### intro

#### “Injustice anywhere is a threat to justice everywhere.”

#### It is because Martin Luther King Jr’s words continue to ring true to this day, that I affirm the resolution:

#### The appropriation of outer space by private entities is unjust.

### fw

#### Observation 1 – because the resolution uses the word “just”, the most important value for today’s debate is justice

#### In order to evaluate justice, we should use the criterion of the veil of ignorance

#### Observation 2 – to better understand the resolution, defining important terms is key:

#### Justice is defined as:

**Pachamama Alliance ND** (Pachamama Alliance, global community with purpose of creating a sustainable future that works for all, ” What is Social Justice?”, https://www.pachamama.org/social-justice/what-is-social-justice

Social justice is the equal access to wealth, opportunities, and privileges within a society. A Brief History of Social Justice Social Justice as a concept arose in the early 19th century during the Industrial Revolution and subsequent civil revolutions throughout Europe, which aimed to create more egalitarian societies and remedy capitalistic exploitation of human labor. Because of the stark stratifications between the wealthy and the poor during this time, early social justice advocates focused primarily on capital, property, and the distribution of wealth. By the mid-20th century, social justice had expanded from being primarily concerned with economics to include other spheres of social life to include the environment, race, gender, and other causes and manifestations of inequality. Concurrently, the measure of social justice expanded from being measured and enacted only by the nation-state (or government) to include a universal human dimension. For example, governments today measure income inequality by only comparing people within the same nation. But social justice can also be applied on a broader scale at the level of humanity as a whole. As the United Nations states: “Slaves, exploited workers and oppressed women are above all victimized human beings whose location matters less than their circumstances.”

#### The veil of ignorance acts as a moral decision-making device by philosopher John Rawls that filters through biased information. When using the veil, one would not know who they would be in this new society, i.e. when creating the ideal society they would aim to achieve equal conditions for all as they may be subject to conditions of the lower class.

#### Prefer the veil

#### Morality – it provides the most moral decision making as we navigate what is best for everyone especially marginalized communities

#### Equality – a world created with the veil is the most equal as it prioritizes the whole and not a particular subgroup

### contention 1

#### contention 1 is exploitation

#### The act of space exploration itself is unjust – that means the affirmative is the quickest route to winning fw and the ballot

#### private space exploration fuels expansion of inequality

**Ward 19** (Peter Ward, master’s in business journalism from Columbia University Graduate School of Journalism, “The unintended consequences of privatising space”, Science Focus, 11/6/19, <https://www.sciencefocus.com/space/the-unintended-consequences-of-privatising-space/>) // el

The forces driving human expansion into space are changing. For decades, the world’s most fearsome superpowers chose space as the battleground on which to fight for scientific superiority. The United States and the USSR sprinted to the stars, spurred on by the nationalist bluster of the Cold War. Pride and paranoia fuelled the race, as two clashing political philosophies went head to head in a galactic face-off – the communist all-for-one spirit of the Soviets against the fearless frontier, r cowboys of the United States. When the Cold War cooled, and later the Soviet Union collapsed, the two countries began to cooperate. The end of international competition in the cosmos failed to take space exploration to new levels, however, and something of a lull took hold of humanity’s ambitions in the wider Universe. Space enthusiasts often express a bitter regret that after the Moon landing in 1969, progress stalled. By now we were supposed to have bases on the lunar surface, hotels orbiting the Earth, and colonies on Mars. The reality has been a lot less inspiring. Government-led agencies have achieved amazing things since the Moon landings, but none have captured the attention of the world in the same way. Some of those jaded space-lovers happened to be extremely wealthy and took it upon themselves to build a private space sector capable of re-energising the pursuit of our cosmic goals. Now, these companies have taken up the baton, and the likes of SpaceX, Blue Origin, Virgin Galactic, and many other companies are looking to make up lost ground in the mission to explore and ultimately colonise the Solar System. This presents the world with an interesting question. If space is a clean slate, abundant with opportunity and a sense the species can “reset” its mistakes, is the private sector and capitalism the best driving force to take us there? In 2009, when SpaceX celebrated its first successful launch, the company did something very simple that hadn’t been done before – it published its prices. This allowed a host of entrepreneurs to put together business plans and investment proposals which had real figures, and a clear path to profits. This was a landmark moment for the private space sector. Not only was the price to launch into space transparent, it was also dropping steadily. There are many industries in space, most of which have been operating for decades already. The most prominent is the satellite sector, which has been launching great hunks of metal into lower Earth orbit ever since the success of Sputnik in 1960. Boosted by cheaper launch prices and new microsatellite technology which has seen devices shrink to the size of a loaf of bread, companies are now launching more and more satellites into space, and that has consequences. The small area of space around our planet is becoming quite crowded, and the potential for damaging and expensive collisions has increased. This is just one area where the private sector is gaining ground and making a large impact. Space tourism – a concept only enjoyed by seven people so far – is about to make a resurgence, led by Virgin Galactic. And as the International Space Station approaches the end of its lifespan, it seems inevitable a private company will either take over operation of the most expensive public project ever or will launch their own versions. These are all activities relatively close to home, but they will have major repercussions – both good and bad – here on Earth. An increase in space tourism could spread the benefits of the overview effect, where astronauts see the world from outside its atmosphere, and appreciate its fragility and lack of borders. If more people were to view the world in such a way, the theory goes, they would appreciate the futility of war and the need to care more for a planet in dire need of better treatment. When the European Space Agency launches a mission into space, Mark McCaughrean explains the hurdles they have to leap to finally get it off the ground But space tourism companies need to make money, and it’s never going to be cheap to send anyone to space. In the worst-case scenario, the practice becomes another symptom of the world’s massive inequality problem, where the rich pay hundreds of thousands to go into space for a matter of minutes, while the millions on the surface struggle to feed themselves. In the 1990s, the Russians attempted to privatise the Mir space station, but before business took off, they brought the craft crashing down to Earth as the nation cooperated with America on the ISS. There are several companies now looking to establish the world’s first private space station. This would bring obvious benefits – it would open up space as a laboratory to anyone who could pay, and would theoretically bring down the costs of manufacturing in space. But space isn’t the bastion of free-floating freedom some think it is, and it’s ripe for exploitation by monopolies. A space station operator, for example, could decide which fibre optics manufacturer could use its facility and which could not. The fibre optics produced in a zero-gravity environment are much cleaner and more valuable than that produced on Earth, meaning that one company would have a massive advantage, and the space station would decide who had access to the best manufacturing conditions. That’s just one example of a potential monopoly, but if you go further into the future of space exploration, things only get more frightening. Imagine a colony on the Moon or Mars run by a corporation. That one company would control everything the colonists need to survive, from the water to the oxygen to the food. That’s a dangerous amount of power for any company, but it’s a very real scenario. So what stops a major corporation landing on the Moon and setting up a colony? One very old document. The Outer Space Treaty was signed in 1967 by all of the major space-faring nations, and explicitly states nobody can go to another planet or the Moon and claim that territory for their own. It’s a very important document, but it’s flawed. For one thing, the private space sector wasn’t around when the treaty was written so it’s not clear how some of the rules would be applied to private companies. And secondly, given the ambitions of many countries and corporations, there’s no way it’s going to last much longer. Anyone with a plan to land on the Moon or Mars and stay there is going to run into the Outer Space Treaty, and the smart money is on the wealthy and powerful winning out against an old loophole-ridden document. Politicians such as Ted Cruz in the United States have already called for changes to be made to the treaty, and given the increasing amounts of money private space companies spend on lobbying in the United States, more such attempts will follow. It’s imperative that the space community as a whole takes this issue on to ensure the needs of all, and not just the private sector, are taken into account should any alterations be made. The further we look into the future of humans in space, the more reality resembles science fiction. That’s why it’s difficult to make people take the issues which could potentially arise seriously. But now is the time to consider the problems that could arise from a commercially-led space race, and take the necessary small steps now to avoid potentially disastrous consequences in the future.

#### That exploitation makes social equality impossible

**Klein 21** (Lauren Klein, Spring contributor, “The billionaire space race showcases the failures of capitalism”, Spring, 7/23/21, <https://springmag.ca/the-billionaire-space-race-showcases-the-failures-of-capitalism>) // el

Discussions of space travel inevitably involve talk of dreams. Shortly after launching into space for the first time on July 11th, self-proclaimed “tie-hater, adventurer,” and billionaire Sir Richard Branson of the UK tweeted an inspirational sentiment about dreams: “To the next generation of dreamers: if we can do this, just imagine what you can do.” With videos of himself twirling and somersaulting in a spacecraft all over his social media pages, the whole stunt will undoubtedly serve as good publicity for Branson’s space tourism company, Virgin Galactic. Nine days later, Jeff Bezos followed Branson into space for a few brief moments. Incidentally, Bezos also cited a childhood dream as his motive for going to space and also happens to own a space tourism company called Blue Origin. Thanks to substantial funding from NASA, Elon Musk is also developing his own company, SpaceX, and aims to launch humans into space by 2024. Dreams of inequality For most of us on planet Earth, the ultimate dream is to survive increasingly volatile conditions on this planet. We are living in a year of wildfires in British Columbia, California, and Northwestern Ontario, as well as flooding in Western Europe and the New York Subway. Not to mention the global pandemic, which continues to rage in many countries due to continued vaccine inequality. Meanwhile in the United States, roughly 31 million people don’t have access to healthcare, 6 million faced eviction in June of 2021, and over 500,000 were recently estimated to be homeless. In 2020 alone over 400 people became billionaires worldwide. In this context of extreme wealth inequality, the dream of space travel starts to seem unbelievably indulgent. But Branson and Bezos’ voyages are only the beginning of a new industry. Space tourism is estimated to generate $8 billion in profits by 2030. It’s not a childhood dream that propels billionaires into space, it’s profit and a colonial desire to expand and conquer. In a phrase that recalls the language of the British Empire, it’s been said that space tourism is soon to become “the crowning jewel of capitalism.” Claiming innovation, progress, and the fulfillment of lofty childhood dreams, Branson, Bezos, and Musk are competing for profits in a new industry that is far more destructive than it is progressive. Contributing no new innovation, space tourism poses a serious threat to the environment and requires funds that could vastly improve the lives of people on earth. Big Fucking Rockets Elon Musk’s initial name for the rockets he hopes will one day establish a colony on Mars was Big Fucking Rockets, or BFRs. After rechristening them more decorously as ‘Starships’ and running more tests, Musk plans to reuse these rockets up to five times. He claims this will make them greener and more affordable. In competition with Branson, Bezos also claims that Blue Origin’s rockets are greener than Virgin Galactic’s. In reality, no rocket is even remotely “green.” Rockets produce 100 times more CO2 per passenger than airplanes. Moreover, CO2 and other gases emitted by rockets can linger in the stratosphere and mesosphere for two to three years, during which time they erode the ozone layer and contribute to heating. The only environmentally friendly approach to space travel would be to simply not travel to space. We don’t need greener rockets or any privatized space travel. The time left to halt climate change is dwindling rapidly and wasteful, destructive tech will only speed irreversible environmental destruction. These billionaires’ false claims of concern for the environment are almost as troubling as the emissions themselves. In 2006, Branson pledged 3 billion towards research on environmentally friendly fuels. For this, he received a United Nations Correspondents Association Citizen of the Year Award. Yet Virgin Galactic aims to eventually launch 400 space flights a year. 600 people have already made reservations for a brief tour of space at the price of $250,000. These hypocritical performances of concern for the environment only divert attention from Branson’s culpability in the climate crisis. Financial costs Not only is space travel not green, it is not remotely affordable either. Most space ventures cost at least several billion dollars. The Toronto Star argues that given their combined net worth of $400 billion, the space musketeers could pay for the entire world to be vaccinated and end homelessness in America while remaining billionaires. Instead, they further pollute the environment in showy displays of ostentatious wealth for a mere several minutes in space. The ultimate dream for most people is a stable life, including access to enough resources. And this is achievable. The Earth gives us everything we need and more. We should be spending as much of our resources as possible figuring out how to redistribute wealth and treat the environment with the respect it deserves. And to achieve this means not only taking on the billionaires, it means taking on the capitalist system which produces them.

### contention 2

#### contention 2 is the environment

#### commercial space tourism vehicles cause massive pollution

**Heilweil** 21 (Rebecca Heilweil, reporter for Open Sourced covering emerging technologies artificial intelligence and logistics, “How bad is space tourism for the environment? And other space travel questions, answered”, Recode Vox, 7/25/21, <https://www.vox.com/recode/22589197/space-travel-tourism-bezos-branson-rockets-blue-origin-virgin-galactic-spacex#:~:text=The%20emissions%20of%20a%20flight,space%20tourism%20becomes%20more%20popular>.) // el

5. What impact will commercial space travel have on the environment? The emissions of a flight to space can be worse than those of a typical airplane flight because just a few people hop aboard one of these flights, so the emissions per passenger are much higher. That pollution could become much worse if space tourism becomes more popular. Virgin Galactic alone eventually aims to launch 400 of these flights annually. “The carbon footprint of launching yourself into space in one of these rockets is incredibly high, close to about 100 times higher than if you took a long-haul flight,” Eloise Marais, a physical geography professor at the University College London, told Recode. “It’s incredibly problematic if we want to be environmentally conscious and consider our carbon footprint.” These flights’ effects on the environment will differ depending on factors like the fuel they use, the energy required to manufacture that fuel, and where they’re headed — and all these factors make it difficult to model their environmental impact. For instance, Jeff Bezos has argued that the liquid hydrogen and oxygen fuel Blue Origin uses is less damaging to the environment than the other space competitors (technically, his flight didn’t release carbon dioxide), but experts told Recode it could still have significant environmental effects. There are also other risks we need to keep studying, including the release of soot that could hurt the stratosphere and the ozone. A study from 2010 found that the soot released by 1,000 space tourism flights could warm Antarctica by nearly 1 degree Celsius. “There are some risks that are unknown,” Paul Peeters, a tourism sustainability professor at the Breda University of Applied Sciences, told Recode. “We should do much more work to assess those risks and make sure that they do not occur or to alleviate them somehow — before you start this space tourism business.” Overall, he thinks the environmental costs are reason enough not to take such a trip.

#### That hurts marginalized communities disproportionately

**United Nations 17** (United Nations, Department of Economic & Social Affairs, “Climate Change and Social Inequality”, 10/17, <https://www.un.org/esa/desa/papers/2017/wp152_2017.pdf>) // el

4 Effects of inequality on exposure to climate change hazards In general, exposure tends to be determined primarily by the location of dwelling and work. Given the location, however the exposure is influenced by the nature of work and tasks performed for livelihood. Both economic and political channels of influence of inequality play a role in determining the location and livelihood. 4.1 Greater exposure to flood, erosion, salinity, mudslides, etc. According to Neumann et al. (2015), a significant part of the population in developing regions now live in “low-elevation coastal zone” and 100-year flood plains, and their number is increasing in both absolute terms and as proportion of the population (Table 1). In general, coastal and near-shore habitats and their ecosystems are more exposed to the Table 1 Population living in low-elevation coastal zones and 100-year flood plains in developing countries Population Low elevation 100-year flood plain Region 2000 2030 2000 2030 2000 2030 Africa 811 1562 54 109 13 24 Asia 3697 4845 461 640 137 200 Latin America & Caribbean 521 702 32 40 6 8 Total 5029 7109 547 789 156 232 Least Developed Countries 645 1325 93 136 World 6101 8626 625 939 189 282 Source: B. Neuman et al., 2015, tables 4 and 5 (scenario B). Scenario B is based on projections from UN population data at the “low end” of global population growth, meaning global population is expected to be 7.8 billion by 2030. It also assumes inclusive social, political and economic governance. In other words, the most generous of the four scenarios examined in the paper – the other three have higher estimates. CLIMATE CHANGE AND SOCIAL INEQUALITY 1 3 effects of climate change (Barbier, 2015). Generally, it is the disadvantaged groups, who find themselves compelled to live in these areas, because they cannot afford to live in safer areas. A large percentage of the populations of low elevation coastal zones are rural – 84 per cent in Africa, 80 per cent in Asia, 71 per cent in Latin America and the Caribbean and 93 per cent in the least developed countries (Neuman et al., 2015). As is known, the incidence of poverty is greater in rural areas than in urban areas. It is also instructive that more people now live in deltas, which are frequently subject to flooding of both types – coastal flooding due to sea level rise and river flooding due to higher precipitation (Table 2). Researchers find that more of the people living in the precarious parts of the deltas belong to the disadvantaged groups (Lou et. al 2015 and Brouwer et al. 2007). In addition to flooding and erosion, the people living in coastal areas and in deltas also suffer from salinity intrusion (Dasgupta et al., 2014 and Rabbani et al. 2013). Shameem et al. (2014) estimate that 70 per cent of farmers in some coastal areas partially or fully ceased farming due to high levels of salinity. Due to their concentration in coastal areas and deltas, the disadvantaged groups are thus more exposed to salinity intrusion caused by climate change. However, greater exposure of the disadvantaged groups to climate hazards is not limited to rural areas only. Even among urban populations, it is the disadvantaged groups that are particularly exposed to climate hazards. An example of this can be observed in Dhaka, Bangladesh, where Braun and ABheure (2011) find that slum dwellers are more likely to live in areas prone to natural hazards. In general, many slums are located in low-lying spots of urban areas that are at high risk of flooding. Similarly, in many \*table\* Latin American countries disadvantaged groups are found to set up their dwellings along risky hill slopes in urban areas, exposing them to mudslides that are becoming more frequent due to climate change (Painter, 2007). 4.2 Greater exposure to drought, heatwaves, water scarcity, etc. About 40 percent of the Earth’s land surface and 29 percent of the world’s population live in arid, semi-arid, and dry sub-humid aridity zones, which are facing additional challenges due to climate change (Table 3). There is a larger concentration of disadvantaged groups of people (such as pastoralists and ethnic minorities) in these areas (WRI, 1997). Two thirds of the global population are estimated to live under conditions where water is severely scarce for at least one month of the year (Mekonnen and Hoekstra, 2016). This exposure is expected to increase with climate change. For example, the number of people exposed to droughts could rise by between 9 and 17 per cent by 2030 under scenarios where emissions growth rates aren’t reduced (Winsemius, et al., 2015). Drought exposure is also higher in rural than in urban areas (43 per cent versus 32 per cent, respectively). Given larger concentration of the people under the poverty line living in rural areas, this implies greater exposure to draught for the disadvantaged groups of people. Cross-country data also point to greater exposure of the disadvantaged groups to water scarcity. In countries with lower human development indexes (HDI), this exposure is much greater (50 per cent) than in countries with higher HDI (14 per cent) (Christenson, et al., 2014). Given the higher rates of households engaged in agricultural production in rural areas and in low income countries, the rates of exposure of disadvantaged groups to droughts is likely to increase further with climate change. 4.3 Effect of inequality on exposure via the political channel Often the compulsion to live in areas that are more exposed to the adverse effects of climate change is of politico-administrative nature, reflecting the political channel of causality noted in Section 3. For example, Mutter (2015) notes that both economic and administrative restrictions led to the concentration of large numbers of disadvantaged people in the Irawaddy Delta that was hard hit by the cyclone Nargis in 2008. Often economic and political factors interact and combine to influence the location decision and exposure to climate hazard. For example, economic and racial factors combined in creating the large concentration of low-income African American people in the low-lying districts of New Orleans before hurricane Katrina (Mutter 2015). 4.4 Greater exposure of disadvantaged groups via occupation and type of tasks Given the location, an important role in determining the exposure to climate hazards belongs to occupation and type of tasks performed. For example, whether somebody works outdoors and the degree to which a person’s tasks depends on weather and climate are important determinants of exposure. Needless to say, inequality plays an important role in the choice or allocation of occupation and type of tasks performed. Apart from income and asset inequality, gender and other types of inequality play an important role in this regard. For example, rural women’s lower asset positions as well as land tenure Table 3 Dry lands populations (estimations as of 1995) Region Population (million) Dry lands population (million) Africa 720 326 Americas & Caribbean 1093 182 Asia 3451 1475 Developing Regions 4533 1983 World 5702 2130 Sources: WRI, 1997. CLIMATE CHANGE AND SOCIAL INEQUALITY 1 5 arrangements and social restrictions limit the land available to them. This leads women farmers to work on more marginal land which is exposed to greater climate related hazards (Perez, et al., 2015). Also, social norms in many places require the women to collect water and firewood, often compelling them to travel long distances and confront hazardous situations in places where these are scarce. Consequently, they face greater exposure to adverse effects of climate change. 5 Effects of inequality on susceptibility to damages caused by climate change Given the same level of exposure, the disadvantaged groups are generally more susceptible to damage from climate hazards. As noted above, of the people living in the same floodplain, those with houses constructed of flimsy materials are more susceptible to damage from flood than those with houses made of sturdy materials. Similarly, in an arid area, people having air conditioning are less susceptible to health damages from excessive heat than those who do not have such facilities. The livelihoods that the disadvantaged groups find compelled to pursue may also increase their susceptibility to damage from climate hazards. Wodon et al. (2014), for example, report that the poorest households in five MENA countries – Algeria, Egypt, Morocco, Syria, and Yemen – experienced higher losses of income, crops, livestock and fish caught due to climate related changes than did the rich households. Lost income reported for the lowest income households was more than double the rate for the richest (46.4% vs 20.7%). Similarly, Gentle et al. (2014) find that low income households in the middle hills region of Nepal are more susceptible to damages from climate hazards than the wealthy households. Hill and Mejia-Mantilla (2015) show that low income farmers in Uganda lost greater shares of income from limited rainfall than the average farmer because of their limited options for changing crop patterns, limited ability to apply water saving technology, and limited access to agricultural extension services and water storage sources (UNDP, 2006). Patankar (2015) shows that low income families in Mumbai required repeated repairs to their homes to secure them against 2005 flood damage, and the cumulative cost often proved to be much greater as proportion of their income than it was the case for the rich. Sometimes, the disadvantaged groups suffer more climate damage even with less exposure. For example, low income households in Honduras reported considerably higher asset loss (31 per cent) due to Hurricane Mitch than did the non-poor (11 per cent), even in areas where the former had less exposure to this hurricane than the latter (Carter, et al., 2007). The disadvantaged groups are more susceptible to climate damages in part because of the lack of diversification of their assets. For example, the urban poor tend to have their savings in the form of housing stock, which is vulnerable to floods (Moser, 2007). Similarly, the rural poor often have their savings in the form of livestock, which is susceptible to droughts (Nkedianye, et al., 2011). Their situation contrasts with that of the wealthier households, who can diversify their assets, both spatially and financially and are therefore less susceptible to damage caused by climate hazards.5 One of the important ways in which inequality increases susceptibility of the disadvantaged groups to damages caused by climate change is through it health effects. Hallegatte, et al. (2016) find that the people living in poverty are more susceptible to the diseases that many climate hazards help to spread, including malaria and water borne diseases causing diarrhoea. This may be due to several reasons. For example, disadvantaged people may not have access to piped water sources, forcing them to drink water 5 The greater levels of damage as well as the more limited diversification of savings and assets feed into greater inequality of assets as a result of climate hazards. Greater susceptibility of the disadvantaged groups can therefore lead to widening of future inequality, as children of the poor families are left with diminished future capacities. 1 6 DESA WORKING PAPER NO. 152 containing pathogens during floods. Indeed, there were reports of greater incidence of diseases among residents of low-income slums in Mumbai in the wake of monsoon floods (Hallegatte, et al., 2016). Similarly, disadvantaged people suffer more adverse health effects from heatwaves and high temperatures, because they cannot afford heat alleviating amenities, including air conditioning. The greater susceptibility to health effects frequently undermines the income and asset position of disadvantaged groups in both short run and long run. In the short run, they suffer from loss of productivity, employment and income. In the long run, they suffer from loss of human capital (from lost school days, the development of chronic conditions such as stunting, and from general health and growth impacts, even future morbidity and higher mortality) (Somanathan, et al., 2014; Li, et al., 2016; Zivin and Neidell, 2014). 5.1 Gender and age inequality and susceptibility Gender and age play an important role in determining the susceptibility to damage caused by adverse effects of climate change. As noted above, the fact that women in many countries are tasked with collecting water and firewood means that they are more susceptible to damages from climate hazards (Egeru, et al., 2014 and IPCC 2014, p. 796).6 Sherwood (2013) finds that prolonged drought created poverty traps for women in Gituamba, Kenya. Using household surveys and village focus group studies conducted across nine countries in Africa, Perez et al. (2015) find that there are a number of issues affecting women that make them more susceptible to impacts of climate change than men.7 6 IPCC (2014, p. 796) notes that climate hazards increase and heighten existing gender inequalities. This happens because in many cases the women have to perform tasks that are more exposed to climate (such as fetching water from afar or gathering fuelwood from forests). 7 Among such issues are: limited control of land (in terms of both quantity and quality of land); less secure tenure; less access to common property resources; less cash to obtain goods or services; and less access to formally registered, Both the young and the old prove to be more susceptible to damage caused by climate hazards than the adults. This is not surprising, given their relative fragility. For example, IPCC reports that flood related mortality in Nepal among girls was twice as high as for women (13.3 per 1000 girls). The mortality was also higher for boys than for men (IPCC, 2014, p. 807-808). Hallegatte, et al. (2016) reports greater incidence in ailments among children following floods in Ho Chi Minh City. Heatwaves have notable effects on the elderly, particularly as they are already more likely to suffer from chronic illnesses, such as coronary heart disease or respiratory diseases that can be exacerbated by heat (Hutton, 2008). Elderly people are also more susceptible to greater health effects from floods and are less able to relocate in the event of disasters (Hutton, 2008). Elderly residents of Limpopo, South Africa lacked access to labour, necessary to construct their houses to withstand flooding. Consequently, their dwellings suffered greater damage (Khandlhela and May, 2006). These differential impacts apply across a variety of disadvantaged groups. For example, it was found in Vietnam that the elderly, widows, and disabled people – in addition to single mothers and women-headed households with small children – were most susceptible to damages caused both by floods and storms and by slow-onset events such as recurrent droughts (IPCC, 2014, p. 808-809). Similarly, Macchi et al. (2014) note that lower caste families, women and other marginal groups in the Himalayan villages in northwest India and Nepal are more susceptible to climate related effects. 5.2 Ethnic and racial inequalities and susceptibility The degree of susceptibility often depends on ethnicity and race. For example, the minority farmers, who make up the bulk of the population in the Irrawaddy delta in Myanmar, were more susceptible to damages due to lack of effective warning systems public and private external organisations that foster agriculture and livestock production. CLIMATE CHANGE AND SOCIAL INEQUALITY 1 7 and infrastructure and therefore suffered the most in terms of lost lives, incomes and assets as a result of the cyclone Nargis in 2008 (Mutter, 2015). IPCC (2014) notes the important role of social positions of different groups in determining the impact of climate change. For example, in many places in Latin America, Afro-Latinos and indigenous groups were found to suffer from disproportionate climate effects. (IPCC, 2014, p. 810). Moreover, differential effect of climate change with respect to race is found in both developing and developed countries, although in both cases low income status is also intertwined with race and ethnicity status. Effects on health were noted as an important concern regarding impacts of climate change on indigenous populations in Latin America. Climate hazards allow diseases to spread in areas where they could not previously thrive, leading to increases in rates of respiratory and diarrhoeal diseases. It has also exacerbated nutritional issues, which has further feedback effects on health outcomes for these populations (Kronik and Verner, 2010). There are also differences in susceptibility of different population groups, depending on whether they are engaged in agricultural activities or they are pastoralists. This refers both to the types of climate related effects, such as changes in rainfall that may affect crops or forage for grazing animals in different ways, and to the different lifestyles of the two groups. For example, on the one hand, pastoralists’ housing maybe temporary or less sturdy, meaning that they are more exposed to the elements. On the other hand, their way of life may limit their susceptibility because of their ability to relocate if local conditions are not conducive to their lifestyle. 5.3 Indirect market based effects of inequality on susceptibility The disadvantaged groups often prove more susceptible via the market and price changes. In the rural areas, the disadvantaged households generally do not own much land and thus are net buyers of food. Consequently, they suffer more from food price increase caused by climate hazards. By contrast, the wealthy households, owning surplus crop available for sale, may even benefit from the food price increase. In the cities, the disadvantaged groups obviously suffer due to rise in food prices, and since expenditure on food comprises a much larger share of their budget than it is the case for the rich, they suffer disproportionately more (Ivanic, et al., 2012). According to Hallegatte et al. (2016, p. 56), the poorest households in the developing world spend between 40 and 60 per cent of their income on food and beverages, compared to less than 25 per cent of wealthier households. 6 Effects of inequality on the ability to cope and recover Coping and recovery are the third channel through which the “inequality-climate change vicious cycle” works. Inequality implies less resources for the disadvantaged groups to undertake coping and recovery measures. These resources can generally take four forms: (i) households’ own (private) resources, (ii) community resources, (iii) resources provided by various non-government organisations (NGOs), including religious and philanthropic organizations and philanthropic activities of private companies, foundations, etc., and (iv) public resources provided by the government, including local governments. Disadvantaged groups are likely to be lacking in some, if not all, of these resources. As a result, their relative situation worsens further.

### contention 3

#### contention 3 is accidents

#### negligence runs rampant in commercial space endeavors

**Bartels 21** (Meghan Bartels, senior writer and science journalist, “Jeff Bezos' Blue Origin faces scathing criticism of safety and culture”, Space, 10/1/21, <https://www.space.com/blue-origin-safety-culture-concerns>) // el

With Blue Origin's second crewed flight less than two weeks away, the company is facing scathing allegations about its culture and the safety of its suborbital launch system, New Shepard. The Federal Aviation Administration (FAA) is now considering concerns related to vehicle safety that were raised in a detailed essay published by the Lioness on Thursday (Sept. 30). In the essay, 21 past and current Blue Origin employees, all but one of them remaining anonymous, raise a string of concerns about the company's culture, including allegations of sexism, corporate suppression of dissent, disdain for sustainability and a habit of prioritizing schedules above safety when it comes to New Shepard. "The FAA takes every safety allegation seriously, and the agency is reviewing the information," an agency spokesperson told Space.com in an email. The allegations come about two months after Blue Origin's founder, Amazon's Jeff Bezos, rode his company's suborbital launch system on an exultant 10-minute long flight, the vehicle's first ever crewed mission — and just days after the company announced that its next crewed mission would launch on Oct. 12. At the time, the company also identified two of the four passengers on the Oct. 12 flight: Chris Boshuizen, a co-founder of Earth-observation company Planet, and Glen de Vries, who is vice chair for life sciences and healthcare at a French software company. De Vries told The New York Times that he was not concerned about safety on the upcoming flight. "I am confident in Blue Origin's safety program, spacecraft, and track record, and certainly wouldn't be flying with them if I wasn't," he told The New York Times. "I've been to the launch site, met people at every level of the company, and everything I've seen was indicative of a great team and culture." In a statement, the company rejected the allegations aired in the Lioness piece. "Blue Origin has no tolerance for discrimination or harassment of any kind," a company spokesperson told Space.com by email. "We provide numerous avenues for employees, including a 24/7 anonymous hotline, and will promptly investigate any new claims of misconduct. We stand by our safety record and believe that New Shepard is the safest space vehicle ever designed or built." New Shepard, a reusable rocket-capsule combo, has flown 17 times without incident. A New Shepard rocket and capsule blast off from Blue Origin's launch site in West Texas. A New Shepard rocket and capsule blast off from Blue Origin's launch site in West Texas. (Image credit: Blue Origin) In an email to employees obtained by CNBC, CEO Bob Smith wrote to "reassure" workers. "First, the New Shepard team went through a methodical and pain-staking process to certify our vehicle for First Human Flight. Anyone that claims otherwise is uninformed and simply incorrect," he wrote, according to CNBC. "It should also be emphatically stated that we have no tolerance for discrimination or harassment of any kind." The essay, which reads as a scathing indictment of the company's culture, marks the second publication by Lioness, a company that bills itself as a "storytelling platform" and also works to arrange media coverage of its features. Only one of the 21 signatories is named publicly: Alexandra Abrams, who worked in Blue Origin's communications department from June 2017 to November 2019, according to her LinkedIn profile. In the statement, the Blue Origin spokesperson wrote, "Ms. Abrams was dismissed for cause two years ago after repeated warnings for issues involving federal export control regulations"; Abrams has said that she was told leadership no longer trusted her. In an interview with CBS Mornings, Abrams offered a little more detail about the group behind the essay, noting that 13 of the 21 people are or were "engineers or technical" personnel. "They span all the major programs of the company, and they also span different levels," Abrams said. Later in the interview, she noted that the group "includ[es] very senior people." Blue Origin has been lucky that nothing has happened so far. -- former Blue Origin employees The essay touches on a range of issues, but the authors highlighted safety as their motivation, calling it "for many of us ... the driving force for coming forward with this essay." The essay paints a portrait of a corporate culture that devalues safety concerns and risk management. "Some of us felt that with the resources and staff available, leadership’s race to launch at such a breakneck speed was seriously compromising flight safety," the authors wrote, comparing the situation to the environment at NASA discovered after the 1986 explosion of the space shuttle Challenger 73 seconds after launch. "Concerns related to flying New Shepard were consistently shut down, and women were demeaned for raising them," the authors wrote. "In the opinion of an engineer who has signed on to this essay, 'Blue Origin has been lucky that nothing has happened so far.' Many of this essay's authors say they would not fly on a Blue Origin vehicle." The letter is sparse on specific allegations, but three items stand out as relatively detailed concerns. One is a reference to a backlog of more than 1,000 unaddressed "problem reports" in 2018 regarding "the engines that power Blue Origin's rockets." The engine in question is likely the company's BE-3, which uses a mix of liquid oxygen and liquid hydrogen and made its first flight in 2015, according to the company's website. According to the website, the company is still testing a new model of BE-3 for use on its planned orbital vehicle, New Glenn. (Other engines Blue Origin is building include the much-delayed BE-4, which is in testing and slated for use on New Glenn and United Launch Alliance's Vulcan, and the BE-7, which is also still in development.) In addition to the engine problem reports, the essay writers also pointed to insufficient staffing on an unspecified aspect of New Shepard. "In 2019, the team assigned to operate and maintain one of New Shepard's subsystems included only a few engineers working long hours," they wrote. "Their responsibilities, in some of our opinions, went far beyond what would be manageable for a team double the size, ranging from investigating the root cause of failures to conducting regular preventative maintenance on the rocket's systems." And the essay writers also noted steps taken out of order in New Shepard's development. "Internally, many of us did not see leadership invest in prioritizing sound systems engineering practices," they wrote. "Systems engineering products were created for New Shepard after it was built and flying, rather than in the design phase; this impacted verification efforts." Abrams told CBS Mornings that, while she was employed at Blue Origin, she approached management about safety concerns reported by technical staff and was rebuffed. "Oftentimes, when I would try to reconcile what I was hearing from the engineers who were close to the vehicle versus leadership about risk and safety, I would often go to leadership and say, 'OK, how am I supposed to think about this?'" Abrams said. "Often the response would be, 'Oh, well, that person in particular doesn't have a high enough risk tolerance.'" According to the interview, the co-authors sent the essay to the FAA before publication in order to flag the safety concerns. Click here for more Space.com videos... Schedule and spending over safety The essay and Abrams' interview with CBS both connect the downplaying of risks with the company's broader culture. "You cannot create a culture of safety and a culture of fear at the same time. They are incompatible," Abrams said. In the opinion of Abrams and her co-authors, the company's blasé safety philosophy developed primarily in response to the "billionaire space race" idea that developed between three rival private space companies: Bezos' Blue Origin, Elon Musk's SpaceX and Richard Branson's Virgin Galactic. Abrams told CBS Mornings that the company's atmosphere was pleasant when she first joined, but it quickly soured. "It was great that Blue Origin was smooth and steady and slow — until Jeff [Bezos] started becoming impatient and Elon [Musk] and Branson were getting ahead," Abrams said. "Then we started to feel this increasing pressure and impatience that would definitely filter down from leadership." When asked, Abrams agreed that, at the time, competition seemed to take precedence over safety in guiding Blue Origin's decisions. The essay also ties safety lapses to competition and Bezos' personal priorities. "At Blue Origin, a common question during high-level meetings was, 'When will Elon or Branson fly?,'" the authors wrote. "Competing with other billionaires — and 'making progress for Jeff' — seemed to take precedence over safety concerns that would have slowed down the schedule." (Bezos' rivalry with Musk may be especially intense, as the two billionaires have traded barbs repeatedly over the years.) A view of a New Shepard rocket and capsule rolling out to the launch pad. A view of a New Shepard rocket and capsule rolling out to the launch pad. But the group notes other factors that they see as contributing to the deprioritization of safety as well. They wrote of a budget-conscious culture and an emphasis on slim spending even when projects were made more ambitious. "Employees are often told to 'be careful with Jeff's money,' to 'not ask for more,' and to 'be grateful,'" they wrote. And both the essay and Abrams' remarks point to increasingly aggressive contract terms for employees, including pressuring existing employees to sign non-disclosure agreements. The group also described diversity shortcomings and "a particular brand of sexism," including at high levels of the company despite its idealistic goals. "The workforce dedicated to establishing this future 'for all' is mostly male and overwhelmingly white," they wrote. "One-hundred percent of the senior technical and program leaders are men." They describe sexist remarks from two unnamed senior figures and leadership's "clear bias against women," manifested in situations like the treatment of departing employees. The essay also accuses the company of dismissing environmental concerns and Bezos of acting counter to his public donations to environmental causes. In general, the essay targets company leadership as a whole and the culture that leadership has created, with no specific allegations against Bezos, although Abrams mentioned him specifically in the CBS Mornings interview. "I think I would say to Jeff that I really wish he was the person we all thought he was and that Blue Origin was the company we all thought it was going to be," she said. Click here for more Space.com videos... Blue Origin's publicity blues The essay marks another publicity blow for Blue Origin, which appears to be deep into bickering with its rival billionaire-founded space companies. The company is sparring with SpaceX over a hotly desired contract for NASA's Human Landing System (HLS), the component designed to ferry astronauts from lunar orbit to the moon's surface, perhaps as early as 2024. NASA officials had previously said that they would like to select more than one concept for HLS funding. But in April 2021, after receiving much less funding for the project from Congress than the agency had requested, NASA decided to fund development work only from SpaceX, which had submitted a cheaper bid than the Blue Origin-led "National Team" or the third entrant in the competition, Dynetics. Blue Origin responded by filing a protest with the agency's internal Office of Inspector General (as Dynetics did as well). When that tactic failed, Blue Origin decided to sue NASA. As a result, the agency and SpaceX cannot work on HLS until November. All told, the objections will mean minimal work completed even six months after the contract's announcement. Meanwhile, in July, Bezos penned an open letter to NASA Administrator Bill Nelson offering to cover some costs of a Blue Origin HLS program in-house and raising a host of complaints about the process behind the contract. The company even raised eyebrows around its greatest success to date, Bezos' own flight. After Branson announced that he would fly on Virgin Galactic's suborbital tourism system just over a week before Bezos' announced flight date, Blue Origin dug into a bitter publicity push comparing the two flight systems. A reusable New Shepard rocket approaches touchdown at the company's West Texas launch site. A reusable New Shepard rocket approaches touchdown at the company's West Texas launch site. Such efforts perhaps didn't come as much of a surprise to the Lioness essay authors. "Billionaires may like to present themselves as altruistic, using their resources for the benefit of humanity; in our opinion, however, much of that image is an illusion created by public relations teams, underpinned by ego," the authors wrote. The essay authors note that they're happy to have billionaires fund space exploration. But they argue that it's important to consider the wider implications that an environment like the one they claim Bezos has fostered has for the space community. "In our experience, Blue Origin’s culture sits on a foundation that ignores the plight of our planet, turns a blind eye to sexism, is not sufficiently attuned to safety concerns, and silences those who seek to correct wrongs," the essay reads. "That's not the world we should be creating here on Earth, and certainly not as our springboard to a better one."

#### private space exploration accidents hold no accountability measures

**Oduntan 16** (Gbenga Oduntan, International Commercial Law at the University of Kent, “SpaceX explosion shows why we must slow down private space exploration until we rewrite law”, The Conversation, 9/12/16, <https://theconversation.com/spacex-explosion-shows-why-we-must-slow-down-private-space-exploration-until-we-rewrite-law-65019>) // el

The recent explosion of a SpaceX Falcon 9 rocket during a test on a launchpad at Cape Canaveral may have opened a Pandora’s box of legal problems previously only discussed with hushed voices in space law circles. While there is an international space law that sets out a general framework for the conduct of all space activities – including those by private firms – most of it was developed decades ago, before the rise of commercial space exploration. It is in fact not entirely clear how much regulation of space activities by private companies currently exists – particularly in relation to the liability for accidents. The ultimate blame for the Falcon 9 crash will only emerge after full investigations are complete. But if the fault does lie with SpaceX, there are reputational consequences and insurance costs for future launches for the company will likely shoot up. Government space programmes like NASA and the European Space Agency are certainly not immune from catastrophic accidents. If NASA was a car driver, its licence likely would have been revoked on account of the number of tragic explosions. In five of the worst NASA accidents since 1967, 17 brave astronauts have lost their lives and several experimental rockets, space vehicles, satellites and space shuttles have been lost. But the sharp increase in private space exploration makes it important to reconsider how the legal landscape has changed. When space accidents do happen, the rules that govern them are contained in a confusing patchwork of agreements and treaties. If an accident occurs on Earth, the liability will depend on national rules, such as the general principle of international law that holds corporate companies responsible for damages. But the Outer Space Treaty (1962) says that a state launching a probe or satellite shall be absolutely liable to pay compensation for damage – even when an accident happens on the surface of the Earth. It can, however, be unclear whether the accident happened in airspace, meaning national aviation laws can apply, or in fact in outer space. Thus, it is becoming increasingly important to determine the exact boundary between airspace and outer space territory. This is important to work out as lawyers will always try to exploit unclear frontiers. Even in cases where it is clear that space law applies to an accident involving a private company, liability is still a tricky issue. According to space law, the state where the launch takes place and which registered the space object is ultimately responsible. But a private company can be registered in a different state to the launch country, creating a lot of confusion. A solution could be to say that the state registering a certain space probe should be liable. This state would then be free to compel the company to pay damages. A rise in serious accidents? It is only a matter of time time before we see more than just launch explosions. The risk of serious space accidents will increase as the number of space objects in orbit extends into thousands. The advent of private activities will also exacerbate the problem of space debris, perhaps as private commercial use of the seas has polluted international maritime spaces. The collision of the satellites Iridium 33 and Kosmos 2251 over Siberia in 2009 is a clear example of what may become a common occurrence. Then there are the 100 to 150 tonnes of man-made space objects that re-enter Earth’s atmosphere annually. Lots of these simply burn up, but some do manage to cause damage to private property. Again, it’s only a matter of time before the first human life or limb is lost to this kind of incident. Launches of rockets and payloads are fraught with danger and quite frequently go wrong. But launch accidents appear to affect different countries in different ways. The costs involved in engaging in space station activities are mind boggling and crippling to struggling economies. Increasingly, developing states rely on commercial launchers. But if a private company launches an object that subsequently causes damage in space, the poor state will be liable. And even in those cases where the launch fails due to misfortune or the mistakes of the private launcher, such companies could still escape paying for the launch accident, as such firms often have water-tight exclusion clauses that protect them from liabilities. The bill again goes to the poor state. This is especially likely when it is a Western company working for a developing country. China on the other hand agreed to pay for a lost satellite it had launched for Nigeria. It is therefore essential that any developing state protects itself to the fullest against unsuccessful operations caused by negligent and/or accidental failures. There are also serious issues around the safety of astronauts, who have the legal right to a safe existence when in outer space. But it is unclear whether this law does – or should – extend to private astronauts. Also, a launching state currently must be notified regarding incidents involving astronauts on international missions – and it is required to assist and contribute substantially to search and rescue operations. Can a private company really supply the enormous sums or other resources that may be needed? Will the home state of the private company be willing to pay? Again, the law isn’t clear. With the increase in private participation in space experimentation and perhaps even mineral mining, the provisions governing civil liability over mishaps arising from the operations of a space station are likely to become one of the most contested areas of space law. What if a module or component part fails to function on a space station? In the absence of multilateral rules on this point, a patchwork of legal rules is gradually maintained through MOUs (Memorandum of Understanding) and other national laws such as the US Commercial Space Launchings Act (CSLA) of 1978. How will private companies fit into these as they possibly become partners? Liberalism and the private entrepreneurial spirit do have their place in outer space. But there must be carefully designed limits. The treaties and legal regime of space law has not been adequately amended to account for the rise of private space exploration. For humanity’s sake, private space exploration may have to proceed more slowly until these important issues are sorted.