitting, or encouraging any nuclear explosion in outer space, as well as in the atmosphere or underwater. Again, it was primarily a United States and Soviet project.<sup>256</sup>

The second stage consisted of adopting international treaties – most notably the Outer Space Treaty – under the auspices of the United Nations. I have already outlined how the negotiation and drafting of the Outer Space Treaty was a small circle exercise, with every word requiring both American and Soviet approval. The process for the Rescue Agreement, the Liability Convention and the Registration Convention was more open, but the predominance of the United States and the Soviet Union remained. This second stage ended when the Moon Agreement was signed in 1979 without gaining American or Soviet signatures.

The third stage in my proposed outline of the space regime's development ran from 1979 to 2020. It consisted of a return to predominantly non-binding instruments. This stage began inauspiciously. In 1982, there was a significant disagreement between the United States and the Soviet Union regarding the *Principles Governing the Use by States of Artificial Earth Satellites for International Direct Television Broadcasting*.<sup>257</sup> This episode concluded with the United Nations General Assembly passing a resolution relating to such broadcasts with the strong support of the Soviet Union, its allies, the concurring votes of most of the Group of 77,<sup>258</sup> but against the contrary or abstaining votes of the United States and its allies.<sup>259</sup>

<sup>&</sup>lt;sup>255</sup> See: UN Doc A/5549/Add.1 (27 November 1963) at 18.

<sup>&</sup>lt;sup>256</sup> "Nuclear Test Ban Treaty", (2020), online: *JFK Library* <a href="https://www.jfklibrary.org/learn/about-jfk/jfk-in-history/nuclear-test-ban-treaty">https://www.jfklibrary.org/learn/about-jfk/jfk-in-history/nuclear-test-ban-treaty</a>.

<sup>&</sup>lt;sup>257</sup> This dispute largely boiled down to a 'freedom of information' versus 'national sovereignty' debate.

<sup>&</sup>lt;sup>258</sup> Eduardo D Gaggero, "Quo Vadis COPUOS?" (1986) 2:3 Space Policy 196–199 at 197.

<sup>&</sup>lt;sup>259</sup> United Nations Digital Library, "Voting Record: Principles Governing the Use by States of Artificial Earth Satellites for International Direct Television Broadcasting", (10 December 1982), online: *Voting Data* <a href="https://digitallibrary.un.org/record/1493353">https://digitallibrary.un.org/record/1493353</a>>.

But change followed the collapse of the Soviet Union. Agreement was reached on several space regime instruments. This included the *Principles Relevant to Use of Nuclear Power* Sources in Outer Space<sup>260</sup> in 1992 and the Declaration on International Cooperation in the Exploration and Use of Outer Space for the Benefit and in the Interest of All States, Taking into Particular Account the Needs of Developing Countries<sup>261</sup> in 1996.

Then, in 1998, the signing of the ISS Agreement marked the start of sustained in-space collaboration between the United States and Russia. Subsequent General Assembly resolutions throughout the 2000s and 2010s were adopted without a vote, having proceeded there from COPUOS with joint American and Russian support (or at least no objection). This included resolutions clarifying aspects of the Liability Convention and Registration Convention,<sup>262</sup> providing recommendations on national space legislation,<sup>263</sup> and endorsing COPUOS' *Space Debris Mitigation Guidelines*<sup>264</sup> in 2007 and *Guidelines for the Long-Term Sustainability of Outer Space Activities* in 2019.<sup>265</sup>

We have now entered new fourth age as of 13 October 2020, with the signing of the Accords. While they have already attracted more signatories than the Moon Agreement, the Accords also

<sup>&</sup>lt;sup>260</sup> General Assembly Resolution 47/68 of 14 December 1992 (adopted without vote).

<sup>&</sup>lt;sup>261</sup> General Assembly Resolution 51/122 of 13 December 1996 (adopted without vote). Steer notes that while the existence of this resolution is "a positive sign ... it has little normative weight as a General Assembly resolution and has had arguably little to no impact." See Steer, *supra* note 2 at 758.

<sup>&</sup>lt;sup>262</sup> General Assembly Resolution 59/115 of 10 December 2004 and 62/101 of 17 December 2007

<sup>&</sup>lt;sup>263</sup> General Assembly Resolution 68/74 of 11 December 2013 (adopted without vote).

<sup>&</sup>lt;sup>264</sup> Space Debris Mitigation Guidelines of the Committee on the Peaceful Uses of Outer Space (Vienna: United Nations Office for Outer Space Affairs, 2010). See also: General Assembly Resolution 62/217 of 22 December 2007 (adopted without vote).

<sup>&</sup>lt;sup>265</sup> *Guidelines for the Long-Term Sustainability of Outer Space Activities*, A/AC.105/2018/CRP.20 (Vienna: Committee on the Peaceful Uses of Outer Space, 2018). See generally: Chen, *supra* note 28 at 674.

attracted strident criticism from other space powers,<sup>266</sup> notably Russia and China.<sup>267</sup> The then-Administrator of Roscosmos notably responded to news of the Accords in a since-deleted tweet by likening the Accords to an invasion of the Moon, a new "Operation Iraqi Freedom" to be performed by a new "Coalition of the Willing."<sup>268</sup> While surely a knee-jerk reaction, the vitriol that the Accords attracted right out of the gate suggests that the Accords represent a paradigm shift. Russia and China now look set to publish their own framework instrument to govern their planned "International Lunar Research Station."<sup>269</sup> While the Accords have been tabled at COPUOS, I identify the Accords as marking the beginning of a further, fourth stage in the development of the space regime.

An increasingly fragmented space regime marks this stage. It appears that the future period of lunar exploration will differ from the previous period of lunar explanation in an important way. During the previous lunar exploratory phase, both American *Apollo* missions and Soviet *Luna* missions – as well as the joint *Apollo-Soyuz* Test Project – operated under the same legal framework (at least in theory).<sup>270</sup> Similarly, as Matthew Looper notes, the ISS has "principally been a joint Russian-American endeavor,"<sup>271</sup> governed by the ISS Agreement. By contrast, the coming phase of lunar exploration looks set to be governed by two separate instruments. There is no guarantee of compatibility between these instruments regarding contentious issues such as

<sup>&</sup>lt;sup>266</sup> Kiran Vazhapully, "Space Law at the Crossroads: Contextualizing the Artemis Accords and the Space Resources Executive Order", (22 July 2020), online: *Opinio Juris* <a href="http://opiniojuris.org/2020/07/22/space-law-atthe-crossroads-contextualizing-the-artemis-accords-and-the-space-resources-executive-order/>. See also: Jack Wright Nelson, "The Artemis Accords and the Future of International Space Law" (2020) 24:31 American Society of International Law (Insights).

<sup>&</sup>lt;sup>267</sup> See generally Paul Stimers & Audrey Jammes, "The Space Review: The Artemis Accords After One Year of International Progress", (18 October 2021), online: *The Space Review* <a href="https://www.thespacereview.com/article/4267/1">https://www.thespacereview.com/article/4267/1</a>>.

<sup>&</sup>lt;sup>268</sup> Joey Roulette, "'Star Trek, not Star Wars:' NASA Releases Basic Principles for Moon Exploration Pact", *Reuters* (15 May 2020), online: <a href="https://www.reuters.com/article/us-space-exploration-artemis-idUSKBN22R2Z9">https://www.reuters.com/article/us-space-exploration-artemis-idUSKBN22R2Z9</a>. See generally: Nelson, *supra* note 88.

<sup>&</sup>lt;sup>269</sup> Stimers & Jammes, *supra* note 270.

<sup>&</sup>lt;sup>270</sup> At that time, the Outer Space Treaty, the Rescue Agreement, and the Liability Convention.

<sup>&</sup>lt;sup>271</sup> Matthew Looper, "International Space Law: How Russia and the U.S. are at Odds in the Final Frontier"

<sup>(2022) 2</sup> SC J Int'l L & Bus 111 at 111.

buffer or "safety zones" around future lunar installations.<sup>272</sup> As such, fragmentation of the space regime as applied on the lunar surface looks increasingly likely.

To take stock: American and Russian engagement has been key to the previous three stages of the space regime's development. They have been the 'indispensable states' in this regime. And, as Looper explains, "historically the U.S. and Russia have seen eye to eye on international space law."<sup>273</sup> But, as Durkee notes:

"the world has changed, and so has space. A bi-polar world has become multipolar, and an optimistic period of multilateralism has given way to a decline in robust international cooperation. Meanwhile, developments in outer space have exploded in complexity, ambition and commercial promise."<sup>274</sup>

As such, the fourth stage's fragmentation is unsurprising given the ongoing decoupling between the United States and Russia. This decoupling is reflected in recent developments across the space regime. Russia (along with China) voted against the creation of the Space Threats Working Group in December 2021<sup>275</sup> (although both states are nonetheless participating in the working group). And the decoupling has accelerated rapidly since Russia further invaded Ukraine on 24 February 2022. Most recently, the newly-installed Administrator of Roscosmos stated that Russia will pull out of the ISS around 2024 – only to swiftly row those comments back.<sup>276</sup> Nonetheless, the ISS will eventually be decommissioned. It will not be replaced. The eventual breaking apart of the American and Russian orbital segments of the ISS will be accompanied by the delinking of the ISS primary mission control centers in Houston and Moscow. The practice of astronauts and cosmonauts training together and launching into space

<sup>&</sup>lt;sup>272</sup> See generally: Jack Wright Nelson, "Safety Zones: A Near-Term Legal Issue on the Moon" (2020) 44:2 J Space L 604.

<sup>&</sup>lt;sup>273</sup> Looper, *supra* note 274 at 115.

<sup>&</sup>lt;sup>274</sup> Durkee, *supra* note 123 at 711.

<sup>&</sup>lt;sup>275</sup> Zhanna Malekos Smith, "Putin and Xi's Pact for Outer Space", (18 April 2022), online: *Articles of War, Lieber Institute, West Point* <a href="https://lieber.westpoint.edu/putin-xis-pact-outer-space/">https://lieber.westpoint.edu/putin-xis-pact-outer-space/</a>.

<sup>&</sup>lt;sup>276</sup> Loren Grush, "Russia Reportedly Tells NASA it's Staying with the International Space Station Until at Least 2028", (27 July 2022), online: *The Verge* <a href="https://www.theverge.com/2022/7/27/23281086/nasa-roscosmos-russia-international-space-station-2028-partnership">https://www.theverge.com/2022/7/27/23281086/nasa-roscosmos-russia-international-space-station-2028-partnership</a>.

together will end.<sup>277</sup> The ISS Agreement, various memoranda and other legal instruments, as well as the previously mentioned bartering practice, will all fall away.

The proposed fate of the ISS is a stark illustration of the destruction of places where people interacted, and by those interactions, contributed to the vitality of the space regime's transnational community. Indeed, it appears that United States – Russian co-operation may have been the fulcrum of that community. I do not doubt that this community – and its central pillar, COPUOS – will survive decoupling. And the space regime itself will not disappear. But, as Eduardo Gaggero notes, "COPUOS is only a mirror of the world around it."<sup>278</sup> As such, the vitality of the space regime's transnational community appears to be in jeopardy in this fourth stage of the space regime's development.

#### **D.** Final comment

In this Chapter, I have examined whether there is a shared understanding regarding the need for the space regime. While I have concluded that there is, there are significant challenges on the horizon. Maintaining this understanding as truly *shared* faces strong headwinds, given the decoupling between the two states that have historically driven the space regime's development. As such, the shared understanding regarding the need for normativity may require reinforcement if efforts to expand the space regime are likely to succeed. But such reinforcements would only be the first step. This is because "shared understandings alone do not make law."<sup>279</sup> They can give rise to social norms, but "what distinguishes legal norms from other types of social norms is not form or pedigree, but adherence to specific criteria of legality."<sup>280</sup> As such, I turn now to consider the eight criteria of legality in relation to the space regime's cornerstone instrument, the Outer Space Treaty.

<sup>&</sup>lt;sup>277</sup> Wendy Whitman Cobb, "Russia's Withdrawal from the International Space Station Could Mean the Early Demise of the Orbital Lab – and Sever another Russian Link with the West", online: *The Conversation* <http://theconversation.com/russias-withdrawal-from-the-international-space-station-could-mean-the-early-demiseof-the-orbital-lab-and-sever-another-russian-link-with-the-west-187754>.

<sup>&</sup>lt;sup>278</sup> Gaggero, *supra* note 261 at 197.

<sup>&</sup>lt;sup>279</sup> Brunnée & Toope, "Interactional International Law", *supra* note 93 at 310.

<sup>&</sup>lt;sup>280</sup> Ibid.

# **CHAPTER 4**

Criteria of Legality

# A. Introduction

Does the Outer Space Treaty satisfy the eight criteria of legality? In this Chapter, I respond to this question. Recall that failing to satisfy one or more of these criteria would degrade the Outer Space Treaty' perceived legality in the eyes of its subjects. As such, in Section B, I test the Outer Space Treaty against each of the eight criteria first identified by Fuller and further developed by Brunnée and Toope: "generality, promulgation, non-retroactivity, clarity, non-contradiction, not asking the impossible, constancy, and congruence between rules and official action."<sup>281</sup> The conclusion reached is that the Outer Space Treaty only partially satisfies the criteria of legality, thus degrading the Outer Space Treaty's legality. The consequences of this conclusion are addressed in Section C.

However, before proceeding to the analysis, I must address two preliminary questions. The first question is: why the Outer Space Treaty? After all, the Outer Space Treaty is just one instrument amongst the many that comprise, in part, the space regime. It is not even the first treaty governing space activity – an honor that goes instead to Partial Test Ban Treaty. And,

<sup>&</sup>lt;sup>281</sup> Brunnée & Toope, *supra* note 21 at 6.

contrary to the views of some commentators<sup>282</sup> and COPUOS representatives,<sup>283</sup> the Outer Space Treaty is not a 'constitution' or 'Magna Carta' for outer space or the space regime.<sup>284</sup> Rather, it is a treaty like any other, subject to the primacy of the *Charter of the United Nations*<sup>285</sup> and subsequent treaties.<sup>286</sup> It does, however, occupy a central place in the space regime due to its heritage<sup>287</sup> and its wide acceptance. Its status as the space regime's fundamental instrument makes it a suitable instrument to be tested against the criteria of legality, as the perceived legality of the Outer Space Treaty has significant consequences for the space regime as a whole.

I should also note that the analysis that follows examines the Outer Space Treaty generally, but also drills down into specific norms that are formalized in the Outer Space Treaty. In particular, the prohibition of national appropriation of outer space and celestial bodies ("**PNA**") – as formalized in Article II of the Outer Space Treaty<sup>288</sup> – will receive a particular focus. This is because of the PNA's importance to the space regime,<sup>289</sup> and the increasingly diverging interpretations of the PNA among various space actors. Analyzing the treaty in this broad manner is somewhat artificial, given that each and every provision of the Outer Space Treaty could be tested against the criteria of legality. However, such analysis would be in many cases highly repetitive (for example, with respect to promulgation). Further, this thesis investigates the space regime as a whole – as such, there is a risk to over-atomizing the components of that regime, and in this way losing the forest for the trees.

<sup>&</sup>lt;sup>282</sup> See, e.g., John Bergstresser, "To Boldly Go: An Analysis of Luxembourg Space Resources Law in Light of the EU Treaty" (2021) 3 Bus Law Rev 143–151 at 144.

<sup>&</sup>lt;sup>283</sup> See: UN Doc A/AC105/C.2/2021/CRP.8 at 15 (representative of Mexico).

<sup>&</sup>lt;sup>284</sup> Michelle Hanlon describes these views as "dangerously simplistic and misleading," given that while the Outer Space Treaty "is inspirational, aspirational, and offers guidance" it "falls far short of organizing a governing regime for outer space." See: Michelle Hanlon, "The Middle Kingdom's Shrewd Strategy to Become the Centre of the Universe" (2016) 41 Annals Air & Space L 287 at 291–292.

<sup>&</sup>lt;sup>285</sup> Charter of the United Nations, 26 June 1945, Can TS 1945 No 7, art 103.

<sup>&</sup>lt;sup>286</sup> By operation of *lex posterior derogat priori*. See: Aaron Xavier Fellmeth & Maurice Horwitz, *Guide to Latin in International Law* (New York: Oxford University Press, 2009).

<sup>&</sup>lt;sup>287</sup> That is, its derivation from the Legal Principles Declaration.

<sup>&</sup>lt;sup>288</sup> This article provides 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."

<sup>&</sup>lt;sup>289</sup> Durkee, *supra* note 105 at 455.

# **B.** The Outer Space Treaty

# 1. Generality

The first criterion of legality requires that laws take the form of generally applicable rules that prohibit or permit behavior of certain kinds.<sup>290</sup> This criterion distinguishes law from, for example, the discretionary decisions of a monarch: while such decisions may have legal effect, they are not considered sufficiently general from the interactional perspective. And, as Lovett notes, "there simply would be no system of rules … if public officials adjudicated all controversies on a case-by-case basis."<sup>291</sup>

Satisfying the generality criterion is not difficult. Written laws – such as the Outer Space Treaty – usually satisfy this criterion. However, this criterion has a particular resonance for space activities. This is because space activities are inherently global: space is variously described as a "domaine commun,"<sup>292</sup> a "global commons,"<sup>293</sup> "res communis"<sup>294</sup> or "Sky Country."<sup>295</sup> It is unnecessary to wade into the ongoing debate between these terms here, other than to note that they generally reflect the idea of space as an inherently global concern.

The nature of this global concern is reflected in our modern economies and environments. As the ITU's website notes:

"[s]atellites enable phone calls, television programs, satellite navigation, and online maps. Space services are vital in monitoring and transmitting changes in such data as ocean temperature, vegetation patterns and greenhouse gases – helping us predict famines, the path of a hurricane, or how the global climate is changing."

<sup>292</sup> Camille Toussaint & Hervé Dumez, "Gérer un Méta-Problème: Le Cas des Débris Spatiaux" (2020) 141 Les Annales des Mines (Gérer & Comprendre) 1 at 7.

<sup>293</sup> Steer, *supra* note 2 at 753.

<sup>294</sup> Martin Svec, "Outer Space, an Area Recognised as Res Communis Omnium: Limits of National Space Mining Law" (2022) 60 Space Policy 101473..

<sup>295</sup> Mitchell et al, "Dukarr Lakarama", *supra* note 184 at 2.

<sup>&</sup>lt;sup>290</sup> Colleen Murphy, "Lon Fuller and the Moral Value of the Rule of Law" (2005) 24:3 Law and Philosophy 239–262 at 240.

<sup>&</sup>lt;sup>291</sup> Lovett, *supra* note 131.

Humanity depends on space assets across various sectors, including the telecommunications, financial, and transportation sectors. As Jakhu, Steer, and David Kuan-Wei Chen summarize, all these sectors are broadly "dependent on services provided by satellites of various nations and companies."<sup>296</sup> As such, space "has become fully integrated with our daily lives" across the globe. <sup>297</sup>

The inherently global nature of space activities stands in contrast to the fact that only a small number of states enjoy independent space access.<sup>298</sup> Accordingly, generality is a particularly important angle by which to interrogate the Outer Space Treaty, as it is through its generality that the Outer Space Treaty can promote the idea that it represents universal values rather than just the values of the space-capable states. To this end, the generality criterion invites consideration of whether the Outer Space Treaty differentiates between states.

Differentiation among states can undermine a treaty's generality. To this end, the Outer Space Treaty does differentiate between "Depository Governments"<sup>299</sup> and other states. In particular, the Outer Space Treaty's entry into force required ratifications by the Depository Governments. They also have certain administrative functions imposed on them.<sup>300</sup> However, these points of differentiation are procedural in nature.<sup>301</sup> Procedural differentiation is common treaty practice and is not generally viewed as impeding the legitimacy of a treaty.<sup>302</sup> Importantly, there are no material differences in the obligations imposed on, or rights granted to, the Depository Governments as opposed to other states. Overall, this procedural differentiation

<sup>&</sup>lt;sup>296</sup> Ram S Jakhu, Cassandra Steer & David Kuan-Wei Chen, "Conflicts in Space and the Rule of Law" (2017) 66 German Journal of Air and Space Law 657 at 657.

<sup>&</sup>lt;sup>297</sup> Ibid.

<sup>&</sup>lt;sup>298</sup> Steer, *supra* note 2 at 753.

<sup>&</sup>lt;sup>299</sup> These are the "Governments of the United Kingdom of Great Britain and Northern Ireland, the Union of Soviet Socialist Republics and the United States of America." See: Outer Space Treaty, art XIV.

<sup>&</sup>lt;sup>300</sup> Outer Space Treaty, arts XIV, XVI and XVII.

<sup>&</sup>lt;sup>301</sup> The multiple 'Depository Governments' were introduced so that states not universally recognized could still sign the treaty, provided that one of the Depository Governments recognized them.

<sup>&</sup>lt;sup>302</sup> See generally: Shabtai Rosenne, "The Depositary of International Treaties" (1967) 61:4 Am J Int'l L 923– 945.

does not render the Outer Space Treaty insufficiently general for the purposes of the generality criterion.

A different type of differentiation is the Outer Space Treaty's various usage of "States" and "States Parties to the Treaty." Unfortunately, it is not always clear from the text why this distinction is made in some places and not others. Both formulations can be seen in relation to obligations. For example, per Article IV, "*States Parties to the Treaty* undertake not to place in orbit around the earth any objects carrying nuclear weapons or any other kinds of weapons of mass destruction." But then, in Article I, "*States* shall facilitate and encourage international cooperation in [scientific] investigation" of outer space.

A related example is provided by Article II of the Outer Space Treaty, which embodies the PNA. This article plainly prohibits "national appropriation by claim of sovereignty, by means of use or occupation, or by any other means."<sup>303</sup> As such, the PNA is phrased as a generally applicable rule prohibiting particular behavior. But the formulation in Article II avoids using the words "States" or "States Parties to the Treaty" (although the former is implied). While using "States" could be perceived as enhancing the PNA's generality it potentially poses a problem vis-à-vis the principle of privity.<sup>304</sup> Nonetheless, this further differentiation does not render the Outer Space Treaty insufficiently general for the purposes of the generality criterion.

While the Outer Space Treaty satisfies the generality criterion, this does not counter the stark inequalities of space as outlined in Chapter 1. From a critical perspective, as Andreas Bianchi notes, "[t]o be on equal footing with other states in terms of formal status does not imply subjection to the same legal regime."<sup>305</sup> As such, while the Outer Space Treaty formally satisfies the generality criteria, it must not be forgotten that the Outer Space Treaty will, in practice, apply differently among states in line with their space capabilities. In this respect,

<sup>&</sup>lt;sup>303</sup> The wording used in the Legal Principles Declaration is materially identical. Paragraph 3 of the Legal Principles Declaration provides that "[o]uter space and celestial bodies are not subject to national appropriation by claim of sovereignty, by means of use or occupation, or by any other means."

<sup>&</sup>lt;sup>304</sup> See generally: Michael Waibel, "The Principle of Privity" in Michael J Bowman & Dino Kritsiotis, eds, *Conceptual and Contextual Perspectives on the Modern Law of Treaties*, 1st ed (Cambridge: Cambridge University Press, 2018) 201.

<sup>&</sup>lt;sup>305</sup> Bianchi, *supra* note 152 at 213.

the generality criterion also invites consideration of how states that are not presently spacecapable may view efforts to expand the space regime.

# 2. Promulgation

The second criterion of legality requires that laws are widely promulgated and publicly accessible. This ensures that the subjects of the law know what it requires.<sup>306</sup> To this end, the Outer Space Treaty is readily and freely available in the six official languages of the United Nations<sup>307</sup> (as well as various translations into other languages by states).<sup>308</sup> In addition, UNOOSA has compiled and published the Outer Space Treaty's *travaux préparatoires* online.<sup>309</sup> As such, the promulgation criterion is clearly satisfied by the Outer Space Treaty.

However, this criterion also invites consideration of linguistic issues, which are intrinsically linked to promulgation. English predominates within COPUOS and UNOOSA. Many documents emanating from UNOOSA are marked in the upper right-hand corner: "English only."<sup>310</sup> Indeed, the entire UNOOSA website is only available in English, as are UNOOSA's annual reports.

The predominance of English has been criticized in other international bodies and in the sciences more generally.<sup>311</sup> This thesis is not the place for engaging in this important debate. But, once again, this invites consideration of accessibility issues: will efforts to expand the space regime be linguistically inclusive? Or will all the preparatory materials, all the drafts, and all the additional information invariably be produced in "English only"?

<sup>&</sup>lt;sup>306</sup> Murphy, *supra* note 293 at 240.

<sup>&</sup>lt;sup>307</sup> "The Outer Space Treaty", online: United Nations Office for Outer Space Affairs

<sup>&</sup>lt;https://www.unoosa.org/oosa/en/ourwork/spacelaw/treaties/introouterspacetreaty.html>..

<sup>&</sup>lt;sup>308</sup> See, e.g., the Japanese translation available at "National Space Law Collection: Japan", online: <a href="https://www.unoosa.org/oosa/en/ourwork/spacelaw/nationalspacelaw/japan/nasda\_1969E.html">https://www.unoosa.org/oosa/en/ourwork/spacelaw/nationalspacelaw/japan/nasda\_1969E.html</a>>.

<sup>&</sup>lt;sup>309</sup> "The Outer Space Treaty: Travaux Préparatoires", online: *United Nations Office for Outer Space Affairs* <a href="https://www.unoosa.org/oosa/en/ourwork/spacelaw/treaties/travaux-preparatoires/outerspacetreaty.html">https://www.unoosa.org/oosa/en/ourwork/spacelaw/treaties/travaux-preparatoires/outerspacetreaty.html</a>.

<sup>&</sup>lt;sup>310</sup> See, e.g., note 10.

<sup>&</sup>lt;sup>311</sup> See generally: Jacob Mikanowski, "Behemoth, Bully, Thief: How the English Language is Taking Over the Planet", *The Guardian* (27 July 2018), online: <a href="https://www.theguardian.com/news/2018/jul/27/english-language-global-dominance">https://www.theguardian.com/news/2018/jul/27/english-language-global-dominance</a>.

A similar point could be made concerning the wealth of literature built around the PNA (and the Outer Space Treaty more generally). The PNA has attracted many commentators. As Durkee notes, law students are particularly engaged in complex questions regarding space resource extraction,<sup>312</sup> and have published numerous notes and articles analyzing the issues in significant detail. However, much of this literature is locked away in paid databases.

This situation is hardly uncommon. In many jurisdictions, legislation is freely and widely available, but the commentary and judicial decisions necessary to interpret that legislation are not. However, equality of access to scholarship is a particular issue in relation to the space regime. This is because much of its subject matter remains theoretical. As such, the relevant debates often take place in pages of academic journals that are not always freely available.<sup>313</sup> So while the promulgation criterion is satisfied by the Outer Space Treaty, this same criterion also suggests that expanding access to the various materials that analyze this treaty would enhance its legality.

# 3. Non-retroactivity

The third criterion of legality requires that laws address future behavior, rather than behavior that occurred in the past.<sup>314</sup> In Fuller's original conception of this criterion, this element has primary relevance to criminal law.<sup>315</sup> Brunnée and Toope broaden the criterion to consider not just strict, criminal retroactivity but rather also retroactive effects.<sup>316</sup>

In the context of the Outer Space Treaty, there may be a slight retroactive effect in relation to the PNA. This is because the phrasing of Article II means that even objects launched prior to the entry into force of the Outer Space Treaty do not, by virtue of occupying a part of outer space, appropriate that part of space.

<sup>&</sup>lt;sup>312</sup> Durkee, *supra* note 105 at 455.

<sup>&</sup>lt;sup>313</sup> Benjamin Plackett, "Equity Concerns Persist over Open-Access Publishing", (9 March 2021), online: *Nature Index* <a href="https://www.nature.com/nature-index/news-blog/equity-concerns-persist-over-open-access-publishing">https://www.nature.com/nature-index/news-blog/equity-concerns-persist-over-open-access-publishing</a>.

<sup>&</sup>lt;sup>314</sup> Murphy, *supra* note 293 at 240.

<sup>&</sup>lt;sup>315</sup> Lovett, *supra* note 131.

<sup>&</sup>lt;sup>316</sup> Brunnée & Toope, *supra* note 21 at 179.

For example, consider Syncom-3.<sup>317</sup> This satellite was launched by the United States on 19 August 1964 – some three years prior to the entry into force of the Outer Space Treaty. As of 31 July 2022, it remains in orbit. Specifically, it occupies a slot in the valuable geosynchronous orbit (despite being non-functional since 1969). As Joanne Irene Gabrynowicz notes, "extended orbital use can present questions of resource appropriation."<sup>318</sup> Syncom-3's occupation of this valuable slot does not, however, mean that the United States could claim to have appropriated that slot on the grounds of occupation prior to the Outer Space Treaty's entry into force. Article II of the Outer Space Treaty prohibits any such appropriation, regardless of whether the appropriation occurred before or after the Outer Space Treaty entered into force.

While the Article II prohibition can therefore have a retroactive effect, this argument could be met by noting that the substantive provisions of the Outer Space Treaty predate the Treaty itself, having been first established in the Legal Principles Declaration. And paragraph 3 of the Legal Principles Declaration is materially identical to Article II of the Outer Space Treaty. To continue the example of Syncom-3, this satellite was launched after the Legal Principles Declaration was adopted. As such, the Outer Space Treaty satisfies the non-retroactivity criterion, even if a broad view of the potential retroactive effect is taken.

# 4. Clarity

The fourth criterion of legality requires that law be clear. This ensures that it is possible for the law's subjects to identify what the law prohibits, permits, or requires.<sup>319</sup> In this respect, the Outer Space Treaty is not a paragon of clarity. In particular, the Outer Space Treaty relies on

<sup>&</sup>lt;sup>317</sup> "Syncom-3", online: National Aeronautics and Space Administration

<sup>&</sup>lt;https://nssdc.gsfc.nasa.gov/nmc/spacecraft/display.action?id=1964-047A>. See further: Roy Balleste, "Space Horizons: An Era of Hope in the Geostationary Orbit" 35 J Envt'l L & Litig 165 at 170.

<sup>&</sup>lt;sup>318</sup> Joanne Irene Gabrynowicz, "Some Legal Considerations Regarding the Future of Space Governance" (2020) 48:3 Ga J Int'l & Comp L 739 at 744. These comments are in relation to the ISS, but the underlying concept is the same.

<sup>&</sup>lt;sup>319</sup> Murphy, *supra* note 293 at 241.

certain key concepts – such as "astronaut"<sup>320</sup> and "national activities"<sup>321</sup> – without defining these terms. "Celestial bodies," another key term in Outer Space Treaty, is undefined. There are a wide variety of natural objects in space: planets, stars, asteroids, black holes, comets, clouds of dust and gas. As Lachs asks, are all such objects 'celestial bodies' despite varying massively in size and proximity to Earth?<sup>322</sup>

These questions remain unaddressed (other than in the literature).<sup>323</sup> Most notoriously, the Outer Space Treaty does not actually define "outer space."<sup>324</sup> The result is that the boundary between outer space and airspace is not fixed. Instead, it has remained, as Gabrynowicz notes,<sup>325</sup> on the COPUOS agenda for more than 35 years.<sup>326</sup> It could be argued that this lack of clarity is mandated by the sheer audacity of the Outer Space Treaty (and the space regime more generally).

This audacity arises because the Outer Space Treaty dares to apply throughout the whole universe. And the universe is a vast place. As Marina Koren explains:

"[w]e live in the inner rim of one of the Milky Way's spiral arms, a shimmery curve against inky darkness. Travel for thousands of light-years in one direction, past countless stars, countless planets, and countless moons, and you'd reach the outer edge of the Milky Way, where the last bits of our galaxy give way to the sprawling stillness of the intergalactic medium. Travel about the same distance in the other direction, past still more stars and planets and moons, through glittering clouds of dust, and you'll end up in the heart of the galaxy, at one of the most mysterious landmarks in the universe."<sup>327</sup>

<sup>324</sup> See generally: Thomas Gangale, *How High the Sky? The Definition and Delimitation of Outer Space and Territorial Airspace in International Law*, Studies in Space Law (Leiden: Brill Nijhoff, 2018).

<sup>325</sup> Lachs, *supra* note 98 at 53–54.

<sup>326</sup> Gabrynowicz, *supra* note 321 at 742.

<sup>327</sup> Marina Koren, "Behold, the Bottomless Pit Holding Everything Together", (12 May 2022), online: *The Atlantic* <a href="https://www.theatlantic.com/science/archive/2022/05/sagittarius-a-black-hole-milky-way/629838/">https://www.theatlantic.com/science/archive/2022/05/sagittarius-a-black-hole-milky-way/629838/</a>.

<sup>&</sup>lt;sup>320</sup> Outer Space Treaty, art V.

<sup>&</sup>lt;sup>321</sup> Outer Space Treaty, art VI.

<sup>&</sup>lt;sup>322</sup> Lachs, *supra* note 98 at 44.

<sup>&</sup>lt;sup>323</sup> See, e.g., Frans G von der Dunk, "Defining Subject Matter Under Space Law: Near Earth Objects versus Space Objects" (2008) IAC-08.E8.4.3 Proc Int'l Inst Space L. See also: Thomas Cheney et al, "Planetary Protection in the New Space Era: Science and Governance" (2020) 7 Front Astron Space Sci 589817.

How could mere treaty definitions attempt to capture all this? Perhaps there was wisdom in the drafters' choice to not even attempt this task. But the Outer Space Treaty's lack of clarity is not just in relation to definitions. It also affects key substantive provisions. For example, Article IX(2) of the Outer Space Treaty mandates that States parties to the treaty "shall pursue studies of outer space, including the Moon and other celestial bodies, and conduct exploration of them so as to avoid their *harmful contamination* ... and, where necessary, shall adopt appropriate measures for this purpose."<sup>328</sup> As Tanja Masson-Zwann and Mahulena Hofmann explain, "[t]his term [i.e., harmful contamination] is not sufficiently precise"<sup>329</sup> because it does not "identify which types of degradation of the outer space environment are prohibited and to what extent."<sup>330</sup>

The Outer Space Treaty's confused drafting also suggests distinctions that may have not been intended, further contributing to the overall lack of clarity. I have already described the differentiation between "States" and "States Parties to the Treaty" in relation to the generality criterion. But consider further that the Outer Space Treaty frequently uses the specific phrasing "outer space, including the moon and other celestial bodies." For example, Article IX provides that:

"[i]n order to promote international co-operation in the peaceful exploration and use of outer space, States Parties to the Treaty conducting activities *in outer space, including the moon and other celestial bodies*, agree to inform the Secretary-General of the United Nations ... of the nature, conduct, locations and results of such activities."<sup>331</sup>

Clearly, Article IX covers all space activities, regardless of where they take place. Contrast this with Article V, which provides that:

<sup>&</sup>lt;sup>328</sup> Outer Space Treaty, art IX(2). My emphasis.

<sup>&</sup>lt;sup>329</sup> Tanja L Masson-Zwaan & Mahulena Hofmann, *Introduction to Space Law*, 4th ed (Alphen aan den Rijn, The Netherlands: Wolters Kluwer, 2019) at 92.

<sup>&</sup>lt;sup>330</sup> *Ibid*.

<sup>&</sup>lt;sup>331</sup> Outer Space Treaty, art IX. My emphasis.

In carrying on activities *in outer space and on celestial bodies*, the astronauts of one State Party shall render all possible assistance to the astronauts of other States Parties.<sup>332</sup>

Does Article V's omission of the word "Moon" mean that "all possible assistance" is not required if carrying on activities on the Moon? It is difficult to justify such an interpretation. Yet the exclusion of the Moon would be supported by applying the presumption of consistent usage.<sup>333</sup> From this perspective, the exclusion of "Moon" is not a mere drafting oversight; rather, it must be a deliberate exclusion, given that the Outer Space Treaty's provisions consistently use "outer space, including the moon and other celestial bodies." Of course, this argument would have to overcome the fact that there is no sensible reason for excluding the Moon from the scope of Article V – and it surely would not align with the Outer Space Treaty's object and purpose.<sup>334</sup> As such, the drafting inconsistencies here adversely affects the Outer Space Treaty's clarity by potentially opening the door to valid but ultimately spurious arguments.

A further example is provided by the articulation of the PNA in Article II of the Outer Space Treaty. I repeat this articulation here for ease of reference:

<sup>334</sup> *Vienna Convention on the Law of Treaties*, 23 May 1969, 1155 UNTS 331 (entered into force 27 January 1980) [hereinafter Vienna Convention], art 31(1). Reliance on the Vienna Convention to interpret the Outer Space Treaty is subject to two criticisms. First, the Outer Space Treaty predates the Vienna Convention. The Vienna Convention expressly provides that it does not apply to treaties that precede its coming into force. Second, the Outer Space Treaty has many more signatories than the Vienna Convention. The United States is a notable example among the independently space-capable states. The United States has ratified the Outer Space Treaty but has not ratified the Vienna Convention. Both objections can be met on the grounds that it is trite law that Vienna Convention arts 31 – 33 represent rules of customary international law. See: Richard Gardiner, *Treaty Interpretation*, 1st ed (Oxford University Press) at 161. Their customary status is also recognized by the United States Department of State: "Vienna Convention on the Law of Treaties", (2017), online: *United States Department of State* </ //2009-2017.state.gov/s/l/treaty/faqs/70139.htm>. has recognized Accordingly, the Vienna Convention can be applied to the Outer Space Treaty on this basis.

<sup>&</sup>lt;sup>332</sup> Outer Space Treaty, art V. My emphasis.

<sup>&</sup>lt;sup>333</sup> This presumption provides that a phrase is presumed to bear the same meaning in a text, while a variation in that phrase will suggest a variation in meaning. See: Antonin Scalia & Bryan A Garner, *Reading Law: The Interpretation of Legal Texts* (St. Paul: Thomson/West, 2012) at 170.

"Outer 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."

Core to this articulation of the PNA is the concept of "national appropriation." This concept is undefined. Even Article II's catch-all text – "or by any other means" – may not broaden the scope of the prohibition (as Christol argues was intended).<sup>335</sup> Rather, it could potentially be read down in line with the *ejusdem generis* canon of interpretation.<sup>336</sup> The argument here would be that "by any other means" must be restricted to other means similar to "use" or "occupation."

Given these issues, and the increasing commercial interest in space, the exact meaning of Article II is increasingly contested. There is an extensive debate regarding whether Article II prohibits commercial exploitation of space resources. As Fabio Tronchetti notes, an "analysis of [Article II] reveals that while the legal status of the Moon and other celestial bodies is virtually uncontroversial, that of the natural resources contained therein remains uncertain."<sup>337</sup> Can these resources be extracted? If so, can they be owned? Can they be sold? These questions are unresolved – what exactly would amount to "national appropriation" under Article II is far from clear. And, as Durkee notes, settled answers to these questions "would determine the prospects of a burgeoning, billion-dollar industry that current rests on an unstable legal foundation."<sup>338</sup>

The issue of commercial space resource extraction has been the subject of extensive and ongoing academic debate. Lachs, writing while he was a sitting Judge of the International Court of Justice in 1972, argues that the PNA clearly prohibits commercial resource extraction.<sup>339</sup> He asserts that national appropriation would cover not only sovereign rights but also property

<sup>&</sup>lt;sup>335</sup> Carl Quimby Christol, "Article 2 of the 1967 Principles Treaty Revisited" (1984) 9 Annals Air & Space L 217 at 241.

<sup>&</sup>lt;sup>336</sup> Joseph Klinger, Yuri Parkhomenko & Constantinos Salonidis, *Between the Lines of the Vienna Convention? Canons and Other Principles of Interpretation in Public International Law* (Kluwer Law International, 2018) at 34. This canon provides that where general words follow a list of two or more things, they apply only to persons or things of the same general kind or class specifically mentioned.

<sup>&</sup>lt;sup>337</sup> Fabio Tronchetti, "Title IV – Space Resource Exploration and Utilization of the US Commercial Space Launch Competitiveness Act: A Legal and Political Assessment" (2016) 41:2 Air & Space L 143 at 145.

<sup>&</sup>lt;sup>338</sup> Durkee, *supra* note 105 at 450.

<sup>&</sup>lt;sup>339</sup> Lachs, *supra* note 98 at 44.

rights:<sup>340</sup> as such, both are prohibited under the PNA. But many other space regime scholars, including Carl Christol,<sup>341</sup> Daniel Goedhuis,<sup>342</sup> Stephen Hobe<sup>343</sup>and Gorove<sup>344</sup> take the opposing view. Jakhu and Freeland chart a middle ground, arguing that

"off-Earth mining for space resources would be legal as long as it is for the benefit of all [hu]mankind. Conversely, it would not be in accordance with international space law is carried out only for 'exclusive' interests."<sup>345</sup>

I earlier outlined the centrality of COPUOS to the space regime's transnational community. Given this centrality, it is unsurprising that COPUOS took up this academic debate and sought to resolve it. Throughout the 1970s, work proceeded on a treaty addressing lunar commercial space resource extraction.<sup>346</sup> This work produced the Moon Agreement, which opened for signature on 18 December 1979.<sup>347</sup> Article 11 of the Moon Agreement simply restates the PNA, in nearly identical language to Article II of the Outer Space Treaty:

"[t]he Moon is not subject to national appropriation by any claim of sovereignty, by means of use or occupation, or by any other means."

However, this same Article also provides that:

<sup>343</sup> Stephan Hobe, "Adequacy of the Current Legal and Regulatory Framework Relating to the Extraction and Appropriation of Natural Resources" (2007) XXXII Annals Air & Space L 204 at 213.

<sup>344</sup> Stephen Gorove, International Space Law in Perspective - Some Major Issues, Trends and Alternatives,
Recueil des Cours de l'Académie de Droit International de la Haye (The Hague: Brill, 1983) at 374.

<sup>345</sup> Jakhu & Freeland, *supra* note 216.

<sup>346</sup> Carl Quimby Christol, "The 1979 Moon Agreement: Where Is It Today?" (1999) 27:1 J Space L 1 at 6–7.

<sup>347</sup> Reproduced in United Nations Office of Outer Space Affairs, *International Space Law: United Nations Instruments* (Vienna, 2017) at 30.

<sup>&</sup>lt;sup>340</sup> *Ibid* at 43.

<sup>&</sup>lt;sup>341</sup> Christol, *supra* note 338.

<sup>&</sup>lt;sup>342</sup> Daniel Goedhuis, "Some Recent Trends in the Interpretation and the Implementation of the Rules of International Space Law" (1981) 19:2 Columbia Journal of Transnational Law 213–234.

"[t]he Moon and its natural resources are the common heritage of mankind," and that "States Parties to this Agreement hereby undertake to establish an international regime, including appropriate procedures, to govern the exploitation of the natural resources of the Moon as such exploitation is about to become feasible."

Does Article 11 impose a moratorium on exploitation pending the establishment of the envisaged "international regime"?<sup>348</sup> Christol, based on an exhaustive analysis of the Moon Agreement's *travaux préparatoires*, argues that no such moratorium was intended by the negotiators.<sup>349</sup> Gorove agrees with this assessment.<sup>350</sup> Nonetheless, as described in Chapter 1, the Moon Agreement is widely viewed as a failure. While in force, it has just 18 ratifications – and none of the ratifying states have comprehensive space capabilities.<sup>351</sup> As such, the Moon Agreement has not resolved the issue – rather, it simply added a further layer to the confusion.

More recently, the debate about the Article II and the PNA has been localized within a COPUOS working group – the Working Group on Legal Aspects of Space Resources Activities ("**Space Resources Working Group**"). The Space Resources Working Group was established in 2021.<sup>352</sup> A questionnaire, prepared by Greece, for circulation among COPUOS members asks several questions relating to the clarity of Article II. These questions include whether Article II should be amended, whether it should be "subject to a commonly accepted interpretation" and whether there should "be a review of the concept of 'celestial bodies,' to narrow the scope of Article II (e.g., as regards comets and asteroids)."<sup>353</sup> Responses can be expected throughout

<sup>&</sup>lt;sup>348</sup> Diego Zannoni, "The Dilemma Between the Freedom to Use and the Proscription against Appropriating Outer Space and Celestial Bodies" (2020) 19:2 Chinese J Int'l Law 329–358 at 340.

 <sup>&</sup>lt;sup>349</sup> Carl Q Christol, *The Modern International Law of Outer Space* (New York: Pergamon Press, 1982) at 298.
<sup>350</sup> Gorove, *supra* note 347 at 374.

<sup>&</sup>lt;sup>351</sup> Nelson, *supra* note 88. From an interactional perspective, the Moon Agreement is nothing more than words on a page – the space regime's very own 'paper tiger.' This is because the Moon Agreement generates little in the way of obligation, even among its states parties. This was made clear when Australia, a party to the Moon Agreement, became a founding signatory to the Accords – despite the fundamental incompatibilities between the Moon Agreement and the Accords.

<sup>&</sup>lt;sup>352</sup> "Working Group on Space Resources", online: *United Nations Office for Outer Space Affairs* <a href="https://www.unoosa.org/oosa/en/ourwork/copuos/lsc/space-resources/index.html">https://www.unoosa.org/oosa/en/ourwork/copuos/lsc/space-resources/index.html</a>.

<sup>&</sup>lt;sup>353</sup> See: UN Doc A/AC.105/C.2/2022/CRP.13 at 2.

2023. However, reflecting the complexity of the issues, and the intense interest it attracts, the current work plan for the Space Resources Working Group does not envisage releasing guidance until 2025, potentially for endorsement by the General Assembly by way of resolution.

It remains to be seen if and how the Space Resources Working Group will be impacted by the United States – Russia decoupling outlined in the Chapter 3. Nonetheless, this is a valuable step toward introducing more clarity into the PNA and by extension the Outer Space Treaty. In the interim, the PNA as embodied in Article II bears out the following comment from Sir Hersch Lauterpacht:

"[o]nce we approach at close quarters practically any branch of international law we are driven, amidst some feeling of incredulity, to the conclusion that although there is as a rule a consensus of opinion on one broad principle – even this may be an overestimate in some cases – there is no semblance of agreement in relation to specific rules and problems."<sup>354</sup>

Overall, the Outer Space Treaty cannot be described as a clear instrument. However, in the international law context, the clarity criterion should not be applied too strictly. As Susanne Therese Hansen notes, "[a]mbiguity, vagueness, legal and linguistic indeterminacy, interpretive leeway, and loopholes" are all "common features of international law."<sup>355</sup> This view is shared by Anthony D'Amato. He comments that "[m]ost treaty provisions are ambiguous because the parties were able to agree only on studied ambiguity instead of concrete particularity."<sup>356</sup> As such, a lack of clarity can be seen as a necessary evil, to enmesh states in the agreement, or simply inevitable given the nature of human languages. Indeed, Fuller does not expect perfect

<sup>&</sup>lt;sup>354</sup> Quoted in Oscar Schachter, *International Law in Theory and Practice*, Recueil des Cours de l'Académie de Droit International de la Haye (The Hague: Brill, 1982) at 67.

<sup>&</sup>lt;sup>355</sup> Susanne Therese Hansen, "Taking Ambiguity Seriously" (2016) 22:1 Eur J Int'l Relations 192–216. *Cf* Oscar Schachter, who remarks that international legal "texts bring clarity and precision where there had been obscurity and doubt." Schachter, *supra* note 357 at 91.

<sup>&</sup>lt;sup>356</sup> Anthony D'Amato, "Purposeful Ambiguity as International Legal Strategy" in Jerzy Makarczyk, ed, *Theory of International Law at the Threshold of the 21st Century* (The Hague: Kluwer Law International, 1996) 109 at 109. Durkee expresses a contrary view, commenting that "[t]reaties offer the benefit of focusing on explicit agreement, textual clarity, and speed in formation." See: Durkee, *supra* note 105 at 434.
clarity; he recognizes rendering laws perfectly understandable (if possible) could readily conflict with other important principles.<sup>357</sup>

In this respect, the Outer Space Treaty's reliance on broad and undefined concepts does not render it an aspirational document devoid of legal content. As Jakhu explains, the Outer Space Treaty remains, for all its blemishes, a binding international agreement that is subject to the well-established rules of treaty interpretation,<sup>358</sup> including the Vienna Convention on the Law of Treaties.<sup>359</sup>

The question then becomes: is the Outer Space Treaty substantially less clear than other contemporary treaties? The answer to this is no: while the drafting is at times confusing, and broad and undefined terms are frequently used, these attributes are common in treaties to the present day. Indeed, on some analysis, all such texts are marked by what George Atkins calls an inherent "instability" that arises due to the unavoidable distance between the drafter's purposes and the words on the page.<sup>360</sup> As such, while the Outer Space Treaty could not be described as clear, it nonetheless satisfies the clarity criterion – particularly when viewed in a comparative perspective. This does not mean that improvements would not be beneficial – it simply indicates that, from an interactional perspective, that the Outer Space Treaty is not so unclear as to be entirely incapable of enjoying legality.

## 5. Non-contradiction

The fifth criterion of legality requires that laws should "avoid contradiction" by "not requiring or permitting and prohibiting at the same time."<sup>361</sup> As Rundle explains, this criterion

<sup>&</sup>lt;sup>357</sup> Fuller, *supra* note 131 at 44–45.

<sup>&</sup>lt;sup>358</sup> Ram S Jakhu, "Legal Issues Relating to the Global Public Interest in Outer Space" (2006) 32 J Space L 31 at34.

<sup>&</sup>lt;sup>359</sup> See comments at footnote 334.

<sup>&</sup>lt;sup>360</sup> George Douglas Atkins, *Reading Deconstruction, Deconstructive Reading* (Lexington: University Press of Kentucky, 1983) at 10.

<sup>&</sup>lt;sup>361</sup> Brunnée & Toope, *supra* note 21 at 256.

"speak[s] primarily to the problem of poor draftsmanship, and how this can render the law unable to be followed."<sup>362</sup>

There are no clear contradictions among the Outer Space Treaty's provisions. However, some provisions can give rise to paradoxes and tensions. Consider Article I of the Outer Space Treaty. This article proclaims that "[o]uter space, including the moon and other celestial bodies, shall be free for exploration and use by all States." However, this freedom to explore and use space is not unlimited. Rather, it is subject to the restrictions set out elsewhere in the Outer Space Treaty – most notably, the PNA as expressed in Article II. Further, the nature of the Outer Space Treaty *qua* law inevitably restrains the very same freedoms that the Outer Space Treaty purports to grant – after all, states were free to explore and use space before the Outer Space Treaty took effect.<sup>363</sup> This gives rise to a paradox: by stating the freedom to explore and use space, the Outer Space Treaty actually constrains that freedom.

The paradox is heightened when we consider the discourse relating to the so-called 'freedom of space.' Notably, what became the ISS was initially called "Space Station Freedom."<sup>364</sup> Moreover, space regime scholarship is not immune to this freedom discourse, which tends to emphasize state freedom of action rather than constraint.<sup>365</sup> This discourse focuses on space as a wide-open frontier, far from Earth-based jurisdictions (and their courts). As such, as Aganaba explains, "the prevailing view of the [freedom to explore and use space] is best explained as negative freedom: an absence of constraint rather than the enabling of an outcome."<sup>366</sup> The view of the Article I freedom as a negative freedom broadly aligns with the limited state practice relating to it, which Cheng pithily summarizes as "first come, first serve."<sup>367</sup>

<sup>366</sup> Aganaba, *supra* note 100 at 5.

<sup>&</sup>lt;sup>362</sup> Rundle, *supra* note 136 at 91.

<sup>&</sup>lt;sup>363</sup> This is aptly demonstrated by Sputnik 1, Explorer 1 and the various other spaceflights that occurred prior to the Outer Space Treaty's entry into force on 10 October 1967.

<sup>&</sup>lt;sup>364</sup> "Space Station Freedom", online: *The Planetary Society* <a href="https://www.planetary.org/space-images/space-station-freedom">https://www.planetary.org/space-images/space-station-freedom</a>.

<sup>&</sup>lt;sup>365</sup> See, e.g., Joshua J Wolff, "Space Law: What Is It and Why It Matters" (2020) 5 The Army Lawyer 67.

<sup>&</sup>lt;sup>367</sup> Bin Cheng, *Studies in International Space Law* (Oxford: New York: Clarendon Press; Oxford University Press, 1997) at 566. The speed with which this freedom discourse has melded into a neo-colonialist view of space has been strongly criticized. See: Mitchell et al, "Dukarr Lakarama", *supra* note 184 at 1.

The paradox raised here can be readily resolved on the grounds that Article II is a limitation on the Article I freedom. As Hobe explains, Article I is in fact "designed not so much through the ambit of the freedoms for the respective activities, but rather through its respective limitations."<sup>368</sup> While this resolves the seeming paradox, tension remains regarding the interactions between these articles, even if they do not rise to level of direct contradiction.

The non-contradiction criterion also invites consideration of whether a law's provisions align with the law's broader object or purpose. To this end, Abdul Koroma posits that the object and purpose of the Outer Space Treaty is to facilitate the peaceful use of outer space.<sup>369</sup> This object and purpose is supported by the Outer Space Treaty's repeated invocations of the concept of peace. Most notably, the Preamble recognizes "the common interest of all mankind in the progress of the exploration and use of outer space for *peaceful purposes*" and describes the Outer Space Treaty as "contribut[ing] to … the legal aspects of the exploration and use of outer space for *peaceful purposes*." To this end, Article IV(2) provides that "[t]he moon and other celestial bodies shall be used by all States Parties to the Treaty *exclusively for peaceful purposes*."

Yet there are notable tensions between this object and purpose and the Outer Space Treaty's carefully phrased provisions relating to weapons and the military uses of outer space. Indeed, a notable feature of Article IV(2) is that only "[t]he moon and other celestial bodies" are reserved for exclusively peaceful purposes. As Cheng notes, "there is no provision ... anywhere in the [Outer Space] Treaty which reserves *the whole of outer space* exclusively for peaceful use."<sup>370</sup> This was at the insistence of the United States and the Soviet Union: neither state could countenance restrictions on the use of their military reconnaissance satellites.<sup>371</sup> As such, each

<sup>&</sup>lt;sup>368</sup> Stephan Hobe, "Article I" in Stephan Hobe, Bernhard Schmidt-Tedd & Kai-Uwe Schrogl, eds, *Cologne Commentary on Space Law* (Köln: Heymanns, 2009).

<sup>&</sup>lt;sup>369</sup> Abdul Koroma, "Third Nandasiri Jasentuliyana Lecture on Space Law" in *54th IISL Colloquium on the Law of Outer Space*, 62nd International Astronautical Congress (Cape Town, 2011).

<sup>&</sup>lt;sup>370</sup> Bin Cheng, "Properly Speaking, Only Celestial Bodies Have Been Reserved for Use Exclusively for Peaceful (Non-Military) Purposes, but Not Outer Void Space" in Michael N Schmitt & Leslie C Green, eds, *International Law Across the Spectrum of Conflict: Essays in Honour of Professor LC Green On the Occasion of His Eightieth Birthday* International Law Studies (Rhode Island: Naval War College Press, 2001) 81 at 107.

<sup>&</sup>lt;sup>371</sup> Frans G von der Dunk & Fabio Tronchetti, eds, *Handbook of Space Law*, Research Handbooks in International Law (Cheltenham: Edward Elgar Publishing, 2017) at 257.

state required that outer space remain open for military uses – in clear tension with the Outer Space Treaty's broader object and purpose.

With respect to weapons, Article IV(1) provides that:

States Parties to the Treaty undertake not to place in orbit around the earth any objects carrying nuclear weapons or any other kinds of weapons of mass destruction, install such weapons on celestial bodies, or station such weapons in outer space in any other manner.

The wording of this provision was insisted upon by the United States and the Soviet Union to permit nuclear weapons and other weapons of mass destruction that pass through outer space without entering into orbit.<sup>372</sup> The reason for this was that both states relied on intercontinental ballistic missiles ("**ICBMs**") that carried nuclear warheads.<sup>373</sup> ICBMs typically have trajectories that take them through outer space, but without completing a full Earth orbit. As such, Article IV(2)'s careful phrasing – "undertake not to place *in orbit* around the earth" – means that this article does not prohibit ICBMs. Accordingly, while the Outer Space Treaty was intended to facilitate the peaceful uses of outer space, it was deliberately designed to not preclude one of the most destructive uses of outer space: namely, the use of space to rain down nuclear destruction. Again, there is clear tension here.

This tension first arose during the drafting of the Outer Space Treaty. The problem was, as Cheng relates, that there was "an almost universal desire" among the United Nations membership "for the *exclusively* peaceful uses of [all] outer space." <sup>374</sup> As such, repeated references to the peaceful uses of outer space were inserted into the Preamble, and Article IV(2) was carefully drafted to create what Cheng describes as "a highly misleading impression that … the whole of outer space was to be used exclusively for peaceful purposes"<sup>375</sup> when in fact only the Moon and other celestial bodies were subject to this limitation. As Chen summarizes, "the

<sup>&</sup>lt;sup>372</sup> *Ibid* at 201.

<sup>&</sup>lt;sup>373</sup> Sa'id Mosteshar, "Space Law and Weapons in Space" in *Oxford Research Encyclopedia of Planetary Science* (Oxford University Press, 2019)..

<sup>&</sup>lt;sup>374</sup> Cheng, *supra* note 373 at 107.

<sup>&</sup>lt;sup>375</sup> *Ibid* at 82.

Outer Space Treaty does not expressly prohibit military uses of outer space ... and only partially de-weaponizes it in relation to nuclear weapons and [other] weapons of mass destruction."<sup>376</sup>

There is a clear disconnect between the ideas behind the Outer Space Treaty and its actual provisions. While speaking of freedom, the Outer Space Treaty actually limits that freedom. Similarly, while speaking of the peaceful uses of outer space, the Outer Space Treaty effectively carves out ICBMs and military reconnaissance satellites. In both cases, the tension arises because the Outer Space Treaty gives the impression of doing one thing, but does the other – in this way, it misdirects its audience. Nonetheless, tensions do not equal contradictions. As such, the Outer Space Treaty satisfies the non-contradiction criterion – but this criterion does suggest that managing these tensions would enhance the treaty's legality.

### 6. Not asking the impossible

The sixth criterion of legality requires that a law not ask the impossible of its subjects.<sup>377</sup> This criterion is not problematic in relation to the prohibitory provisions of the Outer Space Treaty. Such provisions require refraining from particular actions, which is always within a state's power. In relation to the PNA as embodied in Article II, refraining from making a sovereign claim to a part of outer space is clearly within the power of all states. Similarly, the Outer Space Treaty's mandatory or permissive provisions do not conflict with the prohibitory provisions such that an impossibility would result. As such, the Outer Space Treaty satisfies the non-impossibility criterion.

<sup>&</sup>lt;sup>376</sup> Chen, *supra* note 28 at 667.

<sup>&</sup>lt;sup>377</sup> Murphy, *supra* note 293 at 241.

# 7. Constancy

The seventh criterion of legality requires that law not change too frequently.<sup>378</sup> While Article XV of the Outer Space Treaty provides that "[a]ny State Party to the Treaty may propose amendments to this Treaty," no such amendments have been proposed. However, other instruments have aimed to clarify aspects of the Outer Space Treaty. These instruments were passed during the space regime's third stage of development, as outlined in Chapter 3. For example, Resolution 62/101 of 17 December 2007 aimed to clarify the operation of Articles VIII and XI in the context of space object registration.<sup>379</sup> However, these instruments are not formal amendments – and even if they were, these instruments are infrequent. Moreover, fewer such instruments can be expected in the space regime's current fourth stage of development. As such, the Outer Space Treaty satisfies the constancy criterion.

## 8. Congruence

The eighth and final criterion of legality requires congruence between law and its administration.<sup>380</sup> As Lovett explains, "the mere existence of rules capable of governing conduct is not sufficient to constitute a legal system unless those rules are actually observed by the relevant parties."<sup>381</sup> As such, "there must in practice be a congruence between the actions of public officials and the declared legal rules."<sup>382</sup>

With respect to treaties, it is tempting to view this criterion as simply demanding compliance by states with the treaty or the existence of active enforcement of the treaty. However, the criterion is more nuanced and recognizes that even if generally complied with, a treaty can be

<sup>&</sup>lt;sup>378</sup> *Ibid.* As Rundle explains, "the requirement of constancy through time is one that expresses recognition of how too-frequent change in the law can amount to something akin to retroactivity, in so far as citizens are unable to know, or at least are impaired in being able to know, precisely which laws apply to them at a given point in time." See: Rundle, *supra* note 136 at 91.

<sup>&</sup>lt;sup>379</sup> See: UN Doc A/AC.105/891 (2007).

<sup>&</sup>lt;sup>380</sup> Brunnée & Toope, *supra* note 21 at 282.

<sup>&</sup>lt;sup>381</sup> Lovett, *supra* note 131.

<sup>&</sup>lt;sup>382</sup> *Ibid*.

undermined or evaded by acts that do not technically constitute breaches but that may nonetheless compromise the treaty by suggesting that the treaty is a 'paper tiger' rather than an effective legal instrument.<sup>383</sup> Overall, as Rundle explains, this criteria "requires an appreciation, on the part of the relevant legal and administrative actors, of the purposes that [a] legal order is intended to fulfil."<sup>384</sup>

To this end, Jill Stuart notes that while the Outer Space Treaty "has never actually been violated," it has faced "many practical challenges."<sup>385</sup> These challenges have occurred across the Outer Space Treaty's various provisions. A prime challenge has been repeated ASAT testing. The Soviet Union performed numerous ASAT tests throughout the 1970s. The United States tested its own ASAT system in 1985 and 2008; China did the same in 2007. India tested an ASAT system in 2019. Most recently, Russia most performed an ASAT test in 2021.<sup>386</sup>

Each of these tests has produced incredible amounts of orbital debris. The nature of the orbital environment means that this debris can potentially stay in orbit – and therefore remain hazardous to spacecraft – for thousands of years.<sup>387</sup> For example, the 2007 Chinese test produced debris that remains in orbit today and the ISS had to maneuver to avoid debris generated by Russia's 2021 test.<sup>388</sup>

The problems posed by such debris are well-known. In short, debris may destroy other spacecraft through impact. Less destructive, but also critical, is that debris may force other spacecraft to use precious fuel to avoid impact. These avoidance maneuvers shorten a spacecraft's operational life (and as such, can have a significant commercial impact).

<sup>&</sup>lt;sup>383</sup> Brunnée & Toope, *supra* note 21 at 73. See also *Ibid* at 355.

<sup>&</sup>lt;sup>384</sup> Rundle, *supra* note 136 at 91.

<sup>&</sup>lt;sup>385</sup> Jill Stuart, "The Outer Space Treaty Has Been Remarkably Successful – But Is It Fit for the Modern Age?", online: *The Conversation* <a href="http://theconversation.com/the-outer-space-treaty-has-been-remarkably-successful-but-is-it-fit-for-the-modern-age-71381>">http://theconversation.com/the-outer-space-treaty-has-been-remarkably-successful-but-is-it-fit-for-the-modern-age-71381>">http://theconversation.com/the-outer-space-treaty-has-been-remarkably-successful-but-is-it-fit-for-the-modern-age-71381>">http://theconversation.com/the-outer-space-treaty-has-been-remarkably-successful-but-is-it-fit-for-the-modern-age-71381>">http://theconversation.com/the-outer-space-treaty-has-been-remarkably-successful-but-is-it-fit-for-the-modern-age-71381>">http://theconversation.com/the-outer-space-treaty-has-been-remarkably-successful-but-is-it-fit-for-the-modern-age-71381>">http://theconversation.com/the-outer-space-treaty-has-been-remarkably-successful-but-is-it-fit-for-the-modern-age-71381>">http://theconversation.com/the-outer-space-treaty-has-been-remarkably-successful-but-is-it-fit-for-the-modern-age-71381>">http://theconversation.com/the-outer-space-treaty-has-been-remarkably-successful-but-is-it-fit-for-the-modern-age-71381>">http://theconversation.com/the-outer-space-treaty-has-been-remarkably-successful-but-is-it-fit-for-the-modern-age-71381>">http://theconversation.com/the-outer-space-treaty-has-been-remarkably-successful-but-is-it-fit-for-the-modern-age-71381>">http://theconversation.com/the-outer-space-treaty-has-been-remarkably-successful-but-is-it-fit-for-the-modern-age-71381>">http://the-modern-age-71381>">http://the-modern-age-71381>">http://the-modern-age-71381>">http://the-modern-age-71381>">http://the-modern-age-71381>">http://the-modern-age-71381>">http://the-modern-age-71381>">http://the-modern-age-71381>">http://the-modern-age-71381>">http://the-modern-age-71381>">http://the-modern-age-71381<">http://the-modern-age-71381</adaern-age-71381</adaern-age-71381</adaerneage-71381</adaerneage-71381</ada

<sup>&</sup>lt;sup>386</sup> See generally Mosteshar, *supra* note 376. See also Ashley J Tellis, "India's ASAT Test: An Incomplete Success", online: *Carnegie Endowment for International Peace* <a href="https://carnegieendowment.org/2019/04/15/india-s-asat-test-incomplete-success-pub-78884">https://carnegieendowment.org/2019/04/15/india-s-asat-test-incomplete-success-pub-78884</a>.

<sup>&</sup>lt;sup>387</sup> Mosteshar, *supra* note 376. See also Tellis, *supra* note 389.

<sup>&</sup>lt;sup>388</sup> "International Space Station Dodges Chinese Space Junk - The New York Times", online:

<sup>&</sup>lt;https://www.nytimes.com/2021/11/10/science/china-debris-space-station.html>...

Space debris also poses a direct risk to the Earth (and its airspace) in the form of possible uncontrolled re-entries – an example being the recent re-entry of a Chinese launcher near the island of Borneo.<sup>389</sup> A broader concern is that using an ASAT could trigger a Kessler Syndrome event, whereby the entire orbital environment becomes inaccessible to humanity due to the cascading and exponential growth in space debris.<sup>390</sup> Given the broad, downstream usage of orbiting satellites by civilians worldwide, such a result would have a severe and global impact across many different sectors.

The difficulties in predicting debris patterns following an ASAT test, and the potentially catastrophic effects of space debris, make it difficult to reconcile these tests with Article IX of the Outer Space Treaty. This article provides that:

"[i]f a State Party to the Treaty has reason to believe that an activity or experiment planned by it or its nationals in outer space ... would cause *potentially harmful interference* with activities of other States Parties in the peaceful exploration and use of outer space ... it shall undertake appropriate international consultations before proceeding with any such activity or experiment."<sup>391</sup>

The threshold here for requiring consultations – "potentially harmful interference" – is quite low. Yet, as Russia's COPUOS delegation noted in a working paper, "[f]inding a precise method to be used for determining, in an objective way, what constitutes harmful interreference does not seem a fairly easy thing to do."<sup>392</sup> This appears to be correct, and the relevant *travaux préparatoires* do not shed light on the exact threshold. Nonetheless, I argue that ASAT tests do not require a "precise method" because it is common knowledge that such tests generate significant amounts of uncontrollable space debris, and that this debris has a deleterious effect on

<sup>&</sup>lt;sup>389</sup> Emma Roth, "China's Uncontrolled Rocket Crashes Down Over the Indian Ocean", (30 July 2022), online: *The Verge* <a href="https://www.theverge.com/2022/7/30/23285239/china-uncontrolled-rocket-crashes-down-indian-ocean-long-march-5b-borneo">https://www.theverge.com/2022/7/30/23285239/china-uncontrolled-rocket-crashes-down-indian-ocean-long-march-5b-borneo</a>.

<sup>&</sup>lt;sup>390</sup> See generally Jakub Drmola & Tomas Hubik, "Kessler Syndrome: System Dynamics Model" (2018) 44–45 Space Policy 29–39.

<sup>&</sup>lt;sup>391</sup> My emphasis.

<sup>&</sup>lt;sup>392</sup> Quoted in Chen, *supra* note 28 at 668.

satellites and the broader space environment. As such, "appropriate international consultations" would be required before conducting *any* ASAT test.

In some cases, notification has been given by the relevant state prior to the test. For example, China stated that it gave "notice" to, amongst others, the United States and Japan prior to conducting its 2007 ASAT test.<sup>393</sup> This raises the question of what exactly constitutes "appropriate international consultations" under Article IX. As Gorove points out, the details of these consultations are not spelled out:

"there is no indication of how many states a party [must] consult. There is no procedure outlined and no authority to determine the procedure. There is no provision in case the consultations end in a deadlock. There is no indication anywhere that a party must follow another party's recommendation. So long as there is consultation, the requirement is satisfied."<sup>394</sup>

Nonetheless, it is unlikely that a notification could suffice, given that consultation implies two-way communication. This is supported by consideration of Article XII of the Outer Space Treaty. This article provides for reciprocal visits by State representatives to "stations, installations, equipment and space vehicles on the moon and other celestial bodies." To this end, it provides that "representatives shall give reasonable advance *notice* of a projected visit, in order that *appropriate consultations* may be held." Clearly, mere notification is not tantamount to consultation for the purposes of Article XII. Rather, notification is simply a preliminary step to consultation. Applying the presumption of consistent usage,<sup>395</sup> notification cannot satisfy Article IX's consultation requirement.

As such, there is arguable incongruence between what the Outer Space Treaty and the actions of the United States, China, India, and Russia in testing ASATs. Indeed, it may be that these apparent breaches of Article IX have been so widespread and consistent that the rule requiring

<sup>&</sup>lt;sup>393</sup> "China Confirms Anti-Satellite Missile Test", *The Guardian* (23 January 2007), online: <a href="https://www.theguardian.com/science/2007/jan/23/spaceexploration.china">https://www.theguardian.com/science/2007/jan/23/spaceexploration.china</a>.

<sup>&</sup>lt;sup>394</sup> Stephen Gorove, "Contamination and the Outer Space Treaty" (1971) 14 Proc on L Outer Space 63 at 65. See also Chatterjee, *supra* note 72 at 31.

<sup>&</sup>lt;sup>395</sup> Scalia & Garner, *supra* note 336 at 170.

consultation has been – from an interactional perspective – destroyed.<sup>396</sup> To this end, rather than label ASAT tests as requiring consultations under Article IX, it is notable that the United States announced a moratorium on such testing, without suggesting that there were any specific legal obligations attached to these tests.

Of course, Article IX is just one of the Outer Space Treaty's various provisions. Further, it is arguably a more procedural than substantive provision. However, the identity of the states that have conducted ASAT tests – four of the leading space powers – makes the lack of congruence with Article IX particularly impactful.

Consideration of the PNA as embodied in Article II also illustrates the tensions that can arise between the Outer Space Treaty and state practice. Of course, there have been no recorded instances of states outright appropriating any part of space or a celestial body. But national legislation is also a form of practice. To this end, the legislation authorizing commercial space resource extraction in the United States and Luxembourg could be viewed as incongruent practice *vis-à-vis* the Outer Space Treaty.

On 25 November 2015, U.S. President Barack Obama signed into law the Commercial Space Launch Competitiveness Act ("United States Space Resources Legislation").<sup>397</sup> Section 51303 of the United States Space Resources Legislation provides that a United States citizen engaged in commercial recovery of an "asteroid resource" or a "space resource" is "entitled to any asteroid resource or space resource obtained, including to possess, own, transport, use and sell the asteroid resource or space resource obtained."

On 20 July 2017, the Grand Duke of Luxembourg signed a law "sur l'exploration et l'utilisation des ressources de l'espace" ("Luxembourg Space Resources Legislation").<sup>398</sup> The first article of the Luxembourg Space Resources Legislation boldly states that "[1]es ressources de l'espace sont susceptibles d'appropriation." While, as John Bergstresser explains, the United States Space Resources Legislation "is not nearly as expansive as the [Luxembourg Space

<sup>&</sup>lt;sup>396</sup> Brunnée & Toope, *supra* note 21 at 282.

<sup>&</sup>lt;sup>397</sup> U.S. Commercial Space Launch Competitiveness Act, Pub. L. No. 114-90, 129 Stat. 704 (2015) (United States) [hereinafter United States Space Resources Legislation). See generally Tronchetti, *supra* note 340.

<sup>&</sup>lt;sup>398</sup> Loi du 20 juillet 2017 sur l'exploration et l'utilisation des ressources de l'espace, Mémorial A n° 674 de 2017 (Luxembourg) [hereinafter Luxembourg Space Resources Legislation]. See generally Bergstresser, *supra* note 285.

Resources Legislation]" they both "achieves the same intended end: ownership of space resources for commercial purposes."<sup>399</sup>

Both the United States Space Resources Legislation and the Luxembourg Space Resources Legislation create "a potential conflict by investing rights to space resources to private entities which *prima facie* appears to be in direct contradiction" to Article II of the Outer Space Treaty.<sup>400</sup> Indeed, given that "international space law does not clarify whether space resources can be appropriated and used for commercial purposes," Tronchetti notes that the enactment of the United States Space Resources Legislation "has been deemed by some commentators to amount to a breach of the international obligations of the [United States]."<sup>401</sup>

The existence of such a breach of course depends on how Article II is interpreted. To this end, Froehlich notes that Russia "heavily protested the U.S. position on the exploitation of natural resources in outer space" as set out in the United States Space Resources Legislation on the grounds that it was contrary to the Outer Space Treaty.<sup>402</sup> Similar, although less heated, reactions followed the enactment of the Luxembourg Space Resources Legislation.<sup>403</sup> Subsequent and similar space resources legislation in the United Arab Emirates and Japan attracted less strident comments, with the former Administrator of Roscosmos commenting simply that:

"Russia believes that states mustn't adopt any laws and regulations on a unilateral basis because space is our common heritage and belongs to everyone ... [w]e consider the United Nations as a suitable [venue] to discuss these issues."<sup>404</sup>

The argumentation used in this ongoing debate varies and has already been outlined above in relation to the clarity criterion. However, such argumentation is not the focus on this thesis.

<sup>&</sup>lt;sup>399</sup> *Ibid* at 144.

<sup>&</sup>lt;sup>400</sup> *Ibid* at 146.

<sup>&</sup>lt;sup>401</sup> Tronchetti, *supra* note 340 at 143.

<sup>&</sup>lt;sup>402</sup> Froehlich, Seffinga & Qiu, *supra* note 239 at 35.

<sup>&</sup>lt;sup>403</sup> Bergstresser, *supra* note 285 at 18.

<sup>&</sup>lt;sup>404</sup> Jeff Foust, "Japan Passes Space Resources Law", (17 June 2021), online: SpaceNews

<sup>&</sup>lt;https://spacenews.com/japan-passes-space-resources-law/>.

Rather, returning the criteria of legality, these legislative actions do not necessarily indicate incongruence. Indeed, they could be argued to show that the practice of states within the space regime is in fact strongly shaped by the Outer Space Treaty, given the attention paid in both the United States Space Resources Legislation and the Luxembourg Space Resources Legislation to each states' international obligations. The Luxembourg Space Resources Legislation states that an authorized space resource operator must perform their activities "en conformité avec les conditions de son agrément et *les obligations internationales du Luxembourg*."<sup>405</sup> For its part, the United States Space Resources Legislation specifies that rights to resources from asteroids are conferred if those resources they are obtained in accordance international law.<sup>406</sup> As Durkee notes, "[i]f international law in fact prohibits commercial mining and use of outer space resources, then the caveat may swallow the rule."<sup>407</sup>

But the practical reality is that the United States, Luxembourg, and Japan have decided to pre-empt the ongoing discussion that was taking place through COPUOS and elsewhere in relation to Article II. As Tronchetti explains:

"the decisions to adopt, on a unilateral basis, domestic legislation which implements controversial provisions of the Outer Space Treaty not only may undermine the stability and cohesive application of that Treaty but also contribute to creating a climate of tension and lack of transparency among States."<sup>408</sup>

Such pre-emption therefore suggests incongruence. Viewed alongside the concerns about Article IX, it appears that the Outer Space Treaty can only partially satisfy the congruence criterion.

# C. Final comment

In this Chapter, I have explored whether the Outer Space Treaty satisfies the eight criteria of legality. The result is that the Outer Space Treaty satisfies most of the criteria. However, there

<sup>&</sup>lt;sup>405</sup> Luxembourg Space Resources Law, art 2(3).

<sup>&</sup>lt;sup>406</sup> United States Space Resources Law, s 51303.

<sup>&</sup>lt;sup>407</sup> Durkee, *supra* note 105 at 461.

<sup>&</sup>lt;sup>408</sup> Tronchetti, *supra* note 340 at 154.

are challenges surrounding the clarity and congruence criteria. With respect to the lack of clarity, this is an area where the space regime's positivist analysis has been of significant assistance. However, the lack of clarity leaves the door open to diverging interpretations. The extent to which these open doors will be exploited by space actors remains to be seen. But this lack of clarity does not amount to what Rundle would describe as a "total failure,"<sup>409</sup> given the inevitable ambiguities of treaties. Rather, the lack of congruence, I argue, is the most concerning issue arising from the above analysis.

The importance of the congruence criterion arises because a key premise of the interactional framework is that law cannot exist solely on paper or in people's minds.<sup>410</sup> Rather, it must be reflected in actions if it is to count as law. As such, the seeming abandonment by some leading space powers of the Article IX consultation requirement – at least in relation to ASAT tests – is highly problematic. Similarly, legislation in the United States, Luxembourg and Japan relating to commercial space resources challenges the broader space regime by pre-empting ongoing discussions within COPUOS and the broader transnational community, as well as the efforts of the Space Resources Working Group. Overall, incongruence – even with respect to specific articles – degrades the legality of the Outer Space Treaty as a whole.

An important caveat to this discussion is, by and large, the space regime is complied with.<sup>411</sup> This may reflect, as Schachter notes, the fact that international law "is so thoroughly embedded in the minds and habits of officials that it is given effect without conscious decision making."<sup>412</sup> But the embedded nature of law makes the particular examples of incongruence all the more troubling; they may suggest a deliberate disregard by states for the space regime's requirements. In any event, the congruence issues raised in this Chapter suggest that a closer look at practice is warranted. As such, the next Chapter explores the practice of legality that surrounds the space regime.

<sup>&</sup>lt;sup>409</sup> Rundle, "'Fuller's Internal Morality of Law", *supra* note 132 at 500.

<sup>&</sup>lt;sup>410</sup> See Adler, *supra* note 228 at 15.

<sup>&</sup>lt;sup>411</sup> Stuart, *supra* note 388.

<sup>&</sup>lt;sup>412</sup> Schachter, *supra* note 357 at 91.

# **CHAPTER 5**

# Practices of Legality

# A. Introduction

Is the space regime sustained by a continuous effort to realize all the criteria of legality?<sup>413</sup> In this Chapter, I respond to this question. Recall that a regime, even if it enjoys legitimacy and legality, must be supported by a practice of legality to be sustained over time. There is a rich array of practices that are relied upon daily in relation to space activities. Examples of such fundamental practices include those relating to space object registration regime, as facilitated by UNOOSA,<sup>414</sup> and the complex contractual regimes that support commercial satellite transactions.<sup>415</sup> The negotiations that take place in and around COPUOS are another key form of practice, and one that has attracted many writers.<sup>416</sup>

Analysis of all these practices is beyond the scope of this thesis. As such, in this Chapter, I focus on a particularly valuable example of space regime practice: ITU practice. As Paul Larsen notes, a satellite is "useless without a cleared radio-frequency [spectrum] and an exclusive orbit."<sup>417</sup> And satellites still constitute the vast majority of space activity.<sup>418</sup> As such, the common denominator for the vast majority of space activities is the ITU – the United Nations specialized agency responsible for coordinating the international management of radio-frequency spectrum and satellite orbits.

<sup>&</sup>lt;sup>413</sup> Brunnée & Toope, *supra* note 21 at 283.

<sup>&</sup>lt;sup>414</sup> Ram S Jakhu, Bhupendra Jasani & Jonathan C McDowell, "Critical Issues Related to Registration of Space Objects and Transparency of Space Activities" (2018) 143 Acta Astronautica 406–420.

<sup>&</sup>lt;sup>415</sup> See generally Nelson, "NewSpace, Old Problems", *supra* note 159.

<sup>&</sup>lt;sup>416</sup> See, e.g., Froehlich, Seffinga & Qiu, *supra* note 239. See also Gaggero, *supra* note 261.

<sup>&</sup>lt;sup>417</sup> Paul B Larsen, "Small Satellite Legal Issues" (2017) 82:2 J Air L & Com 275–310 at 283.

<sup>&</sup>lt;sup>418</sup> Michael Sheetz, "The Space Industry is on its Way to Reach \$1 Trillion in Revenue by 2040, Citi Says", (21 May 2022), online: *CNBC* <a href="https://www.cnbc.com/2022/05/21/space-industry-is-on-its-way-to-1-trillion-in-revenue-by-2040-citi.html">https://www.cnbc.com/2022/05/21/space-industry-is-on-its-way-to-1-trillion-in-revenue-by-2040-citi.html</a>.

ITU practice is examined in Section B. This examination compares this practice against the eight criteria of legality.<sup>419</sup> I conclude that ITU practice faces issues relating to promulgation and non-contradiction. The end result is that a core aspect of practice within the space regime is not sustained by a continuous effort to realize *all* the criteria of legality. Section C then offers a final comment, noting that the centrality of ITU practice to the space regime suggests that these issues could, over time, inhibit the legality of the space regime.

It should be noted that the application of the criteria of legality to practice represents a novel extension of Fuller's ideas by Brunnée and Toope. This extension is necessary because "law does not exist merely because legal norms are declared."<sup>420</sup> Rather, they "must be continuously maintained or they can be destroyed."<sup>421</sup> The interactional approach takes Fuller's criteria well beyond their original field of application. As such, the analysis in this Chapter differs from the Chapter 4's more rigid analysis. My focus here is on those criteria that are engaged by practice within the space regime; I do not address each criterion seriatim. Further, the field of investigation is large: ITU practice is expansive and incredibly complex. While it is possible to analyze particular parts of this practice, I have chosen to analyze the practice generally. Again, this choice is motivated by my research question, which addresses the space regime at large. Too granular an analysis may impede the extrapolation necessary to respond to my research question. Finally, the criterion of congruence is not addressed specifically. This exclusion is justified on the grounds that the entire concept of analyzing practices of legality derives from the congruence criterion.<sup>422</sup>

# B. The ITU

As Elina Morozova and Yaroslav Vasyanin explain, both radio-frequency spectrum and orbits are limited natural resources: "[d]ue to their physical characteristics, it is impossible to use the same frequencies in neighboring orbital locations without the risk of creating interference to

<sup>&</sup>lt;sup>419</sup> Brunnée & Toope, *supra* note 21 at 6.

<sup>&</sup>lt;sup>420</sup> *Ibid* at 352.

<sup>&</sup>lt;sup>421</sup> *Ibid*.

<sup>&</sup>lt;sup>422</sup> *Ibid* at 282.

other satellites."<sup>423</sup> Accordingly, the ITU aims to ensure that they are used rationally, efficiently, and economically as well as equitably.<sup>424</sup>

Given this focus, it is a heavily technical institution. It is populated primarily by engineers and businesspeople; the ITU's website proudly describes the ITU's Secretary-General, Houlin Zhao, as, first and foremost, an "information and communication technology engineer."<sup>425</sup> The Deputy Secretary-General, Malcolm Johnson, is "a Chartered Engineer [and] a Fellow of the Institution of Engineering and Technology."<sup>426</sup> Of the remaining three members of the ITU executive team, two are engineers and one is a telecommunications policy expert.<sup>427</sup> Clearly, lawyers and diplomats play a predominantly supporting role in the ITU.

The highly technical character of the ITU regime means that it generally satisfies the criteria of generality, non-retroactivity, clarity, non-impossibility, and constancy. As previously described, at the heart of the ITU regime is the knowledge that interference will affect all – that is, without effective coordination, all will be denied use of radio-frequency spectrum through the laws of physics (rather than the laws of states or whims of people). This knowledge induces compliance, but also ensures that the practices within the ITU are generalized across all relevant parties, are forward-looking, are clear (to a technical audience), and reflect reality. However, issues relating to the promulgation and non-contradiction criteria are not so easily resolved, as outlined below.

<sup>426</sup> "Deputy Secretary-General", (2022), online: *International Telecommunications Union* <<u>https://www.itu.int:443/en/osg/dsg/Pages/default.aspx></u>.

<sup>&</sup>lt;sup>423</sup> Elina Morozova & Yaroslav Vasyanin, "International Space Law and Satellite Telecommunications" in *Oxford Research Encyclopedia of Planetary Science* (Oxford University Press, 2019).

<sup>&</sup>lt;sup>424</sup> ITU Constitution, art 44.

<sup>&</sup>lt;sup>425</sup> "Office of the Secretary-General", (2022), online: *International Telecommunications Union* <https://www.itu.int:443/en/osg/Pages/default.aspx>.

<sup>&</sup>lt;sup>427</sup> "Management Team 2019-2022", (2022), online: *International Telecommunications Union* <a href="https://www.itu.int:443/en/osg/Pages/itu-management-team.aspx">https://www.itu.int:443/en/osg/Pages/itu-management-team.aspx</a>>.

# 1. Promulgation

The highly technical nature of ITU practice poses problems regarding the promulgation criterion. The ideal behind the promulgation criterion is access: that all relevant parties should be able to readily access information about that practice. This is invariably hard: a large part of practice within various institutions and regimes is invariably either unwritten, or even contrary to what practices may be written. This is often referred to as 'institutional knowledge.' However, ITU practice is notably inaccessible. More specifically, the ITU implements cost-recovery across much of its key databases and programs that restricts access to key data and information.

Of key relevance to the space regime is the fact that the ITU's *Space Network System* database requires either an annual subscription or ITU membership.<sup>428</sup> This database provides data of geostationary and non-geostationary satellite filings, as well as Earth station filings. Similarly, the ITU's *International Frequency Information Circular (Space Services)* – which sets out the particulars of frequency allotments and space services assignments – is restricted to paying subscribers or ITU national administrations (i.e., national telecommunications authorities).<sup>429</sup>

It could be argued that these are highly technical databases that are suitable for analysis by no-one other than experts. However, this argument does not align with my own experience: I have been confronted with the roadblocks presented by the ITU's cost recovery processes while investigating various satellite systems and filings (including for this thesis).

Indeed, the ITU notes that the *Space Network System* database "is an *essential* reference tool for government agencies, public and private telecommunication operating agencies, manufacturers, scientific/industrial entities, international organizations, consultants, technical colleges, universities, etc."<sup>430</sup> Its apparently essential nature is all the more troubling when it is

<sup>&</sup>lt;sup>429</sup> "International Frequency Information Circular (Space Services)", (2022), online: *International Telecommunications Union* <a href="https://www.itu.int:443/en/ITU-R/space/Pages/brificMain.aspx">https://www.itu.int:443/en/ITU-R/space/Pages/brificMain.aspx</a>.

<sup>&</sup>lt;sup>430</sup> International Telecommunications Union, *supra* note 431. My emphasis.

considered that the *Space Network System* database is only accessible in English,<sup>431</sup> despite the ITU having six official languages.<sup>432</sup>

It appears that the true reason for implementing cost-recovery, and perhaps the reason for the reliance on English alone, is that the ITU is notoriously underfunded.<sup>433</sup> Cost-recovery processes within international organizations are not uncommon.<sup>434</sup> They can be argued against on various grounds, including equitable access grounds. The interactional approach does not disregard these concerns: rather, it adds a further concern – that over time, locking core parts of a regime behind paywalls degrades the practice of legality within that regime. As such, from an interactional perspective, the limitations on these and other key tools degrades the practice of legality within the ITU. This is because access to both databases is essential to understanding ITU practice. Restricting access in this manner also heightens the perception of the ITU as arcane. To this end, a headline article from the Center for Strategic and International Studies is unsurprising, yet troubling from an interactional perspective: *"The International Telecommunication Union: The Most Important UN Agency You Have Never Heard Of.*"<sup>435</sup>

#### 2. Non-contradiction

Consideration of the non-contradiction criterion highlights how the ITU's practices face a perennial conflict. On the one hand, the ITU Constitution refers to equitable access to radio-frequencies spectrum and satellite orbits as a goal (and, as Schachter notes, "implicitly an obligation")<sup>436</sup> of its Member States. On the other hand, ITU practice is fundamentally a practice

<sup>&</sup>lt;sup>431</sup> *Ibid*.

<sup>&</sup>lt;sup>432</sup> Arabic, Chinese, English, French, Russian and Spanish: ITU Constitution, art 29(1).

<sup>&</sup>lt;sup>433</sup> Kristen Cordell, "The International Telecommunication Union: The Most Important UN Agency You Have Never Heard Of", (14 December 2020), online: *Center for Strategic & International Studies* 

<sup>&</sup>lt;https://www.csis.org/analysis/international-telecommunication-union-most-important-un-agency-you-have-never-heard>.

<sup>&</sup>lt;sup>434</sup> See, e.g., *Cost-Recovery Mechanisms: Programme Support Costs*, by World Health Organization, EB/WGSF/2/5 (Geneva: World Health Organization, 2021).

<sup>&</sup>lt;sup>435</sup> Cordell, *supra* note 436.

<sup>&</sup>lt;sup>436</sup> Schachter, *supra* note 357 at 88.

of co-ordination and co-operation. The ITU itself summarizes ITU practice as a "cooperative system" whereby:

"ITU Member States provide the characteristics of their intended use of orbit/spectrum resources, the ITU Radiocommunication Bureau examines their compliance with the Radio Regulations, and then publishes them so that they can be coordinated with other ITU Member States who have satellite projects that could be affected."<sup>437</sup>

Coordination between ITU Member States is fundamentally a bilateral negotiation.<sup>438</sup> Upon the conclusion of this process, the relevant details are included in the "Master International Frequency Register" where they "enjoy the legal rights (mainly operating free from harmful interference) obtained in conformity with the [ITU's] Radio Regulations."<sup>439</sup> It is not empowered to enforce co-ordination or compel co-operation, and by its practices does not do so. Broadly, this means that the ITU practice is 'first come, first serve.' The ITU explains the history of this practice as follows:

"[i]n the process of establishing the ITU's space-related regulations, emphasis was laid from the outset on efficient, rational and cost-effective utilization. This concept was implemented through a 'first come, first served' procedure. This procedure ... is based on the principle that the right to use orbital and spectrum resources for a satellite network or system is acquired through negotiations with the [national] administrations concerned by actual usage of the same portion of the spectrum and orbital resource. If applied correctly (i.e., to cover genuine requirements), the procedure offers a means of achieving efficient spectrum/orbit management."<sup>440</sup>

The key phrase here is "[i]f applied correctly." As Patrick Ryan notes, national administrations are incentivized by 'first come, first served' to "stake a claim" on orbital slots.<sup>441</sup>

<sup>&</sup>lt;sup>437</sup> "Radio Frequencies - Radio Regulations: An Enduring Success" (2019) 2 ITU News at 5.

<sup>&</sup>lt;sup>438</sup> Jakhu, *supra* note 54 at 3.

<sup>439</sup> note 440 at 5.

<sup>&</sup>lt;sup>440</sup> International Telecommunications Union, ITU Radio Regulatory Framework for Space Services (2016).

<sup>&</sup>lt;sup>441</sup> Patrick Ryan, "The Future of the ITU and its Standard-Setting Functions in Spectrum Management" in

Sherrie Bolin, ed, The Standards Edge: Future Generation (Michigan: Sheridan Books, 2005) at 353.

Given that only some states can (or can afford to) access space, and that those states' national administrations also often have the greatest negotiation power, the obvious outcome of this practice is that those states (or their companies) have ended up indefinitely occupying the most valuable orbital slots.

As Theodora Ogden explains, the most valuable orbital slots are those in the "geostationary orbit," around 35,800 kilometers above the Earth's equator.<sup>442</sup> She notes that a "satellite in geostationary orbit rotates at the same rate as Earth, remaining directly above a single location on Earth's surface" – a very useful attribute for "telecommunications, broadcasting and weather satellites," as their receiving dishes need not move to track the satellites.<sup>443</sup> There are a limited number of these slots.<sup>444</sup> It should come as no surprise that developed states and their companies control most of these geostationary orbital slots and have done so since the beginning of space exploration.<sup>445</sup> As such, the reality of ITU practice seems to contradict the goals established in the ITU Constitution.

This contradiction was recognized in the early days of the space regime, and came to a head in 1976, with the *Declaration of the First Meeting of Equatorial Countries*<sup>446</sup> – better known as the "Bogotá Declaration." This declaration, made by seven developing states<sup>447</sup> situated along the equator, asserted sovereignty over those geostationary orbital slots that lay above their respective territories. This initiative met strong resistance,<sup>448</sup> contrary as it was to the PNA (and the interests of the space powers). The initiative was ultimately abandoned. But it is instructive to consider the specific reasons used to justify this bold assertion of sovereignty.

<sup>&</sup>lt;sup>442</sup> Theodora Ogden, "Wealthy Nations are Carving Up Space and its Riches – and Leaving Other Countries Behind", (11 May 2022), online: *The Conversation* <a href="http://theconversation.com/wealthy-nations-are-carving-up-space-and-its-riches-and-leaving-other-countries-behind-182820">http://theconversation.com/wealthy-nations-are-carving-up-space-and-its-riches-and-leaving-other-countries-behind-182820</a>>.

<sup>&</sup>lt;sup>443</sup> *Ibid*.

<sup>&</sup>lt;sup>444</sup> 1,800 slots are currently marked out. See: *Ibid*.

<sup>&</sup>lt;sup>445</sup> Schachter, *supra* note 357 at 88.

<sup>&</sup>lt;sup>446</sup> First Meeting of Equatorial Countries, *Declaration* (Bogotá, 1976). The text of the declaration can be found here: <u>https://www.jaxa.jp/library/space\_law/chapter\_2/2-2-1-2\_e.html</u>.

<sup>&</sup>lt;sup>447</sup> Brazil, Colombia, Congo, Ecuador, Indonesia, Kenya, Uganda, and Zaire (now the Democratic Republic of the Congo).

<sup>&</sup>lt;sup>448</sup> Balleste, *supra* note 320 at 183.

The Bogotá Declaration specifically cites concerns about the saturation of the geostationary orbit, and dismisses solutions proposed by the ITU – which reserved some slots to non-space faring states but did not fundamentally displace the 'first come, first serve' practice<sup>449</sup> – as "impracticable and unfair."<sup>450</sup> More specifically, the Bogotá Declaration states that the ITU's solutions

"would considerably increase the exploitation costs of this resource [i.e., the geostationary orbit] especially for developing countries that do not have equal technological and financial resources as compared to industrialized countries, who enjoy an apparent monopoly in the exploitation and use of its geostationary synchronous orbit."<sup>451</sup>

The Bogotá Declaration then expressly references the ITU Constitution's provisions relating to equitable access, and states that:

"both the geostationary orbit and the frequencies have been used in a way that does not allow the equitable access of the developing countries that do not have the technical and financial means that the great powers have. Therefore, it is imperative for the equatorial countries to exercise their sovereignty over the corresponding segments of the geostationary orbit."

In other words, for this group of States, the lack of their material ability to access the geostationary orbit could only be remedied by asserting sovereignty over that part of outer space. The Bogotá Declaration supports its claims on the basis that the Outer Space Treaty does not define the term "outer space" and asserts that the geostationary orbit is in fact not part of "outer

See: International Telecommunications Union, *supra* note 443. <sup>450</sup> First Meeting of Equatorial Countries, *supra* note 449.

<sup>&</sup>lt;sup>449</sup> These solutions have since been implemented. As the ITU describes it, these solutions involve the

<sup>&</sup>quot;establishment (and introduction into the ITU regulatory regime) of frequency/orbital position plans in which a certain amount of frequency spectrum is set aside for future use by all countries, particularly those which are not in a position, at present, to make use of these resources. These plans, in which each country has a predetermined GSO orbital position associated with the free use, at any time, of a certain amount of frequency spectrum, together with the associated procedures, guarantee for each country equitable access to the spectrum/orbit resources, thereby safeguarding their basic rights."

<sup>&</sup>lt;sup>451</sup> *Ibid*.

space" – such arguments being available due to the Outer Space Treaty's lack of clarity, as described in Chapter 4.

As Roy Balleste explains, "[t]he idea of resorting to claims of sovereignty may have been tempting at a time of limited accessibility to space."<sup>452</sup> But more generally, the Bogotá Declaration also argues that the Outer Space Treaty

"cannot be considered as a final answer to the problem of the exploration and use of outer space, even less when the international community is questioning all the terms of international law which were elaborated when the developing countries could not count on adequate scientific advice and were thus not able to observe and evaluate the omissions, contradictions and consequences of the proposals which were prepared with great ability by the industrialized powers for their own benefit."<sup>453</sup>

This is fundamentally a call for equity, and a criticism of the contradictions that afflict not just ITU practice, but the Outer Space Treaty and the space regime more generally. And the problems identified in the Bogotá Declaration remain today. Indeed, more recent developments relating to megaconstellations have been presented as a potential way of improving equity, yet they seem more likely to reinforce these contradictions than resolve them.

Megaconstellations, as Francis Kinsella explains, "are systems utilizing hundreds to tens of thousands of satellites in Low Earth Orbit ("**LEO**") to deliver low latency broadband data [and imagery] services anywhere on the planet."<sup>454</sup> They provide extensive opportunities, particularly for tackling inequality. In a 2020 report, the United Nations Children's Fund and the ITU found that two-thirds of the schoolchildren globally lack home internet access.<sup>455</sup> This "digital divide" has been exacerbated by the ongoing pandemic (and the consequent heavy reliance on distance

<sup>&</sup>lt;sup>452</sup> Balleste, *supra* note 320 at 181.

<sup>&</sup>lt;sup>453</sup> First Meeting of Equatorial Countries, *supra* note 449.

<sup>&</sup>lt;sup>454</sup> Francis Kinsella, "Megaconstellations in Space: Revolutionising the Satellite Industry", (2022), online: *Airbus* <a href="https://securecommunications.airbus.com/en/meet-the-experts/mega-constellations-in-space-revolutionising-satellite-industry">https://securecommunications.airbus.com/en/meet-the-experts/mega-constellations-in-space-revolutionising-satellite-industry</a>.

<sup>&</sup>lt;sup>455</sup> How Many Children and Young People Have Internet Access at Home?, 978-92-806-5200–0 (New York: UNICEF / ITU, 2020).

education).<sup>456</sup> Megaconstellations offer a potential solution to these problems by 'leapfrogging' technological and infrastructure gaps globally.

However, the challenges presented by megaconstellations are equally significant. The impact on astronomy has had a remarkably high media resonance. A *Space.com* headline from late 2021 declares: "*Megaconstellations Could Destroy Astronomy and There's No Easy Fix.*"<sup>457</sup> Concerns regarding astrocolonialism have also been raised.<sup>458</sup> There is also a significant risk of orbital debris.<sup>459</sup> Overall, the advent of megaconstellations means that LEO will soon become as crowded as Earth's shipping lanes and air routes. Clearly, effective LEO governance is necessary to manage these risks and prevent inequitable distribution of orbits.

However, as Jakhu and Pelton explain, "[t]he issue of who should control and oversee the number of satellites that should be deployed in LEO" – especially for megaconstellations – "is far from clear."<sup>460</sup> Importantly, there are "no accepted international regulations as to systematic control of satellite constellations in LEO and no enforcement process for ensuring that satellites are deorbited" rather than abandoned.<sup>461</sup>

Given this legal and institutional context, megaconstellations governance occurs primarily within national legal systems, subject to coordination through ITU practice.<sup>462</sup> To this end, the ITU previously had a single system for satellite filings that only distinguished between satellites in geostationary orbit and non-geostationary orbit. Most filings were for single satellites or small constellations of 8 to 12 satellites. Then, in 2019, SpaceX submitted a filing (through the relevant

<sup>&</sup>lt;sup>456</sup> Douglas Broom, "Coronavirus has Exposed the Digital Divide Like Never Before", (22 April 2020), online: *World Economic Forum* <a href="https://www.weforum.org/agenda/2020/04/coronavirus-covid-19-pandemic-digital-divide-internet-data-broadband-mobbile/">https://www.weforum.org/agenda/2020/04/coronavirus-covid-19-pandemic-digital-divide-internet-data-broadband-mobbile/</a>>.

<sup>&</sup>lt;sup>457</sup> Paul Sutter, "Megaconstellations Could Destroy Astronomy and There's No Easy Fix", (6 October 2021), online: *Space.com* <a href="https://www.space.com/megaconstellations-could-destroy-astronomy-no-easy-fix">https://www.space.com/megaconstellations-could-destroy-astronomy-no-easy-fix</a>.

<sup>&</sup>lt;sup>458</sup> Ferreira, *supra* note 70. This term generally refers to the erasure by Western science and technology of non-Western cultural links, knowledge systems and understandings relating to outer space.

<sup>&</sup>lt;sup>459</sup> Mejía-Kaiser, *supra* note 60.

<sup>&</sup>lt;sup>460</sup> Jakhu & Pelton, *supra* note 51 at 443.

<sup>&</sup>lt;sup>461</sup> *Ibid*.

<sup>&</sup>lt;sup>462</sup> International Telecommunications Union, *supra* note 170.

U.S. authorities) for 30,000 satellites.<sup>463</sup> Other companies and states soon followed, with Rwanda filing in late 2021 for 327,320 satellites.<sup>464</sup> It is doubtful whether Rwanda actually intends to deploy these satellites, or if their intentions are more strategic.<sup>465</sup> Nonetheless, the filing pressure compelled the ITU to develop dedicated systems to handle these applications<sup>466</sup> – but without changing the fundamental practice of 'first come, first serve.'<sup>467</sup> As such, the contradiction between ITU practice and the ITU Constitution's equitable goals is intensified in the age of megaconstellations.<sup>468</sup>

Consideration of the changes in ITU practice compelled by megaconstellations highlights a central pluralist theme: that "the law is constantly being reinvented by its subjects … even as they may seem to be merely complying with it."<sup>469</sup> This aptly describes the ITU's experience concerning SpaceX and other private actors. And it appears likely that these non-state actors will continue to shape the ITU regime in ways that will not tend towards equality. Instead, they will pursue strategic changes that will benefit their own projects and weaken those of their competitors. As such, the drive toward megaconstellations seem likely to exacerbate contradictions in ITU practice.

As Schachter concludes, this issue is "a complicated problem of distributive justice and can only be understood and dealt with in the light of technical and managerial

<sup>&</sup>lt;sup>463</sup> Jeff Foust, "Satellite Operators Criticize 'Extreme' Megaconstellation Filings", (14 December 2021), online: *SpaceNews* <https://spacenews.com/satellite-operators-criticize-extreme-megaconstellation-filings/>.

<sup>&</sup>lt;sup>464</sup> Ibid.

<sup>&</sup>lt;sup>465</sup> For example, Rwanda could use their filing as a 'bargaining chip' in negotiations with other ITU Member States.

<sup>&</sup>lt;sup>467</sup> Given that these megaconstellations are predominantly planned by private companies, the megaconstellations example further illustrates Durkee's argument that "private entities make law by thrusting states into a reactive position and changing the status quo against which international law develops." See: Durkee, *supra* note 105 at 431.

<sup>&</sup>lt;sup>468</sup> Balleste also points out the contradiction between the ITU practice and Article 1 of the Outer Space Treaty. See: Balleste, *supra* note 320 at 182.

<sup>&</sup>lt;sup>469</sup> Mégret, *supra* note 190 at 551.

considerations."<sup>470</sup> But it represents the persistent contradiction at the heart of ITU practice: given the vast disparities in space access, how could 'first come, first serve' ever result in equitable access to radio-frequency spectrum and satellite orbits?

# C. Final comment

In this Chapter, I have examined whether ITU practice satisfies the criteria of legality. Most of the criteria of legality do not arise – a consequence of the ITU's highly technical nature. However, ITU practice faces challenges relating to promulgation and non-contradiction. The inaccessibility of key tools necessary to understand ITU practice does not support its legality, nor does the fundamental contradiction at the heart of ITU practice regarding equitable access. While neither issue seems to be actively inhibiting daily ITU practice, it is difficult to conclude that this practice fully realizes all the criteria of legality. This calls into question the ability of ITU practice to sustain the broader space regime, given the centrality of the former to the latter. This result is considered further, together with the results reached throughout this thesis, in the next and final Chapter.

<sup>&</sup>lt;sup>470</sup> Schachter, *supra* note 357 at 88.

#### **CHAPTER 6**

## Ways Forward for the Space Regime

Would an expanded space regime be effective in guiding and controlling behavior in space? The conclusion reached is that this question must be answered in the negative. From an interactional perspective, the space regime has certain defects. While there is a shared understanding regarding the need for normativity in space, the Outer Space Treaty and ITU practice only partially satisfy the eight criteria of legality. Extrapolating across the broader space regime, it appears that this regime enjoys legitimacy but a degraded and incompletely sustained legality. This leads to the regime generating a weak sense of obligation among the various space actors – perhaps explaining, in part, some of the challenges we face in space today. Expanding the space regime to address these challenges, without first remedying the regime's underlying legality issues, appears unlikely to be effective in guiding and controlling behavior in space.

This conclusion suggests that the solution to the space regime's problems is not more norms or even 'better' norms, but better use of the norms we have. Such a conclusion is hardly radical. But in the foregoing analysis of the space regime, the details have undoubtedly obscured the whole. According, it is necessary to first, restate the various findings and, second, outline the consequences of these findings.

Having argued in Chapter 2 in favor of an interactional approach to the space regime, in Chapter 3, I established that there is a shared understanding regarding the need for the space regime. This shared understanding is demonstrated by the vitality of the space regime's transnational community. However, this shared understanding is challenged by the near-term fragmentation of the space regime arising from United States – Russia decoupling.

In Chapter 4, I found that the Outer Space Treaty meets many of the criteria of legality. However, there are challenges surrounding the clarity criteria, and the congruence criterion is vexed by legislative practices that pre-empt Article II and disregard of Article IX *vis-à-vis* ASAT testing. These challenges degrade the legality of the Outer Space Treaty as a whole. Finally, in Chapter 5, I identified ITU practice as degraded by promulgation and non-contradiction issues. Cost-recovery requirements inhibit access to essential aspects of ITU practice, and there is a fundamental contradiction between the ITU's equitable ideals and its 'first come, first serve' practice. Each of these findings is suggestive of various remedies. Without listing every possible remedy, four potential themes for further action can be identified as follows.

First, reinforce the vitality of the space regime's transnational community. From an interactional perspective, the space regime's people and places must be strongly supported (particularly following the inevitable downturn in physical interactions during the ongoing pandemic). To this end, conferences, side events, symposiums, debates are all constitutive of the space regime's transnational community, and should be facilitated by universities, national space agencies, scientific institutions, and private enterprises. Such reinforcement would support a broadly shared understanding regarding the need for normative in space. This shared understanding is essential to the space regime, and cannot be taken for granted.

Second, enhance the clarity of core norms through working groups. The establishment of the Space Threats Working Group and the Space Resources Working Group are key steps towards bring greater clarity to, or perhaps even resolving, longstanding debates. These working groups can often force relevant actors to 'put their cards on the table' and openly ventilate their views, concerns, and objections on specific topics. These processes engender a commitment to communication, and at their best they can encourage openness to reciprocal modification of outlook.<sup>471</sup> To this end, consideration should be given to establish a similar working group within COPUOS to address harmful interference under Article IX. Resolution of this issue would generally enhance the space regime's legality.

Third, develop further international manuals. These documents are drafted by international experts with the goal of clearly and neutrally stating the law as it applies within a particular domain. From an interactional perspective, the fact that these manuals – such as the recently published *McGill Manual on International Law Applicable to Military Uses of Outer Space*<sup>472</sup> – are entirely non-binding is of little importance. What is important is that both the instruments

<sup>&</sup>lt;sup>471</sup> Brunnée & Toope, *supra* note 21 at 82.

<sup>&</sup>lt;sup>472</sup> Ram S Jakhu & Steven Freeland, eds, *McGill Manual on International Law Applicable to Military Uses of Outer Space* (Montreal: Centre for Research in Air and Space Law, 2022). See also Chen, *supra* note 28 at 667.

themselves, and the transnational processes that produces those documents, can assist in setting baselines and expectations across the regime.<sup>473</sup>

Fourth, facilitate greater access to the space regime. There are two angles to this. First, ensuring linguistic equality across the space regime. This is an ongoing challenge. While it was not explored by Brunnée and Toope in detail, it is, in my view, a key insight of the interactional approach. Second, removing cost barriers to essential tools and data. While space activities are highly technical, they should not be hidden behind paywalls or membership requirements – and nor should space regime literature.

These four themes for action may be dismissed by some as 'fiddling while Rome burns,' given that the pressures of space debris, weaponization and commercialization are upon us now (and considering the deteriorating geopolitical situation). However, regardless of what drastic changes may be required, the political realities are such that drastic change is largely precluded. This reflects a core concern of Brunnée and Toope: that "law-makers may have to be modest in their aspirations if a sustainable community of legal practice is to emerge."<sup>474</sup> As such, I suggest that the themes for action outlined above should have a higher priority than the development of new treaties or norms – that is, the expansion of the space regime. This is because these themes are conditions antecedent to the effective expansion of that regime.

Alongside providing a response to the primary research question, this thesis' secondary objective has been to demonstrate the utility of the interactional approach to the space regime, and to generally illustrate the benefits of theoretical approaches to this regime. To this end, different theoretical approaches will deconstruct and reconfigure the space regime in different ways. Each approach will present a different picture of that regime, with different issues and different solutions. The resulting heterogeneity can be confusing, but it is to be expected: as Jörg

<sup>&</sup>lt;sup>473</sup> As Steer explains, manuals have been "incorporated into national military manuals and are in the hands of military legal advisors during tensions and hostilities. They, therefore, affect decision making and, potentially, the formation of customary law through state practice and explicit agreement that their content reflects the law." See: Steer, *supra* note 64 at 14. For a critical perspective on manuals generally, and the *Tallinn Manual on the International Law Applicable to Cyber Warfare* specifically, see: Dan Efrony & Yuval Shany, "A Rule Book on the Shelf? Tallinn Manual 2.0 on Cyberoperations and Subsequent State Practice" (2018) 112:4 Am J Int'l L 583–657.

<sup>&</sup>lt;sup>474</sup> Brunnée & Toope, *supra* note 21 at 42.

Kammerhofer summarizes, "[l]egal theorizing means making stark choices and provoking incommensurability."<sup>475</sup>

I suggest that we should not be overly concerned with such incommensurability vis-à-vis the space regime. This is because incommensurability does not, as Ruth Chang notes, "entail incomparability."<sup>476</sup> While each theoretical approach will rely on different assumptions and have different focus points, it is nonetheless possible to compare two theoretical analysis of the space regime and find one more insightful than the other. Indeed, the space regime remains nascent: differing views should be encouraged. After all, space involves big questions; our thinking must be equally broad. In my view, such breadth of thinking can be fostered by further theoretical analysis of the space regime and its key concepts. The international approach is certainly not the only theoretical perspective that can provide insight into the space regime. To this end, further theoretical exploration is not only useful, but entirely necessary: as the space regime comes to encompass more actors, theoretical approaches to the space regime will be needed to better understand the resulting complexity.

This proliferation of space actors brings me to a final point. Despite the somewhat somber conclusions reached in this thesis, the interactional approach suggests hope. Normative convergence remains possible, despite political tensions. Key to this is ensuring communication and dialogue – in a single word, *interaction* (even in the absence of agreement). As such, the more that non-state actors engage with and contribute to the space regime, the more effective the space regime is likely to be. The challenge will be how to keep non-state actors interacting with the regime, rather than trying to extricate themselves from it – in other words, how to keep the space regime truly universal, rather than regional or sectional.

<sup>&</sup>lt;sup>475</sup> Joerg Kammerhofer, "International Legal Positivism" in Anne Orford, Florian Hoffmann & Martin Clark, eds, *The Oxford Handbook of the Theory of International Law* (Oxford: Oxford University Press, 2016) 407 at 426. This term – "incommensurability" – refers to a concept in the philosophy of science. See generally: Eric Oberheim & Paul Hoyningen-Huene, "The Incommensurability of Scientific Theories" in Edward N Zalta, ed, *The Stanford Encyclopedia of Philosophy* (Metaphysics Research Lab, Stanford University, 2018). As Ruth Chang explains it, "[w]hen two items are incommensurable, they 'lack a common measure:" Ruth Chang, "Incommensurability (and Incomparability)" in Hugh Lafollette, ed, *International Encyclopedia of Ethics* (Oxford: Blackwell Publishing, 2013) at 1.

<sup>&</sup>lt;sup>476</sup> Chang, *supra* note 478 at 7.

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