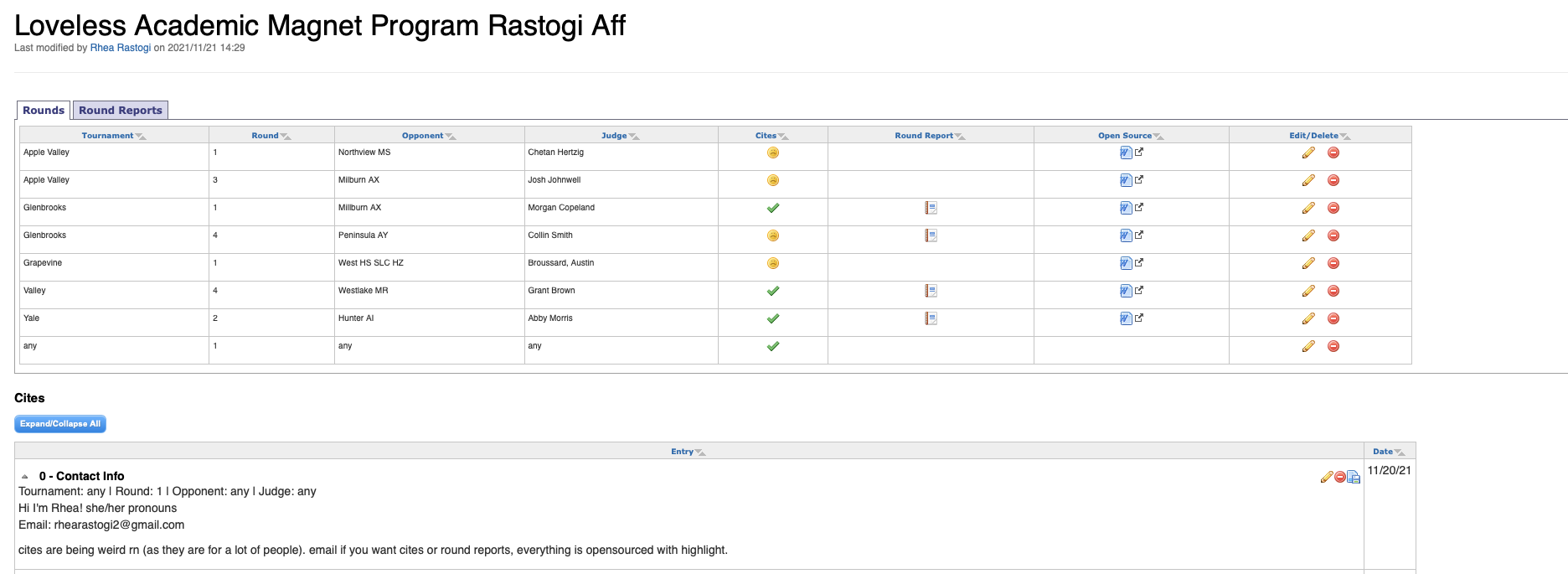
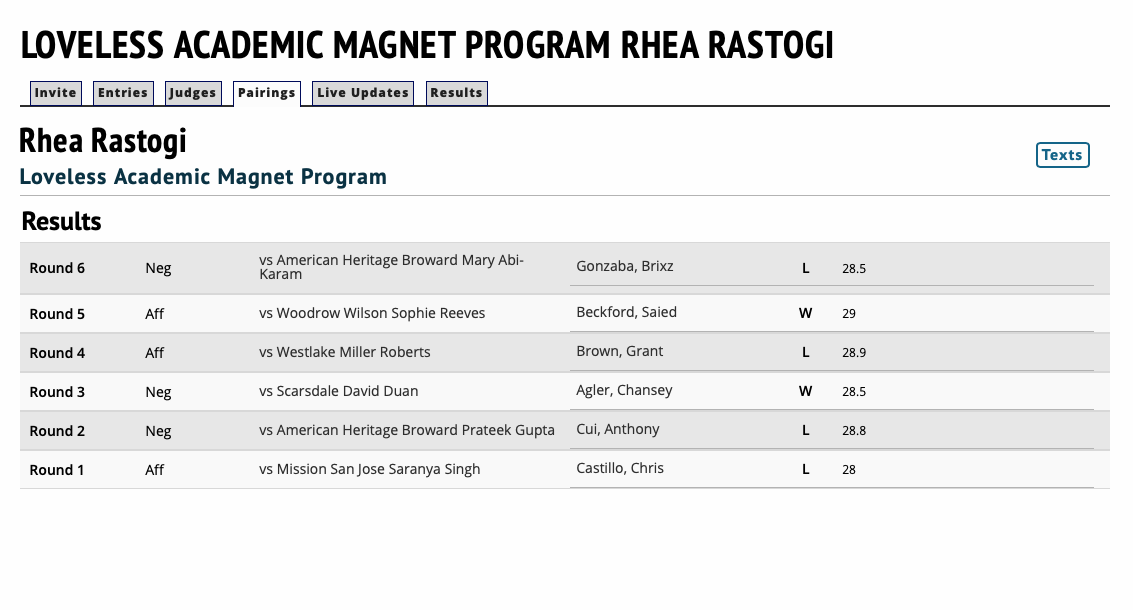
# 1NC

## OFF

#### Interpretation: Debaters must, on the page with their name and the school they attend, disclose the documents they read at least 1 week after the round through open source. Technical difficulties must be cited on their wiki.

#### Violation: They didn’t for rounds at Valley, but competed:





#### Standards:

#### 1] First is research, disclosures increase research and forces debaters to prepare cases knowing that people will have answers to it. That’s

**Nails 13** - (Jacob [I am a policy debater at Georgia State University. I debated LD for 4 years for Starr's Mill High School (GA) and graduated in 2012.] "A Defense of Disclosure (Including Third-Party Disclosure)" http://nsdupdate.com/2013/a-defense-of-disclosure-including-third-party-disclosure-by-jacob-nails/)

I fall squarely on the side of disclosure. I find that **the largest advantage of widespread disclosure is the educational value it provides.** First, **disclosure streamlines research. Rather than every team and every lone wolf researching completely in the dark, the wiki provides a public body of knowledge that everyone can contribute to and build off of.** Students can look through the different studies on the topic and choose the best ones on an informed basis without the prohibitively large burden of personally surveying all of the literature. **The best arguments are identified and replicated, which is a natural result of an open marketplace of ideas. Quality of evidence increases across the board. In theory,** the increased quality of information **[this] could trade off with quantity**. If debaters could just look to the wiki for evidence, it might remove the competitive incentive to do one’s own research. **Empirically**, however**, the opposite has been true.** In fact, a second advantage of **disclosure is that it motivates research. Debaters cannot expect to make it a whole topic with the same stock AC – that is, unless they are continually updating and frontlining it.** Likewise, **debaters with access to their opponents’ cases can do more targeted and specific research. Students can go to a new level of depth, researching not just the pros and cons of the topic but the specific authors, arguments, and adovcacies employed by other debaters.** The incentive to cut author-specific indicts is low if there’s little guarantee that the author will ever be cited in a round but high if one knows that specific schools are using that author in rounds. In this way, disclosure increases incentive to research by altering a student’s cost-benefit analysis so that the time spent researching is more valuable, i.e. more likely to produce useful evidence because it is more directed. In any case, if publicly accessible evidence jeopardized research, backfiles and briefs would have done LD in a long time ago. Lastly, and to my mind most significantly, **disclosure weeds out anti-educational arguments. I have in mind the sort of theory spikes and underdeveloped analytics whose strategic value comes only from the fact that the time to think of and enunciate responses to them takes longer than the time spent making the arguments themselves. If [theory spikes] these arguments were made on a level playing field where each side had equal time to craft answers, they would seldom win rounds, which is a testimony to the real world applicability (or lack thereof) of such strategies.** A model in which arguments have to withstand close scrutiny to win rounds creates incentive to find the best arguments on the topic rather than the shadiest. Having transitioned from LD to policy where disclosure is more universal, I can say that **debates are more substantive, developed, and responsive when both sides know what they’re getting into prior to the round**. The educational benefits of disclosure alone aren’t likely to convince the fairness-outweighs-education crowd, but I’ve learned over the course of many theory debates that most of that crowd has a very warped and confusing conception of fairness. **Debaters who produce better research are more deserving of a win. Debaters who can make smart arguments and defend them from criticism should win out over debaters who hide behind obfuscation.** That so many rounds these days are resolved on frivolous theory and dropped, single-sentence blips suggests that wins are not going to the “better debaters” in any meaningful sense of the term. The structure of LD in the status quo doesn’t incentivize better debating.

#### 2] Second is small school debaters: It’s uniquely key for small school debaters since they don’t have massive backfiles for every single topic which oweighs on accessibility – even if small school debaters shouldn’t disclose they still benefit off of the wiki.

#### Voters:

#### 1] Use competing interps – a) reasonability invites arbitrary judge intervention since we don’t know your bs meter, b) collapses to competing interps – we justify 2 brightlines under an offense defense paradigm just like 2 interps. C) leads to a race to the bottom which detracts from norm setting through arbitrary meets

#### 2] No RVIs – a) logic – you shouldn’t win for meeting a common burden you knew about b) baiting encourages the aff to bait theory c) norm setting – if I realize I’m wrong I should be allowed to concede the shell

#### 3] DTD – disclosure prevents my ability and engage in the round and t is a pre-req to engaging in the aff

## OFF

#### Interpretation – the aff may not defend that the appropriation of outer space by a certain set of private entities is unjust.

#### Entities is a generic bare plural

Nebel 20 [Jake Nebel is an assistant professor of philosophy at the University of Southern California and executive director of Victory Briefs. He writes a lot of this stuff lol – duh.] “Indefinite Singular Generics in Debate” Victory Briefs, 19 August 2020. no url AG

I agree that if “a democracy” in the resolution just meant “one or more democracy,” then a country-specific affirmative could be topical. But, as I will explain in this topic analysis, that isn’t what “a democracy” means in the resolution. To see why, we first need to back up a bit and review (or learn) the idea of generic generalizations.

The most common way of expressing a generic in English is through a *bare plural*. A bare plural is a plural noun phrase, like “dogs” and “cats,” that lacks an overt determiner. (A determiner is a word that tells us which or how many: determiners include quantifier words like “all,” “some,” and “most,” demonstratives like “this” and “those,” posses- sives like “mine” and “its,” and so on.) LD resolutions often contain bare plurals, and that is the most common clue to their genericity.

We have already seen some examples of generics that are not bare plurals: “A whale is a mammal,” “A beaver builds dams,” and “The woolly mammoth is extinct.” The first two examples use indefinite singulars—singular nouns preceded by the indefinite article “a”—and the third is a definite singular since it is preceded by the definite article “the.” Generics can also be expressed with bare singulars (“Syrup is viscous”) and even verbs (as we’ll see later on). The resolution’s “a democracy” is an indefinite singular, and so it very well might be—and, as we’ll soon see, is—generic.

But it is also important to keep in mind that, just as not all generics are bare plurals, not all bare plurals are generic. “Dogs are barking” is true as long as some dogs are barking. Bare plurals can be used in particular ways to express existential statements. The key question for any given debate resolution that contains a bare plural is whether that occurrence of the bare plural is generic or existential.

The same is true of indefinite singulars. As debaters will be quick to point out, some uses of the indefinite singular really do mean “some” or “one or more”: “A cat is on the mat” is clearly not a generic generalization about cats; it’s true as long as some cat is on the mat. The question is whether the indefinite singular “a democracy” is existential or generic in the resolution.

Now, my own view is that, if we understand the difference between existential and generic statements, and if we approach the question impartially, without any invest- ment in one side of the debate, we can almost always just tell which reading is correct just by thinking about it. It is clear that “In a democracy, voting ought to be compul- sory” doesn’t mean “There is one or more democracy in which voting ought to be com- pulsory.” I don’t think a fancy argument should be required to show this any more than a fancy argument should be required to show that “A duck doesn’t lay eggs” is a generic—a false one because ducks do lay eggs, even though some ducks (namely males) don’t. And if a debater contests this by insisting that “a democracy” is existen- tial, the judge should be willing to resolve competing claims by, well, judging—that is, by using her judgment. Contesting a claim by insisting on its negation or demanding justification doesn’t put any obligation on the judge to be neutral about it. (Otherwise the negative could make every debate irresolvable by just insisting on the negation of every statement in the affirmative speeches.) Even if the insistence is backed by some sort of argument, we can reasonably reject an argument if we know its conclusion to be false, even if we are not in a position to know exactly where the argument goes wrong. Particularly in matters of logic and language, speakers have more direct knowledge of particular cases (e.g., that some specific inference is invalid or some specific sentence is infelicitious) than of the underlying explanations.

But that is just my view, and not every judge agrees with me, so it will be helpful to consider some arguments for the conclusion that we already know to be true: that, even if the United States is a democracy and ought to have compulsory voting, that doesn’t suffice to show that, in a democracy, voting ought to be compulsory—in other words, that “a democracy” in the resolution is generic, not existential.

Second, existential uses of the indefinite, such as “A cat is on the mat,” are upward- entailing.3 This means that if you replace the noun with a more general one, such as “An animal is on the mat,” the sentence will still be true. So let’s do that with “a democracy.” Does the resolution entail “In a society, voting ought to be compulsory”? Intuitively not, because you could think that voting ought to be compulsory in democracies but not in other sorts of societies. This suggests that “a democracy” in the resolution is not existential.

#### It applies to this topic – a] entities is an existential bare plural bc it has no determiner

#### Violation – they spec “private rocket launches”

#### Standards

#### 1] Limits – they can spec infinite different entities like spaceX, etc.. - that’s supercharged by the ability to spec combinations of types of entities. This takes out functional limits – it’s impossible for me to research every possible combination of entities, governments, and appropriation.

#### 2] TVA solves – just read your aff as an advantage to a whole rez aff – we don’t stop them from reading new FWs, mechanisms or advantages.

#### 3] PICs aren’t aff offense – a] it’s ridiculous to say that neg potential abuse justifies the aff being non-T b] There’s only a small number of pics on this topic c] PICs incentivize them to write better affs that can generate solvency deficits to PICs

## OFF

#### Interpretation– appropriation means taking possession of something.

Dictionary ND, Dictionary.com, “appropriation”, <https://www.dictionary.com/browse/appropriation>, DD AG

the act of appropriating or taking possession of something, often without permission or consent.

#### Violation – a) space tourism doesn’t take possession of space

Henderson, Tsui, 19, Science Direct, “The Role of Niche Aviation Operations as Tourist Attractions”, URL: <https://www.sciencedirect.com/topics/social-sciences/space-tourism>, KR

Space tourism is another niche segment of the aviation industry that seeks to give tourists the ability to become astronauts and experience space travel for recreational, leisure, or business purposes. Since space tourism is extremely expensive, it is a case of a very small segment of consumers that are able and willing to purchase a space experience. There are several options for space tourists. For example, Crouch et al. (2009) investigate the choice behaviour between four types of space tourism: high altitude jet fighter flights, atmospheric zero-gravity flights, short-duration suborbital flights, and longer duration orbital trips into space. Reddy et al. (2012) find the following motivational factors behind space tourism (in order of importance): vision of earth from space, weightlessness, high speed experience, unusual experience, and scientific contribution. Currently, only high-altitude jet fighter flights and atmospheric zero-gravity flights are commercially available to tourists in the space tourism sector. Accordingly, this section provides an example of each, whilst the potential for suborbital and longer duration orbital trips into space are discussed later in this chapter.

#### b) Private rocket launches don’t take any control in space since they’re created by entities AND are conducted on Earth

#### Standards:

#### 1] Ground – not defending the topic allows for an infinite number of affirmatives that make it impossible to be negative

#### 2] Shiftiness – allows the aff to defend new interpretations of appropriation, making it impossible to predict aff strategy

## OFF

### 1NC – Core

#### CP: States ought to:

#### --Announce that appropriation of outer space by private actors for private rocket launches violates the Outer Space Treaty and that this is a settled matter of customary international law

#### --Announce that this action is taken pursuant to *opinio juris* (the belief that the action is taken pursuant to a legal obligation) and that non-compliant actors are in violation of international law

#### --Fully comply, not appropriating outer space in a manner inconsistent with these proclamations

#### Solves the Aff.

[Fabio](https://kluwerlawonline.com/journalarticle/Air+and+Space+Law/33.3/AILA2008021) **Tronchetti 8**. Dr. Fabio Tronchetti works as a Co-Director of the Institute of Space Law and Strategy and as a Zhuoyue Associate Professor at Beihang University, “The Non–Appropriation Principle as a Structural Norm of International Law: A New Way of Interpreting Article II of the Outer Space Treaty,” Air and Space Law, Volume 33, No 3, 2008, <https://kluwerlawonline.com/journalarticle/Air+and+Space+Law/33.3/AILA2008021>, RJP, **DebateDrills**.

The non–appropriation principle represents the fundamental rule of the space law system. Since the beginning of the space era, it has allowed for the safe and orderly development of space activities. Nowadays, however, the principle is under attack. Some proposals, arguing the need for abolishing it in order to promote commercial use of outer space are undermining its relevance and threatening its role as a guiding principle for present and future space activities. This paper aims at safeguarding the non–appropriative nature of outer space by suggesting a new interpretation of the non–appropriation principle that is based on the view that this principle should be regarded as a customary rule of international law of a special character, namely ‘a structural norm’ of international law.

#### That competes ---

#### 1] Space law is typically treaty-based---Russian and Chinese proposals prove.

Stephanie **Nebehay 8**. Reporter, Reuters, “China, Russia to Offer Treaty to Ban Arms in Space,” Reuters, January 26, 2008, <https://www.reuters.com/article/us-arms-space/china-russia-to-offer-treaty-to-ban-arms-in-space-idUSL2578979020080125>, RJP, **DebateDrills**

GENEVA (Reuters) - China and Russia will submit a joint proposal next month for an international treaty to ban the deployment of weapons in outer space, a senior Russian arms negotiator said on Friday.

Valery Loshchinin, Russia’s ambassador to the United Nations-sponsored Conference on Disarmament, said the draft treaty would be presented to the 65-member forum on February 12.

Russian Foreign Minister Sergei Lavrov is due to address the Geneva forum, which constitutes the world’s main disarmament negotiating body, on that day. Loshchinin gave no details on the proposal which has been circulated to some senior diplomats.

Tensions between Russia and the United States have deepened in recent years over U.S. plans to revive its stalled “Star Wars” program from the 1980s with a new generation of missile defense shields.

Nuclear and other weapons of mass destruction are banned from space under a 1967 international treaty. But Washington’s plans have stirred concerns about non-nuclear arms in space.

#### 2] Treaties are the foundation of space law.

Sophie **Goguichvili et. al 21**. Program Associate, the Wilson Center, “The Global Legal Landscape of Space: Who Writes the Rules on the Final Frontier?” The Wilson Center, October 1, 2021, <https://www.wilsoncenter.org/article/global-legal-landscape-space-who-writes-rules-final-frontier>, RJP, **DebateDrills**

As previously mentioned, a series of treaties adopted by the U.N. General Assembly (UNGA) form the foundation of the global space governance system. The first and most significant of these treaties is the “Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space including the Moon and Other Celestial Bodies,” more commonly known as the **Outer Space Treaty**or**OST** for short (1967). The Outer Space Treaty is considered the most comprehensive space treaty and provides the basic framework for international space law, namely: the exploration and use of outer space for peaceful purposes by all States for the benefit of mankind (Art. I); the outlaw of national appropriation or claims of sovereignty of outer space or celestial objects (Art. II); a ban on the placement of weapons of mass destruction in orbit or on celestial bodies (Art. IV); that astronauts should be regarded as the envoys of mankind (Art. V); and that States are required to supervise the activities of their national entities (Art. VI).

## OFF

#### The plan requires clarifying international space law---causes strategic bargaining to extract concessions

Alexander William Salter 16, Assistant Professor of Economics, Rawls College of Business, Texas Tech University, "SPACE DEBRIS: A LAW AND ECONOMICS ANALYSIS OF THE ORBITAL COMMONS", 19 STAN. TECH. L. REV. 221 (2016), https://law.stanford.edu/wp-content/uploads/2017/11/19-2-2-salter-final\_0.pdf

V. MITIGATION VS. REMOVAL

Relying on international law to create an environment conducive to space debris removal initially seems promising. The Virginia school of political economy has convincingly shown the importance of political-legal institutions in creating the incentives that determine whether those who act within those institutions behave cooperatively or predatorily.47 In the context of space debris, the role of nation-states, or their space agencies, would be to create an international legal framework that clearly specifies the rules that will govern space debris removal and the interactions in space more generally. The certainty afforded by clear and nondiscriminatory48 rules would enable the parties of the space debris “social contract” to use efficient strategies for coping with space debris. However, this ideal result is, in practice, far from certain. To borrow a concept from Buchanan and Tullock’s framework,49 the costs of amending the rules in the case of international space law are exceptionally high. Although a social contract is beneficial in that it prevents stronger nation-states from imposing their will on weaker nation-states, it also creates incentives for the main spacefaring nations to block reforms that are overall welfare-enhancing but that do not sufficiently or directly benefit the stronger nations.

The 1967 Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies (more commonly known as the Outer Space Treaty) is the foundation for current international space law.50 All major spacefaring nations are signatories. Article VIII of this treaty is the largest legal barrier to space debris removal efforts. This article stipulates that parties to the treaty retain jurisdiction over objects they launch into space, whether in orbit or on a celestial body such as the Moon. This article means that American organizations, whether private firms or the government, cannot remove pieces of Chinese or Russian debris without the permission of their respective governments. Perhaps contrary to intuition, consent will probably not be easy to secure.

A major difficulty lies in the realization that much debris is valuable scrap material that is already in orbit. A significant fraction of the costs associated with putting spacecraft in orbit comes from escaping Earth’s gravity well. The presence of valuable material already in space can justifiably be claimed as a valuable resource for repairs to current spacecraft and eventual manufacturing in space. As an example, approximately 1,000 tons of aluminum orbit as debris from the upper stages of launch vehicles alone. Launching those materials into orbit could cost between $5 billion and $10 billion and would take several years.51 Another difficulty lies in the fact that no definition of space debris is currently accepted internationally. This could prove problematic for removal efforts, if there is disagreement as to whether a given object is useless space junk, or a potentially useful space asset. Although this ambiguity may appear purely semantic, resolving it does pose some legal difficulties. Doing so would require consensus among the spacefaring nations. The negotiation process for obtaining consent would be costly.

Less obvious, but still important, is the 1972 Convention on International Liability for Damage Caused by Space Objects, normally referred to as the Liability Convention. The Liability Convention expanded on the issue of liability in Article VII of the Outer Space Treaty. Under the Liability Convention, any government “shall be absolutely liable to pay compensation for damage caused by its space objects on the surface of the Earth or to aircraft, and liable for damage due to its faults in space.”52 In other words, if a US party attempts to remove debris and accidentally damages another nation’s space objects, the US government would be liable for damages. More generally, because launching states would bear costs associated with accidents during debris removal, those states may be unwilling to participate in or permit such efforts. In theory, insurance can partly remediate the costs, but that remediation would still make debris removal engagement less appealing.

A global effort to remediate debris would, by necessity, involve the three major spacefaring nations: the United States, Russia, and China.53 However, any effort would also require—at a minimum—a significant clarification and—at most —a complete overhaul of existing space law.54 One cannot assume that parties to the necessary political bargains would limit parleying to space-related issues. Agreements between sovereign nation-states must be self-enforcing.55 To secure consent, various parties to the change in the international legal-institutional framework may bargain strategically and may hold out for unrelated concessions as a way of maximizing private surplus. The costs, especially the decision-making costs, of changing the legal framework to secure a global response to a global commons problem are potentially quite high.

#### Russia uses negotiations to push the PPWT---erodes US space dominance---unilat solves

Michael Listner 18, JD, Regent University School of Law, the founder and principal of the legal and policy think-tank/consultation firm Space Law and Policy Solutions, Sept 17 2018, "The art of lawfare and the real war in outer space", The Space Review, www.thespacereview.com/article/3571/1

A battle for primacy in outer space took place on August 14, 2018, among the Russian Federation, the United States, and, indirectly, the People’s Republic of China. This battle did not involve the exotic technology of science fiction, antisatellite weapons (ASATs), or the incapacitation of satellites; it was not part of a hot war and did not even occur in outer space. Rather, it took place in the halls of the Conference of Disarmament in Geneva, Switzerland, and concerned the interdiction of the hypothetical deployment of instrumentalities of a hot war in outer space. The carefully orchestrated arena for this battle by the proponents of banning so-called space weapons involved methodologies, institutions, and agents of international law but was undermined by a vigorous counterattack by the United States using the same forum and suite of instruments so skillfully levied against it.1 This battle, of course, is not a single instance but the latest skirmish of a much larger conflict involving real war in space.

There’s been significant attention—and overstatem­ent— about the effect of a proposed Space Force by the United States, including an arms race and dominance as articulated by the United States,2 yet little attention has been given to the contest that continues to be fought over outer space using the tools of international law and policy, both of which are instruments of “lawfare.” Maj. General Charles N. Dunlap, Jr. (retired)3 first defined lawfare in the paper “Law and Military Interventions: Preserving Humanitarian Values in 21st Conflicts,” as “a method of warfare where law is used as a means of realizing a military objective.”4 This definition can be expanded to the use of hard law, soft law, and non-governmental organizations and institutions within the international arena to achieve a national objective and geopolitical end that would otherwise require the use of hard power. As observed by General Dunlap, lawfare imputes the teachings of Sun Tzu in particular this teaching: “The supreme art of war is to subdue the enemy without fighting.”5

Lawfare is not a new concept and has been used in many domains, but the tools brought to bear have become more prolific, and the domain of outer space has been and continues to be a theater where it is applied. The earliest example of lawfare (even though the term was not yet coined) in outer space occurred pre-Sputnik with Soviet Union attempting to use customary law to make claims of sovereignty extending beyond the atmosphere to the space above its territory. This claim was preempted by the launch of Sputnik 1 and the act of the satellite flying over the territory of other nations.6 The Eisenhower Administration saw this as an opportunity to meet a national space policy goal and likewise used customary law as an implement of lawfare and successfully created the principle of free access to outer space, which it utilized for photoreconnaissance activities in lieu of overflights of another nation’s sovereign airspace.7 The Soviet Union unsuccessfully attempted to defeat this move using lawfare in the United Nations through a proposal that would have prohibited the use of outer space for the purpose of intelligence gathering.8

Since that setback, the art of lawfare in outer space has settled on the objective ascribed to another teaching of Sun Tzu:

“With regard to precipitous heights, if you proceed your adversary, occupy the raised and sunny spots, and there wait for him to come up. Remember, if the enemy has occupied precipitous heights before you, do not follow him, but retreat and try to entice him away.”9

The second part of this teaching exemplifies the role of lawfare in the present war in outer space: to employ the tools and institutions of international law as a means to legally corner an adversary and gain geopolitical advantage in soft power, with the aim of slowing and eroding the advantage that adversary has attained through preeminence in the domain of outer space, and replace it with their own. This objective is accomplished by two general means: legally-binding measures, most commonly in the form of treaties, and so-called non-binding measures couched as sustainability.

Lawfare in space continued in the intervening years between Sputnik-1 and the signature and ratification of the Outer Space Treaty and afterward. The weapon of choice: disarmament proposals for outer space. Provisions for banning so-called space weapons in the Outer Space Treaty were rejected by the Soviet Union in favor of separate arms control measures.10 These measures included proposals, some of which related to the proscription of ASATs, designed to not only gain an advantage in outer space but to gauge political intent and resolve.11

The lawfare offensive escalated after the proposed Strategic Defense Initiative with an effort curtail space-based missile defense technology through a ban on so-called space weapons and a proverbial arms race in outer space. The Prevention of an Arms Race in Outer Space (PAROS), introduced in 1985, continues to seek a legally binding measure to place any weapon in outer space, including those designed for self-defense. It spawned measures such as the Prevention of the Placement of Weapons in Outer Space, the Threat or Use of Force against Outer Space Objects (PPWT), co-sponsored by Russia and China. This and other measures have met resistance as unverifiable and certainly are not likely to gain the advice and consent of the US Senate for ratification. The end game of the use of lawfare in the form of efforts like PAROS—the latest attempt at which was defeated in Geneva—is to propose legally binding measures that proponents would ignore to their advantage in any event. The sponsors and advocates of these hard-law measures recognize they will not come to fruition but, in the process of promoting them, will enhance their soft power and moral authority, which can be applied to entice their adversary down.

Non-binding resolutions and measures in the form of political agreements and guidelines are being used concurrently in the lawfare engagement in outer space, where proposals for legally binding measures alone fall short of the goal of creating hard law and challenging dominance in outer space. These resolutions and measures, which emphasize sustainability, are designed to perform an end run around the formalities of a treaty to entice agreement on issues that would otherwise be unacceptable in a hard-law agreement. These measures have the dual effect to create soft-power support on the one hand and hard law on the other. This tool of lawfare, which uses clichés of cooperation and sustainability, is a ploy that applies the ambiguous nature of customary international law to achieve what cannot be done through treaties: to “entice the adversary away” and create legal and political constraints to bind and degrade its use of outer space or prevent it from maintaining its superiority, all the while allowing others to play catchup and replace one form of dominance with another. While lawfare is by nature asymmetric, this indirect approach could be considered a subset an irregular tactic of lawfare, as opposed to the use of formal treaties in lawfare.

The crux is that, like space objects used in outer space, international law and its implements are dual-use in that they can be used for proactive ends or weaponized, with those using the appliances of lawfare to encourage cession of the high ground choosing the latter rather than the former. The decision to weaponize international law and its institutions to prosecute this war in space brings into question the efficacy of new rules or norms. Indeed, the idea of expanding the jurisprudence of outer space through custom, as being suggested by the United States, and more recently gap-filling rules being suggested by academia that could become custom, presents the real chance that, rather than the creation of the ploughshare of sustainability, new and more effective swords for lawfare will be forged.

To paraphrase Sun Tzu, “all war is deception.” In the case of outer space, the pretext in the current war in space is that an arms race and a hot war in outer space is inevitable, and can only be avoided by formal rules or international governance. Conversely, a hot war can be prevented in no small part by using lawfare to engage in the contemporary war in space using the tools of, and the abundant resources found in, the experience of attorneys and litigators in particular to supplement and support diplomats to extend the velvet glove when applicable, and bare knuckles when necessary. If the August 14 statement in Geneva is any indicator, the United States may have just done that and begun the shift from light-touch diplomacy to bringing its legal warriors to bear in full-contact lawfare to engage and win the current war in outer space and help deter a more serious hot war from occurring without sacrificing the superiority it possesses in outer space.

#### The PPWT prohibits space-based missile defense

Jack M. Beard 16, Associate Professor of Law at the University of Nebraska College of Law, Feb 15 2016, "Soft Law ’s Failure on the Horizon: The International Code of Conduct for Outer Space Activities", University of Pennsylvania Journal of International Law, Vol. 38, No. 2, 2016, <https://digitalcommons.unl.edu/cgi/viewcontent.cgi?referer=&httpsredir=1&article=1086&context=spacelaw>

B. Avoid Arms Control Traps in Space

Any successful effort to achieve legally binding restrictions on military activities or weapons in space must focus on specific, definable, and limited objectives or run afoul of issues that have historically ensured deadlock among suspicious and insecure adversaries.306 Some seemingly desirable goals, however, are likely to ensure failure.

The first such problematic goal involves attempting to use arms control agreements or other instruments to comprehensively ensure peace in space. Unfortunately, the integration of modern military systems on earth, sea, air and space guarantees that at some point states seeking to disrupt or deny the ability of an adversary (such as the United States) to project power will find space capabilities to be a particularly appealing target, especially in the early stages of a crisis or conflict.307 The presence of so many things of military value in space thus makes actions by an adversary to neutralize, disrupt or destroy these things likely during a major conflict on earth.308

The second problematic arms control goal in space that seems certain to ensure stalemate involves attempting to define and prohibit military technologies with a view to broadly prevent the weaponization of space. Clearly defining a space weapon for purposes of any legally binding arms control agreement is a daunting task, one which is made particularly challenging by the “essentially military nature of space technology.”309 As noted, space technologies are routinely viewed as dual-use in nature, meaning that they can be readily employed for both civilian and military uses. Determining the ultimate purpose of many space technologies may thus depend on discerning the intentions of states, a process perhaps better suited for psychological than legal evaluation. 310

Further complicating the classification of space military technologies is the inherent difficulty in distinguishing most space weapons on the basis of their offensive and defensive roles or even their specific missions.311 For example, this problem lies at the heart of debates over the status and future of ballistic missile defense (BMD) programs, since the technology underlying BMD systems and offensive ASAT weapons is often indistinguishable.312 Vague and broad soft law instruments do not resolve this problem, but create instead their own confusion and insecurity. Vague and broad provisions in legally binding agreements that do not or cannot distinguish between these missions are similarly problematic.

These issues, particularly difficulties in distinguishing ASAT and BMD systems, have figured prominently in complicating negotiations on space weapons over previous decades.313 Similarly, these concerns were a significant factor in initial U.S. opposition to the arms control measure proposed by China and Russia (the PPWT) since it prohibits states from placing any type of weapon in outer space (regardless of its military mission), thus effectively prohibiting the deployment of ballistic missile defense systems. 314 Furthermore, even if clear legal restrictions could be developed, verifying compliance with respect to technology in orbit around Earth would be very difficult (a point conceded even by China with respect to its own proposed PPWT).315

#### Causes rogue state missile threats---that escalates

Patrick M. Shanahan 19, Acting Secretary of Defense from January to June 2019, previously vice president and general manager of Boeing Missile Defense Systems, Jan 2019, "2019 MISSILE DEFENSE REVIEW", US Department of Defense, https://media.defense.gov/2019/Jan/17/2002080666/-1/-1/1/2019-MISSILE-DEFENSE-REVIEW.PDF

U.S. Homeland Missile Defense will Stay Ahead of Rogue States’ Missile Threats

Technology trends point to the possibility of increasing rogue state missile threats to the U.S. homeland. Vulnerability to rogue state missile threats would endanger the American people and infrastructure, undermine the U.S. diplomatic position of strength, and could lead potential adversaries to mistakenly perceive the United States as susceptible to coercive escalation threats intended to preclude U.S. resolve to resist aggression abroad. Such misperceptions risk undermining our deterrence posture and messaging, and could lead adversaries to dangerous miscalculations regarding our commitment and resolve.

It is therefore imperative that U.S. missile defense capabilities provide effective protection against rogue state missile threats to the homeland now and into the future. The United States is technically capable of doing so and has adopted an active missile defense force-sizing measure for protection of the homeland. DoD will develop, acquire, and maintain the U.S. homeland missile defense capabilities necessary to effectively protect against possible missile attacks on the homeland posed by the long-range missile arsenals of rogue states, defined today as North Korea and Iran, and to support the other missile defense roles identified in this MDR.

This force-sizing measure for active U.S. missile defense is fully consistent with the 2018 NPR, and in order to keep pace with the threat, DoD will utilize existing defense systems and an increasing mix of advanced technologies, such as kinetic or directed-energy boost-phase defenses, and other advanced systems. It is technically challenging but feasible over time, affordable, and a strategic imperative. It will require the examination and possible fielding of advanced technologies to provide greater efficiencies for U.S. active missile defense capabilities, including space-based sensors and boost-phase defense capabilities. Further, because the related requirements will evolve as the long-range threat posed by rogue states evolves, it does not allow a static U.S. homeland defense architecture. Rather, it calls for a missile defense architecture that can adapt to emerging and unanticipated threats, including by adding capacity and the capability to surge missile defense as necessary in times of crisis or conflict.

In coming years, rogue state missile threats to the U.S. homeland will likely expand in numbers and complexity. There are and will remain inherent uncertainties regarding the potential pace and scope of that expansion. Consequently, the United States will not accept any limitation or constraint on the development or deployment of missile defense capabilities needed to protect the homeland against rogue missile threats. Accepting limits now could constrain or preclude missile defense technologies and options necessary in the future to effectively protect the American people.

As U.S. active defenses for the homeland continue to improve to stay ahead of rogue states’ missile threats, they could also provide a measure of protection against accidental or unauthorized missile launches. This defensive capability could be significant in the event of destabilizing domestic developments in any potential adversary armed with strategic weapons, and as long-range missile capabilities proliferate in coming years.

U.S. missile defense capabilities will be sized to provide continuing effective protection of the U.S. homeland against rogue states’ offensive missile threats. The United States relies on nuclear deterrence to address the large and more sophisticated Russian and Chinese intercontinental ballistic missile capabilities, as well as to deter attacks from any source consistent with long-standing U.S. declaratory policy as re-affirmed in the 2018 NPR.

## OFF

#### **CP Text: States should implement a strategy of accelerating carbon sequestration in peridotite**

#### **Solves climate change – any other method won’t keep up with the rate of carbon emissions**

Rigopoulos 18 [Ioannis Rigopoulos, May 2018, " Effect of ball milling on the carbon sequestration efficiency of serpentinized peridotites," Ioannis Rigopoulos PhD canidate at the University of Cyprus · Department of Civil and Environmental Engineering. <https://www.sciencedirect.com/science/article/abs/pii/S0892687518300839#!]//DebateDrills> WW

The concentration of atmospheric CO2 has been increased from a pre-industrial level of 280 ppm to 404 ppm in 2016 (NOAA-ESRL, 2017), primarily due to the widespread use of fossil fuels (Ciais et al., 2013, Keeling et al., 1995, Sawyer, 1972, Siegenthaler and Oeschger, 1987). This abrupt increase is considered to be the main reason for the observed global climate change (IPCC, 2005, Kuo et al., 1990), which seems to be largely irreversible on human timescales (Solomon et al., 2009). Thus, significant efforts have been made to develop efficient carbon capture and storage (CCS) technologies (e.g. Gislason and Oelkers, 2014, Lackner et al., 1995, Matter et al., 2016, Michael et al., 2010, Wilson et al., 2014). The recent COP21 Paris Agreement sets out a global action plan in order to put the world on track and avoid future dangerous climate changes by limiting the global warming to well below 2 °C above the pre-industrial levels (UNFCCC, 2016). Mineral carbonation is a CCS technology that includes the conversion of CO2 into carbonate minerals (Lackner et al., 1995, Oelkers et al., 2008, Olajire, 2013, Power et al., 2013, Sanna et al., 2014, Seifritz, 1990). It comprises the chemical reaction of rocks containing Mg and/or Ca-silicate minerals with CO2 to form carbonate minerals, such as magnesite (MgCO3), calcite (CaCO3) and dolomite (CaMg(CO3)2), which are stable over geologic time. Therefore, this carbon sequestration approach minimizes the risk of leakage and thus facilitates long-term and safe storage (e.g. Gislason and Oelkers, 2014, Matter and Kelemen, 2009, Matter et al., 2016, Seifritz, 1990). Peridotites are among the main sources of forsteritic olivine, which is the most promising mineral for carbon sequestration (O’Connor et al., 2005, Oelkers et al., 2008). The main carbonation reactions of peridotites are described by the following Eqs. (1), (2), (3):Mg2SiO4Forsterite+2CO2→2MgCO3Magnesite+SiO2SilicaMgSiO3Enstatite+CO2→MgCO3Magnesite+SiO2SilicaMg3Si2O5(OH)4Serpentine+3CO2→3MgCO3Magnesite+2SiO2Silica+2H2O The mineralization of CO2 can be performed either in situ, by injecting CO2 into ultramafic or mafic rocks (e.g. Matter and Kelemen, 2009, Matter et al., 2016), or *ex situ* in industrial reactors, after mining and crushing/grinding the rock material (e.g. Bodénan et al., 2014, Gerdemann et al., 2007, Rigopoulos et al., 2016a). *Ex situ* carbonation could provide a potential solution to sequester CO2 from small to medium capacity emitters, where geological storage is not a viable option (Sanna et al., 2014). The major challenges of *ex situ* mineral carbonation are the scale of mining operations, the high energy consumption and the slow reaction kinetics (Gerdemann et al., 2007). Several studies have been performed to speed up the *ex situ* carbonation reactions by: (i) grinding/milling the rock materials, (ii) increasing the temperature, and (iii) dissolving the rock material in various solutions (e.g. Declercq et al., 2013, Haug et al., 2010, Li and Hitch, 2016a, Rigopoulos et al., 2015a, Rigopoulos et al., 2015b, Rigopoulos et al., 2016a, Rigopoulos et al., 2016b). In addition, many works have focused on the *ex situ* carbon mineralization of industrial wastes (e.g. mine tailings, construction waste), which could contribute to the reduction of atmospheric CO2 concentrations and result in a number of economic benefits for many industries (Li and Hitch, 2017a, Power et al., 2013, Sanna et al., 2014, Wilson et al., 2014). An additional advantage of such a process is that it could reduce the hazardous nature of certain wastes, such as asbestos minerals (Bobicki et al., 2012). Emphasis should also be placed on the fact that the final products of mineral carbonation could be used by the construction industry as additives in order to render the whole approach more economically viable.

## CASE

#### ] Circumvention – other rocket launches like for mining or invest still exist – AND now private companies have an incentive to divert research there

#### ] No IL – space tourism hasn’t started yet but their ev says that non-commericial flights are also leading to climate change

#### ] No brightline for warming means the da oweighs on probability – their ev doesn’t say the minimal soot over decades is enough to tip the barrier, especially assumes rocket motors by the gov still leads to pollution

#### Space exploration solves extinction and endless resource wars.

Collins 10 [Patrick Collins, professor of economics at Azabu University in Japan, and a Collaborating Researcher with the Institute for Space & Astronautical Science, as well as adviser to a number of companies, Adriano V. Autino is President of the Space Renaissance International; Manager, CEO/CTO, Systems Engineering Consultant / Trainer at Andromeda Systems Engineering LLC; and Supplier of methodological tools and consultancy at Intermarine S.p.A, Acta Astronautica, Volume 66, Issues 11–12, June–July 2010, “What the growth of a space tourism industry could contribute to employment, economic growth, environmental protection, education, culture and world peace”, Pages 1553–1562]

7. World peace and preservation of human civilisation

The major source of social friction, including international friction, has surely always been unequal access to resources. People fight to control the valuable resources on and under the land, and in and under the sea. The natural resources of Earth are limited in quantity, and economically accessible resources even more so. As the population grows, and demand grows for a higher material standard of living, industrial activity grows exponentially. The threat of resources becoming scarce has led to the concept of “Resource Wars”. Having begun long ago with wars to control the gold and diamonds of Africa and South America, and oil in the Middle East, the current phase is at centre stage of world events today [37]. A particular danger of “resource wars” is that, if the general public can be persuaded to support them, they may become impossible to stop as resources become increasingly scarce. Many commentators have noted the similarity of the language of US and UK government advocates of “war on terror” to the language of the novel “1984” which describes a dystopian future of endless, fraudulent war in which citizens are reduced to slaves.

7.1. Expansion into near-Earth space is the only alternative to endless “resource wars”

As an alternative to the “resource wars” already devastating many countries today, opening access to the unlimited resources of near-Earth space could clearly facilitate world peace and security. The US National Security Space Office, at the start of its report on the potential of space-based solar power (SSP) published in early 2007, stated: “Expanding human populations and declining natural resources are potential sources of local and strategic conflict in the 21st Century, and many see energy as the foremost threat to national security” [38]. The report ended by encouraging urgent research on the feasibility of SSP: “Considering the timescales that are involved, and the exponential growth of population and resource pressures within that same strategic period, it is imperative that this work for “drilling up” vs. drilling down for energy security begins immediately” [38].

Although the use of extra-terrestrial resources on a substantial scale may still be some decades away, it is important to recognise that simply acknowledging its feasibility using known technology is the surest way of ending the threat of resource wars. That is, if it is assumed that the resources available for human use are limited to those on Earth, then it can be argued that resource wars are inescapable [22] and [37]. If, by contrast, it is assumed that the resources of space are economically accessible, this not only eliminates the need for resource wars, it can also preserve the benefits of civilisation which are being eroded today by “resource war-mongers”, most notably the governments of the “Anglo-Saxon” countries and their “neo-con” advisers. It is also worth noting that the $1 trillion that these have already committed to wars in the Middle-East in the 21st century is orders of magnitude more than the public investment needed to aid companies sufficiently to start the commercial use of space resources.

Industrial and financial groups which profit from monopolistic control of terrestrial supplies of various natural resources, like those which profit from wars, have an economic interest in protecting their profitable situation. However, these groups’ continuing profits are justified neither by capitalism nor by democracy: they could be preserved only by maintaining the pretence that use of space resources is not feasible, and by preventing the development of low-cost space travel. Once the feasibility of low-cost space travel is understood, “resource wars” are clearly foolish as well as tragic. A visiting extra-terrestrial would be pityingly amused at the foolish antics of homo sapiens using long-range rockets to fight each other over dwindling terrestrial resources—rather than using the same rockets to travel in space and have the use of all the resources they need!

7.2. High return in safety from extra-terrestrial settlement

Investment in low-cost orbital access and other space infrastructure will facilitate the establishment of settlements on the Moon, Mars, asteroids and in man[/woman]-made space structures. In the first phase, development of new regulatory infrastructure in various Earth orbits, including property/usufruct rights, real estate, mortgage financing and insurance, traffic management, pilotage, policing and other services will enable the population living in Earth orbits to grow very large. Such activities aimed at making near-Earth space habitable are the logical extension of humans’ historical spread over the surface of the Earth. As trade spreads through near-Earth space, settlements are likely to follow, of which the inhabitants will add to the wealth of different cultures which humans have created in the many different environments in which they live.

Success of such extra-terrestrial settlements will have the additional benefit of reducing the danger of human extinction due to planet-wide or cosmic accidents [27]. These horrors include both man-made disasters such as nuclear war, plagues or growing pollution, and natural disasters such as super-volcanoes or asteroid impact. It is hard to think of any objective that is more important than preserving peace. Weapons developed in recent decades are so destructive, and have such horrific, long-term side-effects that their use should be discouraged as strongly as possible by the international community. Hence, reducing the incentive to use these weapons by rapidly developing the ability to use space-based resources on a large scale is surely equally important [11] and [16]. The achievement of this depends on low space travel costs which, at the present time, appear to be achievable only through the development of a vigorous space tourism industry.

#### Commercial space market is overheated—too many companies chasing low demand—crash coming

Foust 19 – PhD, senior aerospace analyst with the Futron Corporation in Bethesda, Maryland, he is the editor and publisher of The Space Review and has written for Astronomy Now and The New Atlantis

Jeff, 3/26. “How the space industry learned to stop worrying and love the bubble.” <https://spacenews.com/how-the-space-industry-learned-to-stop-worrying-and-love-the-bubble/>

Perhaps the strongest sign to date that the space industry is in some kind of bubble is the creation of Hypergiant Galactic Systems.

In early February, Hypergiant Industries, which describes itself as “the AI industrial complex for leading global enterprises and governments,” said it was creating this new division by acquiring a little-known startup, Satellite and Extraterrestrial Operations and Procedures, formed to commercialize a smallsat deployer called Slingshot that was being tested for the first time on the latest Cygnus cargo mission to the ISS.

So what will this company do? “Hypergiant Galactic Systems will focus on artificial intelligence-driven aerospace and astronautic software and hardware products for the booming space industry,” it said in a buzzword-laden press release.

Ben Lamm, chief executive of Hypergiant Industries, wasn’t much clearer in an email exchange. The goal, he said, is to create a “full-stack satellite intelligence offering” that builds, launches and operates satellites, and then analyzes the data to extract insights for customers. “If you just buy a satellite imaging company, you’re gated by what’s already up there and the data they’re collecting,” he said.

There are many satellite imaging companies, and others analyzing imagery. Will Hypergiant stand out from the pack in terms of the quality or quality of the data it collects, or how it analyzes it? “All of the above,” Lamm said.

“While there is much work happening in this field, we feel that there is a method that has the potential to deal with various issues associated with such work that would represent a fundamental leap in how data are collected, downlinked, stored, processed, distributed and transformed,” he explained. He didn’t elaborate on what that method is, or when the company would implement it, or at what cost.

At the very least, Hypergiant shows there’s no lack of enthusiasm about entering the industry, despite the growing number of companies in the field. However, it also suggests that the market may also be overheated, with too many companies chasing too few customers. But if the industry bubble is about to burst, many people in the industry aren’t too worried about it, yet.

Too many rockets

If there’s one part of the space industry that seems the most primed for a shakeout, it’s the small launch vehicle sector. So many ventures have announced plans to create rockets for dedicated launches of smallsats that it’s hard to keep track of just how many are in development. At events like the SmallSat Symposium in Silicon Valley in early February, it was common to hear estimates of 100 or more vehicles in work.

Carlos Niederstrasser of Northrop Grumman Innovation Systems has been keeping track of small launch vehicles programs for several years. As of January, he had identified 112 such vehicles worldwide in various phases of development. That figure, though, includes at least 10 that have since gone defunct and another 10 whose status is unknown. Many of the others are still little more than concepts.

The number of failed launch ventures will “start increasing significantly in the next two years,” he warned in a presentation at the annual meeting of the Transportation Research Board in Washington in January. “It has to. The market is simply not going to be able to support 112 of these companies moving forward.”

There’s widespread agreement in the industry that there is an oversupply of small launch vehicles. “I think we are wildly oversupplied with launch concepts and capabilities at this time, given any reasonable forecast for future demand,” said Carissa Christensen, chief executive of Bryce Space and Technology, at the SmallSat Symposium. “So, particularly on the small launcher side, we going to see some shakeouts there.”

“I think it is 100 percent a bubble in the launch sector right now,” said Sunil Nagaraj, founder and managing partner of Ubiquity Ventures, during a panel discussion at the Commercial Space Transportation Conference Feb. 12 in Washington. He previously worked at Bessemer Venture Partners, an investor in small launch vehicle company Rocket Lab.

Nagaraj thinks some investors didn’t do enough due diligence on the launch companies they’ve funded in terms of their capabilities. “Some of my brethren have pulled into this sector and invested without pulling back three or four levels into the technology,” he said.

Even companies in the small launch market expect their ranks to thin in the next few years. “All of us are looking to get into large-scale production,” said Tom Markusic, chief executive of Firefly Aerospace, at the SmallSat Symposium. “If someone gets out there first with the right-sized launcher, and are launching reliably, it’s going to be very difficult, I think, for new entrants to get in.”

“I love it when I read about armchair analysts who say there’s going to be a shakeout,” Courtney Stadd, head of Washington operations for Vector, said. “As any teenager would say, ‘Duh.’”

Bubble-bursting schedules

Small launch is not the only part of the space startup ecosystem poised for a winnowing. Emmanuel Sauzay, director of commercial space at Airbus Defence and Space, noted at the SmallSat Symposium that there are many companies planning smallsat constellations to provide Internet of Things (IoT) services.

“There are a lot of ventures in the world right now doing IoT from space and how they differentiate themselves is not easy,” he said.

Other sectors, though, may take longer to shake out. Broadband megaconstellations have attracted a lot of attention, but as companies like OneWeb start to launch their satellites, it’s too soon to predict success or failure for that company or any other entrant in that field.

“I think we’ll get more clarity on business direction” in the next year, Christensen said. “I don’t think we’re going to see any of those companies fully drop out. I think we’ll see them move forward, more or less.”

“We can imagine there will be one, two or a maximum of three companies that are sustainable in the long term,” Sauzay said of megaconstellations. “The key moment is when we see there is a market for them. I think 2019 will be too early.”

Nagaraj said his belief that the small launch sector was currently in a bubble didn’t apply to other parts of the space economy yet. “Enabling infrastructure like ground station networks and small satellite constellations are in their prime right now,” he said. “Now the trick is finding business plans that don’t depend on raising $20 million before you get to see if it works.”

Adam Keith, an affiliated principal adviser with Euroconsult, expects the key period for companies in the Earth observation field to be 2020 through 2022 as new systems and new capabilities enter service.

“We’re a little bit fearful around that whole period,” he said at SmallSat Symposium. “If we don’t start to see results by that point that could be an issue from an investment standpoint.”

What, me worry?

Investors, for now, don’t have an issue with emerging space companies as they continue to pour money into them. Space Angels estimated that there was $2.97 billion in equity investment in space startups in 2018, while Seraphim Capital, using slightly different criteria, estimated $3.25 billion in such investment in 2018. Both represented significant increases over 2017.

“I think that momentum is only going to build,” Mark Boggett, chief executive of Seraphim Capital, said during a SmallSat Symposium panel discussion. “There are a whole range of activities going on this year, 2019, in space that is going to maintain that momentum in the market. I think the outlook looks positive.”

Another panel at the conference, featuring investors from early stage venture capital to debt markets, were unanimous that investment would grow in 2019 even if there were signs of an industry shakeout. “It is my expectation that there will be a continued trend toward more investments at higher valuations,” particularly into “breakaway” companies in various market sectors, said Shahin Farshchi, a partner at Lux Capital.

At least one investor there, though, was sounding the alarm. “I think there is going to be a massive crash in [quarter] 3 or 4 later this year,” said Tess Hatch, an investor at Bessemer. She said she was encouraging companies to raise money in the first half of the year “because next year it will be a lot more difficult to raise capital.”

Those problems, she said, were not linked to issues with the space industry itself but macroeconomic ones, such as a potential recession. She expects any venture-backed company, not just space startups, to find it hard to raise money.

Other investors are not as concerned about a lack of capital. “We believe that, in another 12 to 18 months, the capital will be there. It’s not going anywhere,” said Mike Collett, managing partner of Promus Ventures, which has invested in several space companies. “Great companies will get funded always.”

Collett said that venture capitalists are extending their investment timelines, buying more time for startups to provide a return. “The public markets are not operating like they used to,” he explained, with fewer options for startups to go public. “Private companies will be around much longer now.”

In space, some like Nagaraj worry that an impending shakeout in the small launch vehicle sector could leave investors, lured by advanced technologies but without a sustainable business, feeling disillusioned. “I don’t want a desert where VCs dip their toes in, get burned and then leave for another 10 years again,” he said.

#### Warming doesn’t cause extinction

Bojanowski 14

Axel Bojanowski, staff writer, Citing the IPCC and Ragnar Kinzelbach, a zoologist at the University of Rostock, Der Spiegel, March 26, 2014, “UN Backtracks: Will Global Warming Really Trigger Mass Extinctions?”, http://www.spiegel.de/international/world/new-un-climate-report-casts-doubt-on-earlier-extinction-predictions-a-960569.html#

Humans have shrunk the habitats of many life forms, through unsustainable agriculture, fishing or hunting. And it is going to get even worse. Global warming is said to be threatening thousands of animal and plant species with extinction. That, at least, is what the Intergovernmental Panel on Climate Change (IPCC) has been predicting for years.

But the UN climate body now says it is no longer so certain. The second part of the IPCC's new assessment report is due to be presented next Monday in Yokohama, Japan. On the one hand, a classified draft of the report notes that a further "increased extinction risk for a substantial number of species during and beyond the 21st century" is to be expected. On the other hand, the IPCC admits that there is no evidence climate change has led to even a single species becoming extinct thus far.

'Crocodile Tears'

At most, the draft report says, climate change may have played a role in the disappearance of a few amphibians, fresh water fish and mollusks. Yet even the icons of catastrophic global warming, the polar bears, are doing surprisingly well. Their population has remained stable despite the shrinking of the Arctic ice cap.

Ragnar Kinzelbach, a zoologist at the University of Rostock, says essential data is missing for most other life forms, making it virtually impossible to forecast the potential effects of climate change. Given the myriad other human encroachments in the natural environment, Kinzelbach says, "crocodile tears over an animal kingdom threatened by climate change are less than convincing."

The draft report includes a surprising admission by the IPCC -- that it doubts its own computer simulations for species extinctions. "There is very little confidence that models currently predict extinction risk accurately," the report notes. Very low extinction rates despite considerable climate variability during past hundreds of thousands of years have led to concern that "forecasts for very high extinction rates due entirely to climate change may be overestimated."

In the last assessment report, Climate Change 2007, the IPCC predicted that 20 to 30 percent of all animal and plant species faced a high risk for extinction should average global temperatures rise by 2 to 3 degrees Celsius (3.6 to 5 degrees Fahrenheit). The current draft report says that scientific uncertainties have "become more apparent" since 2007.

It notes that key environmental processes and life form characteristics were given scant consideration in the models -- the ability of plants and animals to adapt to new climatic conditions, for example. Consequently, the new assessment report will not include any concrete figures regarding the percentage of species that could become extinct as a result of global warming.

#### **Their debris scenario is only about sateliteis – those aren’t rockets**

#### **Military space satellites have already been broken up by space debris – their escalation scenario is absurd**

Wall 21’ Home News Spaceflight Space collision: Chinese satellite got whacked by hunk of Russian rocket in March By Mike Wall published August 17, 2021 We may see more and more of these orbital smashups in the coming years. //RD Debatedrills

Yunhai 1-02's wounds are not self-inflicted. In March, the U.S. Space Force's 18th Space Control Squadron (18SPCS) reported the breakup of Yunhai 1-02, a Chinese military satellite that launched in September 2019. It was unclear at the time whether the spacecraft had suffered some sort of failure — an explosion in its propulsion system, perhaps — or if it had collided with something in orbit. We now know that the latter explanation is correct, thanks to some sleuthing by astrophysicist and satellite tracker Jonathan McDowell, who's based at the Harvard-Smithsonian Center for Astrophysics in Cambridge, Massachusetts. Sponsored Links Cupertino: Startup Is Changing the Way People Retire SmartAsset Related: The worst space debris events of all time Click here for more Space.com videos... CLOSE On Saturday (Aug. 14), McDowell spotted an update in the Space-Track.org catalog, which the 18SPCS makes available to registered users. The update included "a note for object 48078, 1996-051Q: 'Collided with satellite.' This is a new kind of comment entry — haven't seen such a comment for any other satellites before," McDowell tweeted on Saturday. He dove into the tracking data to learn more. McDowell found that Object 48078 is a small piece of space junk — likely a piece of debris between 4 inches and 20 inches wide (10 to 50 centimeters) — from the Zenit-2 rocket that launched Russia's Tselina-2 spy satellite in September 1996. Eight pieces of debris originating from that rocket have been tracked over the years, he said, but Object 48078 has just a single set of orbital data, which was collected in March of this year. "I conclude that they probably only spotted it in the data after it collided with something, and that's why there's only one set of orbital data. So the collision probably happened shortly after the epoch of the orbit. What did it hit?" McDowell wrote in another Saturday tweet. Yunhai 1-02, which broke up on March 18, was "the obvious candidate," he added — and the data showed that it was indeed the victim. Yunhai 1-02 and Object 48078 passed within 0.6 miles (1 kilometer) of each other — within the margin of error of the tracking system — at 3:41 a.m. EDT (0741 GMT) on March 18, "exactly when 18SPCS reports Yunhai broke up," McDowell wrote in another tweet. Thirty-seven debris objects spawned by the smashup have been detected to date, and there are likely others that remain untracked, he added. Despite the damage, Yunhai 1-02 apparently survived the violent encounter, which occurred at an altitude of 485 miles (780 kilometers). Amateur radio trackers have continued to detect signals from the satellite, McDowell said, though it's unclear if Yunhai 1-02 can still do the job it was built to perform (whatever that may be). Space Junk Clean Up: 7 Wild Ways to Destroy Orbital Debris Click here for more Space.com videos... McDowell described the incident as the first major confirmed orbital collision since February 2009, when the defunct Russian military spacecraft Kosmos-2251 slammed into Iridium 33, an operational communications satellite. That smashup generated a whopping 1,800 pieces of trackable debris by the following October. However, we may be entering an era of increasingly frequent space collisions — especially smashups like the Yunhai incident, in which a relatively small piece of debris wounds but doesn't kill a satellite. Humanity keeps launching more and more spacecraft, after all, at an ever-increasing pace. "Collisions are proportional to the square of the number of things in orbit," McDowell told Space.com. "That is to say, if you have 10 times as many satellites, you're going to get 100 times as many collisions. So, as the traffic density goes up, collisions are going to go from being a minor constituent of the space junk problem to being the major constituent. That's just math." We may reach that point in just a few years, he added. The nightmare scenario that satellite operators and exploration advocates want to avoid is the Kessler syndrome — a cascading series of collisions that could clutter Earth orbit with so much debris that our use of, and travel through, the final frontier is significantly hampered. RELATED STORIES — Who's going to fix the space junk problem? — Space junk removal is not going smoothly — The world needs space junk standards, G7 nations agree Our current space junk problem is not that severe, but the Yunhai event could be a warning sign of sorts. It's possible, McDowell said, that Object 48078 was knocked off the Zenit-2 rocket by a collision, so the March smashup may be part of a cascade. "That's all very worrying and is an additional reason why you want to remove these big objects from orbit,"

Don’t signify change