

Utilitarianism is a theory of calculation

first, Util is best for practical decision-making. It's key to the very functioning of institutions.

Bowden 9 - Peter Bowden (University of Sydney, Australian Association for Professional and Applied Ethics). "In Defense of Utilitarianism." SSRN. June 1st, 2009. http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1534305

The most significant reason for advocating utility theory however, is that it is useful and usable. The institutions in our society – the professional, industry and special interest groups, as well as organisations in business and government, plus the not for profit sector – are faced with many ethical decisions, often complex and difficult, requiring considerable thought, and eventually resolution. The moral issues that arise in these contexts are fundamental to the institutional functioning of our society. Yet very few people have training in moral philosophy. They need a relatively straightforward way of making these decisions – of telling right from wrong. Mill, it will be argued, provides that method. Many who have no training that are faced with these ethical choices will rely on intuition. Perhaps they will use a set of values learned at home, or from their schooling or their church. As we shall see for the more difficult ethical issues, however, intuition is an unreliable guide. If they have training, they may remember virtue ethics, or Kant's deontology, but as I shall also argue later, these theories do not necessarily give straightforward and acceptable answers. The statement that some ethical issues are difficult to resolve should generate little disagreement. Any teacher of professional ethics can identify issues where the profession disagrees on the ethics of a particular practice. Reverse auctions, for instance, where providers of the product or service bid increasingly lower prices, have generated debate on whether we are sacrificing quality or safety for a lower price. Front end loading, where the work items executed earlier are loaded 3 with a higher percentage of the supplier's overheads has generated a similar debate. Whistleblowing is yet another issue where the ethics are debated – whether the person revealing the wrongdoing is ignoring the ethical obligation of loyalty to his or her employer. Or whether the risk of retaliation and losing one's job outweighs the moral obligation to reveal the truth. We are also all aware of the concept of group think, where people in an organisation tend to accept the prevailing opinion, rather than question it. This may have been a cause behind many of the ethical failures seen over recent years in HIH, James Hardie, the Australian Wheat Board and other companies. The fact that no executive spoke out against the unethical behaviours then practised tells us that those who want honesty and transparency were not confident enough of themselves or their judgement to speak out. Alternatively, the failure to speak out may have been due to the tendency to find a justification for an unethical action. Wheat Board people possibly convinced themselves for instance, that they were acting in the best interests of the Australian farmer, and therefore of the nation. And so the national benefits outweighed the negatives of their action. A relatively straight forward way to cut through such fuzzy thinking would be the prior resolution of many of these issues. Utilitarianism, it will be argued, provides that method. It would give those who wish to live and work within an ethical environment stronger tools with which to decide how they should react.

Bostrom '2

Nick, PhD, Faculty in Philosophy at Oxford, "existential risks: analyzing human extinction scenarios and related hazards," <https://www.nickbostrom.com/existential/risks.html>

Existential risks have a cluster of features that make it useful to identify them as a special category: the extreme magnitude of the harm that would come from an existential disaster; the futility of the trial-and-error approach; the lack of evolved biological and cultural coping methods; the fact that existential risk dilution is a global public good; the shared stakeholdership of all future generations; the international nature of many of the required countermeasures; the necessarily highly speculative and multidisciplinary nature of the topic; the subtle and diverse methodological problems involved in assessing the probability of existential risks; and the comparative neglect of the whole area. From our survey of the most important existential risks and their key attributes, we can extract tentative recommendations for ethics and policy:

Second, duties and rights develop based framework devolves into consequentialism. Duties develop because of relative good and maximizing good. Rights, freedom, and autonomy are only impactful because of their ability to interact with the physical world which necessitates a perspective that maximizes benefits.

Contention 1 – Space Debris is on the brink. SQ doesn't solve.

a) Low earth orbit is currently congested with space debris. It is currently at it's brink and will constitute a huge threat if things get worse. David 21'

(Leonard David, April 14, 2021, "Space Junk Removal is Not Going Smoothly",
<https://www.scientificamerican.com/article/space-junk-removal-is-not-going-smoothly/>)

A Space Age "tragedy of the commons" is unfolding right under our nose—or, really, right over our head—and no consensus yet exists on how to stop it. For more than a half-century, humans have been hurling objects into low-Earth orbit in ever growing numbers. And with few meaningful limitations on further launches into that increasingly congested realm, the prevailing attitude has been persistently permissive: in orbit, it seems, there is always room for one more. After so many decades of the buildup of high-speed clutter in the form of spent rocket stages, stray bolts and paint chips, solid-rocket-motor slag, dead or dying satellites and the scattered fragments from antisatellite tests—all of which could individually damage or destroy other assets—low-Earth orbit is finally on the verge of becoming too crowded for comfort. And the problem is now poised to get much worse because of the rise of satellite "mega constellations" requiring thousands of spacecraft, such as SpaceX's Starlink, a broadband Internet network. Starlink is but one of many similar projects: Another mega constellation from a company called OneWeb is already being deployed. And Amazon's Project Kuiper is seeking to create a mega constellation of up to 3,200 satellites in the near future. As the congestion has grown, so too have close calls between orbiting assets. The International Space Station, for instance, regularly tweaks its orbit to avoid potentially hazardous debris. Worse yet, there has been an uptick in the threat of full-on collisions that generate menacing refuse that exacerbates the already bad situation. Consider the February 2009 run-in between a dead Russian Cosmos satellite and a commercial Iridium spacecraft, which produced an enormous amount of debris. ADVERTISEMENT Finding ways to remove at least some of all that space junk should be a top global priority, says Donald Kessler, a retired NASA senior scientist for orbital debris research. In the late 1970s he foretold the possibility of a scenario that has been dubbed the Kessler syndrome: as the density of space rubbish increases, a cascading, self-sustaining runaway cycle of debris-generating collisions can arise that might ultimately make low-Earth orbit too hazardous to support most space activities. "There is now agreement within the community that the debris environment has reached a 'tipping point' where debris would continue to increase even if all launches were stopped," Kessler says. "It takes an Iridium-Cosmos-type collision to get everyone's attention. That's what it boils down to.... And we're overdue for something like that to happen.

b) Current solutions fail to solve – laser blasts, solar sails, ELSA-d, and so on. The only solution is to stay out of space. David 21'

(Leonard David, April 14, 2021, "Space Junk Removal is Not Going Smoothly",
<https://www.scientificamerican.com/article/space-junk-removal-is-not-going-smoothly/>)

Kessler's nightmare scenario has yielded no shortage of possible debris-flushing fixes: nets, laser blasts, harpoons, giant foam balls, puffs of air, tethers and solar sails—as well as garbage-gathering robotic arms and tentacles—have all been proposed as solutions for taking out our orbital trash. A new entrant in grappling with this worrisome state of affairs is the just launched End-of-Life Services by Astroscale Demonstration (ELSA-d) mission. ELSA-d is a two-satellite mission developed by Astroscale, a Japan-based satellite services company: it consists of a "servicer" satellite designed to safely remove debris from orbit and a "client" one that doubles as an object of interest. The project aims to showcase a magnetic system that can capture stable and even tumbling objects, whether for disposal or servicing in orbit. Following a multiphase test agenda, the servicer and client will then deorbit together, disintegrating during their fiery plunge into Earth's atmosphere. ADVERTISEMENT ELSA-d is now circling in Earth orbit. The mission was lofted on March 22 via a Russian Soyuz rocket that tossed scads of other hitchhiking satellites into space. Following the liftoff, Astroscale's founder and CEO Nobu Okada said ELSA-d will prove out debris-removal capabilities and "propel regulatory developments and advance the business case for end-of-life and active debris removal services." The launch is a step toward realizing "safe and sustainable development of space for the benefit of future generations," he said. Although ELSA-d and other

technology demonstrations of its ilk are unquestionably positive developments for clearing orbital debris, they should not be mistaken for cure-alls. Despite their modest successes, such missions are falling short of addressing the dynamic dilemma at hand, and the **proliferation of space junk continues essentially unabated.** “From my perspective, **the best solution to dealing with space debris is not to generate it in the first place.**” says T. S. Kelso, a scientist at Celestrak, an analytic group that keeps an eye on Earth-orbiting objects. “Like any environmental issue, it is easier and far less expensive to prevent pollution than to clean it up later. Stop leaving things in orbit after they have completed their mission.”

c) Private company clean ups fail – multiple warrants prove; Overcrowding will become a problem long before debris removal can take on a significant scale, high costs, and contestation over who will pay. Daily brief 18’

(Daily Brief, 10/1/2018, “Space Debris threatens global economy and security”,
<https://dailybrief.oxan.com/Analysis/DB238840/Space-debris-threatens-global-economy-and-security>)

Actively removing debris from orbit presents enormous technical challenges, but various techniques are proposed or under development. Magnets, nets or harpoons could be used to capture debris. Last month the United Kingdom's RemoveDebris research satellite successfully used a net to capture a satellite for the first time. It will test a harpoon next year, and also a sail that could be used to pull debris into the atmosphere by increasing atmospheric drag. Plasma beams could be used to deflect debris into the atmosphere. Japanese and Australian researchers last month reported testing this successfully in a lab. Lasers could be used to heat part of an object so that its orbit is altered by the force from the material being burned off. Chinese researchers published a numerical simulation demonstrating this possibility earlier this year. **However, on current trends, overcrowding will likely become a serious problem long before active debris removal is possible on any significant scale.** Even when it is, the costs of the clean-up will be high and who should pay for it will be fiercely contested.

Contention 2 – Private companies uniquely increase space debris, pushing it past the brink

Three reasons:

a) One of the biggest concerns of private property rights in space is pollution.

Cherian and Abraham 07'

Cherian and Abraham 07 (Jijo George Cherian and Job Abraham are is a Final Year Students of law, B.A.LLB (Hons) degree program, at the National University of Advanced Legal Studies in Kochi, India, 2007, "Concept of Private Property in Space – An Analysis," The Journal of International Commerical Law and Technology)

One of the primary concerns is the degradation of celestial bodies in exercise of property rights granted to persons. The International community fears whether degradation of celestial bodies would have a negative impact on the environment of the Earth. Man seems to have an inherent trait to alter the ecology of his habitat sometimes knowingly, sometimes unknowingly. Space is one of the very few realms that mankind has not been able to effectively pollute, but even that challenge is being overcome. The issue of space debris is one of such concern. Even in the absence of private players, space debris is now assuming alarming proportions, especially since mankind's contribution to the increase in space debris is substantial. In the event that there exists a possibility that, the climate of earth maybe negatively affected, a thorough study must be undertaken to swot up the possible repercussions of such degradation. And if property rights are indeed deemed to be fit to be incorporated into space law, the issue of pollution of space environment will need to be addressed on "war footing". Another classical example is the offer of the company TransOrbital. It is a private company that, through its "TrailBlazer lunar orbiter," is offering the "first delivery service to the moon". TransOrbital claims it is "the only private company to be authorized by the [U.S.] State Department and [the National Oceanic and Atmospheric Administration] for commercial flights to the Moon". The company's delivery system will take capsules that contain items of the customer's choice, including business cards, jewellery, art, and cremated remains, to the Moon. While, it maybe argued that such action is detrimental to the ecology of the moon, it cannot be said to be the first of its kind. Although the various Space treaties explicitly prohibit the conducting of nuclear tests in space, space tourism will cause its fair share of problems including despoilment of the moon surface

b) Private companies are given the unique permission to launch as many space object as they want without check back – they exponentially increase debris.

Haskins 18'

(Caroline Haskins, May, 08,2018, The Future, "Private Space Companies no longer have to follow the law",

<https://theoutline.com/post/4469/outer-space-treaty-commerce-free-enterprise-bill-spacex-blue-origin-boeing-lockheed-martin>)

It just got a whole lot easier for private companies to launch satellites, rovers, and spacecrafts, and pursue future industries like asteroid mining. The catch? The U.S. is completely ignoring what's outlined in a 51-year-old treaty designed to keep space peaceful and war-free. The Space Commerce Free Enterprise Bill, which passed the House of Representatives yesterday, works off the Outer Space Treaty, which the United States and dozens of other countries signed in 1967 and serves as a basic framework for keeping space safe and accessible for every country. Countries can't own property on behalf of their own nation, and they're liable for any private activity from their country. But the U.S.'s new bill won't apply every part of the Outer Space Treaty to private companies. In other words, the U.S. doesn't believe that it's liable for activities of private space companies like SpaceX or Blue Origin. The bill also bundles almost all space mission approvals under one roof, the Office of Space Commerce, to try and encourage as many companies as possible to launch objects into space. The office would be in charge of

everything from a theoretical asteroid mining industry to private space stations, which have been proposed as tourist attractions by companies like Blue Origin.

- c) Private entities don't need coordination with one another. With no governing body to coordinate between private entities activities into space, there isn't a way to track their space activity and hazardous debris they produce. This is a unique issue with private entities.**

Contention 3: Devasting Impacts

a) Satellite Damage

Space Debris poses a huge danger to Landsat Satellites – just in 2017 there were 300,000 close calls, even debris a little bigger than a paint fleck can cause significant damage. EROS 20'

(Earth Resources Observation and Science Center, January 8, 2020, "Space debris remains ongoing concern landsat and other satellites", <https://www.usgs.gov/news/space-debris-remains-ongoing-concern-landsat-other-satellites>)

There is no question but that they pose concerns for Landsat satellites, said Doug Daniels, Principal Systems Engineer with The Aerospace Corporation at the Earth Resources Observation and Science (EROS) Center. "Absolutely, space debris is something that the Landsat flight operations teams and the mission managers worry about on a daily basis." Daniels said. "Avoiding any type of collision with orbiting spacecraft or a piece of space debris ... everything the team does is paramount to ensuring that doesn't happen." In 2017, the U.S. government reported that it logged 308,984 close calls with space junk and issued 655 "emergency-reportable" alerts to satellite operators. The U.S. Department of Defense uses what it calls the Space Surveillance Network to detect, track, and catalogue the many human-made items swirling around the planet using a global network of telescopes. The clutter in low Earth orbit—described as the space up to 1,250 miles from the planet's surface—has grown rapidly in the last 15 years. On Jan. 11, 2007, the Chinese government destroyed an aged Fengyun-1C weather satellite in a missile test, creating an estimated 2,500 pieces of new debris; On Feb. 10, 2009, a defunct 1,900-pound Russian Cosmos satellite and a 1,200-pound Iridium Communications Inc. satellite collided at 22,300 mph some 490 miles above Siberia, creating even more debris; Potential threats continue to exist with other orbiting, decommissioned satellites. Many of these will slowly decay in orbit for 100-plus years before burning into the atmosphere. Today, more than 23,000 known man-made fragments larger than about four inches—a little wider than two golf balls across—zip around our planet. Those are just the pieces large enough to track. An estimated 500,000 pieces between 0.4 inches and 4 inches across are also littering space. For a satellite to be hit by debris and survive, it would likely have to something as small as a paint fleck. Daniels said. "Any time that you have a satellite that is hit by space debris, it's bad." he said. "The outcome is never going to be positive. It really doesn't take that much." While monitoring tools can assess the orbital debris environment and give Landsat operators a week or more to avoid potential collisions, there are other times when they only have a few hours to react, Daniels said. In either case, the well-being of Landsat isn't left to the Hollywood image of a flight operator nervously commanding the satellite with a joystick 400-plus miles below.

The first impact is food uncertainty. Satellites are crucial to crop monitoring and gives agricultural sectors key information about where and when to plant crop. This information is uniquely key during climate change. Haynes et al 2021'

(Keelin Haynes, Mary Mitkish, Chris Justice, September 23, 2021, "Landsat 9 to further nasa's food security missions", <https://earthobservatory.nasa.gov/blogs/fromthefield/2021/09/23/landsat-9-to-further-nasas-food-security-missions/>)

"Landsat 9 provides a critical extension of the Landsat data record for monitoring our food supplies and helping to inform and address crucial decisions in how we manage, grow and adapt our food production sustainably under a warming climate, with an increasing population and growing demand for food." The next generation of Earth observation satellites is scheduled to launch in just a few short days. The ninth sensor in the NASA/USGS Landsat program will continue the mission's critical work in monitoring how the surface of the Earth has changed in the near-50 years since the first Landsat satellite was launched. Landsat has enabled a number of applications in diverse fields including forest management, fire, and climate. The system has also found extensive use in monitoring global agriculture and food security applications. Landsat revolutionized what it means to monitor agriculture, analyze crop conditions and estimate crop yields. Provided by advancements in satellite imagery and technology, the ability to remotely monitor crops over large areas and in difficult to access places on a regular basis has lowered on-the-ground labor requirements while simultaneously increasing the amount of analysis that can be performed. Advancements

in spatial and temporal resolution, or how “zoomed in” and frequently the imagery is obtained, combined with new computing capabilities have created a variety of novel applications that have completely shifted what is possible in terms of agricultural monitoring and research.

Inefficient farming within the context of climate change leads to massive food shortages – we must preserve satellites for efficient farming. Alexander 17’

(Peter Alexander, et al, May 2017, “Losses, inefficiencies and waste in the global food system”, <https://www.sciencedirect.com/science/article/pii/S0308521X16302384>)

The global food system is subject to the conflicting pressures of delivering the food demanded by an expanding and increasingly affluent population, while helping to achieve environmental sustainability (Godfray et al., 2010, Tilman and Clark, 2014). Along with rising population, higher consumption rates for commodities such as meat and milk, due to rising incomes (Kearney, 2010, Keyzer et al., 2005, Tilman et al., 2011), and increasing non-food demands for agricultural commodities, principally for bioenergy (Müller et al., 2008), all increase the pressures on agriculture. This situation is further complicated by climate impacts, leading to changes in land suitability and crop and animal yields (Müller and Robertson, 2014, Nelson et al., 2014). Meeting food demands either by expanding agricultural areas, causing land use change, or the intensification of production (i.e. seeking higher yields through the use of greater inputs, such as fertilisers, pesticides or water, or changes in management practices) have the potential to cause environmental harm, including greenhouse gas emissions (GHGs), deteriorating soil quality, use of scarce water and biodiversity loss (Cassman, 1999, Johnson et al., 2014, Smith et al., 2013). These impacts need to be reduced, particularly GHGs (currently 30% of all anthropogenic emissions (Le Quéré et al., 2015)) if international climate change targets are to be met (Benton and Bajželj, 2016). Achieving greater food security in a sustainable manner requires improved food system efficiency. Production practices and consumer preferences, including diet and waste rates, influence the efficiency of the food system in producing agricultural biomass and its use in meeting human nutritional requirements (Smil, 2004). Approaches to achieving this objective have considered changes to agricultural production systems (Garnett et al., 2013, Smith, 2008, Tilman et al., 2011), the role of diet and the potential for demand side measures (Bajželj et al., 2014, Lamb et al., 2016, Smil, 2013, Stehfest et al., 2009), and the reduction of food waste (Gustavsson et al., 2011, Hall et al., 2009, Smith, 2013).

The second impact is climate change predictions. Without satellites, it is impossible to assess climate change, predict future consequences and create effective policies.

Chaturvedi 20’

(Aditya Chaturvedi, 1/30/2020, “How satellite imagery is crucial for monitoring climate change, <https://www.geospatialworld.net/blogs/satellites-for-monitoring-climate-change/>)

“If you can’t measure it, you can’t manage it”, said María Fernanda Espinosa Garcés, President of the United Nations General Assembly at the COP 24 in Katowice Poland, summing up how crucial satellites are for measuring climate change. Satellite measurements of Earth’s temperature, greenhouse gas emissions, sea levels, atmospheric gases, dwindling ice and forest cover etc, are essential for improving the understanding of Climate change and predicting future of the Earth. Innovation such as miniaturization of sensors, high-speed data transfer, and upgraded storage capabilities have made satellites an integral part of the climate change mission. It is simply inconceivable to assess climate change sans insights provided by satellites. Without precise data and other inputs provided by satellites, environmentalists and scientists won’t be able to understand, analyze and predict the impact of climate change, and policymakers won’t be able to formulate effective strategies. Using an array of satellites, organizations like NASA, NOAA and ESA monitors ocean conditions, clouds, temperature, sea levels and heat content, to get information on how fast Earth’s temperature is changing. ESA map shows ocean salinity Satellite data provides authoritative information about more than half of the 50 crucial climate change variables. These insights include satellite radar altimetry, which measures distance between a satellite and the earth’s surface and gives us precise information about sea levels. Atmospheric chemical composition and greenhouses gases like Methane are also measured using satellites. Currently, there are around 162 satellites in-orbit that measure the various indicators related to climate change. New generation satellites have enhanced optical and temporal resolutions that have improved weather forecasting, climate modeling and the ability to obtain real-time details. Within the next five years, many new satellite missions will be launched, including Eumetsat’s second-generation polar-orbiting satellites, third-generation Meteosats and Chinese satellites.

b) Kessler Effect and entrapment

Collisions of space debris cause fragmentation, producing an uncontrollable cascade of growing debris – this creates a dangerous barrier around earth's low orbit.

Liou and Johnson '8 [J.-C. Liou- ESCG/ERC,, Nicholas L. Johnson - Orbital Debris Program Office, NASA Johnson Space Center. "Instability of the present LEO satellite populations" Advances in Space Research 41 (2008) 1046–1053]

Since the launch of Sputnik 1, space activities have created an orbital debris environment that poses increasing impact risks to existing space systems, including human space flight and robotic missions. Although the Space Shuttle and International Space Station normally operate in the relatively pristine regime between 200 and 400 km above the Earth, their large cross-sectional areas yield collision rates comparable to their smaller robotic cousins in the more densely populated, higher altitude regions. Three accidental collisions between cataloged satellites during the period from late 1991 to early 2005 have already been documented (Anon, 2005), although fortunately none resulted in the creation of large, trackable debris clouds. Currently, more than 9000 Earth orbiting man-made objects, with a combined mass exceeding 5 million kilograms, are tracked by the US Space Surveillance Network (SSN) and maintained in the US satellite catalog (Anon, 2006). As the satellite population in the low Earth orbit (LEO, 200–2000 km altitude) region increases, the probabilities of mutual collisions among orbiting objects also increase. High collision activities may produce more fragments than those removed by drag in some altitude regimes. This off- balance may lead to a collision cascade such that collision fragments induce more collisions in the environment (Kessler and Cour-Palais, 1978; Eichler and Rex, 1990). The concept of "critical density" was pioneered by Kessler (1991) to characterize this uncontrollable population growth. Additional studies, based on analytical, semi-analytical, and numerical approaches, were carried out by various groups to analyze this phenomenon (Su, 1993; Rossi et al., 1994; Anselmo et al., 1997; Kessler, 2000; Kessler and Anz-Meador, 2001; Krisko et al., 2001a). These studies adopted different model assumptions, initial conditions and future launch rates. Some of them even included different postmission disposal measures in the simulations. They all came to a similar conclusion that, indeed, the LEO debris populations at some altitudes would be unstable. Collisions would take over as the dominant debris generation mechanism, and the debris generated would feed back to the environment and induce more collisions.

The impact is making earth's low orbital impossible to travel through. Welsh 12'

(Jennifer Welsh, Oct 4, 2012, "Space Debris Could Trap Us on Earth", <https://www.businessinsider.com/space-debris-could-trap-us-on-earth-2012-10>)

We think of space as a big empty expanse, but closer to Earth, the space just beyond the outer reaches of our atmosphere are teeming with satellites and broken bits of space debris. Based on an idea called the Kessler syndrome, these defunct satellites and space debris could potentially cut us off from accessing space, since even the tiniest piece of debris could take out a rocket, space shuttle or space station. These tiny pieces of debris are created when two larger satellites collide. There are probably tens of millions of pieces of space debris. The Guardian explains: Back then, NASA employee Donald Kessler, together with colleague Burton Cour-Palais, proposed that as the number of satellites rose, so would the risk of accidental collisions. The resulting debris would take out further satellites, sparking a chain reaction that would swiftly encircle the planet with a vast cloud of debris. Orbits would then become unusable

because anything placed up there would be sandblasted into smithereens, exacerbating the problem.

Eventually our access to space would be lost

C4: No private appropriation solves

A) Preventing private companies from entering space is key – private entities are able to escape through legal loopholes and prevent any meaningful agreements and negotiations. Smith 21'

(Adam Smith, 8/9/2021, "Space Debris is blocking our path off the planet and legal loopholes mean Earth's governments don't have to care", <https://www.newsbreak.com/news/2335529276985/space-debris-is-blocking-our-path-off-the-planet-and-legal-loopholes-mean-earth-s-governments-don-t-have-to-care>)

Over the five decades since there have been attempts to update space law, but the basis of this legal framework remains the same, O'Grady says – and now that private companies are investing billions into breaching the final frontier, the holes in the rulebook are beginning to get bigger. The Outer Space treaty, for example, does place limits on certain actions: if a state launches something into space, it is the responsibility of the state. However, private companies have a much greater scope to ventures into space – as demonstrated by Luxembourg's growing private space industry and the heated competition between Blue Origin and SpaceX. "The ways that states have seemed to adapt to the new commercial space age isn't to create a new Outer Space Treaty or an updated Space Treaty, which would govern on a global level; instead, what nations have done is passed unilateral legislation, domestic legislation, granting their own nationals property rights in space", O'Grady says. The motivation to enact legislation that created the Outer Space Treaty 60 years ago simply is not there, O'Grady continues, because the length of time it takes to negotiate any international agreement simply cannot keep up with the developments that could be made in a tech industry born out of a "move fast, and break things" philosophy.

B) There's a time constraint now. The more private companies enter space, the harder it becomes to create better space regulations. This means any risk of solvency comes from putting a stop to private appropriation. Smith 21'

(Adam Smith, 8/9/2021, "Space Debris is blocking our path off the planet and legal loopholes mean Earth's governments don't have to care", <https://www.newsbreak.com/news/2335529276985/space-debris-is-blocking-our-path-off-the-planet-and-legal-loopholes-mean-earth-s-governments-don-t-have-to-care>)

This lack of legislation gives companies the freedom to develop quickly without heavy legal constraints – although O'Grady does not believe this is a "prime motivation" for why the laws are yet to be properly updated. The underlying driver is the price tag. National budgets have been too low to give Nasa the funding it needs, but private investors in Boeing, SpaceX, and others are the shot in the arm that governments believe the space industry requires. That's not to say that these companies do not also benefit from government funding, of course. In 2015, it was reported that SpaceX, Tesla, and other companies associated with Mr Musk received an estimated \$4.9 billion in government support, and the company has benefitted from further spending since. The bottom line, nevertheless, is that this apathy from elected representatives towards regulating the space industry has resulted in the space waste becoming a huge issue, and one that could get worse. "The more that space becomes accessible to more private entities ... the harder it is to change the rules" O'Grady says, likening the situation to playing sports: you can't decide the rules as you go, they must be set before the game begins.

C) Staying out of space allows space debris to disintegrate – this rectifies space fragmentation and is the only way to solve. Smith 21'

(Adam Smith, 8/9/2021, "Space Debris is blocking our path off the planet and legal loopholes mean Earth's governments don't have to care", <https://www.newsbreak.com/news/2335529276985/space-debris-is-blocking-our-path-off-the-planet-and-legal-loopholes-mean-earth-s-governments-don-t-have-to-care>)

Fortunately, **there is time left for humanity to rectify its situation. Low altitude space** (550 kilometres) **can recover from a series of fragmentations over approximately half a decade,** Aaron C. Boley, associate physics professor at The University of British Columbia, told The Independent – although higher altitudes (700 kilometres) can take ten times as long to recover. “**Even if fragmentations were to take place at low enough altitudes that we might expect the orbits to recover in a few years, the situation would still be largely disruptive.** Plus, energetic fragmentations, such as a satellite-satellite collision or explosion, will place debris on a wide range of orbits”, Professor Boley says, **although it is unlikely that it would ever reach a situation where humanity would absolutely trap itself on Earth.**