

# Cold War Treaties in a New World: The Inevitable End of the Outer Space and Antarctic Treaty Systems

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*The Outer Space Treaty regime faces significant obstacles as Member States push against the rules governing military activities and economic exploration in space. These obstacles could lead to the ultimate collapse of the Outer Space Treaty system. While significant, these issues are not unique – the Antarctic Treaty System faces several of the same issues with the same potential result. This article presents a thematic comparison of the treaties and their respective rules, including their treatment of military activities, the appropriation of territory, transparency and mutual observation, and dispute settlement. The article culminates in an analysis of the obstacles facing both treaty systems and the geopolitical scenarios that could destroy one or both treaty regimes in the near future. These obstacles include military conflict and competing territorial claims, as well as growing private interest in the economic possibilities available in both outer space and Antarctica. By comparing the two treaty systems, analysts can better understand the fault lines of these treaties and how lessons learned from one treaty can be used to better analyse the other.*

*Thus in alternate uproar and sad peace,  
Amazed were those Titans utterly.<sup>1</sup>*

## 1 INTRODUCTION

On 24 May 2016, the Administrator of the National Aeronautics and Space Administration (NASA) delivered a speech to the Alliance for Peacebuilding entitled ‘Next Gen Peace’.<sup>2</sup> He discussed NASA’s history and its future, saying ‘[w]e have helped the world move from a space race to an era of international cooperation. We’re building next generation or “next gen” aircraft and next gen

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<sup>1</sup> See John Keats, *Hyperion* (1819).

<sup>2</sup> See Charles Bolden, *Next Gen Peace: Winning Teams*, National Aeronautics and Space Administration (24 May 2016), [https://www.nasa.gov/sites/default/files/atoms/files/160524\\_bolden\\_allianceforpeace\\_building.pdf](https://www.nasa.gov/sites/default/files/atoms/files/160524_bolden_allianceforpeace_building.pdf) (accessed 3 Aug. 2017).

transportation to space as well. Why not next gen peace?’<sup>3</sup> He went on to call for the peaceful cooperation of all nations to use our space programs to improve the collective welfare and progress of our global society.<sup>4</sup> Two days later, the retiring Chief of Staff of the United States Air Force, General Mark Welsh, delivered an address in which he stated upfront that a major priority for the Air Force must be to prepare for a future fight in outer space.<sup>5</sup> ‘Other nations are treating space as a battlefield’, he said, praising the Air Force Space Command for ‘shift[ing] the focus to ... thinking about the space domain as a war fighting domain’.<sup>6</sup>

More than a year after these duelling perspectives on the role of space in a global society, the geopolitical situation in space is no less complex. In August 2016, the Air Force Space Command launched two new satellites in its Geosynchronous Space Situational Awareness Program, designed to be a ‘neighborhood watch’ to detect any threats or nefarious activities from other nations’ missions in outer space.<sup>7</sup> The program, designed in response to ‘myriad counter-space threats ... on the near horizon’, was declassified as a deterrence measure.<sup>8</sup> In March 2017, the new US Air Force Chief of Staff said in an interview that the Air Force needed to ensure ‘space superiority’ to ensure freedom of movement and freedom from attack for US assets in space.<sup>9</sup> In April 2017, President Trump commented that there is ‘tremendous military application in space’ and that the US was ‘rebuilding [its] military like never before’.<sup>10</sup> Also this year, the world celebrated the 50th Anniversary of the Outer Space Treaty, the foundational treaty establishing the international legal regime governing space, the preamble to which recognizes ‘the common interest of all mankind in the ... use of outer space for peaceful purposes’.<sup>11</sup>

The world appears entangled in a legal regime based on the peaceful use of outer space while simultaneously developing and deploying significant military

<sup>3</sup> *Ibid.*, at 4.

<sup>4</sup> *Ibid.*, at 10, 14.

<sup>5</sup> See Alyssa Gibson, *Welsh Shares AF Priorities with AFA*, US Air Force News Service (27 May 2016), <http://www.af.mil/News/Article-Display/Article/783879/welsh-shares-af-priorities-with-afa/> (accessed 3 Aug. 2017). See also *Gen Mark Welsh at AFA/Air Force Breakfast Session*, Video recorded by the Air Force Association (3 June 2016), <https://www.youtube.com/watch?v=uHKCow9QV3U> (accessed 3 Aug. 2017).

<sup>6</sup> *Gen Mark Welsh at AFA*.

<sup>7</sup> See Justin Ray, *Delta 4 Rolls Out for Second Launch in ‘Neighborhood Watch’ Effort*, Spaceflight Now (6 July 2016),

<sup>8</sup> See Jon Harper, *Air Force Launching Satellites to Spy on Other Satellites*, Stars & Stripes (22 July 2014).

<sup>9</sup> See David Ignatius, *War in Space is Becoming a Real Threat*, Wash. Post (16 Mar. 2017).

<sup>10</sup> See NASA Astronaut Peggy Whitson Talks STEM Education with President Trump, NASA press release and video (24 Apr. 2017), <https://www.nasa.gov/press-release/nasa-astronaut-peggy-whitson-talks-stem-education-with-president-trump> (accessed 3 Aug. 2017).

<sup>11</sup> See *Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies*, 27 Jan. 1967, 18 U.S.T. 2410, 610 U.N.T.S. 205, Preamble [hereinafter Outer Space Treaty].

weaponry designed to operate in outer space.<sup>12</sup> At the same time, states like Russia, Luxembourg, the United States, and others have begun pursuing unilateral efforts to facilitate the private exploration and extraction of natural resources in outer space, potentially contravening the Outer Space Treaty's prohibition against national appropriation.<sup>13</sup> Across multiple fronts, countries are pushing at the seams of the Outer Space Treaty in preparation for a day when national interests will overtake their desire to follow the treaty's rules, and they are concernedly watching other states making similar preparations. While governments and journalists debate the future of the international space regime, there is a similar treaty-based system that provides insight into how these space tensions may evolve – the Antarctic Treaty System.

This article explores the parallels between the space law regime and the Antarctic Treaty System, noting their similar origins, requirements, and geopolitical stressors. While neither treaty has a direct relation to the other, the similarities are so stark that important lessons learned from one system can be applied to the other. Specifically, this article looks at how the structure and stressors of either system may lead to its ultimate collapse under three potential scenarios – a military conflict, a 'tipping point' in the quest for natural resource extraction, or heightened tensions due to territorial claims or attempts at appropriation.<sup>14</sup> Territorial claims and resource exploitation are progressing at different speeds in space and the Antarctic, so the consequences of such stressors will almost certainly affect one treaty regime before they begin affecting the other, which allows us to study how the first regime handled the enhanced stressor and how it emerged after the crisis. Ultimately these lessons could be used to help prepare for or navigate a similar future crisis affecting the other treaty. Military crises, on the other hand, could impact both treaty regimes at the same time. A military conflict severe enough to warrant violations of either treaty could likely cause violations of the other treaty as well. Both outer space and Antarctica offer military advantages in a large conflict – a military openly violating one treaty in a conflict bodes ill for the other treaty regime as well.

<sup>12</sup> See e.g. Jeff Daniels, *Space Arms Race as Russia, China Emerge as 'Rapidly Growing Threats' to US*, CNBC (29 Mar. 2017) (quoting the Deputy Commander of the US Strategic Command, 'While we're not at war in space, I don't think we can say we are exactly at peace either.');

<sup>13</sup> See generally Alan Boyle, *Planetary Resources Strikes \$28 Million Pact with Luxembourg for Asteroid Mining*, Geekware (3 Nov. 2016); see also Dan Murtaugh, *Space May Be Next Frontier for Earth's Crude Oil Giants, Analyst Says*, Bloomberg News (23 Apr. 2017); Jim Edwards, *Goldman Sachs: Space-Mining for Platinum is 'more Realistic than Perceived'*, Bus. Insider (6 Apr. 2017); David Axe, *Trump's Transition Team Asked NASA About Surveying the Moon for Valuable Resources*, Motherboard (12 Apr. 2017).

<sup>14</sup> 'Collapse' is here defined as a global situation in which countries either openly flout the rules of either treaty system to such an extent that the treaty is de facto obsolete, or a situation in which Member States acknowledge the obsolescence of the treaty system(s) and make serious efforts to negotiate either a replacement or a fundamental restructuring of the current regime.

This paper is structured in four parts: (1) a brief history of the two treaty regimes and the geopolitical context in which they were drafted, (2) thematic similarities between the treaties, specifically prohibitions surrounding military activities, natural resources, and national appropriation, (3) the major weaknesses of both treaty systems, and (4) a hypothetical exploration of the three scenarios that could lead to the weakening or outright collapse of either treaty system. Ultimately, the paper will argue that policymakers and legal scholars should pay attention to any developments occurring with either system to better understand the crises and stressors faced by both systems.

## 2 A BRIEF HISTORY OF THE TREATIES

Both the Outer Space Treaty and the Antarctic Treaty were signed in the early years of the Cold War and were initially relevant to a fairly small number of states, though this number increased as more states became involved in either outer space or Antarctica. Antarctica had been a destination for explorers in the centuries leading up to the Antarctic Treaty, and several countries had made territorial claims to sections of the continent.<sup>15</sup> Between 1908 and 1943, seven states made formal claims over various sections of the Antarctic, though these were by no means universally accepted.<sup>16</sup> After World War II, myriad states tried to settle the Antarctica question and all fell short.<sup>17</sup> The Cold War certainly influenced these efforts – the United States' primary interest in the region, for example, was not only for scientific research, but to counter 'increased Soviet activity'.<sup>18</sup> Territorial interests of Antarctica-claimant countries and the strategic interests of the United States and Soviet Union were preventing action on Antarctica.

Finally in 1957–1958, after close cooperation during the International Geophysical Year, twelve countries agreed to continue that cooperation, including a 'gentleman's agreement' to halt any political activity. The United States quickly proposed a multilateral treaty 'designed to preserve the continent as an international laboratory for scientific research and ensure that it be used only for peaceful

<sup>15</sup> See generally Robert Clancy, John Manning & Henk Broksma, *Mapping Antarctica: A Five Hundred Year Record of Discovery* (Springer Praxis Books 2013). See also Kurt Shusterich, *The Antarctic Treaty System: History, Substance, and Speculation*, 39(4) Int'l J. 800 (1984); Bernard Oxman, *The Antarctic Regime: An Introduction*, 33 U. Miami L. Rev. (Dec. 1978); P. Jessup, *Sovereignty in Antarctica*, 41 Am. J. Int'l L. (1947).

<sup>16</sup> The seven states were Argentina, Australia, Chile, France, New Zealand, Norway, and the United Kingdom. See Shusterich, *supra* n. 15, at 801–802.

<sup>17</sup> *Ibid.*, at 804.

<sup>18</sup> See NSC 5804/1, *Statement of U.S. Policy on Antarctica*, National Security Council Report (8 Mar. 1958).

purposes'.<sup>19</sup> In 1959, the countries signed the new Antarctic Treaty, which went into force in 1961.<sup>20</sup> In the context of mounting tensions between the United States and the Soviet Union, on a disputed continent overlaid with overlapping claims of sovereignty, all parties came together to sign a document legally requiring the peaceful use of Antarctica.

The Outer Space Treaty was also signed during the early Cold War, when the space and arms races instilled fear between the United States and the Soviet Union. Space obviously had fewer immediately relevant states (far fewer states had launched a rocket into space than had laid claim to Antarctica), but the Outer Space Treaty espoused principles that 'stem from those in the Antarctic Treaty'.<sup>21</sup> Despite the potential of space for military and economic purposes and despite the intensity with which the two main parties feared one another, the Outer Space Treaty represents the same ideals of the Antarctic Treaty. In the context of conflict and competition between nuclear states, the treaty calls for the peaceful use and exploration of space by all countries. The next section will discuss the similarities and points of deviation between the two treaties.

### 3 A THEMATIC COMPARISON OF THE TREATIES

Both treaties express similar goals and share strong thematic similarities on issues like military activities, transparency, freedom of movement and research, and territorial claims. This section explores some of the more notable similarities in the treaties to ultimately demonstrate how their similarities of construction could lead to similarities in their future potential deconstruction. It also explores significant differences between the treaties that may have relevance to their futures.

#### 3.1 SIMILARITIES OF MOTIVATION

The preambles for both treaties include very similar language concerning the core motivations for drafting and enacting the agreements.<sup>22</sup> Both preambles recognize the importance of peaceful use of both locations. In the Outer Space Treaty, the preamble '[recognizes] the common interest of all mankind in the progress of the exploration and use of outer space for peaceful purposes'. Similarly, the Antarctic Treaty '[recognizes] that it is in the best interests of all of mankind that Antarctica

<sup>19</sup> Shusterich, *supra* n. 15, at 805. The twelve nations included the seven countries with territorial claims on Antarctica and Belgium, Japan, South Africa, the Soviet Union, and the United States.

<sup>20</sup> *Ibid.*, at 806. See generally Antarctic Treaty, 1 Dec. 1959, 12 U.S.T. 794, 402 U.N.T.S. 71 [hereinafter Antarctic Treaty].

<sup>21</sup> See Diana Johnson, *The Impact of International Law and Treaty Obligations on United States Military Activities in Space*, 3(1) High Tech. L.J. 33, 40 (1988).

<sup>22</sup> All citations in this section are from the preambles to the two treaties.

shall always continue forever to be used exclusively for peaceful purposes and shall never become the scene or object of international discord'. Both preambles frame this peaceful use as ultimately for the benefit of all mankind, rather than in the interest of just one state. The Outer Space Treaty states that 'the exploration and use of outer space should be carried on for the benefit of all peoples irrespective of the degree of their economic or scientific development'. The Antarctic Treaty similarly states that 'the establishment of a firm foundation for the continuation and development of such cooperation on the basis of freedom of scientific investigation in Antarctica as applied during the International Geophysical Year accords with the interests of science and the progress of all mankind'.

Finally, both preambles predict the facilitation of greater cooperation and understanding between Member States – this was a particularly significant focus, considering the Cold War tensions that gave context to both treaties. The Outer Space Treaty dually '[desires] to contribute to broad international co-operation in the scientific as well as legal aspects of the exploration and use of outer space for peaceful purposes' and '[believes] that such co-operation will contribute to the development of mutual understanding and to the strengthening of friendly relations between States and peoples'. The Antarctic Treaty foresees its role as 'ensuring the use of Antarctica only for peaceful purposes only and the continuance of international harmony in Antarctica'. These similarities exist merely in the preambles to the two treaties, demonstrating the similar goals of the two treaties, despite their drastically different subject matter. Peaceful use, global progress for mankind, and improved international relations are at least ostensibly the ontological bedrock of these two treaties. To see how each treaty implements these shared visions, we must look at individual articles and compare the approaches of each treaty to identify their commonalities.

### 3.2 PEACEFUL PURPOSES

In keeping with these aspirations, both treaties invoke rules concerning the peaceful use of space and Antarctica, respectively. Article III of the Outer Space Treaty states that States 'shall carry on activities in the exploration and use of outer space ... in accordance with international law ... in the interest of maintaining international peace and security'.<sup>23</sup> It more explicitly states this in Article IV: '[t]he moon and other celestial bodies shall be used by all States Parties to the Treaty exclusively for peaceful purposes', though it should be noted that this statement only applies to celestial bodies, rather than 'outer space' entirely.<sup>24</sup> The Antarctic

<sup>23</sup> Outer Space Treaty, Art. III.

<sup>24</sup> *Ibid.*, at Art. IV.

Treaty states in Article I(1) that 'Antarctica shall be used for peaceful purposes only'.<sup>25</sup> While it exempts military personnel and equipment being used for peaceful purposes, such as scientific research, the Antarctic Treaty prohibits 'any measure of a military nature' in Antarctica, to include 'the establishment of military bases and fortifications, the carrying out of military manoeuvres, as well as the testing of any type of weapon'.<sup>26</sup> The Outer Space Treaty includes a near-verbatim prohibition, prohibiting '[t]he establishment of military bases installations and fortifications, the testing of any type of weapons and the conduct of military manoeuvres on celestial bodies',<sup>27</sup> with the same exception for using military personnel for peaceful purposes or 'any equipment or facility necessary for peaceful exploration of the moon and other celestial bodies'.<sup>28</sup>

### 3.3 NUCLEAR WEAPONS AND MATERIALS

Both treaties include provisions prohibiting nuclear weapons. The Outer Space Treaty requires that Member States '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'.<sup>29</sup> The Antarctic Treaty prohibits 'any nuclear explosions' or any disposal of radioactive waste in Antarctica.<sup>30</sup> It allows a possible change in these prohibitions, however, in the event that the international community concludes agreements concerning nuclear energy, nuclear explosions, and radioactive waste disposal, which would then apply to Antarctica if all the Antarctic Treaty Member States were parties.<sup>31</sup> Note that the Outer Space Treaty does not appear to prohibit nuclear weapons in sub-orbital flight patterns through space, nor does it define 'weapon of mass destruction'. These distinctions will be discussed in more detail in the next section.

### 3.4 APPROPRIATION OF TERRITORY

Both treaties place limitations on territorial claims in outer space or Antarctica. The Outer Space Treaty explicitly states 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>32</sup> This is a broad

<sup>25</sup> Antarctic Treaty, Art. I(1).

<sup>26</sup> *Ibid.*

<sup>27</sup> Outer Space Treaty, Art. IV.

<sup>28</sup> *Ibid.*

<sup>29</sup> *Ibid.*

<sup>30</sup> Antarctic Treaty, Art. V(1).

<sup>31</sup> *Ibid.*, at Art. V(2).

<sup>32</sup> Outer Space Treaty, Art. II.

prohibition that effectively renders everything beyond Earth's atmosphere as unclaimable by any state. The breadth of this article speaks to the state of exploration and territorial claims at the time of its drafting, when only the United States and the Soviet Union actually had functional space programs, and neither had made territorial claims. In signing the treaty, both countries recognized the difficulty that these claims could cause.

The Antarctic Treaty had a far different context of exploration and territorial claims. At the time of its drafting, numerous states held myriad territorial claims in Antarctica. The first of these claims was almost five centuries old, when representatives of Portugal and the Crown of Castile<sup>33</sup> signed the 1494 Treaty of Tordesillas, which divided newly discovered lands between the two states, extending all the way to the South Pole. Argentina and Chile have used the treaty to justify their claims over portions of Antarctica.<sup>34</sup> In 1917, the British modified their territorial claim surrounding the Falkland Islands to include portions of Antarctica, forming the British Antarctic Territory.<sup>35</sup> Ultimately seven states made territorial claims in the Antarctic in the first half of the twentieth Century, often overlapping with or failing to recognize other claims.<sup>36</sup> Eight other states had explored the territory – including the United States and the Soviet Union.<sup>37</sup>

With these rival claims, the Antarctic Treaty was clearly negotiated in a far different context than the Outer Space Treaty. Instead of a total prohibition on and nullification of territorial claims, the drafters of the Antarctic Treaty conceived Article IV, perhaps the most neutral approach to the situation. Instead of making any judgment concerning territory, the Antarctic Treaty explicitly states that it does not renounce any previously asserted territorial rights or claims or any basis on which states might make these claims, that it does not prejudice any member state's position regarding territorial claims, and that no activities during the treaty's duration could be used to assert or deny a territorial claim.<sup>38</sup>

While remaining neutral to current claims at the time of ratification, the Antarctic Treaty prohibits any new territorial claims while the treaty is in force. So while it does not create a wholly unclaimable territory like the Outer Space Treaty attempts to do, it effectively sidelines the question of territorial claims until a

<sup>33</sup> A medieval state comprising the majority of modern-day Spain.

<sup>34</sup> See Robert E. Wilson, *National Interest and Claims in the Antarctic*, 17(1) *Arctic* 15, 17 (1964).

<sup>35</sup> See David Hunter Miller, *National Rights in the Antarctic*, 5(3) *Foreign Aff.* 508 (1927).

<sup>36</sup> Argentina, Australia, Chile, France, New Zealand, Norway, and the United Kingdom have all made territorial claims in Antarctica. Other states have expressed possible interest in claiming territory in the future. See Antarctica, CIA World Factbook (Jan. 2017), <https://www.cia.gov/library/publications/resources/the-world-factbook/geos/ay.html> (accessed 3 Aug. 2017).

<sup>37</sup> These states were the United States, the Soviet Union, Belgium, Germany, Poland, Sweden, Japan, and South Africa. See Narrative for the Antarctic Treaty, Bureau of Arms Control, Verification, and Compliance, United States Department of States, <https://www.state.gov/t/avc/trty/193967.htm> (accessed 3 Aug. 2017).

<sup>38</sup> Antarctic Treaty, Art. IV.



time when the treaty is no longer in force. Interestingly, the Antarctic Treaty foresees its own obsolescence and establishes rules to guide states even after its demise.

### 3.5 INFORMATION SHARING AND TRANSPARENCY

Both treaties require Member States to keep other states informed of ongoing scientific activities and to widely share results of those activities. The Outer Space Treaty requires states 'to inform the Secretary-General of the United Nations as well as the public and the international scientific community, to the greatest extent feasible and practicable, of the nature, conduct, locations and results of such activities'.<sup>39</sup> The Antarctic Treaty requires Member States 'to the greatest extent feasible and practicable', to exchange 'information regarding plans for scientific programs in Antarctica ... to permit maximum economy of and efficiency of operations', to exchange 'scientific personnel between expeditions and stations', and to exchange and make freely available 'scientific observations and results from Antarctica'.<sup>40</sup>

### 3.6 MUTUAL OBSERVATION

Even with these provisions promoting peaceful cooperation, both treaties recognized the tensions of the Cold War and included provisions requiring some degree of transparency among Member States. The Outer Space Treaty requires Member States to 'consider on a basis of equality any requests by other [member states] to be afforded an opportunity to observe the flight of space objects launched by those States',<sup>41</sup> and, perhaps predicting a faster rate to space exploration than would come to pass, requires that '[a]ll stations, installations, equipment and space vehicles on the moon and other celestial bodies shall be open to representatives of other [member states] on a basis of reciprocity', with reasonable notice.<sup>42</sup>

The Antarctic Treaty's similar provisions prove more applicable to the current state of settlements in Antarctica, giving Member States 'the right to designate observers to carry out any inspections' of '[a]ll areas of Antarctica, including all stations, installations and equipment within those areas, and all ships and aircraft at points of discharging or embarking cargoes or personnel in Antarctica'.<sup>43</sup> Interestingly, it contains no provision for reasonable notice like the Outer Space

<sup>39</sup> Outer Space Treaty, Art. XI.

<sup>40</sup> Antarctic Treaty, Art. III.

<sup>41</sup> Outer Space Treaty, Art. X.

<sup>42</sup> *Ibid.*, at Art. XII.

<sup>43</sup> Antarctic Treaty, Art. VII.

Treaty, but instead gives designated observers ‘complete freedom of access at any time to any or all areas of Antarctica’.<sup>44</sup> In contrast, the Outer Space Treaty recognizes a need for ‘appropriate consultations’ to allow for ‘maximum precautions ... to assure safety and to avoid interference’.<sup>45</sup>

### 3.7 DISPUTE SETTLEMENT

Both treaties are vague about how disputes will be settled and how treaty interpretation will be determined. The Outer Space Treaty is particularly vague and does not even discuss ‘disputes’ as such, although it requires Member States to carry out activities in space ‘in accordance with international law, including the Charter of the United Nations’.<sup>46</sup> Disputes in space are thus at least procedurally similar to other disputes between nations, requiring that states respect international law and use appropriate international mechanisms (e.g. diplomacy or international bodies) to achieve a resolution.

The Antarctic Treaty also provides a loose framework for dispute resolution, though it addresses the issue directly. It requires states disputing ‘the interpretation or application’ of the treaty to ‘consult among themselves with a view to having the dispute resolved by negotiation, inquiry, conciliation, arbitration, judicial settlement or other peaceful means of their own choice’.<sup>47</sup> If all parties involved in a dispute consent to a means of peaceful resolution, the treaty allows for any such approach. Disputing parties that cannot reach a peaceful resolution shall refer the matter to the International Court of Justice if all parties consent.<sup>48</sup> If parties do not consent, they are still bound to pursue alternative peaceful arrangements.<sup>49</sup>

Despite their differing histories and practicalities, Antarctica and outer space birthed treaties conceived in the same global geopolitical context and espouse remarkably similar principles. The treaty systems establish similar rules governing peaceful use, military activities, appropriation and sovereignty claims, and nuclear materials. Because of all these similarities, one can look at the implementation and durability of these treaties side-by-side, because weaknesses in one treaty system will likely show some level of parallel weakness in the other. In the next section, the paper will discuss several weaknesses that affect both treaty systems, any one of which could ultimately lead to the weakening or collapse of its respective treaty and provide valuable lessons to those interested in the other regime.

<sup>44</sup> *Ibid.*

<sup>45</sup> Outer Space Treaty, Art. XII.

<sup>46</sup> *Ibid.*, at Art. III.

<sup>47</sup> Antarctic Treaty, Art. XI.

<sup>48</sup> *Ibid.*

<sup>49</sup> *Ibid.*

## 4 CRACKS IN THE FOUNDATION

Generalizing slightly, two of the primary purposes of both treaties are to prevent the militarization of outer space and Antarctica and to prevent states from making or enforcing any territorial claims of such territories, both with the goal of ensuring peaceful cooperation among states. This section examines these areas and discusses how current events, geopolitical tensions, and national interests could effect the end or weakening of either treaty.

### 4.1 MILITARIZATION

Both treaties prohibit certain military activities, but both have exceptions allowing some level of military activity. Over the past fifty years, countries have used these exceptions to push the boundaries of what is permissible. Under the Outer Space Treaty, countries are prohibited from putting nuclear weapons or any other kinds of weapons of mass destruction into orbit around the earth, installing such weapons on celestial bodies, or stationing such weapons in outer space ‘in any other manner’.<sup>50</sup> States are also prohibited from establishing military sites, testing any type of weapons, or conducting military manoeuvre on celestial bodies, though they are allowed to use military personnel, equipment, and facilities for peaceful exploration.<sup>51</sup>

Specifically with regard to the limitation on nuclear weapons and weapons of mass destruction, the treaty only prohibits stationing such weapons in space or putting them into Earth orbit, but not using of outer space to deliver such weapons. A state is not prohibited from launching a sub-orbital rocket with a nuclear payload.<sup>52</sup> Because the nuclear weapon is not ‘stationed’ in space or in orbit, the treaty does not limit this activity. It places limitations on the use of other weapons of mass destruction, but nowhere defines what a weapon of mass destruction is, an important omission as different states can interpret this quite differently. The United States, for example, has multiple statutory definitions of ‘weapon of mass destruction’, one under Title 50 of the US Code (War and National Defense)<sup>53</sup> and another under Title 18 (Crimes and Criminal Procedure).<sup>54</sup> Despite some similarities, Title 18 includes significantly more types of weapons than Title 50.<sup>55</sup> These definitions are not semantic, but fundamental to the

<sup>50</sup> Outer Space Treaty, Art. IV.

<sup>51</sup> *Ibid.*

<sup>52</sup> Note that such questions may also be governed by other bilateral or multilateral treaties, though the Member States to such treaties would differ from those of the Outer Space Treaty.

<sup>53</sup> 50 U.S.C. § 2302(1).

<sup>54</sup> 18 U.S.C. § 2332a(C)(2).

<sup>55</sup> Among other devices, the Title 18 definition incorporates any destructive weapon as defined in 18 U.S.C. § 921, a substantial list of devices that are absent from the Title 50 definition including any

question of what states can launch into orbit. If states disagree on these undefined terms, it could lead to significant differences in national defence systems and military readiness.

The treaty's prohibitions on military activities were not based on theoretical threats. Prior to the Outer Space Treaty, both superpowers had explored various ways to gain military space dominance. Though never officially confirmed by the United States, the US Air Force considered detonating a small nuclear weapon on the moon as a show of strength and after rumours that the Soviet Union was planning a similar lunar nuclear strike.<sup>56</sup> In 1959, the US Army studied the potential construction of a military base on the Moon 'to develop and protect potential United States interests on the moon; to develop techniques in moon-based surveillance of the earth and space ... and for military operations on the moon if required'.<sup>57</sup> For its part, the Soviet Union began developing the Fractional Orbital Bombardment System (FOBS), which would launch an intercontinental ballistic missile into low-earth orbit, preventing an adversary from calculating its intended target, above which it would de-orbit to strike the target.<sup>58</sup>

Although the past fifty years have shown that countries give some degree of deference to the Outer Space Treaty, it is interesting to note where countries have pushed the limits. The FOBS program is a perfect example. There was no authoritative statement that fractional orbit systems like FOBS fell under Article IV's prohibition on placing nuclear weapons 'in orbit'<sup>59</sup> until the 1979 SALT II treaty, which required the United States and the Soviet Union to not 'develop, test, or deploy ... systems for placing into Earth orbit nuclear weapons or any other kind of weapons of mass destruction, *including fractional orbital missiles*'.<sup>60</sup>

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explosive bomb, grenade, or any weapon (excluding certain sporting guns) with a barrel wider than one half-inch. See 18 U.S.C. § 921(a)(4).

<sup>56</sup> See e.g. *U.S. Weighed A-Blast on Moon in 1950s*, L.A. Times (18 May 2000).

<sup>57</sup> See Project Horizon: A US Army Study for the Establishment of a Lunar Military Outpost, declassified by the US Army in 1961, accessed in two volumes at, [http://www.history.army.mil/faq/horizon/Horizon\\_V1.pdf](http://www.history.army.mil/faq/horizon/Horizon_V1.pdf) and [http://www.history.army.mil/faq/horizon/Horizon\\_V2.pdf](http://www.history.army.mil/faq/horizon/Horizon_V2.pdf) (accessed 3 Aug. 2017). The document was declassified in 1961, coming to wider public knowledge when published by the National Security Archive at George Washington University in 2014.

<sup>58</sup> See Allan Rosas, *The Militarization of Space and International Law*, 20(4) J. Peace Res. 357, 359 (Dec. 1983). See also Herbert York, *Nuclear Deterrence and the Military Uses of Space*, 114(2) Daedalus 17, 18 (Spring 1985).

<sup>59</sup> See Outer Space Treaty, Art. IV. Later documents would support the interpretation that FOBS programs are not prohibited under the treaty. See e.g. Eilene Galloway, *Agreement Governing the Activities of States on the Moon and Other Celestial Bodies*, Prepared at the request of Hon. Howard W. Cannon, Chairman, Committee on Commerce, Science, and Transportation, United States Senate, 49 (May 1980) ('The OST does not prohibit use of fractional orbital bombardment system (FOBS), i.e. a spacecraft that does not complete a full orbit of the Earth.').

<sup>60</sup> See Treaty Between the United States of America and the Union of Soviet Socialist Republics on the Limitation of Strategic Offensive Arms, Together with Agreed Statements and Common Understanding Regarding the Treaty ('SALT II Treaty'), Art. IX(1)(c) (emphasis added).

Under the current legal regime, including later space treaties, states are not prohibited from placing conventional munitions in space, to be used either space-to-space (e.g. fired from one spacecraft to an enemy spacecraft) or space-to-earth (dropping said munitions to a terrestrial target), leading to an impressive creativity and vigour with which world militaries have pursued new methods to wage war in outer space.

The United States military has long sought 'the freedom to do what they want to do in space'.<sup>61</sup> A 2001 study led by Donald Rumsfeld recommended the development and deployment of 'the means to deter and defend against hostile acts directed at U.S. space assets and against the uses of space hostile to U.S. interests', and a push to '[s]hape the domestic and international legal and regulatory environment [to] ensure U.S. national security interests'.<sup>62</sup> Military conflict in space was inevitable, and the United States 'must develop the means both to deter and to defend against hostile acts in and from space'.<sup>63</sup>

Other countries have also pursued military efforts in space. In 2007, China destroyed a Chinese weather satellite, though the Foreign Ministry spokesperson would not comment beyond reiterating that 'China advocates the peaceful use of space and opposes the weaponization of space, and also opposes any form of arms race'.<sup>64</sup> In response, the United States publicly stated that China's development and use of an anti-satellite system was 'inconsistent with the spirit of cooperation ... in the civil space area',<sup>65</sup> though a year later the United States itself shot down a disabled US spy satellite.<sup>66</sup> Although the United States denied that this was in reaction to the earlier Chinese operation, the Russian Defence Ministry accused the United States of hiding 'preparations for the classical testing of an anti-satellite weapon'.<sup>67</sup>

The world is almost certainly in some form of space race, with the United States, Russia, and China all vying for military dominance, or at least deterrence, in space. The Outer Space Treaty, despite its emphasis on the peaceful use of space, did little to slow or prevent the development, testing, and deployment of non-nuclear space weapons and other military and intelligence-related space systems. Because of its narrow and vague prohibitions, the Outer Space Treaty is unlikely to prevent states from using space during future hostilities. Indeed, it seems like at three countries are planning for it.

<sup>61</sup> See e.g. Julian Borger, *Bush Likely to Back Weapons in Space*, Guardian (18 May 2005), <https://www.theguardian.com/science/2005/may/19/spaceexploration.usnews> (accessed 3 Aug. 2017).

<sup>62</sup> See Report of the Commission to Assess United States National Security Space Management and Organization, Pursuant to Public Law 106-65, 7, 8 (11 Jan. 2001).

<sup>63</sup> *Ibid.*, at 10.

<sup>64</sup> See e.g. *Concern over China's Missile Test*, BBC News (19 Jan. 2007).

<sup>65</sup> *Ibid.*

<sup>66</sup> See Kristin Roberts, *Pentagon Plans to Shoot Down Disabled Satellite*, Reuters (14 Feb. 2008).

<sup>67</sup> See *US Spy Satellite Plan 'A Cover'*, BBC News (17 Feb. 2008).

The Antarctic Treaty has many parallels to prevent the militarization of Antarctica, which was one of the major goals of the treaty.<sup>68</sup> The first sentence of its preamble recognizes that ‘it is in the best interests of all mankind that Antarctica ... shall never become the scene or object of international discord’.<sup>69</sup> The first article prohibits ‘any measure of a military nature’, which includes establishment of military bases, carrying out military manoeuvres, or testing any weapons.<sup>70</sup> It does, like the Outer Space Treaty, allow for military personnel and equipment used for peaceful purposes.<sup>71</sup> And quite similar to the Outer Space Treaty, Member States have pushed the boundaries of the Antarctic Treaty.

Despite the ban on territorial claims and military activities, states have strategically built a total of sixty-eight bases across the continent.<sup>72</sup> China has built five bases in the South Pole and the United States operates a South Pole base that ‘conveniently straddles every territorial claim’.<sup>73</sup> Russia’s bases are strategically located all over the continent.<sup>74</sup> The Australian government condemned a 2014 Chinese base construction for its ‘dual-use’ scientific research ... useful for military purposes’, such as satellite tracking and surveillance.<sup>75</sup> Chile and Argentina both maintain permanent military presences on the continent, and other countries are suspected of either not reporting military presence or of hiring civilian contractors to effectively perform military missions.<sup>76</sup> The increased national security activities of various countries occurs in an environment where ‘the ban on militarization is widely flouted’.<sup>77</sup> To be sure, both treaties have influenced states to cancel or avoid certain military programs, but they are regimes in which powerful militaries are still fully equipped to wage war in space or in Antarctica. The development and deployment of weapons, systems, and bases against the rules or aspirations of the treaties has demonstrated that states likely value military dominance over treaty provisions in both domains.

## 4.2 TERRITORIAL CLAIMS

Military activities and future wars are the most dramatic incidents that may ultimately destroy either treaty regime, but these are fundamentally unpredictable

<sup>68</sup> See Sam Bateman, *Is Antarctica Demilitarised?*, Strategist, Australian Strategic Policy Institute (23 Apr. 2013).

<sup>69</sup> Antarctic Treaty, Preamble.

<sup>70</sup> *Ibid.*, at Art. I.

<sup>71</sup> *Ibid.*, at Art. I.

<sup>72</sup> See Matthew Teller, *Why do so many Nations Want a Piece of Antarctica?* BBC News (20 Jun. 2014), <http://www.bbc.com/news/magazine-27910375> (accessed 3 Aug. 2017).

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

<sup>74</sup> *Ibid.*

<sup>75</sup> *Ibid.*

<sup>76</sup> *Ibid.*

<sup>77</sup> *Ibid.*

events. An armed conflict significant enough to demand space-based or Antarctica-based warfare could be several years or several decades away. Even without military conflict of this magnitude, the steadily developing interest in property rights and territorial claims in both outer space and Antarctica is a far more predictable catalyst for fundamental changes in both regimes.

As space travel becomes more accessible to private interests, entrepreneurs have expressed interest in commercial ventures in space, the most important of which involves mining resources in space. In 1997, Professor John Lewis of the University of Arizona estimated the minable value of the smallest known asteroid near Earth at over USD 20 trillion in 1996 market value.<sup>78</sup> While the technology for a company to reach, mine, and retrieve these resources does not exist, companies have begun launching asteroid mining efforts. In 2012, Planetary Resources, backed by Silicon Valley billionaires and director James Cameron, announced a plan to mine precious metals from asteroids. The company hopes to reduce the cost of reaching an asteroid from approximately USD 1 billion to a few million dollars, but has no expectation of being ‘an overnight financial homerun’.<sup>79</sup> A year later, John Lewis partnered with other people long-affiliated with space ventures founded Deep Space Industries, a competitor to Planetary Resources, with the same long-term timeline and audacious goals for mining.<sup>80</sup>

Of course, the Outer Space Treaty states that no part of outer space, including the moon and other celestial bodies, is ‘subject to national appropriation by claim of sovereignty, by means of use or occupation, or by any other means’.<sup>81</sup> This prohibition does not refer to property rights or private ownership explicitly, but the treaty holds Member States responsible for providing ‘authorization and continuing supervision’ of space activities conducted by non-governmental entities.<sup>82</sup> Thus, while private actors like Planetary Resources are not party to the Outer Space Treaty, the United States government is responsible for regulating and supervising all their activities in space.

As the interest in space mining increased and developed into capital investments in research and exploration, the US Congress passed the US Commercial Space Launch Competitiveness Act in 2015, which required the President to ‘facilitate commercial exploration for and commercial recovery of space resources by United States citizens’<sup>83</sup> and to ‘promote ... commercial recovery of space

<sup>78</sup> John S. Lewis, *Mining the Sky: Untold Riches from the Asteroids Comets, and Planets* (Perseus Publishing 1997).

<sup>79</sup> See Matthew Sparkes, *Planetary Resources Unveils Cosmic Plan ‘to Boldly Go’ and Mine Asteroids for Gold and Platinum*, *Telegraph* (24 Apr. 2012).

<sup>80</sup> See Paul Rincon, *New Venture ‘to Mine Asteroids’*, *BBC News* (22 Jan. 2013).

<sup>81</sup> Outer Space Treaty, Art. II.

<sup>82</sup> *Ibid.*, at Art. VI.

<sup>83</sup> Public Law 114-90 (25 Nov. 2015), § 51302(a)(1).

resources free from harmful interference'.<sup>84</sup> It also clarified the right of US citizens to 'possess, own, transport, use, and sell' any acquired asteroid resources.<sup>85</sup> Despite the provision that all this must be done 'in manners consistent with the international obligations of the United States', it is an open question whether the United States actually has the power to grant property rights to its citizens for space resources. While common law principles would typically govern the mining of unclaimed property in the public domain,<sup>86</sup> the Outer Space Treaty may negate these by prohibiting states from appropriating any territory in space.<sup>87</sup>

The United States is not alone in this effort. Russia's Federal Space Program (FSP) has published plans to establish a 'full-fledged scientific and mining base' on the Moon by the mid-2050s.<sup>88</sup> In 2016, the government of Luxembourg announced its plan to become 'a European hub in the exploration and use of space resources'.<sup>89</sup> It intends to create a legal framework to govern space mining activities and guarantee investors of a stable regulatory scheme.<sup>90</sup> In the absence of an international regulatory regime governing space mining activities, the number of countries investing in or encouraging space resource utilization efforts will increase and grow increasingly fragmented. This may not pose an immediate threat to the Outer Space Treaty regime, but a fractured regulatory system can only ultimately end in conflict as states begin to disagree over which countries and companies have rightful claims to certain areas of celestial bodies, particularly as surveying and sensing missions grow more sophisticated and are better able to identify particularly lucrative resources.

Another concern is that a regime in which all countries seek to maximize their own economies will inherently leave behind less-wealthy nations that lack the capability to launch space-mining missions. This is not dissimilar to the problem of certain Earth orbits filling up with satellites from the top few wealthy countries in the world, leaving developing countries who may develop space-faring capabilities

<sup>84</sup> *Ibid.*, at § 51302(a)(3).

<sup>85</sup> *Ibid.*, at § 51303.

<sup>86</sup> See Benjamin Davis, *Property Rights in Space: Assuring Economic Development*, 11 SciTech L. 18 (2014).

<sup>87</sup> To be sure, space mining does not directly equate to territorial claims by a state, and many companies and countries within reach of such operations would fervently argue that mining is not a claim of sovereignty. This argument is weakened if one simply projects forward after the first generation of space mining has commenced, when now-developing countries are able to launch their own space mining operations and discover that Western companies have already established extraction operations on the most accessible or lucrative sources. While extraction of the choicest space resources is not an explicit claim of sovereignty, the countries who face the consequences of current technological and economic disparities will assuredly see little difference between the two.

<sup>88</sup> See Craig Foster, *Excuse Me, You're Mining My Asteroid: Space Property Rights and the U.S. Space Resource Exploration and Utilization Act of 2015*, U. Ill. J.L. Tech. & Pol'y 407, 415 (2016).

<sup>89</sup> Transcript of Press Conference by Étienne Schneider, Deputy Prime Minister of the Economy, Le Gouvernement du Grand-Duché de Luxembourg (3 Feb. 2016), [https://www.gouvernement.lu/5678423/Press-conference-SpaceResources\\_lu-Transcript.pdf](https://www.gouvernement.lu/5678423/Press-conference-SpaceResources_lu-Transcript.pdf) (accessed 1 Aug. 2017).

<sup>90</sup> Foster, *supra* n. 88, at 415.



in a few decades to feud over a few remaining subprime orbital slots. The same could prove true for space resources if the United States, Europe, and Russia are able to lay claim to the most prized areas and celestial bodies to mine. This may potentially be a violation of the Outer Space Treaty, which requires that the exploration and use of outer space be carried out 'for the benefit and interests of all countries, irrespective of their degree of economic or scientific development', and that space exploration and use be free 'without discrimination of any kind, on the basis of equality'.<sup>91</sup>

Without some form of unified regulatory scheme, wealthy states will almost certainly engage in an extraterrestrial land-grabbing operation that could jeopardize the long-term economic growth of developing nations even worse than colonialism. In 2009, Fabio Tronchetti wrote a book arguing that because of this lack of guidance for the international community, the global community of states should draft and ratify an international legal regime, preferably through a treaty.<sup>92</sup> Professor Tronchetti also foresees the need for an international organization (which he dubs the International Space Authority) to oversee and direct the exploitation of space resources.<sup>93</sup> Without some form of this unified regime, the Outer Space Treaty will gradually face increased pressure from poorer states watching the most lucrative or easiest reached space resources be swallowed up by states with the resources to do so in the short-term. It may also face sharper pressure if entities of two different states enter a dispute over rights to a particular resource. Without an international regime, that dispute would be nigh impossible to litigate, which would quickly demonstrate the importance of establishing such a regime.

Antarctica similarly shows the potential for a wealth of natural resources hidden behind a series of technologically difficult and costly obstacles. The US Geological Survey estimates that there may be up to thirty-six billion barrels of oil and gas in Antarctica – up until now, most of these resources were too difficult to reach compared to more accessible resources elsewhere.<sup>94</sup> Developing technology, however, promises to open up potential means of exploiting these natural resources.<sup>95</sup> When this happens, it may be 'naïve to think that the current no-mining consensus might not change during this century'.<sup>96</sup> As resources become

<sup>91</sup> Outer Space Treaty, Art. I.

<sup>92</sup> See Fabio Tronchetti, *The Exploitation of Natural Resources of the Moon and other Celestial Bodies* 242 (2009).

<sup>93</sup> *Ibid.*, at 244.

<sup>94</sup> See John Kingston, *The Undiscovered Oil and Gas of Antarctica*, 91-597 USGS Numbered Series (1991).

<sup>95</sup> See e.g. Ashley Coates, *Nationalism Threatens Antarctica's Future as a Peaceful Hub for Science*, *Indep.* (29 Mar. 2017), <http://www.independent.co.uk/news/science/nationalism-threat-antarctica-future-as-peaceful-hub-for-science-oild-mining-land-grab-territorial-a7622721.html> (accessed 3 Aug. 2017).

<sup>96</sup> *Ibid.* (quoting Klaus Dobbs, Professor of Geopolitics at the University of London).

less accessible in other regions of the world and ‘the technological barriers to Antarctic exploration [ease]’, more states will seek access to Antarctic resources.<sup>97</sup> The Antarctic Treaty ‘is proving inadequate to respond to the challenges of the current era: resource scarcity, climate change, and the changing global order’.<sup>98</sup> According to a project funded by the Norwegian Research Council, ‘[g]lobal pressure on natural resources in the Antarctic will only increase over the next few decades’.<sup>99</sup> In the interim, countries are expanding operations in Antarctica and are exploring, albeit at the early stages, the possibility of resource extraction.<sup>100</sup> Argentinian politicians and diplomats have expressed concern about the long-term plans of China and Russia while also insisting that ‘the wealth [of Antarctic resources] belongs to everyone, but an important part of it is ours’.<sup>101</sup> Chinese President Xi Jinping explicitly argued before a Politburo committee conference that increasing Chinese presence in Antarctica was necessary to ‘take advantage of ocean and polar resources’.<sup>102</sup>

To be sure, there has been some notable success in Antarctica. In 2016, twenty-four countries and the European Union concluded a hard-fought negotiation at the Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR) and created the world’s largest marine park, the Ross Sea Protected Area.<sup>103</sup> This agreement was designed to regulate fishing in the lucrative fishing fields of Ross Sea.<sup>104</sup> Yet even this step forward for environmentalism was not without the influence of global powers with interest in the natural resources of the Antarctic – in a compromise with China and Russia, both of which have strong fishing industries operating near Antarctica, the protected area expires after thirty-five years and does not actually limit the number of fish allowed to be caught.<sup>105</sup> Instead, it regulates where the fishing industry can operate within the Antarctic waters to avoid certain habitats and research zones.<sup>106</sup> Tellingly, the expiration of the protected area occurs around

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<sup>97</sup> *Ibid.*

<sup>98</sup> *Ibid.* (quoting Anne-Marie Brady, Executive Editor of *The Polar Journal* and Professor of Political Science at the University of Canterbury).

<sup>99</sup> See *Antarctica: Everyone Wants It, But No One Owns It*, Press Release, University of Oslo (15 Mar. 2017), <https://www.sciencedaily.com/releases/2017/03/170315115121.htm> (accessed 3 Aug. 2017).

<sup>100</sup> See e.g. Jeremy Bender, *China Is Making Moves in Antarctica*, *Bus. Insider* (5 May 2015).

<sup>101</sup> See Benedict Mander, *Antarctic Mission Underlines Argentina’s Territorial Claims*, *Fin. Times* (20 Jan. 2017). See also Jeremy Bender, *Russia and China Are Drastically Scaling Up Their Presence in Antarctica*, *Bus. Insider* (5 Jan. 2016).

<sup>102</sup> See Nicola Davison, *China Eyes Antarctica’s Resource Bounty*, *Guardian* (8 Nov. 2013).

<sup>103</sup> See Michael Slezak, *World’s Largest Marine Park Created in Ross Sea in Antarctica in Landmark Deal*, *Guardian* (28 Oct. 2016).

<sup>104</sup> *Ibid.*

<sup>105</sup> *Ibid.*

<sup>106</sup> *Ibid.*

the same timeframe that the Antarctic Treaty allows for environmental exploitation to be put back on the table.

The concern for Antarctic land and resources is not as immediate as the nascent debate over exploitation of resources in space. The Antarctica Treaty has done an effective job of freezing the Antarctica debate for several more decades. In the interim, however, countries are positioning themselves for maximum benefit when the resource prohibition, or the treaty itself, goes away. After emphasizing the 'considerable value' of the Australian Antarctic Territory (AAT), both environmentally and diplomatically, the Australian Strategic Policy Institute highlighted the importance for Australia to continue its claim over its claimed Antarctic territory lest it weaken its claim 'as developments incrementally change the playing field'.<sup>107</sup> Suggestions included 'position[ing] Australia as the lead nation in the AAT', 'challeng[ing] misconceptions that suggest that Antarctic claims are dormant or decreasing [in] relevance', and 'promot[ing] the AAT in the Australian consciousness'.<sup>108</sup> While the space race is likely to be the more visible dispute in this field, the Antarctic question will continue to brew under the surface until the time comes for countries to face the issue head-on. The next section will discuss scenarios in which either treaty regime could collapse – with regard to demilitarization, any serious military conflict between any of the powerful space-faring or Antarctic-involved countries could very quickly and easily destroy any pretence of the treaties' power and would have significant consequences for the future legal regime governing either region.

## 5 SCENARIOS FOR TREATY REGIME COLLAPSE

Any prediction for how either of these treaties will end is inherently speculative, but a review of the aforementioned similarities between the two, as well as the similar geopolitical pressures placed on the respective treaty regimes, yields three feasible scenarios. The first has direct implications for both treaties, regardless of which treaty is the first to be impacted, while the other two scenarios will likely occur to only one treaty at a time. In all three scenarios, lessons can likely be learned from the dissolution or near-dissolution of one treaty and applied to the other treaty regime to better anticipate, avoid, or cope with similar situations.

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<sup>107</sup> See Anthony Bergin, *Antarctic Sovereignty: Are We Serious?* Strategist, Australian Strategic Policy Institute (30 Apr. 2013).

<sup>108</sup> *Ibid.*

### 5.1 ARMED CONFLICT

The chance of a major conflict spilling into either space or Antarctica is certainly not implausible. Although the international community has largely avoided direct military conflicts between superpowers, that prevention is neither assured nor automatic. Without speculating whether any of the current geopolitical crises are at risk of expanding into major conflicts, it is sufficient to say that any direct armed conflict between two global powers with interests in outer space or Antarctica, if not quickly mediated and quelled through diplomacy, would likely result in military actions in those two arenas. The question is to what extent it would extend into them. This is uncharted territory for politicians and military leaders alike, so it is possible that military use of space would start out in a limited fashion – perhaps a cyber-attack to disable a spy satellite temporarily, an act that could serve both tactical and psychological purposes.<sup>109</sup> Similarly, a major conflict could result in increased military use of facilities in Antarctica, particularly intelligence-gathering assets. If a conflict escalated further, more brazen attacks could occur, which would inevitably inspire responses of the same or escalating degree. All major militaries are preparing for war in space while sending the official message that they only need these capabilities in case another country recklessly engages them militarily in outer space. As soon as that first engagement occurs, military and civilian leaders will likely show little regard for the rules outlined in the Outer Space Treaty. International space law will likely be a secondary consideration when deciding how to best retaliate to an attack in space. As the conflict becomes more entrenched, attacks (both cyber and kinetic) on Antarctica-based intelligence and military operations become a distinct possibility as countries seek to acquire whatever advantage they can. If a party can prove that an Antarctic base was a military operation, attacking it would hold little downside – there would be no collateral damage, as there would be nobody unaffiliated with the base present.

Regardless of how a conflict escalated in these two areas, the treaties become immediately unstable as soon as the first conspicuous attack occurs. Once a military action intentionally results in damage to another country's equipment or personnel, the core pacific purpose of the treaties disappears. At such point, there is likely a limited window in which the conflict could be deescalated. If an actual war is fought and uses space or Antarctica (or both) as a significant battlefield, there is

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<sup>109</sup> Interestingly, the UN Group of Governmental Experts, which had been working for years to establish international legal norms for cyberwarfare, just recently announced its failure to reach an agreement among all involved states on these norms. See Remarks by Michele Markoff, Explanation of Position at the Conclusion of the 2016–2017 UN Group of Governmental Experts (GGE) on Developments in the Field of Information and Telecommunications in the Context of International Security, New York City (23 June 2017), <https://www.state.gov/s/cyberissues/releasesandremarks/272175.htm> (accessed 3 Aug. 2017).

little chance that the treaties will still be effective afterward. During the conflict, international humanitarian law – previously known as the law of armed conflict or *jus in bello* – will become more relevant to state conduct than either treaty. After the conflict, space war will no longer be a science fiction being esoterically researched in corners of the military – the *vox populi* will demand primacy in space. Major powers will recognize the threat and likely increase their development to ensure that they are prepared for the next conflict. Once Antarctica is the scene of military activity, countries with territorial claims will likely reassert those claims to dissuade countries from operating militarily in that territory. Countries may defend or enforce their claimed sovereignty over their territory, particularly countries party to the conflict, to better justify using the continent for their own operations and preventing other countries from doing the same. For both treaties, the prohibition on military activities is currently respected, but Member States treat these prohibitions as valid during peace while somberly preparing for a time of war in which the rules will not apply. When that time comes, it will likely usher in a new era of space law, to be created in the debris of the war that ended its first era.

## 5.2 COMPETING TERRITORIAL CLAIMS

A less violent scenario that could also spell the end of either treaty is the tension between the treaties' view of these territories as the common heritage of mankind and Member States' realpolitik interests in claiming and exploiting territory. This form of dissolution would almost certainly affect one treaty at a time based on the exploration, colonization, and exploitation of the territories in question. This could take numerous forms, but we can look at natural resources and colonization as test cases. In the next decade or two, it is quite possible that private companies (in no small part supported by their respective governments) will be mining or otherwise extracting natural resources from celestial bodies. As soon as the first company initiates the first feasible mission to do this, countries and companies around the world will recognize that the market has shifted and that the race for the most profitable territory has begun. The same near-panic may occur when the first colony is established on a celestial body. Regardless of the medium and material, countries who lack this capability will almost certainly raise legal challenges, citing violations of the Outer Space Treaty. Countries sponsoring such activities will almost certainly dismiss these complaints.<sup>110</sup> If a solution is not

<sup>110</sup> It is telling that the United States Congress recently convened multiple hearings with members of private industry interested in space, and that the consensus of private industry was that instead of revising the Outer Space Treaty, the United States should provide 'maximum certainty [for investors] with minimal regulation'. The current regime allows wealthy states to incentivize private investment in space resources while side-stepping the international law that might limit whether the United States

reached in a relatively timely manner, this scenario would either force countries to negotiate revisions to the Outer Space Treaty that allow for territorial ownership in some fashion or cause powerful countries to ignore provisions of the Outer Space Treaty, which would in effect render that portion of the treaty irrelevant for any country with the capability to reach space.

Similarly, the first industry exploration or extraction of natural resources in Antarctica will likely result in all other interested countries and companies racing to do the same. This could happen with or without an internationally agreed-upon framework to govern natural resource extraction in Antarctica. If it occurs inside of such a framework, this would be a natural evolution as envisioned in the Antarctic Treaty, but it is also possible that no such framework will be negotiated when the option becomes available and that certain countries and companies will decide to unearth their territorial claims to justify extraction on 'their sovereign territory'. This would immediately result in all other claimant countries reasserting their claims, and non-claimant countries like Russia and the United States likely deciding to exercise their reserved right to make territorial claims. While this may not lead to the formal dissolution of the Antarctic Treaty System, it would result in most of the continent being under the rule of specific Member States and would likely lead to conflict, either military or diplomatic, between countries with overlapping claims. The foundational principles of the Antarctic Treaty System would be practically (and perhaps formally) replaced by a new system of cooperation or conflict between states.

### 5.3 ECONOMIC ACTIVITIES AND REGULATORY INCONGRUENCE

The previous examples dealt with somber matters of states and sovereignty – war, territory, and the projection of state power. This third scenario is quite different. It posits that the ongoing development of multiple regulatory systems to govern economic activities in outer space will ultimately, if unchecked, force states to negotiate a revision or addition to current space law to allow for more unified control of these activities. This situation is not directly like that of Antarctica, but the negotiations on space resource governance will almost certainly share many similarities with the Antarctica resource governance negotiation that opens in

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has the authority to give private companies permission to begin extracting and selling the most lucrative, accessible space resources. The consensus from private industry at the hearing was that the US should attempt to make no changes to the Outer Space Treaty – this is unsurprising, but will inevitably lead to future conflict. See Marcia Smith, *Congress Looking at Additional Measures to Facilitate Commercial Space*, Space Policy Online (31 May 2017), <http://www.spacepolicyonline.com/news/congress-looking-at-additional-measures-to-facilitate-commercial-space> (accessed 3 Aug. 2017).

2048. Depending on the growth of private industry in space, one of these negotiations will surely provide ample lessons for the other, later negotiation.

With the United States, Luxembourg, Russia, and other countries growing more interested in regulating space resources, and the unlikelihood that the international community will agree to a global amendment to the Outer Space Treaty to allow for private space exploitation, these countries are likely to continue their current unilateral efforts to encourage and regulate space resource industries. In the short term, this is unlikely to significantly damage the Outer Space Treaty – at best, this is a handful of Member States perhaps stretching the limits of what the treaty allows. Once resources begin flowing, however, or two systems come into conflict over claimed resources or other forms of interference, some form of negotiation will be required to merge the relevant regulatory systems. Indeed, industry and investors may push this charge to ensure certainty in their billions of dollars of investments in these companies. These negotiations could result in bilateral or exclusive multilateral agreements among countries with space industries, in which case it would likely undermine the foundational rules of the Outer Space Treaty or, far less likely, could ultimately result in a new or revised treaty with more specific guidelines on the space industry. The most likely scenario of new smaller treaties would effectively end the Outer Space Treaty regime holding outer space for the benefit of all peoples and would create a more capitalist system in which certain countries and companies could acquire property or use rights to directly profit from space exploration and exploitation. This evolution is possibly a necessary or even natural progression for the exploration of space, but it is no doubt a departure from the last fifty years of a more quixotic legal approach to ownership in space. Similarly, the post-2048 economic resource regime in Antarctica will result in a series of rights and relationships quite dissimilar from today's regime – while it may result in a peaceful, effective system, states must pay attention to the transition between regimes and the potential consequences that might arise.

## 6 CONCLUSION

At first glance, there is little in common between outer space and Antarctica besides the cold. As discussed in the preceding pages, however, the treaty regime systems that govern these territories have remarkable similarities and weaknesses. They were both formed in the early years of the Cold War and created areas of scientific discovery and exploration outside the quotidian geopolitical realities of the rest of the world. After fifty years of prominence, both treaties face the same stressors that could lead to their ultimate dissolution. These scenarios could include military conflict, territorial disputes, or simply competing governance frameworks

for private activities. The value of this parallel analysis is that if the same factors increase the likelihood of system collapse in either regime, then the same strategies to prevent or to navigate that collapse can likely be used for both systems. By studying the development of these factors and watching how they impact either treaty, legal scholars can investigate how each system copes with each factor and can use that knowledge to suggest revisions or improvements to the other treaty, or simply to how governments approach either treaty regime. Additionally, scholars can develop an analytic framework from the events of one treaty and perhaps apply it to the analysis of the other treaty, resulting in a more realistic and cohesive understanding of how large multilateral treaties survive, evolve, or fail as the world develops around them.

Ultimately, all states involved in activities in either outer space or Antarctica should be mindful that both systems may be more fragile than they appear, and that the likely course of economic and geopolitical events could very well lead to the dissolution of one or both treaties. It is hoped that this paper has highlighted these fragilities in both systems and has spurred a more forward-looking approach to the systems, whether that results in attempts to revise one of the treaties or build supplemental agreements and policies to help mitigate some of these weaknesses. If states do not look beyond the immediate horizon, they will hopefully recognize the risks when one of the treaties faces a serious crisis in the inevitable future and will see fit to seek solutions for both treaties before reality forces a new regime upon us.