## 1AC - TOC v3

### 1AC---Plan

#### Plan: States should reduce appropriation of outer space by private entities that engage in anti-competitive business practices in accordance with the higher ethical principles of the outer space treaty.

Top of Form

#### Antitrust is uniquely compatible with the OST---the plan generates momentum for international harmonization.

Maria Lucas-Rhimbassen 21, Research Associate at the Chaire SIRIUS (Space Institute for Researches on Innovative Usages of Satellites) at the University of Toulouse, J.D. from Moncton University, Certificate in Strategic Space Law from McGill University, PhD Candidate in Space Law at the University of Toulouse, “An Introduction to Space Antitrust,” Open Lunar Foundation, 6/6/2021, https://www.openlunar.org/library/an-introduction-to-space-antitrust

Equality and Free Access

Secondly, it could be argued that the principle of “equality” and “free access” as enshrined within article I of the OST would seem to preclude monopolies insofar as equal access to celestial bodies must be maintained while, in theory, monopolization would potentially bar such equal access:

(...) Outer space, including the moon and other celestial bodies, shall be free for exploration and use by all States without discrimination of any kind, on a basis of equality and in accordance with international law, and there shall be free access to all areas of celestial bodies (...) (42). (emphasis added)

The main concern raised by the above-cited paragraph is to determine to what extent the article I applies to space resources on the celestial bodies in question. Since celestial bodies are not defined, as previously stated, and since there is no mention of space “resources” within the OST, national law or doctrine can be used to answer the question. The only national legislations mentioning space resources are the ones in favor of the commercialization, as listed supra (43). Secondary sources, or doctrine, reflect divergent views expressed by scholars at the international level (44). This situation illustrates how national law is filling the legal void previously referred to. Nevertheless, which void does it precisely try to fill? The term “appropriation” appears in article II of the OST, alongside with the term “celestial body” which, in article I appears next to “free access”, “equality” and “benefit”. By association, it can be inferred that the States in favor of space commerce do not object to the idea of the extension of these principles to space resources. In this case, as space resources regulation seems to emanate from the national level, national antitrust measures constitute, (at the first stage) an adequate legal response, in parallel, to contain and monitor the risk of monopolization or other anti-competitive behavior in space (an international level field). Such measures could indeed be included within current and future national space legislation and enforce fair competition based on the OST principles. This could in turn generate enough momentum and critical mass to trigger an international framework and intensify harmonization efforts (at the second stage), especially with regards to the commercialization of the space sector.

#### Exemptions collapse Rule of the Road – those are necessary to a thriving space industry.

Larsen 18, Paul B. "Minimum International Norms for Managing Space Traffic, Space Debris, and Near Earth Object Impacts." J. Air L. & Com. 83 (2018): 739. (taught air and space law for more than 40 years respectively at Southern Methodist University and at Georgetown University. He is co-author of Lyall and Larsen, Space Law a Treatise (2ne edition Routledge 2017) and of Larsen, Sweeney and Gillick, Aviation Law.)//Miller

D. NON-GOVERNMENTAL ORGANIZATIONS AS MODELS FOR MINIMUM SPACE NORMS Space industry operators are concerned that national and international government-established operating norms may be too restrictive and may kill off the inventive start-up space business initiatives now appearing in the marketplace. No one state or non-governmental entity can appropriate or assert sovereignty over outer space. The Outer Space Treaty Article IX requires states to pay due regard to the corresponding activities of other states.218 But that requirement does not give one state regulatory authority over the business authorities of other states. Article IX merely requires appropriate international consultations.219 Individual space businesses need room to experiment.220 At the same time, they are concerned about the intense competition and the need for some basic safety and traffic rules. Another complication is that the competing space businesses are of different nationalities, and the space businesses authorized by one state may receive inadequate protection from their authorizing state against competing businesses authorized by another state. The nations have to coordinate in order to establish order and basic operating rules for non-sovereign outer space by voluntary agreement. Several operators have sought to join together in associations for their own protection and coordination. A good example is the Space Data Association, in which large space operators like Intelsat, SES, and Euelsat have joined with large manufacturers such as Airbus, and even some space agencies like NASA and the German DLR, to pool information about traffic in outer space.221 They have formed subcommittees on urgent issues such as safety, procedural developments, and interference with radio frequencies.222 However, the large number of small satellite operators have tended to form their own association representing New Space. It is recognized that industry standardsetting organizations, such as the International Standardization Organization (ISO),223 and the new space standardization organization, CONFERS,224 have important roles for setting product standards for the space industry. However, the norms needed for management of space traffic, space debris, and NEOs require minimum government coordination among the states to establish international uniformity. Several industry observers call for some kind of international policing of outer space.225 The private associations can only depend on the goodwill of their competitors in obeying and complying with association rules. Private associations have no inherent police powers for enforcement other than legal action for breach of contract.226 Enforcement of contracts may depend on national laws and on national courts that may favor domestic business over foreign business. Furthermore, associations may be restricted by national antitrust and anti-monopoly laws. Conflicting with the idea of operators working in unison for their common good is the proposition that space operators are basically in business for individual profit. Thus, an individual business may not be willing to sacrifice its profit motives for the sake of public safety. That becomes the nub of the question of whether to leave safety in outer space to be resolved by the non governmental entities: each of the operators will always be motivated by self-interest. A neutral policing authority would therefore be more acceptable to direct traffic than competing business operators. Importantly, the individual national governmental authorities do not have exclusive policing authority in outer space. The only effective solution is to establish international minimum operating norms for space debris generation, space traffic, and planetary defense. It appears that, for space business to succeed, international norms with adequate input from business operators will be the best solution for these urgent public safety problems for space business to succeed. Standards and norms are commercial necessities. They enable businesses to satisfy a larger market demand for their products and services. Some technical standards and norms can be established by the commercial interests without government involvement, but others require minimum governmental regulation and oversight. Space traffic norms will benefit business enterprises, but they require international coordination and policing to assure uniformity. Reduction and elimination of space debris is another activity that requires international coordination combined with national enforcement. Planetary defense against threatening NEOs is yet another area beyond the ability of commercial enterprises to control. These three space activities requiring minimum government safety norms will help businesses prosper and allow space exploration to continue.

#### The Plan’s grounding in OST principles harmonizes space governance and broader applications of noble anti-trust.

**Rhimbassen 22** [Maria Rhimbassen, Research Fellow with Open Lunar & PhD Candidate in Space Law at the University of Toulouse and CNES, 2-8-2022, accessed on 4-22-2022, Openlunar, "From Toxic to Noble Competition: Implementing A New Perspective of Antitrust in Outer Space based on Ethics and Beyond - Open Lunar Foundation" <https://www.openlunar.org/library/from-toxic-to-noble-competition>] Adam

National legislation can also be approached with amendments proposals in terms of licensing requirements. State aid should hence comply with such new requirements. Prior to this, to come up with a clearly defined set of ethical standards, the creation of an interdisciplinary working group composed of a variety of stakeholders, such as the Hague International Space Resources Governance Working Group (HISRGWG) [76] is strongly recommended. There needs to be consensus on determining the exact ethical principles to be selected, the correlating parameters to be relied upon and the key performance indicators (KPI) necessary for appropriate assessments. This is reminiscent of the Massachusetts Institute of Technology (MIT)’s recent Space Sustainability Rating (SSR) [77], which measures sustainability compliance to assess resulting eligibility for incentives. The product of this kind of cross-sectoral working groups represent a high potential of productivity as in the case of the HISRGWG which crystallized into recommendations that are: adopted by the now growing Artemis Accords (e.g., with regards to the “safety zones”). These recommendations are used both as a foundational start and as a pillar of academic debatable material, for instance, by the Outer Space Institute (OSI)’s Vancouver Recommendations [78], in terms of what “benefit sharing” should entail [79]. They are also cited at the UNCOPUOS for future international guidelines, recommendations and groundwork for the new working group on the governance of space resources [80], and they inspire international non-governmental organizations such as the Moon Village Association (MVA)’s Global Expert Group on Sustainable Lunar Activities (GEGSLA) (81).

These overarching realizations are expected to lay the foundations for a substantial harmonization in terms of standardizing a new competitive dynamic. The proposed working group, which could be tentatively called “Space Antitrust Group of Experts” (SAGE) must involve antitrust experts, space lawyers, ethicists, and so forth to find the perfect common ground where antitrust and space can best prevail. Designing a roadmap with these elements in mind is already underway, following a special session at the International Astronautical Congress (IAC), held in Dubai, in October 2021, where a multidisciplinary group consisting of over a dozen academic leaders and representatives from the public sector met, on a personal capacity, and helped to design, together with the audience, a roadmap to identify clashes between the emerging transnational space commercial law and international space law in its current state, and to anticipate contention points before formulating recommendations 5 . This is only the start for a long-term initiative to further develop the foundational pillars of this new discipline (e.g., noble space antitrust). The resulting network of interdisciplinary nexuses is a most valuable asset for ensuring the perennial protection of space ethics that are enshrined within the OST while bearing in mind the growing role of the private sector. Finally, a group similar to SAGE should also include actors from the private sector, at the strategic level, because antitrust is part of competitive intelligence and not to be contained at a mere technical level. On the contrary, it can be the central pivot to a company’s business model, and therefore this kind of feedback is critical for successful implementation.

### 1AC---Adv---Space Law

#### International space law isn’t equipped for the privatization of space BUT US-led space antitrust checks its erosion AND allows for international harmonization

Maria Lucas-Rhimbassen 21, Research Associate at the Chaire SIRIUS (Space Institute for Researches on Innovative Usages of Satellites) at the University of Toulouse, J.D. from Moncton University, Certificate in Strategic Space Law from McGill University, PhD Candidate in Space Law at the University of Toulouse; Dr. Lucien Rapp, Affiliate Professor at the HEC Paris School of Law, Head of the SIRIUS at the University of Toulouse, “New Space Property Age: At the Crossroads of Space Commons, Commodities and Competition,” August 2021, Journal of Property, Planning, and Environmental Law, Vol. 13, p. 100-101

11. Discussion

Traditionally, international space law, as opposed to national space law, is not equipped to deal directly with the private sector. However, antitrust has the tools to do so. The broader range of space antitrust might help delve further down into the elusive and transnational commercial law, which is likely to accelerate in the near future and multiply interest around the commodification of the space market. As suggested throughout this paper, space concentration, leading to monopolies, is a likely outcome of the further development of space commerce. To mitigate the risks of monopolization, collusive and of other anti-competitive behavior, especially when considering the particular nature of space resources, to be exchanged on the emerging space-based market – including the complex and specialized services attendant thereto – special ethical and legal safeguards must be put in place to incentivize competition while containing the risks of fragmentation mentioned previously.

This is important to enable a healthy expansion of the ecosystem. Our emphasis on the market forces at play is rooted in the assumption that through the observation of the current trends of commercialization and of the growing number of non-traditional actors (either public or private) stemming from old and from new space-faring nations, it is easier to anticipate risk and to provide supporting regulatory proposals.

Our suggested approach toward an adaptive and polycentric governance model attempts to resolve some of these challenges, by allowing for a bottom-up framework that fosters commercialization, to surface organically, from the players, with minimal outside intervention. Our goal is to prevent the risk of privatization and commercialization that might gradually erode the ethical principles of international space law. To use the analogy of the carrot and the stick in striking a balance between regulatory intervention and free initiative, we prefer the carrot approach. Incentivizing the private sector to compete around ethically balanced markets has the potential to unlock new and unforeseen forces of antitrust in space to channel the fragmentation of forces in a sustainable manner while ensuring the respect of the conventional set of ethical principles to which many corporations already subscribe to in the context of their corporate compliance programs. Here we would an additional layer of space law higher ethical principles (such as enumerated supra) and investigate into further incentivizing soft law implementations. These higher principles are rooted in system interconnectivity and complexity, and have direct consequences on life, planetary protection, environmental aspects, intergenerational equity, etc. In approaching these issues through the angle of antitrust, we argue that antitrust is bound to evolve and to adapt, both in Space and on Earth. Furthermore, a broad space antitrust scope might also benefit from polycentric governance when concrete self-determination claims would manifest, such as Elon Musk’s self-governing principles on Mars. Any future space colonies (or settlements) would either rely on their own resources or would depend on the import and the export of resources, and therefore, on resource commodification. It then follows that having an ethical space antitrust regime well in place appears as a foreseeable necessity. An ethical space antitrust should also consider non-market factors such as the potential new rights granted to specific resources and regulate accordingly (e.g. the equivalent in space of legal rights to natural resources, etc.). Without such an ethical regime framework harnessing uncoordinated competitive forces, one possible outcome would be the dystopia described by Andy Weir’ Artemis economy on the Moon based on “soft landing grams” credits directly applied to one’s consumption of oxygen. A bleak perspective. Finally, antitrust is an adequate response to space property and resources, as property law is, at its basis, domestic law and so is competition law. They can evolve in parallel in the space sector and merge into an international framework, adapted to the international space law forum. There is no internationally harmonized antitrust framework as of this writing, except non-binding UN guidelines. Perhaps, a “space antitrust” would help bridge that gap and contribute to reducing growing issues such as “forum shopping,” fragmentation and “conflict of laws.”

12. Limitations and further research

While this paper is at the exploratory level, further research is necessary in determining the scope of antitrust in space, property and commodities and how ethics can play a role specifically, at the implementation level. Case studies should be conducted with a clear methodology. Moreover, the research must include other financial aspects such as spacebased assets and securities, notably the Space Assets Protocol of the UNIDROIT Cape Town Convention. Finally, more work must be done in terms of international/transnational recommendations for antitrust, as there is no internationally harmonized antitrust governance or regime and it remains heavily politicized – or not enough, depending on the school of thought (Teachout, 2020, p. 212).

13. Conclusion

This paper explored a roadmap into managing fragmentation triggered by the accelerated development of the outer space ecosystem and the rise in non-traditional space actors, be they public or private. International space law no longer suffices to cope with all the new actors, and therefore, transnational alternates are recommended. This paper recommends a transformed antitrust regime, adapted to space, based on the corpus juris spatialis ethics. This could help preventing the risk of space law erosion while privatization and commercialization of space are trending and potentially leading to the commodification of the space market and ecosystem, while space lawyers are still debating internationally as per the principle of non-appropriation and as per what a “space object” should consist of and what property rights could be applicable in space. An interdisciplinary approach could prove very helpful to address this problem. For instance, E. Ostrom’s work on classifying the goods into four categories from an economic standpoint might help space lawyers into classifying space goods once and for all and this could serve as a catalyst for polycentric space governance, governed inter alia, by competing forces. However, these competing forces should rather be seen as the dark matter in a space ecosystem, enabling sustainable synergies and interactions, with intergenerational equity in mind. This would be essential to avoid unregulated speculation based on space commodities, which could prove to be more detrimental in such an extreme environment as space. For instance, speculation benefits from climate change impact on crops and other commodities on Earth. We are all too familiar with the consequences. Imagine what space weather-based speculation could do in space. It could obliterate entire economies at once. One could argue that either space antitrust monitors the space commoditization closely, either space derivatives should be significantly regulated.

#### Space law erosion causes space wars.

Dr. Valentyn Halunko 19, Professor and President of the Research Institute of Public Law in Kyiv, Editor in Chief of the Scientific Law Journals “Advanced Space Law” and “Scientific Bulletin of Public and Private Law; Dr. Serhii Didenko, Associate Professor and Director of the Kherson Institute of

Interregional Academy of Personnel Management, “Private International Space Law. Philosophical and Legal Factors of Approval by the World Community,” 2019, Philosophy and Cosmology, Volume 22, p. 21-22

Consequences of the lack of legal rules of conduct for individuals in space

As the authors have shown above, public international law well regulates the exploration and use of outer space by States. However, more and more private companies and individuals are making real or virtual use of comic space and space bodies. So far, private companies are working closely with the relevant national structures. For example, SpaceX works closely with NASA. It works for profit, but according to public international and national space laws of the United States. Accordingly, while significant problems in this area do not arise. However, after the withdrawal of the orbit of the Earth by the SpaceX company of about 12000 satellites that will give away “free” Internet traffic of all comers, problems without doubt arises. First of all, it will be connected with the protection of intellectual property rights and counter-terrorism. The such States, such as China and Russia, will be categorically against all available Internet because they profess the theory and practice of the state-controlled Internet. In other words, the activities of a private company that will operate under soft (softlaw) space law will conflict with the national laws of sovereign States. Consequently, in the context of private companies and individuals, when using space, they enjoy soft law and act in accordance with a constitutional principle of English law: “Everything which is not forbidden is allowed”.

Even more, there is a violation of the principle of justice and sometimes common sense about the virtual use of cosmic bodies. For example, Dennis M. Hope, the formal owner of the Moon since 1980. In 2015, two private companies, Moonestates and Moonlife Ltd, merged and merged is bring together the community of over 6 million space enthusiasts that have purchased land on the Moon (https://www.moonestates.com/about-us/). MoonEstates.com, and Moonlife Ltd view the “legalities” of selling extraterrestrial property and are quite legally valid in the U.S.A. legislative field (<https://www.moonestates.com/about-us/space-law/>).

From our point of view, it is unacceptable that individuals and organizations that do not enjoy any legitimacy from society should (albeit virtually) use or dispose of space objects as their property. This is a direct road to the future confrontation for the natural resources of space. The worst consequence of which can be real space wars. Philosophy of War and Peace, as well as its influence on the formation of the foundations of national and planetary security strategies, are considered in the study Philosophy of War and Peace: in Search of New European Security Strategy [Bazaluk & Svyrydenko, 2017]. Private international space law, adopted by the international community through the legalization in the UN, has the right to regulate the activities of individuals about comic objects. Consequently, the lack of legal rules of conduct for individuals in space leads to two main types of incidents:

1. Not the settlement of the right of private ownership of space bodies, will not lead to the fair capture of space bodies by persons who do not have the right to do so, and the redistribution of such objects will objectively lead to space wars.

2. Not controlled by the right of private companies to use the near-earth space will lead to a threat to the life and health of the inhabitants of the Earth, negative environmental consequences and legal conflicts, both interstate and private.

#### They go nuclear---AND erode nuclear deterrence.

Dr. Robert Farley 22, Assistant Professor of Security and Diplomacy at the Patterson School at the University of Kentucky, Ph.D. in Political Science from the University of Washington, B.A. from the University of Oregon, “Does A Space War Mean A Nuclear War?,” 1945, 1/9/2022, https://www.19fortyfive.com/2022/01/does-a-space-war-mean-a-nuclear-war/

The recent Russian anti-satellite test didn’t tell the world anything new, but it did reaffirm the peril posed by warfare in space. Debris from explosions could make some earth orbits remarkably risky to use for both civilian and military purposes. But the test also highlighted a less visible danger; attacks on nuclear command and control satellites could rapidly produce an extremely dangerous escalatory situation in a war between nuclear powers. James Acton and Thomas Macdonald drew attention to this problem in a recent article at Inside Defense. As Acton and MacDonald point out, nuclear command and control satellites are the connective tissue of nuclear deterrence, assuring countries that they’re not being attacked and that they’ll be able to respond quickly if they are.

For a long time, these strategic early-warning satellites were akin to a center of gravity in ICBM warfare. Nuclear deterrence requires awareness that an attack is underway. Attacks on the monitoring system could easily be read as an attempt to blind an opponent in preparation for general war, and could themselves incur nuclear retaliation. Thus, the nuclear command and control satellites are critical to the maintenance of nuclear deterrence. They make it possible to distribute an order from the chief of government to the nuclear delivery systems themselves. Consequently, their destruction might lead to hesitation or delay in performing a nuclear launch order.

It was only later that the relevance of satellites for conventional warfare became clear. Satellites could reconnoiter enemy positions and, more importantly, provide communications for friendly forces. Indeed, the expansion of the role of satellites in conventional warfare has complicated the prospect of space warfare. States have a clear reason for targeting enemy satellites which support conventional warfare, as those satellites enable the most lethal part of the kill chain, the communications and recon networks that link targets with shooters. Thus, we now have a situation in which space military assets have both nuclear and conventional roles. In a conflict confusion and misperception could rapidly become lethal. If one combatant views an attack against nuclear command and control as a prelude to a general nuclear attack, it might choose to pre-empt.

Nuclear powers have dealt with problems in this general category for a good long while; would a conventional attack against tactical nuclear staging areas represent an escalation, for example? Would the use of ballistic missiles that can carry either conventional or nuclear weapons trigger a nuclear response? Do attacks against air defense networks that have both strategic and tactical responsibilities run the risk of triggering a nuclear response? There’s also the danger that damage to communications networks designated for conventional combat could force traffic onto the nuclear control systems, further confusing the issue.

No one has ever fought a nuclear war, and no two nuclear powers have engaged in a prolonged, high-intensity conventional conflict. Now that conventional systems have become implicated in space technologies for reconnaissance, targeting, and communications, leaders will have to make very difficult, very careful decisions on what enemy capabilities they want to disrupt. Acton and MacDonald propose a straightforward ban on attacks against nuclear satellite infrastructure, which would also require agreement to keep nuclear and conventional communications networks separate. This is the little ask; countries should plan to fight more carefully. The big ask is for a multilateral ban to prevent future anti-satellite weapons tests in space. This would reduce the danger that debris could close off, temporarily or permanently, human access to certain locations in earth orbit. But given that countries use satellites for the conduct of conventional military operations, it’s a lot to ask for warfighters to consider critical military infrastructure off-limits in any particular conflict.

#### Private appropriation results in arbitrary valuation of businesses in the space industry and monopolization, which decks innovation and causes armed conflict. Sterns and Tennen 03

P.M. Sterns, L.I. Tennen, Privateering and profiteering on the moon and other celestial bodies: Debunking the myth of property rights in space, Advances in Space Research, Volume 31, Issue 11, 2003, Pages 2433-2440, ISSN 0273-1177, https://doi.org/10.1016/S0273-1177(03)00567-2. (https://www.sciencedirect.com/science/article/pii/S0273117703005672)

If claims of private appropriation are ineffective, in contravention of the corpus juris spatialis, and contrary to the long term interests of space commercialization, than it must be asked what is the benefit of making such claims? There are two economic aspects which would be positively impacted by private appropriation of celestial bodies: the first is the increase in the net worth of the privateering company, artificially inflated by the optimistic valuation of the claimed space assets; and second is the pursuit of profit by the trade in “subsidiary rights” such as leasehold interests, mining rights, easements, and other traditionally alienable property rights. Neither of these economic considerations is directly related to the use of celestial resources, nor to the providing of a product or service uniquely available in the celestial environment. If the intent of the entrepreneur is to capitalize on these economic considerations, that intent should be clearly stated at the outset. Any other course would be disingenuous and deceptive. The private ownership of unlimited rights to celestial property would add a significant element to the cost of conducting an entrepreneurial venture. That is, the ability of all states to explore and utilize areas on or below the surface of celestial bodies, as guaranteed by the corpus juris spatialis, no longer would be a right, but a commodity available only to the highest bidder. Monopolies and other anti-competitive practices would restrict rather than enhance space commercialization. These anti-competitive effects of private appropriation arc exemplified by the activities of the Lunar Embassy itself: The cost for a piece of the moon has gone up astronomically. Before 200 1, Hope sold 17,700-acre tracts for $16, the price he now charges for one acre (The Arizona Republic, section D, p. 2). Thus, even while operating in a vacuum, the price structure of the Lunar Embassy has not been stable, but has been arbitrarily manipulated. One can only imagine the proliferation of anti-competitive practices if private appropriation were officially permitted. CONCLUSION The assertion that private entities are not subject to the non-appropriation principle, as expressed in article II of the Outer Space Treaty, is a myth, and lacks a cogent analytical foundation. Not only would so called private appropriation be in violation of the corpus juris spatialis, but the arguments which have been presented in opposition to article II lack either a legal justification, a factual predicate, or both. Moreover, the abrogation or renunciation of the non-appropriation principle would be antithetical to the interests of space commercialization. Conflicting, competing and overlapping claims would create international tensions, and potentially lead to armed conflict, both on and off this planet. The extant law of outer space, both international and domestic, provide a basic framework for the development of regulation of space commerce. Domestic licensing regimes, together with international commitments regarding authorization and supervision of private entities in space, prevention of harmful interference, and participation in consultations concerning potentially harmful interference, grant a significant measure of protection for private ventures in space. Claims of fee simple ownership of space property are unnecessary and ineffective to protect private interests from interference. Those who advocate the renunciation and abandonment of the non-appropriation principle are either seeking to increase their own bottom line by disingenuous and deceptive constructs, or lack an appropriate appreciation and respect for international processes. Perhaps most significant in this regard is the tangible benefit the corpus juris spatialis has made in maintaining outer space exclusively for peaceful purposes.

#### Antitrust harmonization prevents extinction from resource depletion, human rights abuse, and war

Geoffrey A. Manne 13, Lecturer in Law at Lewis & Clark Law School, Executive Director of the International Center for Law & Economics, JD from the University of Chicago Law School, Former Olin Fellow at the University of Virginia School of Law, and Dr. Seth Weinberger, PhD and MA in Political Science from Duke University, MA in National Security Studies from Georgetown University, AB from the University of Chicago, Associate Professor in the Department of Politics and Government at the University of Puget Sound, “International Signals: The Political Dimension of International Competition Law”, The Antitrust Bulletin, Volume 57, Number 3, Last Revised 7/18/2013, p. 497-503

A. The international political environment

At the root of international political theory is the fundamental maxim that relations between sovereign nations in the absence of mitigating factors is characterized by intense competition, mutual distrust, the inability to make credible commitments, and war.20

[FOOTNOTE] 20 Political scientists characterize the international system as “anarchic.” In the absence of world government (or other mitigating force), competition between states is largely unregulated by external laws or enforcement. The world is characterized by mistrust, the inability to contract, and the ultimate reliance on a state’s own devices. See THOMAS HOBBES, LEVIATHAN 80 (Edwin Curley ed., 1994) (in the state of nature “the condition of man . . . is a condition of war of everyone against everyone”). In fuller terms:

There is no authoritative allocator of resources: we cannot talk about a ‘world society’ making decisions about economic outcomes. No consistent and enforceable set of comprehensive rules exists. If actors are to improve their welfare through coordinating their policies, they must do so through bargaining rather than by invoking central direction. In world politics, uncertainty is rife, making agreements is difficult, and no secure barriers prevent military and security questions from impinging on economic affairs.

ROBERT O. KEOHANE, AFTER HEGEMONY: COOPERATION AND DISCORD IN THE WORLD POLITICAL ECONOMY 18 (1984). Efficiency-enhancing gains from trade are difficult to appropriate because trade itself (and any other form of exchange or agreement between nations) is characterized by the absence of credible commitments to future behavior. And underlying the problem is the ever-present threat of the use of force. See, e.g., Kenneth N. Waltz, Anarchic Orders and Balances of Power, in NEOREALISM AND ITS CRITICS 98, 98 (Robert O. Keohane ed. 1986) (“The state among states . . . conducts its affairs in the brooding shadow of violence . . . . Among states, the state of nature is a state of war.”). Although this dire characterization of the international environment is, of course, a stylized approximation of the real world—there are always overlying constraints on sovereign behavior in the form of norms, reputational effects, and customary international law, HEDLEY BULL, THE ANARCHICAL SOCIETY: A STUDY OF ORDER IN WORLD POLITICS (1977)—it is a useful and widely accepted heuristic for crafting a theory of international politics. [END FOOTNOTE]

As one commentator notes, “Nations dwell in perpetual anarchy, for no central authority imposes limits on the pursuit of sovereign interests.”21 And states are “unitary actors who, at a minimum, seek their own preservation and, at a maximum, drive for universal domination.”22 As a result, states operating on the international stage are unable to judge the sincerity of each others’ stated intentions when those intentions are contrary to this manifest interest. Because of self-help rules, states are forced in the main to assess their own security environment by assessing the capabilities of competitors, downplaying their motives. Given that the nature of the competition can implicate the fundamental survival of one (or more) of the actors, actions taken by one state to improve its own security must necessarily decrease the security of its competitor; in the absence of mitigation, security is a zero-sum game.23 In a world where cooperation is exceedingly difficult (because there is no authority to enforce agreements, nor any basis for assessing the reliability of another state’s commitments), international relations are characterized by a continuous race to the bottom, a mindless arms race rather than the opportunity to realize gains from cooperation.

It is obvious that not all relations between states are characterized by the security dilemma, however. Canada, for example, shares an unprotected border with the most powerful nation in the world without degenerating into a destructive and costly arms race. By some mechanism, then, Canada must be able reliably to judge U.S. intentions, even absent the apparent ability by the United States credibly to bind itself to a nonaggressive policy toward Canada. The key to mitigating the pressures of the security dilemma is the ability to distinguish a state with aggressive and expansionist tendencies from a benign one.24 States can be distinguished by their fundamental type. They can be classified as “revisionist,” that is, they seek to subvert the dominant order, or they can be classified as “status quo,” that is, they seek to support it.25 But, as noted, a state’s ability to judge another’s intentions (as opposed simply to counting its armaments) is extremely tenuous and comes at great cost. In fact, political science offers few well-understood mechanisms for judging a state’s propensity for aggression.

At the same time, hegemonic states have an abiding interest in spreading and maintaining their dominant worldview.26 Not only is it imperative that dominant states receive credible signals about other states’ intentions, but it is also important that dominant states attempt to inculcate their norms within other states that, over time, might mount credible challenges to the dominant states’ security.27 The spread of hegemony through internalization of norms occurs for three reasons. First, states with similar institutions and sympathetic domestic norms are simply better and more reliable trading partners, and it is in the hegemon’s economic interest to instill its norms.28 Second, states with defensive military postures and that adhere to the status quo present significantly less security risk to dominant states.29 And finally, the hegemon has a normative interest in the spread of its culture, its worldview, and its norms.30 This conception of the playing field upon which states interact leads to the conclusion that, entirely apart from the immediate and substantial economic benefits to a state from well-ordered interactions with other states, hegemonic states also have a national security and a normative interest in the information to be gleaned from the fact that these interactions are, in fact, well ordered.

In the absence of centralized enforcement, privately held and nonverifiable information as to a state’s fundamental type is the critical problem in assessing motives.31

[FOOTNOTE] 31 See KEOHANE, supra note 20, at 31 (“Order in world politics is typically created by a single dominant power [or hegemon].”). States are consequently classified as one of two types, “revisionist” or “status quo,” based on their acceptance and adherence to the political norms, institutions, and rules created by the hegemon. Status quo states are those that try to improve their condition from within the framework of the accepted world order. Revisionist states, by contrast, seek to gain position both by working outside that order and by working to subvert the hegemonic order itself. For instance, the existing world order is generally accepted to be that created by the United States after World War II. It comprises a liberal international economic order, the use of multilateral institutions (such as the United Nations and the WTO), negotiation for dispute resolution rather than the threat of violence, and the promotion of liberal democratic moral norms. See, e.g., Schweller, supra note 24, at 85; HANS J. MORGENTHAU, POLITICS AMONG NATIONS: THE STRUGGLE FOR POWER AND PEACE 32 (1948). Trade disputes between status quo states (like tariff disputes between the United States and Europe) are resolved through peaceful negotiation rather than the threat of war. Although status quo states do not entirely eschew the use of violence, they typically seek international authorization and legitimization before employing military force, as in the multilateral operations in Iraq, Kosovo, and Afghanistan. Revisionist states, on the other hand, such as North Korea, Iran, and China, will more readily use military force as a bargaining tool and are more reluctant fully to participate in transparent military, economic, and political negotiations. [END FOOTNOTE]

States wishing to escape the pressures of the security dilemma and engage in cooperative behavior need a means of conveying their preferences to others in a credible manner. There are, in general, two means by which such information can be transmitted: states can either bind themselves in such a way that they are unable to deviate from a stated behavior (known as “hands tying” in Schelling),32 or they can signal their intention to engage in a specified course of action by incurring costs sufficiently large that they discourage the misrepresentation of preference.33

International institutions can play a crucial role in facilitating the transmission of this information.34 In particular, international agreements over the terms of trade, even without binding supranational enforcement authority, provide a means for states to bind themselves to a desirable course of behavior in the short run and, more importantly, to signal their acquiescence to the ruling world order in the long run. Because compliance with treaty obligations often requires signatories to alter their domestic laws to reflect the terms of the treaty, the costs of compliance can be substantial. In the short run, to the extent that states enforce their domestic laws they can bind themselves to a certain course of behavior. In the long run, a state’s willingness to incur the substantial costs of changing its laws, both the transaction costs inherent in changing domestic laws and the even more substantial costs in domestic political capital, signals a willingness to engage other states on the terms set by the reigning international power. Moreover, there may be unintended effects, as changes in domestic laws result in a new set of domestic incentives to which actors respond, and new windows of opportunity may open up through which policy entrepreneurs can push for the internalization of new norms.35 Competition laws in particular are susceptible to this mode of analysis.

Most nations have adopted competition laws as a way to actualize (as well as to symbolize) a degree of commitment to the competitive process and to the prevention of abusive business practices . . . . The introduction of competition laws and policies has also gone hand in hand with economic deregulation, regulatory reform, and the end of command and control economies.36

The surest way to remove the threat of war, increase wealth, conserve resources, and protect human rights is through fundamental agreement between all states (or at least effective agreement between verifiably status quo states) under a normative umbrella that promotes all of those values. This normative convergence can be effected through the stepwise internalization of the sorts of economic and democratic values inherent in international economic liberalization, perhaps most notably through the adoption of principled international antitrust standards.37

#### Rules of the road check Russian and Chinese ASATs--- cause Taiwan war, AND deck cred among allies.

Dr. Brian G. Chow 20, Independent Policy Analyst, Spent 25 years as a Senior Physical Scientist Specializing in Space and National Security, Ph.D in Physics from Case Western University, MBA and Ph.D in Finance from the University of Michigan, “Space Traffic Management in the New Space Age,” Strategic Studies Quarterly, Winter 2020, p. 76-78

* Modified for ableist language

The Necessity for Space Traffic Management

In 2018, the Long Term Sustainability (LTS) Working Group of the Committee on the Peaceful Uses of Outer Space (COPUOS) tried to establish voluntary “measures for the safe conduct of proximity space operations.”15 Russia blocked adding these RPO measures to the 21 guidelines developed by the working group over the prior eight years.16 Finally, in June 2019, Russia endorsed the 21 guidelines, but RPO rules were not included. While these guidelines will help avoid accidental collisions of functional satellites with space debris, they will not prevent satellites from being deliberately threatened or disabled by robotic spacecraft.

Even if Russia and China agreed to reconsider RPO measures, there is another problem. COPUOS has long focused only on guidelines for commercial safety, not military security. Taking advantage of this tradition, Russia and China could steer RPO guidelines toward helping commercial operators avoid accidental collisions but leaving the option of using proximity operations to threaten critical US military satellites. This threat could be a powerful instrument for executing their asymmetric strategies to counterbalance the more superior US military capabilities in space. For example, in its 2019 document China Military Power, the US Defense Intelligence Agency states, “PLA [People’s Liberation Army] writings emphasize the necessity of ‘destroying, damaging, and interfering with the enemy’s reconnaissance . . . and communications satellites,’ suggesting that such systems, as well as navigation and early warning satellites, could be among the targets of attacks designed to ‘~~blind and deafen~~ [disorient] the enemy.’ ”17

Such an attack would be most damaging if it is the fateful opening of a war in space or on Earth. China could pre-position and maintain multiple dual-use robotic spacecraft arbitrarily close to our critical satellites. Even more worrying is that this threat will grow. Sometime in the latter half of the 2020s, China will have the capability to pre-position dozens of cheap RPO small satellites (smallsats18) close to dozens of our satellites, such as the Global Positioning System (GPS). Although these spacecraft are slow-moving, they will be able to legally pre-position during peacetime and get unreasonably close. After “legitimately” setting up this threatening posture, China would have an advantage in a crisis, such as one involving Taiwan. If the US intervenes, China could disable critical satellites so quickly that we would not have enough time to defend them. The disabling could severely degrade US war-fighting capabilities. Furthermore, knowing an intervention could fail, the US might decide not to intervene in the first place and would risk its credibility among allies.19 The US could prevent such a threat scenario and outcome by creating and enforcing a more comprehensive STM regime that provides timely warning and prevention.

Already, “rumors have been circulating for years that the Chinese Communist Party (CCP) has developed small satellites with robotic arms that could be used as anti-satellite weapons.” The rumors indicate that “some of the smaller satellites are lighter than 22 pounds, yet have a triple-eye sensor to gauge the shapes of targets and can adjust their speed and rotation, allowing them to grab objects within a distance of six inches, using a single robotic arm.”20 Considering their significant research and development in RPOs and smallsats,21 China as well as Russia can likely deploy a few attackers in the first half of the 2020s and then, in the second half of the decade, dozens of inexpensive smallsats capable of RPOs to mount a simultaneous proximity attack. These proximity ASATs would have a cost ratio (e.g., millions each for ASATs versus hundreds of millions each for a victim’s satellites) highly favorable to the attacker. It would be even more favorable to the attacker if one includes the high cost to the victim of losing the services provided until its satellite capability is fully replaced. Constellations of even dozens of satellites could still be vulnerable. For example, the 32 GPS III satellites, which will replace the current GPS by 2025, cost about half a billion dollars each.22 Dozens of cheap, robotic ASATs could defeat most of these 32 satellites, degrading or eliminating a critical service needed in peacetime and wartime.

#### Chinese ASAT attacks go nuclear.

Lee Billings 15, Editor at Scientific American covering space and physics, Citing Michael Krepon, an arms-control expert and co-founder of the Stimson Center, and James Clapper, Director of National Intelligence, The Scientific American, August 10, 2015, “War in Space May Be Closer Than Ever”, http://www.scientificamerican.com/article/war-in-space-may-be-closer-than-ever/

The world’s most worrisome military flashpoint is arguably not in the Strait of Taiwan, the Korean Peninsula, Iran, Israel, Kashmir or Ukraine. In fact, it cannot be located on any map of Earth, even though it is very easy to find. To see it, just look up into a clear sky, to the no-man’s-land of Earth orbit, where a conflict is unfolding that is an arms race in all but name.

The emptiness of outer space might be the last place you’d expect militaries to vie over contested territory, except that outer space isn’t so empty anymore. About 1,300 active satellites wreathe the globe in a crowded nest of orbits, providing worldwide communications, GPS navigation, weather forecasting and planetary surveillance. For militaries that rely on some of those satellites for modern warfare, space has become the ultimate high ground, with the U.S. as the undisputed king of the hill. Now, as China and Russia aggressively seek to challenge U.S. superiority in space with ambitious military space programs of their own, the power struggle risks sparking a conflict that could ~~cripple~~ [destroy] the entire planet’s space-based infrastructure. And though it might begin in space, such a conflict could easily ignite full-blown war on Earth.

The long-simmering tensions are now approaching a boiling point due to several events, including recent and ongoing tests of possible anti-satellite weapons by China and Russia, as well as last month’s failure of tension-easing talks at the United Nations.

Testifying before Congress earlier this year, Director of National Intelligence James Clapper echoed the concerns held by many senior government officials about the growing threat to U.S. satellites, saying that China and Russia are both “developing capabilities to deny access in a conflict,” such as those that might erupt over China’s military activities in the South China Sea or Russia’s in Ukraine. China in particular, Clapper said, has demonstrated “the need to interfere with, damage and destroy” U.S. satellites, referring to a series of Chinese anti-satellite missile tests that began in 2007.

There are many ways to disable or destroy satellites beyond provocatively blowing them up with missiles. A spacecraft could simply approach a satellite and spray paint over its optics, or manually snap off its communications antennas, or destabilize its orbit. Lasers can be used to temporarily disable or permanently damage a satellite’s components, particularly its delicate sensors, and radio or microwaves can jam or hijack transmissions to or from ground controllers.

In response to these possible threats, the Obama administration has budgeted at least $5 billion to be spent over the next five years to enhance both the defensive and offensive capabilities of the U.S. military space program. The U.S. is also attempting to tackle the problem through diplomacy, although with minimal success; in late July at the United Nations, long-awaited discussions stalled on a European Union-drafted code of conduct for spacefaring nations due to opposition from Russia, China and several other countries including Brazil, India, South Africa and Iran. The failure has placed diplomatic solutions for the growing threat in limbo, likely leading to years of further debate within the UN’s General Assembly.

“The bottom line is the United States does not want conflict in outer space,” says Frank Rose, assistant secretary of state for arms control, verification and compliance, who has led American diplomatic efforts to prevent a space arms race. The U.S., he says, is willing to work with Russia and China to keep space secure. “But let me make it very clear: we will defend our space assets if attacked.”

Offensive space weapons tested

The prospect of war in space is not new. Fearing Soviet nuclear weapons launched from orbit, the U.S. began testing anti-satellite weaponry in the late 1950s. It even tested nuclear bombs in space before orbital weapons of mass destruction were banned through the United Nations’ Outer Space Treaty of 1967. After the ban, space-based surveillance became a crucial component of the Cold War, with satellites serving as one part of elaborate early-warning systems on alert for the deployment or launch of ground-based nuclear weapons. Throughout most of the Cold War, the U.S.S.R. developed and tested “space mines,” self-detonating spacecraft that could seek and destroy U.S. spy satellites by peppering them with shrapnel. In the 1980s, the militarization of space peaked with the Reagan administration’s multibillion-dollar Strategic Defense Initiative, dubbed Star Wars, to develop orbital countermeasures against Soviet intercontinental ballistic missiles. And in 1985, the U.S. Air Force staged a clear demonstration of its formidable capabilities, when an F-15 fighter jet launched a missile that took out a failing U.S. satellite in low-Earth orbit.

Through it all, no full-blown arms race or direct conflicts erupted. According to Michael Krepon, an arms-control expert and co-founder of the Stimson Center think tank in Washington, D.C., that was because both the U.S. and U.S.S.R. realized how vulnerable their satellites were—particularly the ones in “geosynchronous” orbits of about 35,000 kilometers or more. Such satellites effectively hover over one spot on the planet, making them sitting ducks. But because any hostile action against those satellites could easily escalate to a full nuclear exchange on Earth, both superpowers backed down. “Neither one of us signed a treaty about this,” Krepon says. “We just independently came to the conclusion that our security would be worse off if we went after those satellites, because if one of us did it, then the other guy would, too.”

Today, the situation is much more complicated. Low- and high-Earth orbits have become hotbeds of scientific and commercial activity, filled with hundreds upon hundreds of satellites from about 60 different nations. Despite their largely peaceful purposes, each and every satellite is at risk, in part because not all members of the growing club of military space powers are willing to play by the same rules—and they don’t have to, because the rules remain as yet unwritten.

Space junk is the greatest threat. Satellites race through space at very high velocities, so the quickest, dirtiest way to kill one is to simply launch something into space to get in its way. Even the impact of an object as small and low-tech as a marble can disable or entirely destroy a billion-dollar satellite. And if a nation uses such a “kinetic” method to destroy an adversary’s satellite, it can easily create even more dangerous debris, potentially cascading into a chain reaction that transforms Earth orbit into a demolition derby.

In 2007 the risks from debris skyrocketed when China launched a missile that destroyed one of its own weather satellites in low-Earth orbit. That test generated a swarm of long-lived shrapnel that constitutes nearly one-sixth of all the radar-trackable debris in orbit. The U.S. responded in kind in 2008, repurposing a ship-launched anti-ballistic missile to shoot down a malfunctioning U.S. military satellite shortly before it tumbled into the atmosphere. That test produced dangerous junk too, though in smaller amounts, and the debris was shorter-lived because it was generated at a much lower altitude.

More recently, China has launched what many experts say are additional tests of ground-based anti-satellite kinetic weapons. None of these subsequent launches have destroyed satellites, but Krepon and other experts say this is because the Chinese are now merely testing to miss, rather than to hit, with the same hostile capability as an end result. The latest test occurred on July 23 of last year. Chinese officials insist the tests’ only purpose is peaceful missile defense and scientific experimentation. But one test in May 2013 sent a missile soaring as high as 30,000 kilometers above Earth, approaching the safe haven of strategic geosynchronous satellites.

#### Taiwan conflict causes global nuke war.

Joseph Gerson 21, Executive Director of the Campaign for Peace, Disarmament and Common Security and Vice-President of the International Peace Bureau, “Taiwan: The Most Dangerous Flashpoint in the U.S.-China Cold War”, Mass Peace Action, 7/19/2021, https://masspeaceaction.org/taiwan-the-most-dangerous-flashpoint-in-the-u-s-chinese-cold-war/

Preventing accidents or miscalculations (political as well as military) that could trigger armed conflict and escalate to nuclear war must now become an urgent priority. Taiwan is the most dangerous flashpoint for great power and potentially nuclear war, followed by the South China/West Philippine and Baltic Seas. With the contradictory forces of popular Chinese backing for Taiwan’s reunification and growing support for Taiwanese national independence, as well as the inevitable tensions between rising and decline powers, a nervous sailor who pulls a trigger or a Taiwanese political leader who makes a reckless statement could ignite a nuclear World War.

#### Universalizing principles under the OST creates rules of the road for sustainable space activities.

Rhimbassen 21, Maria, and Lucien Rapp. "Competitive space foresight: Incentivizing compliance through antitrust." Acta Astronautica 189 (2021): 235-240. (serves as a Research Associate at the Chaire SIRIUS and is also a PhD Candidate in space law since 2016)//Miller

The purpose of this paper is to address STM through an unconventional but pragmatic angle to help optimize efficient compliance governance. This paper proposes using antitrust mechanisms in space as a pragmatic and utilitarian tool for sustainable purposes with regards to STM within a soaring space ecosystem. In the context of accelerated space commercialization and privatization, having a new space antitrust framework at the helm of such transition might indeed prove to be a flexible yet decisive tool into shaping the future of STM and ensuring perennial protection of higher space principles which are enshrined in the Outer Space Treaty and form the essence of space law. On one hand, examples of antitrust key components include fair competition while, on the other hand, higher ethical principles of space law include non-discrimination and benefits sharing. Furthermore, in between these two extremes, security and commerce both rely, respectively on non-harmful interference and competitiveness. To navigate through all these factors, a new space antitrust framework might indeed prove strategic and beneficial to incentivizing the creation of an adaptive, polycentric and action-oriented governance mechanism with great resonance among the commercial new space players and reaffirm the importance of sustainable space traffic management before return on investment, while still making a profit in the long run. Previous article in issue Next article in issue Keywords STM Antitrust Compliance Governance Security 1. Introduction While higher ethical principles such as non-discrimination, equal access, and benefit sharing are enshrined within the magna carta (the Outer Space Treaty (OST) of 1967) [1], of the corpus juris spatialis, it becomes a challenge to ensure the perennialism of such principles given the recent acceleration of commercialization and privatization of the outer space sector. Given this transitional trend, it is important to delve into new regulatory methods to deal with the private actors contributing to the thriving new space economy and to regulate accordingly. Arguably, global outer space governance is lacking, and space law is facing fragmentation. Consequently, space traffic management (STM), including space situational awareness (SSA), faces the risk of a battle of standards of sorts. In the meantime, the Kessler effect [2] urges action since time is ticking. In that regard, it is relevant to look for regulatory alternatives and find a pragmatic and efficient approach for STM governance, since STM implies both a technical and a regulatory aspect. In this paper, we propose that such an alternative approach might be found in antitrust -- or competition law, especially given its power to intervene in the commercial sector. We also address some of the key arguments in favor or against our proposal and make some recommendations as to how antitrust might provide answers to the STM conversation. 2. Context STM is becoming a top priority in the space sector as, so far, there are no “rules of the road” on orbit. The lack of regulation and inherent legal void leaves room for either navigating through loopholes or setting customary practices, especially by the private sector seeking to protect commercial interests, regardless of ethics, public policy or international law. This might trigger a battle of standards in the realm of STM, which would rather be unacceptable as there is no place for more than one code of conduct about “rules of the road” and interoperability in that regard is essential. A battle of technical standards, downstream, might be caused, inter alia, by a battle of suppliers and services, upstream. Most strikingly, such upstream battle might be exacerbated by the fact that STM services, including SSA, are engulfed by the digital sector, including artificial intelligence (AI), algorithms (algos), big data, cloud infrastructure, and intellectual property (IP). Since cloud providers are part of the GAFAM world [3] which appeared relatively recently in antitrust hearings [4], and since IP plays a determining role in antitrust, we formulate the hypothesis that antitrust is a relevant regulatory option, when there is no global consensus in either space law or in STM standards, and when harmonization efforts need to be set in motion. 3. The decade-long problem As mentioned above, there is no global space governance in STM as of this writing. According to a recent report by the Institute for Defense Analysis (IDA), there is a danger that no international STM regime will be agreed upon within the next decade: “Issues related to lack of trust and transparency pose challenges to efforts to develop more binding and formal institutions for STM. For these and other reasons, unless some “wildcards” (an example being a significant collision event in space) come into play, or unless significant political will is exerted, there is likely to be no international agreement on an international STM regime in the next decade” [5]. At the fast pace with which the space exploration is soaring and given the growing number in both space faring nations and private actors, ten years is a long time and, therefore, it increases the risks of fragmentation despite the urgency to act (e.g., Kessler effect). As far as fragmentation concerns the private actors, a recent report by the Chatham House confirms that: “The rise in private space actors has increased the number of commercial STM providers and, with plans in the US to move responsibility for STM to civilian control, there will likely be more opportunities for international collaboration, particularly through the EU Space Surveillance and Tracking (SST) programme” [6]. In an ideal world, such collaborations would indeed solve the issue rapidly. However, the fragmentation does not stop there. International geopolitical differences cause further hurdles, as stated in the same report: “There are worldwide challenges, both political and technical, to providing STM coverage, which may lead to a lack of collaboration and gaps in understanding of activities in orbit. Existing sensors have limitations in terms of the size of objects that can be detected and the precision with which their movements can be predicted. These capability gaps represent opportunities for the EU to contribute.” These fragmentation issues might slow down the progress of collaborative efforts such as the recent UN Long Term Sustainability (LTS) guidelines [7], which lays down the foundations of behavioral sustainability in outer space. 4. The imminent need While the digital sphere of influence is skyrocketing and while regulation struggles to keep up, it is important to monitor and contain the high-tech industry which is growing out of control and if, “too big to fail”, it might overlap with the sectoral regulation of the aerospace sector. Traditionally, the outer space sector was a sanctuary for states and public actors, hence its reliance on international space law. However, due to the privatization and commercialization of the space sector, diversified non-governmental actors are growing both in size and importance. Moreover, some of these new entities are of a multinational nature. However, this multinationalism is in fact turning into an elusive transnationalism, which is more complex to deal with in legal terms. This adds to the fragmentation of international space law since it faces new challenges. For this reason, global space governance is at an impasse. Therefore, we propose the alternative of antitrust. Furthermore, as previously mentioned, the OST focuses on principles such as non-discrimination, benefit sharing, equality of access and opportunity. The International Telecommunications Union (ITU) Constitution protects fair competition of telecommunications services through “equitable distribution” [8]. Interestingly, antitrust provides protection to fair competition, more particularly, fair economic competition. The economic term here responds to the newly privatized space sector and market. Antitrust defines what an economic activity is and whether it prevents fair competition within that market. In our case, that would be space-based services, more precisely, space-based STM services. 5. Commercial aspects of STM As explained, STM is composed of both a technical and a regulatory side [9]. On the one hand, the technical aspect delves gradually more into the information age (AI, etc.) and IP plays a crucial role. On the other hand, on the regulatory part, we witness initiatives such as the recent US Space Policy Directive-3 (SPD-D) to transfer civilian and commercial STM from the Department of Defense (DOD) to a civilian governmental agency such as the Department of Commerce (DOC) [10]. If this goes on as planned, initially, it will open the possibility of further commercialization of STM and hence the growing role which will be played by the lex mercatoria. However, due to more recent policy and budget modifications, this particular scenario is on hold. Regardless, STM rules and potential related services include: Safety provisions for launches; specific regime for space between airspace and outer space; zoning (selection of orbits); right of way rules for in-orbit phases; prioritization with regard to maneuvers; security rules for human spaceflight; specific rules for GSO, LG Points, Polar Orbits; specific rules for LEO satellite constellations; debris mitigation regulations; safety rules for re-entry (i.e. descent corridors); environmental provisions (e.g. pollution of the atmosphere/troposphere); radiofrequency use and avoidance of interference, etc. [11]. These are important elements to be aware of with regards to the development of the sector and to potentially new services. As a reminder, here is a broad definition of STM, while keeping in mind that there is no single definition accepted worldwide: “… the set of technical and regulatory provisions for promoting safe access into outer space, operations in outer space and return from outer space to Earth free from physical or radiofrequency interference.” [12]. This definition once again brings us to competition, and most particularly ethical and fair competition. Firstly, let us emphasize the word “access”. While one of the OST's principles focuses on the need to protect equal access to space, anti-competitive behavior should consequently be precluded. Secondly, radiofrequency (RF) interference refers to non-harmful interference, as enshrined within the OST, but it also refers to the ITU constitutional provisions which include fair competition and non-discrimination. Therefore, both “access” and “RF interference” add up to our arguments in terms of adopting pro-competitive regulatory measures in outer space, notably in the STM sub-sector.

#### STM reverse causally solves Debris.

Larsen 18, Paul B. "Minimum International Norms for Managing Space Traffic, Space Debris, and Near Earth Object Impacts." J. Air L. & Com. 83 (2018): 739. (taught air and space law for more than 40 years respectively at Southern Methodist University and at Georgetown University. He is co-author of Lyall and Larsen, Space Law a Treatise (2ne edition Routledge 2017) and of Larsen, Sweeney and Gillick, Aviation Law.)//Miller

II. BENEFITS OF INTERNATIONAL NORMS A. PUBLIC SAFETY BENEFIT Commercial space operations are more vulnerable than military activities. They need regulatory protection from threatening elements, such as space debris from collision with other satellites. Moreover, uncertainties raised by NEOs threaten all commercial satellites, regardless of their nationality. As governments authorize more launches of commercial satellites, potential for damage to and interference with current space operations grows.36 These dangers are greatest for the United States, which has the most exposure in terms of space investment and technology.37 Loss of satellites from collisions can be financially ruinous. Operators need to know where other satellites and space debris are located in outer space. Operators need to have exclusive radio frequencies and orbital slots for safe navigation and control of their satellites. Space traffic management and rules of the road for outer space are now necessary for safe operations in outer space.38 Commercial operators do not have policing powers in outer space. Only states can establish and enforce STM under current rules. Only states can manage and provide exclusive radiofrequencies and orbital slots free of interferences. Only states can save operators from the growing dangers of collisions with space debris. However, states do not have exclusive sovereignty in outer space; therefore, they need to coordinate and cooperate with other states and to arrange for uniform international norms so that national regulations do not conflict with operators authorized by other nations. B. EFFICIENCY International norms are needed for efficient commercial operations in outer space. Coordinated international standards would be more efficient and less confusing than would one hundred different sets of norms set by individual national agencies. The ability to operate without interference from other operators and free from space debris will create better results for organiza tions doing business in space. States could organize efficient commercial environments in outer space by coordinating and cooperating with other states. Operators in regulated outer space would be free from having to negotiate terms with a variety of other commercial operators because there would already be an agreed-upon, worldwide standard. C. CONFLICT PREVENTION Article II of the Outer Space Treaty specifically outlaws claims of exclusive appropriation.39 Each state has an equal legal right to operate in outer space,40 so no state can be the exclusive user by excluding other states and their operators from also using celestial bodies. Nevertheless, conflicts and occasional assertions of exclusive use occur.41 Conflicts lead to delays and to possible loss of and damage to space objects. Only coordination and cooperation among states will result in establishing conflict-free environments in which operators can conduct profitable businesses. D. COMMERCIAL OPERATORS’ NEEDS FOR ORDER IN OUTER SPACE The current shift from military to commercial space enterprises has made the operators of the commercial endeavors apprehensive about heavy-handed governmental regulation.42 On the one hand, commercial space operators require “agile, transparent, and internationally coordinated rule-making to make it sustainable.”43 Too much regulation can kill the commercial revolution.44 On the other hand, the current launches and planned launches of thousands of commercial satellites threaten collisions among satellites and with space debris. Commercial operators have come to appreciate government regulation of space traffic and reduction of debris dangers.45 The collision danger led a 2018 study by the Aerospace Corporation to conclude that “[t]o facilitate the envisioned New Space activity and maintain a safe operating environment for everyone in space, the issues of establishing an effective next-step STM conjunction assessment system must be addressed as soon as possible.”46 The question is how to develop internationally-needed regulation without killing the many valuable start-up enterprises now fueling the commercial revolution. Again, the Chicago Convention shows the way. At the conference, there were active industry experts not only advising but also actually negotiating through working groups.47 Perhaps most valuable for the aviation industry was the participation and contributions of the then-general counsel for Pan-American Airlines, John Cobb Cooper.48 Through industry participation, the commercial enterprises were able to not only contribute but also guide the formation of the new Convention on International Civil Aviation. A similar infusion of active commercial guidance will be needed for a corresponding new regime establishing norms on space debris and STM, so that the many dangers that threaten commercial space operations can be avoided. E. WHERE TO BEGIN It is important to note that, while this discussion is about international space traffic norms, the actual implementation of international, uniform norms would be by the individual states. Negotiation of a separate treaty to establish international norms for space debris, space traffic, and NEO defense would very likely begin in the UN Committee on the Peaceful Use of Space (COPUOS) Legal Committee. It would be approved by the full committee then finalized by a diplomatic conference. Alternatively, the new regime could become a protocol to the Outer Space Treaty the same way the 2012 Berlin Space Protocol became a protocol to the Cape Town Convention.49 The result would be a protocol that would only become binding on parties to it. However, all the space-interested states would want to ratify as soon as possible in order to gain the advantages of the new safety norms. Consequently, traffic in outer space would become orderly, the debris problem would become less urgent, and the Kessler Syndrome prospect of foreclosure of access to outer space would disappear. III. THE SCOPE OF INTERNATIONAL TECHNICAL REGULATION OF CIVIL SPACE ACTIVITIES The following section will discuss establishment of international operating norms for STM, space debris, and NEOs. A. INTERNATIONAL NORMS FOR CIVIL STM50 Travel in outer space is highly dangerous. One danger is the tremendous speed at which space objects move.51 Available assistance is minimal, and collisions are likely to be catastrophic. There are currently no uniform norms for traffic in outer space.52 With increasing traffic and more obstacles to navigate around, indications are that travel in outer space may eventually become impossible unless uniform traffic norms are established.53 The advantage of international STM norms is that all navigable traffic would use the same uniform traffic rules. International STM is in constant need of updating. These norms would have to be administered, analyzed, and supplemented by knowledgeable experts as traffic conditions change. The result would be greater safety.54 Traffic in outer space is increasing drastically in the New Space age. There are currently more than 1,200 functional satellites in orbit.55 Estimates of satellites to be launched into orbit in the immediate future range up to 27,000 satellites.56 Most of the new launches are expected to be in low Earth orbit.57 The amount of space debris in orbit is also increasing rapidly. There is estimated to be close to 1 million debris objects in orbit, of which only approximately 23,000 are currently being tracked, although new tracking technology now being deployed will increase tracking capability four-fold.58 The point is that the totality of outer space traffic congestion is increasing rapidly. For new launches to be safely orbited, new international STM is urgently needed. Individual states supervise the traffic that they authorize,59 and while states may try to track the space objects60 launched by other states, current tracking technology still leaves some space objects untracked. For example, when the re sponsible state lacks the capability to track objects, it may simply warn space operators to avoid the general location of its existing, known space objects. Additionally, some objects are so small that they cannot be safely tracked.61

#### Debris cascades---nuke war.

Les Johnson 13, Deputy Manager for NASA's Advanced Concepts Office at the Marshall Space Flight Center, Co-Investigator for the JAXA T-Rex Space Tether Experiment and PI of NASA's ProSEDS Experiment, Master's Degree in Physics from Vanderbilt University, Popular Science Writer, and NASA Technologist, Frequent Contributor to the Journal of the British Interplanetary Sodety and Member of the American Institute of Aeronautics and Astronautics, National Space Society, the World Future Society, and MENSA, Sky Alert!: When Satellites Fail, p. 9-12 [language modified]

Whatever the initial cause, the result may be the same. A satellite destroyed in orbit will break apart into thousands of pieces, each traveling at over 8 km/sec. This virtual shotgun blast, with pellets traveling 20 times faster than a bullet, will quickly spread out, with each pellet now following its own orbit around the Earth. With over 300,000 other pieces of junk already there, the tipping point is crossed and a runaway series of collisions begins. A few orbits later, two of the new debris pieces strike other satellites, causing them to explode into thousands more pieces of debris. The rate of collisions increases, now with more spacecraft being destroyed. Called the "Kessler Effect", after the NASA scientist who first warned of its dangers, these debris objects, now numbering in the millions, cascade around the Earth, destroying every satellite in low Earth orbit. Without an atmosphere to slow them down, thus allowing debris pieces to bum up, most debris (perhaps numbering in the millions) will remain in space for hundreds or thousands of years. Any new satellite will be threatened by destruction as soon as it enters space, effectively rendering many Earth orbits unusable. But what about us on the ground? How will this affect us? Imagine a world that suddenly loses all of its space technology. If you are like most people, then you would probably have a few fleeting thoughts about the Apollo-era missions to the Moon, perhaps a vision of the Space Shuttle launching astronauts into space for a visit to the International Space Station (ISS), or you might fondly recall the "wow" images taken by the orbiting Hubble Space Telescope. In short, you would know that things important to science would be lost, but you would likely not assume that their loss would have any impact on your daily life. Now imagine a world that suddenly loses network and cable television, accurate weather forecasts, Global Positioning System (GPS) navigation, some cellular phone networks, on-time delivery of food and medical supplies via truck and train to stores and hospitals in virtually every community in America, as well as science useful in monitoring such things as climate change and agricultural sustainability. Add to this the [destruction] ~~crippling~~ of the US military who now depend upon spy satellites, space-based communications systems, and GPS to know where their troops and supplies are located at all times and anywhere in the world. The result is a nightmarish world, one step away from nuclear war, economic disaster, and potential mass starvation. This is the world in which we are now perilously close to living. Space satellites now touch our lives in many ways. And, unfortunately, these satellites are extremely vulnerable to risks arising from a half-century of carelessness regarding protecting the space environment around the Earth as well as from potential adversaries such as China, North Korea, and Iran. No government policy has put us at risk. It has not been the result of a conspiracy. No, we are dependent upon them simply because they offer capabilities that are simply unavailable any other way. Individuals, corporations, and governments found ways to use the unique environment of space to provide services, make money, and better defend the country. In fact, only a few space visionaries and futurists could have foreseen where the advent of rocketry and space technology would take us a mere 50 years since those first satellites orbited the Earth. It was the slow progression of capability followed by dependence that puts us at risk. The exploration and use of space began in 1957 with the launch of Sputnik 1 by the Soviet Union. The United States soon followed with Explorer 1. Since then, the nations of the world have launched over 8,000 spacecraft. Of these, several hundred are still providing information and services to the global economy and the world's governments. Over time, nations, corporations, and individuals have grown accustomed to the services these spacecraft provide and many are dependent upon them. Commercial aviation, shipping, emergency services, vehicle fleet tracking, financial transactions, and agriculture are areas of the economy that are increasingly reliant on space. Telestar 1, launched into space in the year of my birth, 1962, relayed the world's first live transatlantic news feed and showed that space satellites can be used to relay television signals, telephone calls, and data. The modern telecommunications age was born. We've come a long way since Telstar; most television networks now distribute most, if not ali, of their programming via satellite. Cable television signals are received by local providers from satellite relays before being sent to our homes and businesses using cables. With 65% of US households relying on cable television and a growing percentage using satellite dishes to receive signals from direct-to-home satellite television providers, a large number of people would be cut off from vital information in an emergency should these satellites be destroyed. And communications satellites relay more than television signals. They serve as hosts to corporate video conferences and convey business, banking, and other commercial information to and from all areas of the planet. The first successful weather satellite was TIROS. Launched in 1960, TIROS operated for only 78 days but it served as the precursor for today's much more long-lived weather satellites, which provide continuous monitoring of weather conditions around the world. Without them, providing accurate weather forecasts for virtually any place on the globe more than a day in advance would be nearly impossible. Figure !.1 shows a satellite image of Hurricane Ivan approaching the Alabama Gulf coast in 2004. Without this type of information, evacuation warnings would have to be given more generally, resulting in needless evacuations and lost economic activity (from areas that avoid landfall) and potentially increasing loss of life in areas that may be unexpectedly hit. The formerly top-secret Corona spy satellites began operation in 1959 and provided critical information about the Soviet Union's military and industrial capabilities to a nervous West in a time of unprecedented paranoia and nuclear risk. With these satellites, US military planners were able to understand and assess the real military threat posed by the Soviet Union. They used information provided by spy satellites to help avert potential military confrontations on numerous occasions. Conversely, the Soviet Union's spy satellites were able to observe the United States and its allies, with similar results. It is nearly impossible to move an army and hide it from multiple eyes in the sky. Satellite information is critical to all aspects of US intelligence and military planning. Spy satellites are used to monitor compliance with international arms treaties and to assess the military activities of countries such as China, Russia, Iran, and North Korea. Figure 1.2 shows the capability of modem unclassified space-based imaging. The capability of the classified systems is presumed to be significantly better, providing much more detail. Losing these satellites would place global militaries on high alert and have them operating, literally, in the blind. Our military would suddenly become vulnerable in other areas as well. GPS, a network of 24-32 satellites in medium-Earth orbit, was developed to provide precise position information to the military, and it is now in common use by individuals and industry. The network, which became fully operational in 1993, allows our armed forces to know their exact locations anywhere in the world. It is used to guide bombs to their targets with unprecedented accuracy, requiring that only one bomb be used to destroy a target that would have previously required perhaps hundreds of bombs to destroy in the pre-GPS world (which, incidentally, has resulted in us reducing our stockpile of non-GPS-guided munitions dramatically). It allows soldiers to navigate in the dark or in adverse weather or sandstorms. Without GPS, our military advantage over potential adversaries would be dramatically reduced or eliminated.

### 1AC---FW

#### The meta-ethic is phenomenalism – conscious experience is a structural pre-req to any form of knowledge, including moral knowledge.

Sayre-McCord 01 [Geoffrey Sayre-McCord, Philosophy, University of North Carolina, Chapel Hill, "Mill's “Proof” Of The Principle of Utility: A More Than Half-Hearted Defense", Social Philosophy and Policy, 2001, accessed: 1 April 2020, https://www.cambridge.org/core/journals/social-philosophy-and-policy/article/mills-proof-of-the-principle-of-utility-a-more-than-halfhearted-defense/FDBE07CBE08D4E17523930BF8C7BBC32, R.S.]

When it comes to visibility, no less than desirability, Mill explicitly denies that a "proof" in the "ordinary acceptation of the term" can be offered.25 As he notes, "To be incapable of proof by reasoning is com mon to all first principles; to the first premises of our knowledge, as well as to those of our conduct."26 Nonetheless, support -- that is, evidence, though not proof -- for the first premises of our **knowledge** is **provided by** "our **senses, and** our internal **consciousness.**" Mill's suggestion is that, when it comes to the first principles of conduct, desire play the same epistemic role that the senses play, when it comes to the first principles of knowledge.

To understand this role, it is important to distinguish the fact that someone is sensing something from what is sensed, which is a distinction mirrored in the contrast bet ween the fact that someone is desiring something and what is desired. In the case of our senses, the evidence we have for our judgments concerning sensible qualities traces back to what is sensed, to the content of our sense-experience. Likewise, Mill is suggesting, in the case of value, the evidence we have for our judgments concerning value traces back to what is desired, to the content of our desires. Ultimately, the grounds we have for holding the principles we do must, he thinks, be traced back to our experience, to our senses and desires. Yet the evidence we have is not that we are sensing or desiring something but what it is that is sensed or desired.

When we are having sensations of red, when what we are looking at appears red to us, we have evidence (albeit overrideable and defeasible evidence) that the thing is red. Moreover, if things never looked red to us, we could never get evidence that things were red, and would indeed never have developed the concept of redness. Similarly, when we are desiring things, when what we are considering appears good to us, we have evidence (albeit overrideable and defeasible evidence) that the thing is good. Moreover, **if we never desired** things, **we could never get evidence** that **things were good, and** would indeed **never have developed** the concept of **value.**

Recall that desire, for Mill, like taste, touch, sight, and smell, is a "passive sensibility." All of these, he holds, provide us with both the content that makes thought possible and the evidence we have for the conclusions that thought leads us to embrace. "Desiring a thing" and "thinking of it as desirable (unless for the sake of its consequences)" are treated by Mill as one an d the same, just as seeing a thing as red and thinking of it as red are one and the same. Accordingly, a person who desires x is a person who ipso facto sees x as desirable. Desiring something, for Mill, is a matter of seeing it under the guise of the good. This means that it is important, in the context of Mill's argument, that one not think of desires as mere preferences or as just any sort of motive. They constitute, according to Mill, a distinctive subclass of our motivational states, and are distinguished (at least in part) by t heir evaluative content. Thus, Mill is neither assuming nor arguing that something is good because we desire it; rather, he is depending on our desiring it as establishing that we see it as good.

At the same time, while desiring something is a matter of seeing it as good, one could, on Mill's view, believe that something is good without desiring it, just as one can believe something is red without seeing it as red. While desire is supposed to be the fundamental source of our concept of, and evidence for, desirability, once the concept is in place there are contexts in which we will have reason to think it applies even when the corresponding sensible experience is lacking. Indeed, in Chapter IV, Mill is concerned not with generating a desire, but with justifying the belief that happiness is desirable, and the only thing desirable, as an end, and so concerned with defending the standard for determining what should be desired.

Mill's aim is to take what people already, and he thinks inevitably, see as desirable and argue that those views commit them to the value of the general happiness (whet her or not their desires follow the deliverances of t heir reason). Those who, like Mill, desire the general happiness already hold the view that the general happiness is desirable. They accept the claim that Mill is trying to defend. As Mill knows, however, there are many who do not have this desire -- many who desire only their own happiness, and some who even desire that others suffer. These are the people he sets out to persuade, along with others who are more generous and benevolent, but who nonetheless do not see happiness as desirable, and the only thin g desirable, as an end. Mill's argument is directed at convincing t hem all -- whether their desires follow or not -- that they have grounds for, and are in fact already com mitted to, regarding the happiness of others as valuable as an end.

Mill recognizes that whatever argument he might hope to offer will need to appeal to evaluative claims people already accept (since he takes to heart Hume's caution concerning inferring an 'ought' from an 'is'). The claim Mill thinks he can appeal to -- that one's own happiness is a good (i.e. desirable) -- is something licensed as available by people desiring their own happiness. Yet he is not supposing here that the fact that they desire their own happiness, or anything else, is proof that it is desirable, just as he would not suppose that the fact that someone sees something as red is proof that it is. Rather, he is supposing that if people desire their own happiness, or see something as red, one can rely on t hem having available, as a premise for further argument, the claim that their own happiness is desirable or that the thing is red (at least absent contrary evidence). As he puts it in the third paragraph, "If the end which the utilitarian doctrine proposes to itself were not, in theory and in practice, acknowledged to be an end nothing could ever convince any person that it was so."

Thus, in appealing to the analogy bet ween judgments of sensible qualities and judgments of value, Mill is not trading on an ambiguity, nor does his argument here involve identifying being desirable with being desired or assuming that "desirable" means "desired." He is instead relying consistently on an empiricist account of concepts and their application -- on a view according to which we have the concepts, evidence, and knowledge we do only thanks to our having experiences of a certain sort. In the absence of the relevant experiences, he holds (with other empiricists), we would not only lack the required evidence for our judgments, we would lack the capacity to make the judgments in the first place. **In** the **presence of** the relevant **experience**s, though, **we have** both the concepts and the required **evidence** -- "not only all the proof which the case admits of, but all which it is possible to require."

#### Indifference – Even if there are apriori moral truths, I can choose to ignore them. Cognition is binding – if I put my hand on a hot stove, I can’t turn off my natural aversion to it.

#### The standard is maximizing expected wellbeing. Pleasure and pain define intrinsic physical value and disvalue – robust neuroscience.

Blum et al. 18 [Kenneth Blum, 1Department of Psychiatry, Boonshoft School of Medicine, Dayton VA Medical Center, Wright State University, Dayton, OH, USA 2Department of Psychiatry, McKnight Brain Institute, University of Florida College of Medicine, Gainesville, FL, USA 3Department of Psychiatry and Behavioral Sciences, Keck Medicine University of Southern California, Los Angeles, CA, USA 4Division of Applied Clinical Research & Education, Dominion Diagnostics, LLC, North Kingstown, RI, USA 5Department of Precision Medicine, Geneus Health LLC, San Antonio, TX, USA 6Department of Addiction Research & Therapy, Nupathways Inc., Innsbrook, MO, USA 7Department of Clinical Neurology, Path Foundation, New York, NY, USA 8Division of Neuroscience-Based Addiction Therapy, The Shores Treatment & Recovery Center, Port Saint Lucie, FL, USA 9Institute of Psychology, Eötvös Loránd University, Budapest, Hungary 10Division of Addiction Research, Dominion Diagnostics, LLC. North Kingston, RI, USA 11Victory Nutrition International, Lederach, PA., USA 12National Human Genome Center at Howard University, Washington, DC., USA, Marjorie Gondré-Lewis, 12National Human Genome Center at Howard University, Washington, DC., USA 13Departments of Anatomy and Psychiatry, Howard University College of Medicine, Washington, DC US, Bruce Steinberg, 4Division of Applied Clinical Research & Education, Dominion Diagnostics, LLC, North Kingstown, RI, USA, Igor Elman, 15Department Psychiatry, Cooper University School of Medicine, Camden, NJ, USA, David Baron, 3Department of Psychiatry and Behavioral Sciences, Keck Medicine University of Southern California, Los Angeles, CA, USA, Edward J Modestino, 14Department of Psychology, Curry College, Milton, MA, USA, Rajendra D Badgaiyan, 15Department Psychiatry, Cooper University School of Medicine, Camden, NJ, USA, Mark S Gold 16Department of Psychiatry, Washington University, St. Louis, MO, USA, “Our evolved unique pleasure circuit makes humans different from apes: Reconsideration of data derived from animal studies”, U.S. Department of Veterans Affairs, 28 February 2018, accessed: 19 August 2020, <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6446569/>, R.S.]

**Pleasure** is not only one of the three primary reward functions but it also **defines reward.** As homeostasis explains the functions of only a limited number of rewards, the principal reason why particular stimuli, objects, events, situations, and activities are rewarding may be due to pleasure. This applies first of all to sex and to the primary homeostatic rewards of food and liquid and extends to money, taste, beauty, social encounters and nonmaterial, internally set, and intrinsic rewards. Pleasure, as the primary effect of rewards, drives the prime reward functions of learning, approach behavior, and decision making and provides the **basis for hedonic theories** of reward function. We are attracted by most rewards and exert intense efforts to obtain them, just because they are enjoyable [10].

Pleasure is a passive reaction that derives from the experience or prediction of reward and may lead to a long-lasting state of happiness. The word happiness is difficult to define. In fact, just obtaining physical pleasure may not be enough. One key to happiness involves a network of good friends. However, it is not obvious how the higher forms of satisfaction and pleasure are related to an ice cream cone, or to your team winning a sporting event. Recent multidisciplinary research, using both humans and detailed invasive brain analysis of animals has discovered some critical ways that the brain processes pleasure [14].

Pleasure as a hallmark of reward is sufficient for defining a reward, but it may not be necessary. A reward may generate positive learning and approach behavior simply because it contains substances that are essential for body function. When we are hungry, we may eat bad and unpleasant meals. A monkey who receives hundreds of small drops of water every morning in the laboratory is unlikely to feel a rush of pleasure every time it gets the 0.1 ml. Nevertheless, with these precautions in mind, we may define any stimulus, object, event, activity, or situation that has the potential to produce pleasure as a reward. In the context of reward deficiency or for disorders of addiction, homeostasis pursues pharmacological treatments: drugs to treat drug addiction, obesity, and other compulsive behaviors. The theory of allostasis suggests broader approaches - such as re-expanding the range of possible pleasures and providing opportunities to expend effort in their pursuit. [15]. It is noteworthy, the first animal studies eliciting approach behavior by electrical brain stimulation interpreted their findings as a discovery of the brain’s pleasure centers [16] which were later partly associated with midbrain dopamine neurons [17–19] despite the notorious difficulties of identifying emotions in animals.

Evolutionary theories of pleasure: The love connection BO:D

Charles Darwin and other biological scientists that have examined the biological evolution and its basic principles found various mechanisms that steer behavior and biological development. Besides their theory on natural selection, it was particularly the sexual selection process that gained significance in the latter context over the last century, especially when it comes to the question of what makes us “what we are,” i.e., human. However, the capacity to sexually select and evolve is not at all a human accomplishment alone or a sign of our uniqueness; yet, we humans, as it seems, are ingenious in fooling ourselves and others–when we are in love or desperately search for it.

It is well established that modern biological theory conjectures that **organisms are** the **result of evolutionary competition.** In fact, Richard Dawkins stresses gene survival and propagation as the basic mechanism of life [20]. Only genes that lead to the fittest phenotype will make it. It is noteworthy that the phenotype is selected based on behavior that maximizes gene propagation. To do so, the phenotype must survive and generate offspring, and be better at it than its competitors. Thus, the ultimate, distal function of rewards is to increase evolutionary fitness by ensuring the survival of the organism and reproduction. It is agreed that learning, approach, economic decisions, and positive emotions are the proximal functions through which phenotypes obtain other necessary nutrients for survival, mating, and care for offspring.

Behavioral reward functions have evolved to help individuals to survive and propagate their genes. Apparently, people need to live well and long enough to reproduce. Most would agree that homo-sapiens do so by ingesting the substances that make their bodies function properly. For this reason, foods and drinks are rewards. Additional rewards, including those used for economic exchanges, ensure sufficient palatable food and drink supply. Mating and gene propagation is supported by powerful sexual attraction. Additional properties, like body form, augment the chance to mate and nourish and defend offspring and are therefore also rewards. Care for offspring until they can reproduce themselves helps gene propagation and is rewarding; otherwise, many believe mating is useless. According to David E Comings, as any small edge will ultimately result in evolutionary advantage [21], additional reward mechanisms like novelty seeking and exploration widen the spectrum of available rewards and thus enhance the chance for survival, reproduction, and ultimate gene propagation. These functions may help us to obtain the benefits of distant rewards that are determined by our own interests and not immediately available in the environment. Thus the distal reward function in gene propagation and evolutionary fitness defines the proximal reward functions that we see in everyday behavior. That is why foods, drinks, mates, and offspring are rewarding.

There have been theories linking pleasure as a required component of health benefits salutogenesis, (salugenesis). In essence, under these terms, pleasure is described as a state or feeling of happiness and satisfaction resulting from an experience that one enjoys. Regarding pleasure, it is a double-edged sword, on the one hand, it promotes positive feelings (like mindfulness) and even better cognition, possibly through the release of dopamine [22]. But on the other hand, pleasure simultaneously encourages addiction and other negative behaviors, i.e., motivational toxicity. It is a complex neurobiological phenomenon, relying on reward circuitry or limbic activity. It is important to realize that through the “Brain Reward Cascade” (BRC) endorphin and endogenous morphinergic mechanisms may play a role [23]. While natural rewards are essential for survival and appetitive motivation leading to beneficial biological behaviors like eating, sex, and reproduction, crucial social interactions seem to further facilitate the positive effects exerted by pleasurable experiences. Indeed, experimentation with addictive drugs is capable of directly acting on reward pathways and causing deterioration of these systems promoting hypodopaminergia [24]. Most would agree that pleasurable activities can stimulate personal growth and may help to induce healthy behavioral changes, including stress management [25]. The work of Esch and Stefano [26] concerning the link between compassion and love implicate the brain reward system, and pleasure induction suggests that social contact in general, i.e., love, attachment, and compassion, can be highly effective in stress reduction, survival, and overall health.

Understanding the role of neurotransmission and pleasurable states both positive and negative have been adequately studied over many decades [26–37], but comparative anatomical and neurobiological function between animals and homo sapiens appear to be required and seem to be in an infancy stage.

Finding happiness is different between apes and humans

As stated earlier in this expert opinion one key to happiness involves a network of good friends [38]. However, it is not entirely clear exactly how the higher forms of satisfaction and pleasure are related to a sugar rush, winning a sports event or even sky diving, all of which augment dopamine release at the reward brain site. Recent multidisciplinary research, using both humans and detailed invasive brain analysis of animals has discovered some critical ways that the brain processes pleasure.

Remarkably, there are pathways for ordinary liking and pleasure, which are limited in scope as described above in this commentary. However, there are **many brain regions**, often termed hot and cold spots, that significantly **modulate** (increase or decrease) our **pleasure or** even produce **the opposite** of pleasure— that is disgust and fear [39]. One specific region of the nucleus accumbens is organized like a computer keyboard, with particular stimulus triggers in rows— producing an increase and decrease of pleasure and disgust. Moreover, the cortex has unique roles in the cognitive evaluation of our feelings of pleasure [40]. Importantly, the interplay of these multiple triggers and the higher brain centers in the prefrontal cortex are very intricate and are just being uncovered.

Desire and reward centers

It is surprising that many different sources of pleasure activate the same circuits between the mesocorticolimbic regions (Figure 1). Reward and desire are two aspects pleasure induction and have a very widespread, large circuit. Some part of this circuit distinguishes between desire and dread. The so-called pleasure circuitry called “REWARD” involves a well-known dopamine pathway in the mesolimbic system that can influence both pleasure and motivation.

In simplest terms, the well-established mesolimbic system is a dopamine circuit for reward. It starts in the ventral tegmental area (VTA) of the midbrain and travels to the nucleus accumbens (Figure 2). It is the cornerstone target to all addictions. The VTA is encompassed with neurons using glutamate, GABA, and dopamine. The nucleus accumbens (NAc) is located within the ventral striatum and is divided into two sub-regions—the motor and limbic regions associated with its core and shell, respectively. The NAc has spiny neurons that receive dopamine from the VTA and glutamate (a dopamine driver) from the hippocampus, amygdala and medial prefrontal cortex. Subsequently, the NAc projects GABA signals to an area termed the ventral pallidum (VP). The region is a relay station in the limbic loop of the basal ganglia, critical for motivation, behavior, emotions and the “Feel Good” response. This defined system of the brain is involved in all addictions –substance, and non –substance related. In 1995, our laboratory coined the term “Reward Deficiency Syndrome” (RDS) to describe genetic and epigenetic induced hypodopaminergia in the “Brain Reward Cascade” that contribute to addiction and compulsive behaviors [3,6,41].

Furthermore, ordinary “liking” of something, or pure pleasure, is represented by small regions mainly in the limbic system (old reptilian part of the brain). These may be part of larger neural circuits. In Latin, hedus is the term for “sweet”; and in Greek, hodone is the term for “pleasure.” Thus, the word Hedonic is now referring to various subcomponents of pleasure: some associated with purely sensory and others with more complex emotions involving morals, aesthetics, and social interactions. The capacity to have pleasure is part of being healthy and may even extend life, especially if linked to optimism as a dopaminergic response [42].

Psychiatric illness often includes symptoms of an abnormal inability to experience pleasure, referred to as anhedonia. A negative feeling state is called dysphoria, which can consist of many emotions such as pain, depression, anxiety, fear, and disgust. Previously many scientists used animal research to uncover the complex mechanisms of pleasure, liking, motivation and even emotions like panic and fear, as discussed above [43]. However, as a significant amount of related research about the specific brain regions of pleasure/reward circuitry has been derived from invasive studies of animals, these cannot be directly compared with subjective states experienced by humans.

In an attempt to resolve the controversy regarding the causal contributions of mesolimbic dopamine systems to reward, we have previously evaluated the three-main competing explanatory categories: “liking,” “learning,” and “wanting” [3]. That is, dopamine may mediate (a) liking: the hedonic impact of reward, (b) learning: learned predictions about rewarding effects, or (c) wanting: the pursuit of rewards by attributing incentive salience to reward-related stimuli [44]. We have evaluated these hypotheses, especially as they relate to the RDS, and we find that the incentive salience or “wanting” hypothesis of dopaminergic functioning is supported by a majority of the scientific evidence. Various neuroimaging studies have shown that anticipated behaviors such as sex and gaming, delicious foods and drugs of abuse all affect brain regions associated with reward networks, and may not be unidirectional. Drugs of abuse enhance dopamine signaling which sensitizes mesolimbic brain mechanisms that apparently evolved explicitly to attribute incentive salience to various rewards [45].

Addictive substances are voluntarily self-administered, and they enhance (directly or indirectly) dopaminergic synaptic function in the NAc. This activation of the brain reward networks (producing the ecstatic “high” that users seek). Although these circuits were initially thought to encode a set point of hedonic tone, it is now being considered to be far more complicated in function, also encoding attention, reward expectancy, disconfirmation of reward expectancy, and incentive motivation [46]. The argument about addiction as a disease may be confused with a predisposition to substance and nonsubstance rewards relative to the extreme effect of drugs of abuse on brain neurochemistry. The former sets up an individual to be at high risk through both genetic polymorphisms in reward genes as well as harmful epigenetic insult. Some Psychologists, even with all the data, still infer that addiction is not a disease [47]. Elevated stress levels, together with polymorphisms (genetic variations) of various dopaminergic genes and the genes related to other neurotransmitters (and their genetic variants), and may have an additive effect on vulnerability to various addictions [48]. In this regard, Vanyukov, et al. [48] suggested based on review that whereas the gateway hypothesis does not specify mechanistic connections between “stages,” and does not extend to the risks for addictions the concept of common liability to addictions may be more parsimonious. The latter theory is grounded in genetic theory and supported by data identifying common sources of variation in the risk for specific addictions (e.g., RDS). This commonality has identifiable neurobiological substrate and plausible evolutionary explanations.

Over many years the controversy of dopamine involvement in especially “pleasure” has led to confusion concerning separating motivation from actual pleasure (wanting versus liking) [49]. We take the position that animal studies cannot provide real clinical information as described by self-reports in humans. As mentioned earlier and in the abstract, on November 23rd, 2017, evidence for our concerns was discovered [50]

In essence, although nonhuman primate brains are similar to our own, the disparity between other primates and those of human cognitive abilities tells us that surface similarity is not the whole story. Sousa et al. [50] small case found various differentially expressed genes, to associate with pleasure related systems. Furthermore, the dopaminergic interneurons located in the human neocortex were absent from the neocortex of nonhuman African apes. Such differences in neuronal transcriptional programs may underlie a variety of neurodevelopmental disorders.

In simpler terms, the system controls the production of dopamine, a chemical messenger that plays a significant role in pleasure and rewards. The senior author, Dr. Nenad Sestan from Yale, stated: “Humans have evolved a dopamine system that is different than the one in chimpanzees.” This may explain why the behavior of humans is so unique from that of non-human primates, even though our brains are so surprisingly similar, Sestan said: “It might also shed light on why people are vulnerable to mental disorders such as autism (possibly even addiction).” Remarkably, this research finding emerged from an extensive, multicenter collaboration to compare the brains across several species. These researchers examined 247 specimens of neural tissue from six humans, five chimpanzees, and five macaque monkeys. Moreover, these investigators analyzed which genes were turned on or off in 16 regions of the brain. While the differences among species were subtle, **there was** a **remarkable contrast in** the **neocortices**, specifically in an area of the brain that is much more developed in humans than in chimpanzees. In fact, these researchers found that a gene called tyrosine hydroxylase (TH) for the enzyme, responsible for the production of dopamine, was expressed in the neocortex of humans, but not chimpanzees. As discussed earlier, dopamine is best known for its essential role within the brain’s reward system; the very system that responds to everything from sex, to gambling, to food, and to addictive drugs. However, dopamine also assists in regulating emotional responses, memory, and movement. Notably, abnormal dopamine levels have been linked to disorders including Parkinson’s, schizophrenia and spectrum disorders such as autism and addiction or RDS.

Nora Volkow, the director of NIDA, pointed out that one alluring possibility is that the neurotransmitter dopamine plays a substantial role in humans’ ability to pursue various rewards that are perhaps months or even years away in the future. This same idea has been suggested by Dr. Robert Sapolsky, a professor of biology and neurology at Stanford University. Dr. Sapolsky cited evidence that dopamine levels rise dramatically in humans when we anticipate potential rewards that are uncertain and even far off in our futures, such as retirement or even the possible alterlife. This may explain what often motivates people to work for things that have no apparent short-term benefit [51]. In similar work, Volkow and Bale [52] proposed a model in which dopamine can favor NOW processes through phasic signaling in reward circuits or LATER processes through tonic signaling in control circuits. Specifically, they suggest that through its modulation of the orbitofrontal cortex, which processes salience attribution, dopamine also enables shilting from NOW to LATER, while its modulation of the insula, which processes interoceptive information, influences the probability of selecting NOW versus LATER actions based on an individual’s physiological state. This hypothesis further supports the concept that disruptions along these circuits contribute to diverse pathologies, including obesity and addiction or RDS.

#### Prefer:

#### 1] Actor spec—governments must use util because they don’t have intentions and are constantly dealing with tradeoffs—outweighs since different agents have different obligations—takes out calc indicts since they are empirically denied.

#### 2] No intent-foresight distinction for states.

Enoch 07 Enoch, D [The Faculty of Law, The Hebrew Unviersity, Mount Scopus Campus, Jersusalem]. (2007). INTENDING, FORESEEING, AND THE STATE. Legal Theory, 13(02). doi:10.1017/s1352325207070048 https://www.cambridge.org/core/journals/legal-theory/article/intending-foreseeing-and-the-state/76B18896B94D5490ED0512D8E8DC54B2

The general difficulty of the intending-foreseeing distinction here stemmed, you will recall, from the feeling that attempting to pick and choose among the foreseen consequences of one’s actions those one is more and those one is less responsible for looks more like the preparation of a defense than like a genuine attempt to determine what is to be done. Hiding behind the intending-foreseeing distinction seems like an attempt to evade responsibility, and so thinking about the distinction in terms of responsibility serves 39. Anderson & Pildes, supra note 38. I will use this text as my example of an expressive theory here. 40. See id. at 1554, 1564. 41. For a general critique, see Mathew D. Adler, Expressive Theories of Law: A Skeptical Overview, 148 U. PA. L. REV. 1363 (1999–2000). 42. As Adler repeatedly notes, the understanding of expression Anderson & Pildes work with is amazingly broad, so that “To express an attitude through action is to act on the reasons the attitude gives us”; Anderson & Pildes, supra note 38, at 1510. If this is so, it seems that expression drops out of the picture and everything done with it can be done directly in terms of reasons. 43. This may be true of what Anderson and Pildes have in mind when they say that “expressive norms regulate actions by regulating the acceptable justifications for doing them”; id. at 1511. http://journals.cambridge.org Downloaded: 03 Aug 2014 IP address: 134.153.184.170 Intending, Foreseeing, and the State 91 to reduce even further the plausibility of attributing to it intrinsic moral significance. This consideration—however weighty in general—seems to me very weighty when applied to state action and to the decisions of state officials. For perhaps it may be argued that individuals are not required to undertake a global perspective, one that equally takes into account all foreseen consequences of their actions. Perhaps, in other words, individuals are entitled to (roughly) settle for having a good will, and beyond that let chips fall where they may. But this is precisely what stateswomen and statesmen—and certainly states—are not entitled to settle for.44 In making policy decisions, it is precisely the global (or at least statewide, or nationwide, or something of this sort) perspective that must be undertaken. Perhaps, for instance, an individual doctor is entitled to give her patient a scarce drug without thinking about tomorrow’s patients (I say “perhaps” because I am genuinely not sure about this), but surely when a state committee tries to formulate rules for the allocation of scarce medical drugs and treatments, it cannot hide behind the intending-foreseeing distinction, arguing that if it allows45 the doctor to give the drug to today’s patient, the dxeath of tomorrow’s patient is merely foreseen and not intended. When making a policy-decision, this is clearly unacceptable. Or think about it this way (I follow Daryl Levinson here):46 perhaps restrictions on the responsibility of individuals are justified because individuals are autonomous, because much of the value in their lives comes from personal pursuits and relationships that are possible only if their responsibility for what goes on in the (more impersonal) world is restricted. But none of this is true of states and governments. They have no special relationships and pursuits, no personal interests, no autonomous lives to lead in anything like the sense in which these ideas are plausible when applied to individuals persons. So there is no reason to restrict the responsibility of states in anything like the way the responsibility of individuals is arguably restricted.47 States and state officials have much more comprehensive responsibilities than individuals do. Hiding behind the intending-foreseeing distinction thus more clearly constitutes an evasion of responsibility in the case of the former. So the evading-responsibility worry has much more force against the intending-foreseeing distinction when applied to state action than elsewhere.

#### 3] Death bad—non-experience is a negative evil—their evidence doesn’t assume premature death which they cause

Preston and Dixon 7**—**Rio Hondo College AND Minnesota State Community and Technical College (Ted and Scott, “Who wants to live forever? Immortality, authenticity, and living forever in the present”, Int J Philos Relig (2007) 61:99–117, dml)

Death might be very bad for the one who is dead. If death deprives ~~him~~ of a lot of pleasure—the pleasure he would have enjoyed if he had not died—the death might be a huge misfortune for someone. More explicitly, death might be extrinsically bad for the one who is dead even though nothing intrinsically bad happens to ~~him~~ as a result. In my view, death would be extrinsically bad for ~~him~~ if ~~his~~ life would have contained more intrinsic value if ~~he~~ had not died then (Ibid, p. 140). This is a tricky issue. On the one hand, someone might claim that even a negative evil has to happen to someone, and the dead person who no longer exists is no longer a “somebody” to experience the evil, so there shouldn’t be any subjective harm. On the other hand, it is a powerful intuition that death deprives the dead of something, somehow. Nagel tries to resolve this problem by claiming that the person who used to exist can be beneﬁted or harmed by death, and tries to show that our intuitions are in harmony with this idea. For instance, he claims we could and would say of someone trapped in a burning building who died instantly from being hit on the head rather than burning to death, that the person was lucky, or better off, for having died quickly. Of course, after dying from the head trauma, there was no one in existence who was spared the pain of burning to death, but Nagel claims that the “him” we refer to in such an example refers to the person who was alive and who would have suffered (Nagel, 1987). Nagel believes the person subjectively beneﬁted, although no subject was there to receive the beneﬁt. It would be easier to understand this objectively in terms of the qualitative assessment of Feldman; however, that is not Nagel’s position. Similarly, if someone dies before seeing the birth of a grandchild, and there is no life after death, there is no person in existence who is presently being deprived of anything at all, including, of course, births of grandchildren. But the person who was alive and who would have seen it, if not for death, has counterfactually and subjectively missed out on something. The same kind of thing could be said about death as a negative evil. When you die, all the good things in your life come to a stop: no more meals, movies, travel, conversation, love, work, books, music, or anything else. If those things would be good, their absence is bad. Of course, you won’t miss them: death is not like being locked up in solitary conﬁnement. But the ending of everything good in life, because of the stopping of life itself, seems clearly to be a negative evil for the person who was alive and is now dead. When someone we know dies, we feel sorry not only for ourselves but for him, because he cannot see the sun shine today, or smell the bread in the toaster (Ibid, p. 93). This is admittedly a confusing concept: the idea that one can be negatively harmed or beneﬁted even when one does not exist, but it is a concept Nagel claims is intuitively powerful for us, and which Feldman supports. It is confusing because of its counterfactual base; that a subject experiences harm or good even though there is no subject. It is intuitive because we do talk and think in terms of what it would have been for someone to experience. What these two articulations may show is that counterfactuals are being used in different ways, with the intuitive version masking a lot of the work of the counterfactual harm version. In response to the problem of locating when death is a problem for someone, Feldman claims that a state of affairs can be bad for someone regardless of when it occurs: “The only requirement is that the value of the life he leads if it occurs is lower than the value of the life he leads if it does not occur” (Feldman, 1992, p. 152). The comparison is between the respective values of two possible lives. The state of affairs pertaining to someone dying at some particular time, is bad for that person, if “the value-for-her of the life she leads where [that state of affairs] occurs is lower than the value-for-her of the life she would have led if [that state of affairs] had not taken place” (Ibid, p. 155). When is it the case that the value-for-her of her life would be comparatively lower? Eternally. Eternally, as opposed to at any particular moment, because “when we say that her death is a bad for her, we are really expressing a complex fact about the relative values of two possible lives” (Ibid, p. 154). Lives taken as a whole, that is. It seems that Feldman is offering an objective qualitative analysis here, which may be addressing a different component than Nagel’s subjective argument does. If we take the two arguments together, they may offer a rather compelling account of why deprivation is a bad thing in an abstracted sense. We should not forget, however, that a possible life is not a life that is lived or being lived. In that way, they both lose a bit of their intuitive force. In another attempt to undermine the Epicurean argument that death is not a bad thing but one that focuses upon one’s actual desires and interests, we may turn to Nussbaum’s work. Adding to an argument already developed by David Furley, Nussbaum argues that death is bad for the one who dies because it renders “empty and vain the plans, hopes, and desires that this person had during life” (Nussbaum, 1994). As an example, consider someone dying of a terminal disease. Subjectively, the terminally ill person is unaware of this fact, though some friends and family do know. This person plans for a future that, unbeknownst to him, will be denied him, and, to the friends and relatives who objectively know, “~~his~~ hopes and projects for the future seem, right now, particularly vain, futile, and pathetic, since they are doomed to incompleteness” (Ibid). Moreover, the futility is not removed by removing the knowing spectators. “Any death that frustrates hopes and plans is bad for the life it terminates, because it reﬂects retrospectively on that life, showing its hopes and projects to have been, at the very time the agent was forming them, empty and meaningless” (Ibid). Nussbaum is making an interesting move here. She is collapsing the subjective and objective views, such that if the agent were aware, ~~his~~ projects would change and mirror reality. ~~He~~ would realize that ~~his~~ interests cannot be realized, and would change ~~his~~ interests, and live out his days with an accurate assessment of his interests and mortality. Nussbaum appreciates this argument because it shows how death reﬂects back on an actual life, and our intuitions do not depend on “the irrational ﬁction of a surviving subject” (Ibid, p. 208). This argument is in harmony with Nagel’s claim that death can be bad for someone—even if that someone no longer exists. And, because it is rooted in the feared futility of our current projects, it is not vulnerable to the “asymmetry problem” (i.e., the alleged irrationality of lamenting the loss of possible experience in the future due to “premature” death, but not lamenting the loss of possible experience in the past due to not having been born sooner) since the unborn do not yet have any projects subject to futility. Nussbaum adds, to this argument, however, by appealing to the temporally extended structure of the relationships and activities we tend to cherish. A parent’s love for a child, a child’s for a parent, a teacher’s for a student, a citizen’s for a city: these involve interaction over time, and much planning and hoping. Even the love or friendship of two mature adults has a structure that evolves and deepens over time; and it will centrally involve sharing futuredirected projects. This orientation to the future seems to be inseparable from the value we attach to these relationships; we cannot imagine them taking place in an instant without imagining them stripped of much of the human value they actually have. . . . Much the same, too, can be said of individual forms of virtuous activity. To act justly or courageously, one must undertake complex projects that develop over time; so too for intellectual and creative work; so too for athletic achievement. . . . So death, when it comes, does not only frustrate projects and desires that just happen to be there. It intrudes upon the value and beauty of temporally evolving activities and relations. And the fear of death is not only the fear that present projects are right now empty, it is the fear that present value and wonder is right now diminished (Ibid, p. 208–209). This argument also helps to explain our intuition that death is especially tragic when it comes prematurely. While we might grieve the death of someone at any age, it seems especially bad when it is a child, or a young adult, that died. We sometimes explicitly state this in terms of the deceased having “so much left to do,” or having their “whole lives ahead of them.” It is not that death is unimportant when it is the elderly who die, but that, in many cases, the elderly have already had a chance to accomplish goals they have set for themselves. Indeed, many times those who face impending death with tranquility are those who can say, of themselves, that they have already lived a long, full life—while the elderly who most lament death are those who regret what they have failed to do in the time they had. “It is those who are most afraid of having missed something who are also most afraid of missing out on something when

#### Discussing space policy is key to develop skills of space policy literacy - space scenario planning can develop emancipatory skills, combat inequality, and fracture expertism in space activities

Weeks, 12—Adjunct Professor of International Relations Online Program, Webster University (Edythe, “OUTER SPACE DEVELOPMENT: THE SOLUTION FOR GLOBAL INEQUALITY,” *Outer Space Development, International Relations and Space Law: A Method for Elucidating Seeds*, Chapter 7, pg 171-174, dml)

This is the time to discuss equality. Once societies in outer space are established it will be too late. The first wave of outer space development in the last half of the 20th century changed the world. This process included establishing a satellite telecommunications infrastructure in the geostationary orbit along with the globalization of new high-tech products and services. The retirement of the NASA space shuttle program symbolized the start of the second wave of outer space development, which is likely to be propelled by the privatization of space tourism and space mining. This type of space industrialization will undoubtedly result in extreme wealth for a few who know what is happening, while those who have no knowledge will be left behind. Decision makers, scholars, trouble-shooters, and others worry constantly about existing inequality gaps, lack of development, poverty, and economic hardship. This chapter suggests a method for preventative maintenance prior to humankind’s next development project. It argues that education, information, and sharing knowledge can become tools for generating perpetual equality as we embark on our journey to colonize the final frontier. Those historically disenfranchised can gain a fresh advantage through preparation and education to develop an expertise

aimed at providing valuable knowledge useful for space endeavors. In addition, in these times of crashing economies, job loss, high unemployment rates, and school system failures, people are searching for ways to create prosperous futures for themselves and their families. Outer space could prove to be a way for many to find their answer. Newly Emerging Trends Relevant for Outer Space Development The passage of the NASA Authorization Act of 2010 demonstrates a willingness by the U.S. to fund a stepped-up phase of space activities. During bad economic times, this Act provides $58,400,000,000 for various space-related programs from 2011 to 2013. In 2010/2011, media reports constantly alerted the general public to be ready for the retirement of the NASA Space Shuttle program. This initiative complemented the New Vision for U.S. Space Exploration Policy (2004), as well as various other laws and policies initiated by the United States and discussed in previous chapters. When read together, it is fair to assume the newly emerging space industries will be related to achieving advanced space transportation systems, private spacecraft development, commercial space habitats, space stations, space settlements, commercial space mining, spacecraft trajectory optimization techniques for landing on near-Earth asteroids, commercial spaceport construction, interplanetary telecommunications, and space exploration missions. The thing for teachers, students, and members of the general public to do in order to prepare to take advantage of these linked opportunities is to imagine how these goals are likely to play out, and what types of goods, services, and skill-sets will be needed. Education as the Solution Outer space development historically has been the purview of skilled professionals in the science, technology, engineering, and math (STEM) fields. The STEM-oriented opportunities for those proficient in physics, astrophysics, space medicine, engineering, calculus, etc., have always been limited to a few select students. But now global society is calling for something, more since the STEM fields have failed to attract diverse people on an equal footing.186 A bridge can be created by using social and behavioral sciences curricula, thereby to attract people from a wider range of backgrounds to learn about outer space development and newly emerging industries. New education paradigms can help ensure equity and enable wider citizen participation throughout the international community. Curricula using the new paradigm can be used to motivate and inspire a new generation of scholars who can play a key role in the process of outer space development. In effect, an educational system that unleashes human creativity and curiosity will empower students with the knowledge and competencies not only for the second wave of outer space development, but also for the global engagement necessary for the 21st century and beyond (Weeks and Tamashiro, 2011). It is never too early to begin cultivating a person’s intellectual and academic talents. Most children are naturally curious. As part of the curriculum, students of all ages can be shown how to do research, how to write a research paper, to compile and present data, perform critical analytical thinking, and to anticipate and develop relevant skill-sets for newly emerging industry trends. Learning these skills will enable more people to develop an expertise aimed at supplying talent that will be in demand as future industries emerge. This can change people’s lives. Students can learn how to anticipate and prepare for future emerging industries while they are at the K-12 level. Students can also learn at young ages how to get recognized by publishers, editors, the mass media, and others. In situations where the resources necessary for teaching science are unavailable, space studies can be introduced through the social and behavioral sciences and the arts. For many years, space studies has remained the exclusive purview of engineers, scientists, and technology experts. However, there is room at the table for social and behavioral sciences students to join in and develop a specialty area of expertise. Key actors within the outer space development community have expressed an interest in advancing space studies to a broader audience. Orchestrating such a process carries with it the power to improve international relations, education, inspiration, dreams, and creativity, and to boost the global economy by creating a myriad of new jobs and degree programs. We can open an additional door to allow a broader range of knowledge into the minds of more people by introducing outer space development studies through the social and behavioral sciences (Hammond and Weeks, 2011). Unlike engineering, an interdisciplinary social and behavioral sciences lens enables us to interpret the meaning behind sets and patterns of human behaviors—this includes the behavior of individuals, institutions, groups, presidents, members of congress, business and other organizations, mass media, international organizations, and lawmakers. Humankind can progress beyond the “STEMs = space studies” model by including, encouraging, involving, and preparing a new breed of social and behavioral sciences geniuses. These would be people who are naturals in international relations, conflict resolution, and peace studies, as well as versed in international law, politics, social psychology, critical analysis, discourse analysis, international communication, artistic architecture, race and ethnic studies, gender studies, religious studies, economics, finance, business and entrepreneurship, history, and political economy, while also being concerned with inequality gaps, oppression, subjugation, revolts, uprisings, revolutions, and various other social and behavioral phenomena. People who understand the issues concerning human beings now have a way of participating in future emerging space industries. The audience of learners scheduled to receive cutting-edge knowledge of fields relevant for outer space development will be expanded by online learning techniques and sharing of information through the open-source technologies of the Internet. Shaping Ideology Imagine teaching students about the newly emerging trends related to outer space development. This would give students permission to envision and carve out their role in designing future space societies. Students from all disciplines can be taught to see what’s coming next by learning to research and interpret economic policies, laws, and international relations. This will enable them to detect newly emerging industries and to anticipate the elements likely to be in demand. Students can then shape their skill-sets and prepare to satisfy these emerging needs. Students can be taught to perform this type of interdisciplinary analysis and to research combined dynamics—government hearings and transcripts, policy statements and speeches, laws, economic initiatives, and international treaties. They can also be taught to combine this type of primary data with theoretical understandings of historical, ideological, institutional, political, economic, psychological, and structural phenomena.