# NC – KCI Round 1

## Off

### Advocacy

#### I negate Resolved: The appropriation of outer space by private entities is unjust

### Definition – Appropriation

#### “Appropriation” requires illegal use

**Merriam-Webster ‘N/D** (<https://www.merriam-webster.com/dictionary/appropriation>) // ELog

Essential Meaning of appropriation formal 1: the act of getting or saving money for a specific use or purposethe appropriation of funds to repair the bridge 2: the act of taking or using something especially in a way that is illegal, unfair, etc.The economy has been weakened by the appropriation of the country's resources by corrupt officials. 3: an amount of money that is used or provided by a government for a specific purposeThe library's appropriation (from the state) has decreased over the years.

#### Violation: First affirmative contention talks about how private entities aren’t regulated – proves it’s no illegal

#### Standards:

#### Limits – limiting appropriation to illegal actions ensures the topic isn’t infinite – anything else means Affs can get offense on anything in space

#### Ground – preexisting law ensures there’s literature

#### Predictability – It’s a dictionary – this is a standard and predictable definition of extinction

#### Intent to define – It’s a dictionary

#### Reject the team – it’s key for deterrence and anything else decks fairness and skews debate Aff because we will always be unprepared for their args

#### At worst, both advantages are untopical – means they have zero offense and Neg will win on a risk of an impact

#### No RVI – You don’t get to win for being topical – RVIs disincentivize reading T which means Affs can read even more untopical ground – supercharges fairness – time tradeoff is inevitable and infinite prep, last speech, and equal speech times check

### Definitions – Outer Space

#### “Outer space” is the empty vacuum – excludes planets and starts

**Baird ’13** (Christopher Baird; Assistant Professor of Physics at West Texas A&M University. “How does the expansion of the universe make outer space a vacuum?” <https://www.wtamu.edu/~cbaird/sq/2013/10/08/how-does-the-expansion-of-the-universe-make-outer-space-a-vacuum/> 8 October 2013) // ELog

The vacuum of outer space is not caused by the expansion of the universe, but is caused by gravity. First of all, when we say outer space (the space outside the atmosphere of planets and stars) is a "vacuum" or is "empty", we really mean that outer space is nearly empty or almost a perfect vacuum. In reality, even the most remote spot of outer space has gas, dust, radiation, gravity, and a [whole host of other things](https://wtamu.edu/~cbaird/sq/2012/12/20/what-keeps-space-empty/). There is no such thing as truly empty space. If we tried to suck all the particles out of a certain volume, we could still never get it empty. There would still be things like vacuum fluctuations, gravity, and dark matter, which can't be sucked out. With that said, outer space is very close to empty compared to earth's atmosphere. Why?

#### Violation: The affirmative’s advantages are about colonization of Mars (Cosmical ’21) and capitalism on Earth (Foster ’19)

#### Prefer our definition:

#### Intent to define – it’s from an explanation of what outer space is

#### Limits – outer space is literally infinite – letting the Aff have planets and stars gives them extra ground like mining, colonization, alien settlements, solar energy, etc. that’s unpredictable

#### Cross apply the voters from above

### Value/Value Criterion

#### The value is justice – I’ll defend it as the quality of being righteous, equitable, or morally right (<https://www.dictionary.com/browse/justice>)

#### Prefer it - it’s literally in the resolution – means it’s most predictable and framer’s intent

#### The value criterion is to evaluate gendered implications of the resolution first

#### Prefer it – “outer space” is a social construct created by patriarchal and heteronormative discourses – these aren’t always clear which makes interrogating the topic a priori

Griffin ‘9 (Penny, Senior Lecturer - Convenor, MA International Relations, ‘The Spaces Between Us: The Gendered Politics of Outer Space’, in Bormann, N. and Sheehan, M. (eds), Securing Outer Space. London and New York: Routledge, pp.59-75.)

Outer space is a conceptual, political and material space, a place for collisions and collusions (literally and metaphorically) between objects, ideas, identities and discourses. Outer space, like international relations, is a global space always socially and locally embedded. There is nothing 'out there' about outer space. It exists because of us, not in spite of us, and it is this that means that it only makes sense in social terms, that is, in relation to our own constructions of identity and social location. In this chapter, outer space is the problematic to which I apply a gender analysis; an arena wherein past, current and future policy-making is embedded in relation to certain performances of power and reconfigurations of identity that are always, and not incidentally, gendered. Effective and appropriate behaviour in the politics of ourer space is configured and prescribed in particularly gendered forms, with heteronormative gender regulations endowing outer space's hierarchies of technologically superior, conquesting performance with theif everyday power. It is through gender that US techno-strategic and astro-political discourse has been able to (re)produce outer space as a heterosexualized, masculinized realm. To talk of US outer space politics and discourse as 'sexed', and therefore gen­ dered (through the pre/proscription and reproduction of those human identi­ ties considered most effective and appropriate to space) is not purely to limit discussion to sex acts, or sexual identities in the usual sense; it is to talk about 'sex as it is mediated by publics', some of whose obvious relation to sex may be obscure (Berlant and Warner 1998: As Bedford argues, using sexuality as an analytical concept extends beyond discussion of gay, lesbian, bisexual and transgender issues to consider the ways in which heterosexuality as 'unmarked' (that is, thoroughly normalized) is (re)produced in changing forms by political actors (2005: 296), The institutions, structures of understanding and practical orientations through which US space discourse privileges and normalizes het­ erosexuality as universal are tacitly, not explicitly, gendered. The dominant discursive rationalizations of outer space exploration and conquest that consti­ tute space as heterosexual, and (re)produce the heterosexual imperatives that constitute suitable space-able people, practices and behaviours, do so in ways that are not necessarily obvious nor are they always coherent. As Butler argues, 'gender' operates in discourse as a 'norm', a 'standard of normalization' that serves to discursively regulate the bodies over which it presides. When gender operates as a normalizing principle in social practice, it is more likely to be 'implicit, difficult to read', and 'discernible most clearly and dramatically' in the effects that it produces, thus the prescription and reproduction of heteronormative gender in outer space discourse, like all other norms, 'may or may not be explicit' (Butler 2004: 41).

### K – Private Violence

#### The Aff reifies a public/private dichotomy through a rejection of private entities in space on the basis of the private existing beyond regulation – this binary is always insufficient to deal with market discourse and justifies state inaction in the face of domestic violence

**Thornton ’91** (Margaret Thornton; Postdoctoral scholar at the Princeton University School for Public and International Affairs. “The Public/Private Dichotomy: Gendered and Discriminatory” <file:///C:/Users/easto/Downloads/thornton1991%20(1).pdf> Published Winter 1991) // ELog

This paper argues that the malleability of the public/private dichotomy within liberal discourse is deployed by the state in order to mediate polarized interests. Even though anti-discrimination legislation does challenge the assignation of women to the private and men to the public spheres, the centrality of the dichotomy ensures that any changes which occur in the relations between men and women do not threaten the immunity accorded domestic life, the primary site of inequality for women. Selected aspects of the substance and procedure of anti-discrimination legislation will be used to illustrate the thesis. The examples are drawn from Australian anti- discrimination legislation, but the thesis applies equally to similar legislative models found in the United Kingdom, Canada and the United States of America. While I have focused on the particular significance of the public/ private dichotomy for gender, many facets of the dichotomy apply also to race, sexual preference, disability and other proscribed grounds. I also do not discount the ways in which gender may be shaped by its intersection with multifarious situational factors, including those factors which constitute proscribed grounds. The meaning of 'public' and 'private' within liberal theory and practice is by no means self-evident, particularly as the terms may be used in multifarious ways.1 Some recent social theory has opted for the older terminology of state and civil society in preference to that of public and private.2 If the public boundary is drawn around the polity, the meaning of state/civil society and public/private may be synonymous. However, if the public encompasses the polity, the market and other associative rights of civil society, leaving only the family with a private designation, as tends to be the case within feminist discourse, a quite different result emerges.3 Indeed, it is apparent that 'civil society' is no more linguistically precise than the term 'private'. Jean Cohen, in fact, distinguishes civil society from the market economy to encompass property, plurality, privacy, and legality.4 I shall retain the language of public/ private because of its gender significance which is occluded by the language of state/civil society. Indeed, the association of men and women with public and private respectively is one of the few assertions that can be categorically made about the nature of the dualism. Within the Western liberal tradition, men have been associated with the public sphere, in the character of government, and civil society, while women have been indelibly associated with the private sphere, in the character of family. Liberty and equality are the pre-eminent values among a constellation which constitute liberalism,5 although 'equality has taken a back seat to liberty'.6 The consistent concern of liberal theorists has been how to formulate a blueprint for the good life in the public sphere, the domain of free and equal citizens. The invisibility of women's role within the family has profoundly affected women's status as citizens within contemporary Western democracy.7 In the three hundred years of liberal thought since Locke's 'father of the family' was considered to be a 'ruler in his own household',8 he is still 'head of the family' in Rawls' A Theory of Justice.9 Classical liberal theory accepts the division between public and private as the reason for the existence of state regulation. Thus, that sphere designated as public constitutes the appropriate terrain of regulation, whereas that designated as private is treated as beyond the purview of the state. While the family has been conceptualized as private and the affairs of government as public, the sphere of the market and economic activity has become increasingly difficult to categorize, particularly as the state has become more interventionist. This multidimensionality of the state and its instrumentalities within Western democratic capitalism has eroded the possiblity of clear lines.'0 Correspondingly, large-scale private corporations have become indistinguishable from the exercise of public power.1 1 Even the family, viewed as quintessentially private within classical liberal theory, is not necessarily so in practice. Matrimonial matters, child welfare and incest are well-established subjects of state intervention, although the state continues to be ambivalent about the criminalization of 'domestic' violence. However, we should not ignore the fact that the state shapes the territoriality of public and private. The legislative and administrative activity involved in constituting the private sphere in the character of family is clearly public action.12 For example, by continuing to permit taxation rebates for 'dependent spouses', the state seeks to entrench the norm of women's economic dependency on men.13 The endorsement by the state of the idea of the husband as head of the household, even if only in an indirect sense, conduces to the blurred line of demarcation between public and private in addition to signalling a potential conflict with the application of the non-discrimination principle. Most particularly, it shows the inability (or unwillingness) of contemporary liberalism to move beyond the fundamental gender inequality of the Lockean family model. The legislative proscription against discrimination simultaneously reifies and challenges the public/private dichotomy. The contradiction is thrown into high relief in all facets of discrimination law. In respect of substance, the dualism manifests itself within the proscribed grounds as well as within the ambit of operation. In respect of procedure, the privatized nature of conciliation as the preferred means of resolving discrimination complaints, in contradistinction to the public mode of formal adjudication, elicits an ambivalent response. A cursory look at anti-discrimination law suggests that we are always looking at the dichotomy through a moving prism; its lines are not clear-cut but are refracted according to time and circumstance. Potentially devastating for the application of the non-discrimination principle is the asymmetry of the bipolarized spheres of public and private, a consistent theme in the Western intellectual tradition for more than two millenia: The public world of politics and free citizenry was conceptually and structurally parasitic upon the world of necessity, a realm downgraded and demeaned systematically by powerful public voices, including those of Plato and Aristotle.14 Women's association with the subordinated realm of necessity (that is, nature and nurture) has continued to constitute a fundamental impediment to both the theory and practice of equality because equality discourse is comprehensible only in relation to a society of equals within the public realm.15 Needless to say, it is a convention of male political theorists that the biological act of giving birth is averredly closer to nature than the biological act of fathering a child. This distinction has been crucial in constructing the gendered epistemological foundation of the Western liberal tradition. Women's supposedly greater proximity to nature has led to assumptions that women are less rational than men which somehow justifies the gendered allocation of childcare and household responsibilities. Men's supposed distance from nature has grounded the claim of male rationality and superiority of intellect which has enabled (white, Anglo-Celtic) men to dominate public and professional life. Far from representing two analytically discrete realms arising from 'natural' differences and the complementary biological roles of men and women, the public/private dichotomy is a conventional creation which serves a significant ideological purpose within liberalism.16 In mediating interests which appear to be irreconcilable, the task of the liberal state is made easier if there are some areas conceptualized as 'private' with which it does not have to grapple. The capitalist imperative is also served by the immunity, for the contemporary movement in favour of deregulation of the business sector is intent upon reasserting the traditional parameters of civil society to secure its immunity from the purview of state regulation."7 It is the coalescence of patriarchy and capitalism which is instrumental in shaping the nature of contemporary liberalism. The public/private dichotomy therefore constitutes a malleable political mechanism which can be effectively utilized to safeguard dominant interests under the guise of seeming neutrality and naturalness.

#### The public/private dichotomy necessarily creates ordered violence against women in the private sphere with the intent to contain it from the masculine public – it turns domestic violence into a normalized, sacrificial ritual

**Decker ‘8** (Brian R Decker; Attorney at Metropolitan Public Defender in Hillsboro, Oregon. “VIOLENCE AND THE PRIVATE: A GIRARDIAN MODEL OF DOMESTIC VIOLENCE IN SOCIETY” <https://scholarship.law.upenn.edu/cgi/viewcontent.cgi?article=1072&context=jlasc> Published 2008) // ELog

Society, dominated by men, has erected a wall between the public and the private, and it considers violence in the former significantly more dangerous, blameworthy, and unbearable than violence in the latter.62 It is easy for men to take this view, as feminists like West and MacKinnon have noted, because they tend not to be the victims of violence in the private sphere. 63 But the Girardian model goes further. To Girard, society opts to tolerate ordered violence because of the belief that it might mitigate disordered violence. In this model, the private sphere provides the needed order: private violence is ideally limited geographically (to within or around the home) 64 and temporally (to those times at which the abuser and victim are together), and it selects its victims from a limited pool (sometimes children, usually wives or partners, and almost always women). Hence, society tolerates private violence because it views the private sphere as an outlet, a container for violence. Male dominance and violence in the home will stave off violent disorder in the streets. Some empirical evidence supports this intuition. Neil Jacobson and John Gottman's study of the different types of batterers suggests that at least one group, which they dub "Cobras," is comprised of antisocial and potentially psychopathic men who tend to have criminal records and view violence in the home as a means to gratification in life. 65 Viewing this group of men through a Girardian framework, one could infer that these men might, but for the fortuitous circumstance of having an intimate victim to manipulate within the private, commit greater violence in the public sphere. The findings of other psychologists suggest that frustrated weaker men, dominated by stronger men in the public sphere, might turn to the private sphere to let out their aggression. 66 Also implicit in this model is the concept of home as sacred ground, a strange location that is both a place of tension and a haven from the outside world. Like Girard's sacrificial act, the violent marital home encompasses both transgression and a curb on wider disorder. Its inhabitant, the wife or female intimate partner, is the scapegoat. On the one hand, her batterer views her as the vile source of frustration, tension, and violence. As Barbara Ehrenreich noted of the Playboy revolution of the 1950s, men may perceive wives as carping crushers of spirit, domineering deprivers of freedom, and money-grubbing demanders of their share of men's own good life.67 On the other hand, the wife is simultaneously sacred in the transition she provides from disorder to order, from chaos to haven, even if her role is that of victim. 68 Jacobson and Gottman noted that the more numerous type of batterers, "Pit Bulls," are "motivated by a fear of being left" and thus desperately cling to their wives; 69 their jealous rage is almost a form of worship. 70 The fact that modern society has developed a complex, legalized social structure does not necessarily mean it has escaped the Girardian model for ritualistic violence. Girard stresses that even advanced and secular societies are rooted in primitive ones, and that law is the continuation of ritual by other means: "Even when this theology disappears, as has happened in our culture, the transcendental quality of the system remains intact. Centuries can pass before men realize that there is no real difference between their principle of justice and the concept of revenge." 71

#### The alternative is to reject the public/private distinction – the private sphere and domination that sustains it ensure discriminate gendered violence, but our Girardian rereading publicizes the domestic to prevent sustained violence

**Decker ‘8** (Brian R Decker; Attorney at Metropolitan Public Defender in Hillsboro, Oregon. “VIOLENCE AND THE PRIVATE: A GIRARDIAN MODEL OF DOMESTIC VIOLENCE IN SOCIETY” <https://scholarship.law.upenn.edu/cgi/viewcontent.cgi?article=1072&context=jlasc> Published 2008) // ELog

In addition to a redefinition of woman, the Girardian understanding of domestic violence challenges society to undertake a redefinition of private-or at least abandon the distinction between private and public violence. In light of this model, society uses the concept of domination to provide structure to the distinction between the private and public, attempting to create a closed private space where hierarchical or dominating violence may stave off chaotic violence in the public. Yet domination is ineffective at this task: violence, no matter the channel through which it is directed, begets more violence. Domination is less about the relationship between men and women-merely a mechanism by which societal violence is funneled and more about the relationship between violence and mankind, a relationship society must transform to forestall all forms of violence. Catharine MacKinnon's contribution to the feminist legal discourse is focusing the legal issue on a narrative of dominance. MacKinnon argues that the fundamental dynamic between men and women is the former dominating the latter, and that society has structurally accepted this through legal fictions that ignore the plight of women. 103 For instance, if the legal regime "defines rape as intercourse with force or coercion and without consent," its premise is that intercourse with force or coercion but not without consent is permissible sex.10 4 This presents an odd set of equivalencies: "dominance plus submission [equals] force plus consent," which "equals sex, not rape.'' 10 5 If a man dominates, as men are wont to do, and a woman accepts that domination, according to a male standard of what acceptance looks like, the act is protected. The structure thus preserves domination itself as a legitimate dynamic. In MacKinnon's view, this perverse outcome of legitimized domination is no less likely in the domestic-violence arena than in that of rape. 1 0 6 In domestic violence, the legal mechanism that preserves such domination is not the fictive consent of the rape scheme but the proliferation of the private sphere. 07 The private sphere is "man's sovereign castle, where most women remain for a lifetime, where women are mostly to be battered and sexually assaulted, and where they have no recourse because the private, by definition, is inviolable and recourse means intervention. ' 10 8 MacKinnon's solution is to get women out of the home and thus out of the private sphere and into the public sphere, where women have "freedom of action, resources, and access to a larger world," and are "most equal" with men.10 9 For MacKinnon, freedom and equality keep score in a zero-sum game between men and women, and since "men have the most freedom at home, . . . women gain correspondingly greater equality, hence freedom, the farther away from home they go.""10 In her argument in favor of the Violence Against Women Act, MacKinnon envisions women seeking legal redress from the federal government as opposed to the state because the federal government is conceptually (and likely geographically) further from the maledominated home. "'1 MacKinnon and others have identified how the private sphere disadvantages women, and the Girardian model explains why society has nevertheless preserved and defended it as a site for sacrificial violence alienated from the public. 112 The intuition is clear: dominance of one clear category of people over another means hierarchy and order, and ordered violence within such a hierarchy is necessary to stave off disordered violence. But even as it establishes the model for private violence as a container for chaotic violence, Girard's theory provides the solution to unraveling the premise that dominance is necessary.

### CP – Space Tax

#### Text: States should regulate the appropriation of outer space by corporations and impose an orbital use fee of $14,900 per year that escalates at 14% per year until $235,000 per year in 2040 to offset negative impacts of corporate space appropriation

#### CP is the only way to solve debris and grows the space industry

**Rao et al. ‘20** (Akhil Rao; Assistant Professor of Economics at Middlebury College. Matthew Burgess; Assistant Professor of Environmental Studies at Brooklyn College. Dan Kaffine; Professor of Economics at the University of Colorado-Boulder. “Orbital-use fees could more than quadruple the value of the space industry” [https://www.pnas.org/content/117/23/12756 26 May 2020](https://www.pnas.org/content/117/23/12756%2026%20May%202020)) // ELog

The space industry’s rapid recent growth represents the latest tragedy of the commons. Satellites launched into orbit contribute to—and risk damage from—a growing buildup of space debris and other satellites. Collision risk from this orbital congestion is costly to satellite operators. Technological and managerial solutions—such as active debris removal or end-of-life satellite deorbit guidelines—are currently being explored by regulatory authorities. However, none of these approaches address the underlying incentive problem: satellite operators do not account for costs they impose on each other via collision risk. Here, we show that an internationally harmonized orbital-use fee can correct these incentives and substantially increase the value of the space industry. We construct and analyze a coupled physical–economic model of commercial launches and debris accumulation in low-Earth orbit. Similar to carbon taxes, our model projects an optimal fee that rises at a rate of 14% per year, equal to roughly $235,000 per satellite-year in 2040. The long-run value of the satellite industry would more than quadruple by 2040—increasing from around $600 billion under business as usual to around $3 trillion. In contrast, we project that purely technological solutions are unlikely to fully address the problem of orbital congestion. Indeed, we find debris removal sometimes worsens economic damages from congestion by increasing launch incentives. In other sectors, addressing the tragedy of the commons has often been a game of catch-up with substantial social costs. The infant space industry can avert these costs before they escalate. In 2017, 466 new satellites were launched—more than double the previous year’s launches and more than 20% of all active satellites in orbit in 2017 ([1](https://www.pnas.org/content/117/23/12756#ref-1), [2](https://www.pnas.org/content/117/23/12756#ref-2)). Rapid space industry growth is projected to continue, driven largely by commercial satellites ([Fig. 1](https://www.pnas.org/content/117/23/12756#F1)). This growth is driving buildup of debris in low-Earth orbit, currently including over 15,000 objects ([3](https://www.pnas.org/content/117/23/12756#ref-3)). Collision risk from debris is costly; collisions damage or destroy expensive capital assets that are difficult or impossible to repair. Debris buildup could eventually make some low-Earth orbits economically unviable and other orbits difficult or impossible to access ([4](https://www.pnas.org/content/117/23/12756#ref-4)). In the worst case—although uncertain and occurring over long time horizons—debris growth could become self-sustaining due to collisions between debris objects, a tipping point called Kessler Syndrome ([4](https://www.pnas.org/content/117/23/12756#ref-4), [5](https://www.pnas.org/content/117/23/12756#ref-5)). Proposed solutions have so far largely been technological and managerial, aimed at mapping, avoiding, and removing debris ([6](https://www.pnas.org/content/117/23/12756#ref-6), [7](https://www.pnas.org/content/117/23/12756#ref-7)). These include end-of-life deorbit guidelines and “keep out” zones for active satellites and nets, harpoons, and lasers to deorbit debris ([6](https://www.pnas.org/content/117/23/12756#ref-6)). However, with open access to orbits, reducing debris and collision risk incentivizes additional satellite launches, which eventually restore the debris and risk. For instance, if firms were willing to tolerate a 0.1% annual risk of satellite loss before a technological improvement in debris removal, they will be willing to launch more satellites until the 0.1% annual risk of satellite loss was restored. Thus, the core of the space debris problem is incentives, not technology. Since satellite operators are unable to secure exclusive property rights to their orbital paths or recover collision-related costs imposed by others, prospective operators face a choice between launching profitable satellites, thereby imposing current and future collision risk on others, or not launching and leaving those profits to competitors. This is a classic tragedy of the commons problem ([1](https://www.pnas.org/content/117/23/12756#ref-1), [3](https://www.pnas.org/content/117/23/12756#ref-3), [8](https://www.pnas.org/content/117/23/12756#ref-8), [9](https://www.pnas.org/content/117/23/12756#ref-9)). It can be economically efficiently addressed via incentive-based solutions, such as fees or tradable permits per year in orbit, analogous to carbon taxes or cap and trade ([8](https://www.pnas.org/content/117/23/12756#ref-8), [10](https://www.pnas.org/content/117/23/12756#ref-10)[⇓](https://www.pnas.org/content/117/23/12756#ref-11)–[12](https://www.pnas.org/content/117/23/12756#ref-12)). Incentives should target objects in orbit—rather than launches—because orbiting objects are what directly imposes collision risk on other satellites ([13](https://www.pnas.org/content/117/23/12756#ref-13)). We quantify the economic benefits of implementing such incentives to correct the underlying open-access problem. We use a coupled physical–economic model combining rich physical dynamics with satellite economics to quantify the benefits of an internationally harmonized “orbital-use fee” (OUF) relative to a business as usual (BAU) open-access scenario and relative to a scenario with active debris removal. An OUF is a type of Pigouvian tax—a well-known economic instrument for addressing externality problems ([14](https://www.pnas.org/content/117/23/12756#ref-14)). Our model accounts for the effects of each scenario on satellite launch decisions ([Materials and Methods](https://www.pnas.org/content/117/23/12756#sec-4) and [SI Appendix](https://www.pnas.org/lookup/suppl/doi:10.1073/pnas.1921260117/-/DCSupplemental)). While we focus on an OUF for analytical convenience, it is conceptually equivalent to other mechanisms for pricing orbits, such as tradable permits. Our physical model of satellite and debris evolution in orbit obeys relevant accounting identities and utilizes reduced form approximations of physical processes validated in other works ([15](https://www.pnas.org/content/117/23/12756#ref-15), [16](https://www.pnas.org/content/117/23/12756#ref-16)). We fit and calibrate the model using data on collision risk and orbital debris from the European Space Agency (ESA) ([17](https://www.pnas.org/content/117/23/12756#ref-17)) and data on active satellites from the Union of Concerned Scientists (UCS) ([2](https://www.pnas.org/content/117/23/12756#ref-2)) ([Materials and Methods](https://www.pnas.org/content/117/23/12756#sec-4) and [SI Appendix](https://www.pnas.org/lookup/suppl/doi:10.1073/pnas.1921260117/-/DCSupplemental)). The ESA dataset covers 1958 to 2017, and the UCS dataset covers 1957 to 2017. Our physical model assumes runaway debris growth (Kessler Syndrome) cannot occur, which likely leads our model to understate the benefits of OUFs ([Materials and Methods](https://www.pnas.org/content/117/23/12756#sec-4)). Our economic model assumes that satellites are launched and operated to maximize per satellite private profits, net of any fees, subject to collision risk. We calibrate the model by fitting the BAU scenario (no fees or debris removal) to historical industry data and launch trends ([1](https://www.pnas.org/content/117/23/12756#ref-1), [2](https://www.pnas.org/content/117/23/12756#ref-2)) ([Materials and Methods](https://www.pnas.org/content/117/23/12756#sec-4) and [SI Appendix](https://www.pnas.org/lookup/suppl/doi:10.1073/pnas.1921260117/-/DCSupplemental)). We project future launch rates to 2040 under the BAU scenario using our fitted model and published projections of future growth of the space economy ([18](https://www.pnas.org/content/117/23/12756#ref-18)). The projections in ref. [18](https://www.pnas.org/content/117/23/12756#ref-18) were developed by projecting how the industries constituting the space sector—telecommunications, imaging, etc.—would grow from 2017 to 2040 under different assumptions on their individual profitability over time, then aggregating up to obtain projections for the space sector. We then calculate launch rates that would maximize the long-run value of the industry, and we calculate the time series of OUFs that would incentivize these optimal launch rates. The industry value is measured as net present value (NPV)—the long-run value of the entire fleet of satellites in orbit, accounting for both the financial costs of replacing satellites due to natural retirement and collisions as well as the opportunity cost of investing funds in satellites rather than capital markets. For instance, an NPV of $1 trillion in 2020 means the sum total of the stream of net benefits, looking from 2020 into the future and accounting for the timing of the net benefits, is $1 trillion. Although our models are deliberately simplified for tractability, they are based on previously validated approaches to orbital object modeling ([15](https://www.pnas.org/content/117/23/12756#ref-15), [16](https://www.pnas.org/content/117/23/12756#ref-16)), and our calibrations allow us to reproduce observed trends and magnitudes in the growth of orbital debris and satellite stocks as well as the calculated collision risk ([Fig. 3](https://www.pnas.org/content/117/23/12756#F3)). Nonetheless, our projections should be interpreted as order of magnitude approximations that can be refined as needed by more detailed models. In these respects, our approach mirrors integrated assessment modeling approaches that have been useful in developing solutions to other natural resource management problems (e.g., ref. [19](https://www.pnas.org/content/117/23/12756#ref-19)). Results We project that shifting from open access to the optimal series of OUFs in 2020 would increase the NPV of the satellite industry from around $600 billion under BAU to around $3 trillion—a more than 4-fold increase (4.18- to 6.49-fold increases in 95% of parameter sets randomly drawn from their calibrated distributions) ([Fig. 2D](https://www.pnas.org/content/117/23/12756#F2)). Assuming a 5% market rate of return, an increase of $2.5 trillion in NPV would be equivalent to annual benefits of approximately $120 billion in perpetuity. The large immediate increase in NPV that we project in each OUF scenario, relative to BAU ([Fig. 2A](https://www.pnas.org/content/117/23/12756#F2)), comes primarily from the immediate effect of reducing launch activity while the satellite and debris stocks are suboptimally high ([SI Appendix](https://www.pnas.org/lookup/suppl/doi:10.1073/pnas.1921260117/-/DCSupplemental)). Based on our calculations ([Materials and Methods](https://www.pnas.org/content/117/23/12756#sec-4)), the optimal OUF starts at roughly $14,900 per satellite-year in 2020 and escalates at roughly 14% per year (aside from some initial transition dynamics) to around $235,000 per satellite-year in 2040. Rising optimal price paths are common in environmental pricing such as carbon taxes ([20](https://www.pnas.org/content/117/23/12756#ref-20)), although declining optimal price paths are also possible ([21](https://www.pnas.org/content/117/23/12756#ref-21)). The rising price path in this case partly reflects the rising value of safer orbits (resulting in rising industry NPV) ([Fig. 2A](https://www.pnas.org/content/117/23/12756#F2)) from the OUF. For comparison, the average annual profits of operating a satellite in 2015 were roughly $2.1 million. The 2020 and 2040 OUF values we describe amount to roughly 0.7 and 11% of average annual profits generated by a satellite in 2015.

#### Regulations solve the advantage –

#### The CP proves the resolution untrue – the topic is ahistorical, if we can prove a hypothetical future of private space use that isn’t unjust, it’s a reason to negate

## Case

### Contention One

#### The 1967 Outer Space Treaty restricts lunar development for states, but doesn’t apply to corporations – private entities are the only route to space colonization

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On 30th April 2020, NASA – the US government’s space agency – awarded three private space companies a jointcontract worth $967m to complete a lunar mission by 2024, in what was celebrated as “the last piece that [America] need[s] in order to get to the moon” by NASA administrator Jim Brindestine (The Telegraph, 2020). Yet, whilst this development was widely covered in the media, less coverage has focused on the extent to which existing international legislation surrounding outer space endeavours appropriately applies to private entities. Indeed, the prospect of a corporate foothold within the extra-terrestrial domain has thrown up both a mixture of optimism and concern regarding the potential benefits of expanding capital projects into space (Adolph, 2006; Dickens & Ormrod, 2007). By adopting the 1967 UN Outer Space Treaty (OST) as an analytical framework in relation to the rise of the so-called US ‘NewSpace’ actors, this essay argues that there are significant legal ambiguities regarding the status of private space companies in orbital space. Such loopholes allow the US government to circumvent its own obligations to the OST, whilst simultaneously undermining the notion of space as a ‘global commons’ through a commodification process. The lack of specificity within the OST surrounding private property rights over extra-terrestrial resources risks the prospect of reinforcing Earth-bound wealth inequalities and US dominance in space, by restricting the potential economic benefits for the broader global citizenry in favour of a narrow class of wealthy American investors. Moreover, the OST’s weak clause regarding the regulation of space surveillance risks the incentivisation of a ‘global panopticon’ network of US satellites. The rise of dual-use technology is blurring the boundaries between military and civilian observations, raising serious ethical concerns over the nature of US space-based data collection. Finally, the increasing number of private satellite constellations is facilitating the possibility of cataclysmic space debris collisions which could exacerbate geopolitical tensions. Such developments are also contributing towards the contamination of the broader space environment in ways that the OST had never envisioned. The UN Outer Space Treaty and Rise of the ‘NewSpace’ Actors Although ratified into international law in 1967, the UN Outer Space Treaty (OST) is perhaps still the most relevant piece of legislation for analysing state and non-state entity activity in outer space. Designed to prevent both the militarisation of space and national appropriation of celestial bodies at the height of Cold War tensions, the UN OST holds significant influence as a form of customary international law (Hebert, 2014: 6). Ratified by over 100 nations – including major spacefaring nations such as the United States, Russia and China – the treaty is widely accepted as an authoritative document and has formed the basis for all other space treaties that have succeeded it (Kramer, 2017: 129). This is in contrast to more recent legislation such as the 1972 Moon Treaty designed to promote cooperation in Moon exploration and development, which the US and other major space superpowers have refrained from signing (Adolph, 2006: 968-969). The type of American actors becoming involved in the realm of outer space has undergone significant diversification. Despite working alongside NASA since the 1950s, commercial enterprises were largely confined to the manufacturing of parts utilised in rockets and other equipment for space activities (Lal, 2016: 63-66). However, the continuous sharp decline in NASA’s overall budget that has occurred since the Apollo 11 moon landing, and the increasing trends towards the privatisation of government functions has drastically altered both the capabilities and the outlooks of private space companies. Indeed, although the space economy is growing overall, global government spending decreased by 1.3% between 2012 and 2013 while commercial-sector growth increased by roughly 7% (Conklin, 2017: 33). Central to the impetus behind this private sector space boom has been the emergence of the socalled ‘NewSpace’ actors – “a broad range of primarily US-based entrepreneurs… who, for more than 30 years, have aimed to commercialise space” (Valentine, 2012: 1046). Driven by a libertarian outlook of economics, and critical of NASA’s historical grip on space exploration, these individuals portray themselves as the pioneers of the ‘final frontier’ who will save humanity from extinction through privately-funded extra-terrestrial missions (Kearnes & van Dooren, 2017: 182). Near-Earth Object and Lunar Resource Mining: US Private Property in Space Lunar rock samples from the Apollo missions containing rare Earth resources, such as Helium-3 which produces more power and less waste than traditional nuclear reactors on Earth, have since fuelled incentives for extraterrestrial resource mining (Brearley, 2006: 44-46). This was further facilitated by suggestions that near-earth objects (NEOs) like the so-called ‘Anteros asteroid’ could comprise of over five trillion dollars’ worth of magnesium silicate and aluminium (Kramer, 2017: 131). Envisaging appropriation concerns that might arise from the future extraction of space assets by spacefaring nations, Article II of the UN OST declared that: “Outer space is not subject to national appropriation by claim of sovereignty, by means of use or occupation, or by any other means” (UN, 1967). The emphasis on claims of national sovereignty were intimately tied to the Cold War context at the time, where space activities were under the exclusive monopoly of governmental agencies and initiated for goals of military dominance or national prestige (Sachdeva, 2017: 210). However, the privatisation of the space industry that has occurred since the 1980s has meant that the legislation leaves an enormous amount of legal ambiguity and interpretation regarding the regulation of private resource mining in space. As Shaer (2016) demonstrates, the Article II provision fails to address either the exploitation of space for financial gain or the property claims of commercial enterprises (Shaer, 2016: 47). Nevertheless, Article VI of the UN OST asserts that: “States shall be responsible for national space activities whether carried out by governmental or non-governmental entities” (UN, 1967; own emphasis). Some scholars have suggested that this clause significantly restrains the activities of private space corporations by incentivising states to regulate their domestic organisations for fear of liability concerns (Abeyratne, 1998: 168). However, the US government recently enacted a piece of legislation which exploited this clause, in order to circumvent its own restrictions and strengthen US economic influence in space. The passage of the 2015 SPACE Act enabled US citizens to privately “possess, own, transport, use, and sell the resources” they obtain in outer space, whilst making careful consideration to deny national sovereign claims over such materials (Leon, 2018: 500). Yet, regardless of whether it is an American private company or public venture, the US is still satisfying its geopolitical interests; by exclusively siphoning off extra-terrestrial resources for American gain, the nation’s soft power is thereby extended at the expense of spacefaring adversaries such as China (Basu & Kurlekar, 2016: 65). Indeed NewSpace actors cleverly played on these strategic concerns prior to the bill’s passage, with billionaire space entrepreneur Robert Bigelow asserting that the biggest danger wasn’t private enterprises on the Moon, but that “America is asleep and does nothing, while China comes along… surveying and laying claim [to the Moon]” (Klinger, 2017: 222). The US government’s support for private space companies is also likely to lead to the reinforcement of Earth-bound wealth inequalities in space. Many NewSpace actors frame their long-term ambitions in space with strong anthropogenic undertones, by offering the salvation of the human race from impending extinction through off-world colonial developments (Kearnes & Dooren: 2017: 182). Yet, this type of discourse disguises the highly exclusive nature of these missions. Whilst they seem to suggest that there is a stake for ordinary citizens in the vast space frontier, the reality is that these self-described space pioneers are a member of a narrow ‘cosmic elite’ – “founders of Amazon.com, Microsoft, Pay Pal… and a smattering of games designers and hotel magnates” (Parker, 2009: 91). Indeed, private space enterprises have themselves suggested that they have no obligation to share mineral resources extracted in space with the global community (Klinger, 2017: 208). This is reflected in the speeches of individuals such as Nathan Ingraham, a senior editor at the tech site EngadAsteroid mining, who claimed that asteroid mining was “how [America is] going to move into space and develop the next Vegas Strip” (Shaer, 2016: 50). Such comments highlight a form of what Beery (2016) defines as ‘scalar politics’. In similar ways to the ‘scaling’ of unequal international relations that has constituted our relationship with outer space under the guise of the ‘global commons’ (Beery, 2016: 99), private companies – through their anthropogenic discourse – are scaling existing Earthbound wealth inequalities and social relations into space by siphoning off extra-terrestrial resources. By constructing their endeavours in ways that appeal to the common good, NewSpace actors are therefore concealing the reality of how commercial resource extraction serves the exclusive interests of their private shareholders at the expense of the vast majority of the global population.

### Contention Two