# Lay AC

#### I affirm the resolution resolved: The appropriation of outer space by private entities is unjust.

#### Because the resolution questions what is unjust, and Oxford Dictionaries defines unjust as not based on or behaving according to what is morally right and fair, I value morality.

#### Appropriation: “the act of [appropriating](https://www.dictionary.com/browse/appropriate) or taking possession of something, often without permission or consent.” (<https://www.dictionary.com/browse/appropriation>)

#### Outer space: outside the boundary of the Earth’s atmosphere: prefer our definition because it’s a review of commonly used legal applications that are most rigorous in policymaking

(https://spacelaw.univie.ac.at/fileadmin/user\_upload/p\_spacelaw/EPIL\_Outer\_Space.pdf)

2. The absence of a formal definition of outer space does not mean that no general perception exists as to what is meant by outer space, even if the use of the term in natural sciences and in law may not always be exactly the same. It should be remembered that there is no definitive physical boundary between atmospheric space and extra-atmospheric space, the transition from one to the other being gradual. Although at 100 km the density of the air is but one millionth of what it is at sea level, for natural scientists these two regions of space, in some respects, may be perceived as one single whole. However, with the launching of the first satellite in 1957 the notion of outer space became inextricably linked with the exploration and uses of space by means of man-made spacecraft (→ Spacecraft, Satellites, and Space Objects). The physical and technical factors are directly relevant to the legal regulation of the region of space concerned. The atmospheric space of the earth and most of the activities in this space fall within the ambit of → Air Law. The space beyond the atmosphere is governed by space law. The ‘spatial’ element of each of the two above-mentioned branches of law is reflected in their denominations: the first being known as air (ie atmospheric) law, the second as space law, often referred to as outer space (ie extra-atmospheric) law

3. The legal regimes governing → airspace and outer space are fundamentally different. Thus, logically and jurisprudentially it is necessary to know where air space ends and outer space begins. In theory, there must be no ‘outer’ boundary of application of space law, since outer space itself is limitless, but in practice space law, keeping pace with the development of space technology, does not purport to regulate space activity beyond the solar system (see Art. 1 Agreement Governing the Activities of State on the Moon and Other Celestial Bodies [(adopted 18 December 1979, entered into force 11 July 1984) 1363 UNTS 3]). At the same time, ‘celestial bodies’ of the solar system, other than the earth, but comprising the Moon, are included in the legal notion of outer space (→ Moon and Celestial Bodies). This follows from the title and text of the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and other Celestial Bodies ([signed 27 January 1967, entered into force 10 October 1967] 610 UNTS 205) (‘Outer Space Treaty’)

#### Private entity:

(https://www.law.cornell.edu/definitions/uscode.php?width=840&height=800&iframe=true&def\_id=6-USC-625312480-168358316&term\_occur=999&term\_src=title:6:chapter:6:subchapter:I:section:1501)

(A) In general Except as otherwise provided in this paragraph, the term “private entity” means any person or private group, organization, proprietorship, partnership, trust, cooperative, corporation, or other commercial or nonprofit entity, including an officer, employee, or agent thereof.

#### The value criterion is maximizing the greatest amount of good or pleasure, also known as utilitarianism. prefer this value criterion for the following reasons

#### 1] The only facts that have stood the test of time are that pleasure is good and pain is bad, so err heavily on the side of intuition: our biological programming has evolved over hundreds of thousands of years to avoid pain, meaning that we should be concerned with avoiding it

#### 2] Death is the worst impact under utilitarianism because it causes a lot of pain and denies the ability for us to gain future pleasure.

#### 3] All policies entail tradeoffs, which means we must aggregate consequences — Even if they win their framework is more theoretically true, the only one that can be used in the real world is mine as policy will always have trade offs between good and bad, and an unconditional right to strike clearly has more good impacts than bad

## Contention 1 - Inequality

#### Space development cements inequality by favoring the rich

**Edythe 12’ - Dr. Edythe Weeks in her book on Space Development International Relations and Space Law in 2012** [“Outer space development, international relations and space law : a method for elucidating seeds” Newcastle upon Tyne, Cambridge Scholars Publishing]cdm

The global community is experiencing economic recession, natural disasters, lack of opportunity, employment anxiety, failing K-12 programs, widening inequality gaps, uprisings, revolutions, revolts, unmet educational goals, and a general failure to uplift, inspire, and provide meaningful opportunities for significant portions of our population. In the United States of America, the wars in Iraq and Afghanistan failed to jumpstart the economy; the Dow Jones failed; Wall Street failed; millions of working people lost their houses to foreclosure; tent communities and homeless populations are on the increase; many people are experiencing depression, anxiety, career anxiety; we see alarming rates of people dropping out of high school and college; and there is a general lack of opportunities, along with high rates of job loss. People need something that will allow them to focus anew their talents, energies, abilities, and gifts, and use this bleak climate as an opportunity for positive change. Outer space development is emerging as an answer to this state of crisis. The question is: To whom will the benefits accrue? Many strategic decisions have already been taken regarding space development of which the global general public is unaware. Once legal rights to space resources are granted, only those with the capital to take advantage of new laws and policies will be in a position to profit from the new space industries. Only those who are in a position to know about outer space development will be in position to take advantage of the opportunities. It is important to remember that the global general public has for several decades being paying the start-up costs for space exploration research, science, and technology. It‘s not too late to factor in equality before an infrastructure of inequality is forever with us as we venture to establish the final frontier.

#### The exclusivity of space exploration marginalizes billions and biases scientific efforts

**Edythe 14’ - Dr. Edythe Weeks Acta Astronautica 2014** [Ayodele Adekunle Faiyetoleb “Science, technology and imaginable social and behavioral impacts as outer space develops” Volume 95, February–March 2014, Pages 166–173]cdm

Nations characterized as “developing” and therefore, perceived as uninterested in outer space, may now be very interested in playing a key role in the development of outer space and its vast resources. For example, there is the aspect of information technology, which has brought about unprecedented opportunities for global and peaceful cooperation, and has paradoxically been used to display shows of technological rivalry or war. Here is a telling insight: The world’s first geosynchronous satellites were launched by NASA. The first was launched on February 14, 1963. Syncom 2 was launched July 26, 1963, becoming the world’s first successful geosynchronous satellite. Posi-tioned over the Atlantic, the satellite set new records in long range communications including a telephone con-versation between President John F. Kennedy and Niger-ian Prime Minister Abubakar Tafawa Balewa. The following year, on August 19, 1964, Syncom 3 was hurled into geosynchronous orbit and positioned above the Pacific near the International Date Line. Shortly after the arriving on station, the satellite transmitted a TV relay of the Olympic Games in Tokyo, Japan, the first TV program ever to span the Pacific from synchronous orbit. For several years the two satellites served as primary com-munication links between Southeast Asia and the wes-tern Pacific ( [14]). As communication satellite technology developed, international cooperation grew. Industry growth and international development has fostered peaceful coopera-tion between nations. Cooperation is a more logical and harmonious way for space activities and exploration. “In 1984 President Reagan articulated an interest in construct-ing an international space station for commercial, techno-logical, and scientific purposes. The international community heeded this call in September 1988 by signing the International Space Station Multilateral Intergovern-mental Agreement” ( [34]: 81). Following the success of the International Space Station (ISS), which was built on the peaceful working together of the erstwhile cold war countries of USA and Soviet Russia, it has demonstrated working together with global partners is even more achievable. Therefore, outer space could be better developed using global efforts [6, 10], which could include developed and developing countries. We believe that more of this can occur if we include and involve more people in the process of outer space develop-ment. For example, Nigeria and many other countries of the global South have been “actors” during the first wave of outer space development by the transatlantic testing of long distance communication over satellites, setting a new record significantly occasioned by the communication between President John F. Kennedy and the only prime minister of an independent Nigeria, Prime Minister Abuba-kar Tafawa Balewa. Thus we would like to help effect a shift in the ideology that suggests outer space development is only important for a few people in a few nations. Outer space development is important for all humankind. If we miss this opportunity, all that will remain is more of the negative reflections on what went wrong. The resultant effect will again be that inequality has been further established causing more of the phenomenon aptly described by Seralgedin [30] as “scientific apartheid”. He states: There is a real danger that the benefits of proprietary science will serve to bring more and more to the privileged few rather than serve the needs of the billions of the marginalised poor and their children. That the developing countries will not be able to adjust fast enough to the needs of the competitive global economy of science-based production and knowledge-based income.

## Contention 2 is Mining

#### Mining creates space debris

Boley and Byers 20 (Arron, Department of Physics and Astronomy, University of British Columbia; Michael, Department of Political Science, University of British Columbia) U.S. policy puts the safe development of space at risk, SCIENCE, 9 Oct 2020, Vol 370, Issue 6513, pp. 174-175 <https://www.science.org/doi/full/10.1126/science.abd3402> EE

Mining can generate serious operational concerns. Lunar dust is a known challenge to operations on the Moon. Any surface activity could exacerbate lunar dust migration, including by lofting dust onto trajectories that cross lunar orbits, such as that of NASA's proposed Lunar Gateway (11). Moreover, without cooperation by all actors, the limited number of useful lunar orbits could quickly become filled with space debris.

On asteroids, low escape speeds will make it difficult to prevent the loss of surface material. Even if full enclosures are used, waste material may be purposefully jettisoned. Mining could also lead to uncontrolled outbursts of volatile sublimation after the removal of surface layers. Because the asteroids targeted for mining are likely to be those with small minimum orbit intersection distances, the resulting meteoroid debris streams could threaten lunar operations as well as satellites in Earth's orbit (12). In a worst-case scenario, a trajectory change resulting from mining could eventually lead to an Earth-impact emergency.

Space missions already provide some evidence of these risks. In 2019, during the course of Japan's Hayabusa2 mission, a small impactor was used to make a crater on (162173) Ryugu (13). Some of the resulting anthropogenic meteoroids could begin reaching Earth during the 2033 apparition. In 2022, NASA will test its ability to deflect an asteroid by striking (65803) Didymos B (Dimorphos) with the Double Asteroid Redirection Test spacecraft. This impact will produce anthropogenic meteoroids, with the possibility of immediate delivery to Earth (14). Although these risks are small, they demonstrate how easily human actions can change the near-Earth environment.

#### Space dust destroys spirals and exponentially accumulates through time, increasing the likelihood of collisions.

Intagliata 17 [Christopher Intagliata, 5-11-2017, "The Sneaky Danger of Space Dust," Scientific American, <https://www.scientificamerican.com/podcast/episode/the-sneaky-danger-of-space-dust/>]//DDPT

When tiny particles of space debris slam into satellites, the collision could cause the emission of hardware-frying radiation, Christopher Intagliata reports.

Aside from all the satellites, and the space station orbiting the Earth, there's a lot of trash circling the planet, too. Twenty-one thousand [baseball-sized chunks](https://www.scientificamerican.com/article/orbital-debris-space-fence/) of debris, [according to NASA](https://www.orbitaldebris.jsc.nasa.gov/faq.html). But that number's dwarfed by the number of small particles. There's hundreds of millions of those.

"And those smaller particles tend to be going fast. Think of picking up a grain of sand at the beach, and that would be on the large side. But they're going 60 kilometers per second."

Sigrid Close, an applied physicist and astronautical engineer at Stanford University. Close says that whereas mechanical damage—like punctures—is the worry with the bigger chunks, the dust-sized stuff might leave more insidious, invisible marks on satellites—by causing electrical damage.

"We also think this phenomenon can be attributed to some of the failures and anomalies we see on orbit, that right now are basically tagged as 'unknown cause.'"

Close and her colleague Alex Fletcher modeled this phenomenon mathematically, based on plasma physics behavior. And here's what they think happens. First, the dust slams into the spacecraft. Incredibly fast. It vaporizes and ionizes a bit of the ship—and itself. Which generates a cloud of ions and electrons, traveling at different speeds. And then: "It's like a spring action, the electrons are pulled back to the ions, ions are being pushed ahead a little bit. And then the electrons overshoot the ions, so they oscillate, and then they go back out again.”

That movement of electrons creates a pulse of electromagnetic radiation, which Close says could be the culprit for some of that electrical damage to satellites. The study is in the journal Physics of Plasmas. [Alex C. Fletcher and Sigrid Close, [Particle-in-cell simulations of an RF emission mechanism associated with hypervelocity impact plasmas](http://aip.scitation.org/doi/full/10.1063/1.4980833)]

#### Collisions with high-value satellites guarantee nuclear escalation.

Egeli 21 [Sitki Egeli is an assistant professor in the Political Science and International Relations Department of Izmir University of Economics. He was previously a director for foreign affairs in Turkey’s Undersecretariat for Defense Industries (SSM) and vice president in charge of the defense and aerospace sectors of an international consulting firm.] “Space-to-Space Warfare and Proximity Operations: The Impact on Nuclear Command, Control, and Communications and Strategic Stability,” Published 25 Jun 2021, <https://www.tandfonline.com/doi/full/10.1080/25751654.2021.1942681>, VM

“Amid increased tensions, perhaps even an imminent military confrontation between **two nuclear-armed adversaries**, a high-value (for example, early-warning or strategic communication) **satellite stops functioning** or communicating **instantly and inexplicably**. SSA sensors do not pick up any anomalies. **This may be the outcome of** a technical malfunction or a natural phenomenon, such as the impact of a collision with a meteoroid or piece of **space debris small enough to have evaded detection**. Alternatively, the satellite perhaps becomes the victim of a deliberate, undetected attack. Earth-to-space kinetic, electronic, or directed energy attacks would leave behind some trails. A cyberattack, which is harder to detect and attribute, is a strong possibility. So is a stealthy attack by hostile spacecraft. In fact, the adversary is known to have experimented with ominous small spacecraft that could easily conceal or disguise themselves until conducting a final maneuver to neutralize their targets. The victim would also be aware that, especially at distant GEO and HEO altitudes, SSA is not sufficiently comprehensive to detect and give warning of all suspicious or threatening movements as they happen. As suspicions abound, decision makers are faced with hard choices. Could this perhaps be the harbinger of a wider nuclear or nonnuclear **first strike**, along with which the attacker is seeking to eliminate the **possibility of retaliation** by degrading the defender’s capacity to command, control, and communicate with its forces? Should the defender react immediately before the remaining space-enabled NC3 elements are also compromised and its control over nuclear and nonnuclear forces degrades even further? In the absence of a clear-cut picture of what actually has happened, there is a risk that impending decisions will be made on the basis of insufficient and potentially **erroneous information**, and the climate will be ripe for unfounded presumptions and predispositions. The resulting ultimatums, responses, or counteractions could **set off a dangerous cycle of escalation** and tit-for-tat actions, whereby reactions and overreactions between adversaries lead to potentially catastrophic consequences. At a minimum, heightened tension in orbit would **have the outcome of spilling down to Earth** so as to further aggravate an already tense situation.?”

#### Nuclear war causes extinction.

Starr ’17 (Steven; director of the University of Missouri’s Clinical Laboratory Science Program, senior scientist at the Physicians for Social Responsibility, Associate member of the Nuclear Age Peace Foundation, expert in the environmental consequences of nuclear war; 1/9/17; “Turning a Blind Eye Towards Armageddon — U.S. Leaders Reject Nuclear Winter Studies”; <https://fas.org/2017/01/turning-a-blind-eye-towards-armageddon-u-s-leaders-reject-nuclear-winter-studies/>; Federation of American Scientists; accessed 11/24/18; TV) [AV]

The detonation of an atomic bomb with this explosive power will **instantly ignite fires** over a surface area of three to five square miles. In the recent studies, the scientists calculated that the **blast**, **fire**, and **radiation** from a war fought with 100 atomic bombs could produce **direct fatalities** comparable to all of those worldwide in World War II, or to those once estimated for a “**counterforce**” **nuclear war** between the superpowers. However, the **long-term environmental effects** of the war **could** significantly disrupt the global weather for at least a decade, which would likely **result in** a vast **global famine**. The scientists predicted that **nuclear firestorms** in the burning cities would cause at least five million tons of **black carbon smoke** to quickly rise above cloud level into the stratosphere, where it could not be rained out. The smoke would circle the Earth in **less than two weeks** and would form **a** global **stratospheric smoke layer** that **would remain for** more than **a decade**. The smoke would absorb warming sunlight, which would **heat the smoke** to temperatures near the boiling point of water, producing **ozone losses of** 20 to **50 percent** over populated areas. This would almost double the amount of UV-B reaching the most populated regions of the mid-latitudes, and it would create UV-B indices unprecedented in human history. In North America and Central Europe, the time required to get a painful sunburn at mid-day in June could decrease to as little as six minutes for fair-skinned individuals. As the smoke layer blocked warming sunlight from reaching the Earth’s surface, it would produce the **coldest** average **surface temperatures** in the last 1,000 years. The scientists calculated that global **food production would decrease** by 20 to **40 percent** during a five-year period following such a war. Medical experts have predicted that the shortening of growing seasons and corresponding decreases in agricultural production could cause up to **two billion** people to perish from **famine**. The climatologists also investigated the effects of a nuclear war fought with the vastly more powerful modern **thermonuclear** weapons possessed by the United States, Russia, China, France, and England. Some of the thermonuclear weapons constructed during the 1950s and 1960s were 1,000 times more powerful than an atomic bomb. During the last 30 years, the average size of thermonuclear or “strategic” nuclear weapons has decreased. Yet today, each of the approximately 3,540 strategic weapons deployed by the United States and Russia is seven to **80 times** more powerful than the atomic bombs modeled in the India-Pakistan study. The smallest strategic nuclear weapon has an explosive power of **100,000 tons of TNT**, compared to an atomic bomb with an average explosive power of 15,000 tons of TNT. Strategic nuclear weapons produce much larger nuclear firestorms than do atomic bombs. For example, a standard Russian 800-kiloton warhead, on an average day, will ignite fires covering a surface area of 90 to 152 square miles. A **war** fought with hundreds or thousands of U.S. and Russian strategic nuclear weapons would **ignite immense** **nuclear firestorms** covering land surface areas of many thousands or **tens of thousands** of square miles. The scientists calculated that these fires would produce up to **180 million tons** of black carbon soot and **smoke**, which would form a dense, **global stratospheric smoke layer**. The smoke would remain in the stratosphere for 10 to **20 years**, and it **would block** as much as **70 percent of sunlight** from reaching the surface of the Northern Hemisphere and 35 percent from the Southern Hemisphere. So much sunlight would be blocked by the smoke that the noonday sun would resemble a full moon at midnight. Under such conditions, it would only require a matter of days or weeks for daily minimum **temperatures** to **fall below freezing** in the largest agricultural areas of the Northern Hemisphere, where freezing temperatures would occur every day for a period of between one to more than two years. Average surface temperatures would become colder than those experienced 18,000 years ago at the height of the last Ice Age, and the prolonged cold would cause average rainfall to decrease by up to 90%. Growing seasons would be completely eliminated for more than a decade; it would be **too cold and dark** to grow food crops, **which would doom the** majority of the **human population.** NUCLEAR WINTER IN BRIEF The profound cold and darkness following nuclear war became known as nuclear winter and was first predicted in 1983 by a group of NASA scientists led by Carl Sagan. During the mid-1980s, a large body of research was done by such groups as the Scientific Committee on Problems of the Environment (SCOPE), the World Meteorological Organization, and the U.S. National Research Council of the U.S. National Academy of Sciences; their work essentially supported the initial findings of the 1983 studies. The idea of nuclear winter, published and supported by prominent scientists, generated extensive public alarm and put political pressure on the United States and Soviet Union to reverse a runaway nuclear arms race, which, by 1986, had created a global nuclear arsenal of more than 65,000 nuclear weapons. Unfortunately, this created a backlash among many powerful military and industrial interests, who undertook an extensive media campaign to brand nuclear winter as “bad science” and the scientists who discovered it as “irresponsible.” Critics used various uncertainties in the studies and the first climate models (which are primitive by today’s standards) as a basis to criticize and reject the concept of nuclear winter. In 1986, the Council on Foreign Relations published an article by scientists from the National Center for Atmospheric Research, who predicted drops in global cooling about half as large as those first predicted by the 1983 studies and described this as a “nuclear autumn.”

## Contention 3 is the Environment

#### Ozone is improving in the status quo

**UN 19**, United Nations Report, 9-16-2019, "Ozone on track to heal completely in our lifetime, UN environment agency declares on World Day.," UN News, <https://news.un.org/en/story/2019/09/1046452> Livingston RB

The phaseout of controlled uses of ozone-depleting substances has not only helped replenish the protective layer for future generations but is also helping guard human health by filtering harmful rays from reaching Earth, said [UNEP](https://www.unep.org/) shared in a[statement](https://ozone.unep.org/ozone-day/32-years-and-healing). The recognition of this success comes on [World Ozone Day,](https://www.un.org/en/events/ozoneday/) marked 16 September. This year celebrates “32 Years and Healing”; a commemoration of the international commitment to protect the ozone later and the climate under the historic [Montreal Protocol](https://ozone.unep.org/sites/default/files/2019-08/MP_Handbook_2019_0.pdf), which has led to the phase-out of 99 per cent of ozone-depleting chemicals in refrigerators, air-conditioners and other consumer products. **Since 2000**, parts of **the ozone** layer **have recovered at a rate of 1-3 per cent** every ten years, the latest [Scientific Assessment of Ozone Depletion](https://www.esrl.noaa.gov/csd/assessments/ozone/2018/)estimates. At projected rates the “**Northern Hemisphere and mid-latitude ozone will heal completely by the 2030’s**”, UNEP said, with the Southern Hemisphere repaired by the 2050’s, and Polar Regions in the following decade. UN Secretary-General, António Guterres [said](https://www.unenvironment.org/news-and-stories/statement/secretary-generals-message-world-ozone-day-2019) “**we must be careful not to neglect the ozone layer**,” as we “rightly focus our energies on tackling climate change”, spotlighting the importance of preventing threats posed by emission of ozone-depleting gases**. Regenerating the ozone has helped curb the effects of climate change** - with approximately 135 billion tonnes of carbon dioxide emissions from 1990 to 2010 averted by a strong protective shield.

#### Space launches are rapidly increasing now – commercialization destroys the ozone layer

Marais 21 Eloise Marais 7-19-2021 "Space tourism: rockets emit 100 times more CO₂ per passenger than flights – imagine a whole industry" <https://theconversation.com/space-tourism-rockets-emit-100-times-more-co-per-passenger-than-flights-imagine-a-whole-industry-164601> (Associate Professor in Physical Geography, UCL) //Jia Recut

The commercial race to get tourists to space is heating up between Virgin Group founder Sir Richard Branson and former Amazon CEO Jeff Bezos. On Sunday 11 July, Branson ascended 80 km to reach the edge of space in his piloted Virgin Galactic VSS Unity spaceplane. Bezos’ autonomous Blue Origin rocket is due to launch on July 20, coinciding with the anniversary of the Apollo 11 Moon landing. Though Bezos loses to Branson in time, he is set to reach higher altitudes (about 120 km). The launch will demonstrate his offering to very wealthy tourists: the opportunity to truly reach outer space. Both tour packages will provide passengers with a brief ten-minute frolic in zero gravity and glimpses of Earth from space. Not to be outdone, Elon Musk’s SpaceX will provide four to five days of orbital travel with its Crew Dragon capsule later in 2021. What are the environmental consequences of a space tourism industry likely to be? Bezos boasts his Blue Origin rockets are greener than Branson’s VSS Unity. The Blue Engine 3 (BE-3) will launch Bezos, his brother and two guests into space using liquid hydrogen and liquid oxygen propellants. VSS Unity used a hybrid propellant comprised of a solid carbon-based fuel, hydroxyl-terminated polybutadiene (HTPB), and a liquid oxidant, nitrous oxide (laughing gas). The SpaceX Falcon series of reusable rockets will propel the Crew Dragon into orbit using liquid kerosene and liquid oxygen. Burning these propellants provides the energy needed to launch rockets into space while also generating greenhouse gases and air pollutants. Large quantities of water vapour are produced by burning the BE-3 propellant, while combustion of both the VSS Unity and Falcon fuels produces CO₂, soot and some water vapour. The nitrogen-based oxidant used by VSS Unity also generates nitrogen oxides, compounds that contribute to air pollution closer to Earth. Roughly two-thirds of the propellant exhaust is released into the stratosphere (12 km-50 km) and mesosphere (50 km-85 km), where it can persist for at least two to three years. The very high temperatures during launch and re-entry (when the protective heat shields of the returning crafts burn up) also convert stable nitrogen in the air into reactive nitrogen oxides. These gases and particles have many negative effects on the atmosphere. In the stratosphere, nitrogen oxides and chemicals formed from the breakdown of water vapour convert ozone into oxygen, depleting the ozone layer which guards life on Earth against harmful UV radiation. Water vapour also produces stratospheric clouds that provide a surface for this reaction to occur at a faster pace than it otherwise would. Space tourism and climate change Exhaust emissions of CO₂ and soot trap heat in the atmosphere, contributing to global warming. Cooling of the atmosphere can also occur, as clouds formed from the emitted water vapour reflect incoming sunlight back to space. A depleted ozone layer would also absorb less incoming sunlight, and so heat the stratosphere less. Figuring out the overall effect of rocket launches on the atmosphere will require detailed modelling, in order to account for these complex processes and the persistence of these pollutants in the upper atmosphere. Equally important is a clear understanding of how the space tourism industry will develop. Virgin Galactic anticipates it will offer 400 spaceflights each year to the privileged few who can afford them. Blue Origin and SpaceX have yet to announce their plans. But globally, rocket launches wouldn’t need to increase by much from the current 100 or so performed each year to induce harmful effects that are competitive with other sources, like ozone-depleting chlorofluorocarbons (CFCs), and CO₂ from aircraft. During launch, rockets can emit between four and ten times more nitrogen oxides than Drax, the largest thermal power plant in the UK, over the same period. CO₂ emissions for the four or so tourists on a space flight will be between 50 and 100 times more than the one to three tonnes per passenger on a long-haul flight. In order for international regulators to keep up with this nascent industry and control its pollution properly, scientists need a better understanding of the effect these billionaire astronauts will have on our planet’s atmosphere.

#### Climate change disproportionately impacts minority communities, destroying homes, shelters, and stable living conditions – causes unbelievable amounts of violence

**Carmin Chappell 17** [Carmin Chappell. . “Climate change in the US will hurt poor people the most, according to a bombshell federal report”. 10-5-2017. CNBC. https://www.cnbc.com/2018/11/26/climate-change-will-hurt-poor-people-the-most-federal-report.html. Accessed 12-27-2021]//Jia

Climate change will hit low-income communities the hardest as it takes a toll on the U.S. in general, says a blockbuster government report released on Friday. Low-income communities in both urban and rural areas will be disproportionately impacted by climate change relative to other communities, according to the assessment, which was created by a team of over 300 experts from the government and the private sector to analyze the impact of climate change on the country. Those communities already have higher rates of many adverse health conditions, are more exposed to environmental hazards and take longer to bounce back from natural disasters. These existing inequalities will only be exacerbated due to climate change, according to the report, which is known as the Fourth National Climate Assessment. We need to take climate change seriously, Richard Branson says The report made waves in Washington despite being released the day after Thanksgiving, which prompted speculation that the Trump administration was trying to bury the findings. The assessment is at odds with the views of President Donald Trump, who has historically denied evidence of climate change. Last year, he announced that the U.S. would withdraw from the Paris Agreement, which aims to reduce global greenhouse gas emissions. Earlier this month, he tweeted, “Brutal and Extended Cold Blast could shatter ALL RECORDS – Whatever happened to Global Warming?” On Monday, Trump rejected the report’s findings about climate change’s economic impact. “I don’t believe it,” he told reporters on the White House South Lawn, as he was departing to hold campaign rallies in Mississippi. Several politicians seized on the report’s release as an opportunity to promote their own plans for mitigating climate change. On Twitter, Alexandria Ocasio-Cortez, a Democrat who was elected to represent part of New York City in Congress, touted her Green New Deal proposal, which aims to create a committee in the House that would develop a plan to generate all of the country’s electricity from renewable energy. “People are going to die if we don’t start addressing climate change ASAP,” she said in the tweet. Sen. Elizabeth Warren, a potential 2020 Democratic presidential candidate, also tweeted about the Climate Risk Disclosure Act she introduced in September, which would require publicly traded companies to disclose their greenhouse gas emissions. Health and jobs at risk Heart and lung disease, heat stroke and bacterial infections are just a few of the health consequences associated with climate change. Low-income populations “typically have less access to information, resources, institutions, and other factors to prepare for and avoid the health risks of climate change,” the report says, leaving them especially vulnerable. Lack of health insurance among the poor will also intensify the risks of illnesses caused by climate change. In urban areas, which produce 80 percent of greenhouse gas emissions in North America, the poor “live in neighborhoods with the greatest exposure to climate and extreme weather events,” the report says. This includes living near pollution sites and in housing developments without sufficient insulation or air conditioning. Additionally, disruptions to infrastructure during natural disasters can have an outsized impact on city residents who rely on public transportation. Rural areas often have agriculture-dependent economies, so the livelihoods of low-income residents are more vulnerable to changing environmental conditions. Many rural households also suffer from energy poverty, the report states, meaning they “are not able to adequately heat or provide other required energy services in their homes at affordable cost.” As average temperatures continue to rise, people who cannot affordably cool their houses will continue to feel financial strains. Disasters and ‘green gentrification’ Recent storms like Hurricane Florence and Hurricane Harvey, which brought record levels of flooding to coastal areas, also exposed inequities in disaster preparedness as poorer communities struggled to rebuild. “Some property owners can afford to modify their homes to withstand current and projected flooding and erosion impacts,” write the report’s authors. “Others who cannot afford to do so are becoming financially tied to houses that are at greater risk of annual flooding.” Even climate change prevention efforts can reflect existing inequalities, according to the assessment. “Better-resourced communities have created climate offices and programs, while response has lagged in smaller or poorer communities,” the report says. Infrastructure improvements to protect against climate change can lead to what the report calls “green gentrification,” in which property values rise and low-income residents are pushed out. To combat these inequalities, the report emphasizes the need for government officials to involve residents when developing solutions to climate change. “Decisions about where to prioritize physical protections, install green infrastructure, locate cooling centers, or route public transportation,” should be made with low-income communities in mind, according to the report.

#### And, global warming causes extinction.

**Torres ‘16** (Phil, affiliate scholar at the Institute for Ethics and Emerging Technologies founder of the X-Risks Institute “We’re Speeding Toward a Climate Change Catastrophe...and That Makes 2016 the Most Important Election Year in a Generation”, 4/101/6 <http://www.alternet.org/environment/were-speeding-toward-climate-change-catastropheand-makes-2016-most-important-election)> / MM

But nuclear terrorism probably isn’t the most significant risk that the 45th president of the United States will have to confront. Rather, this title goes to the ongoing, slow-motion catastrophe of anthropogenic climate change — a phenomenon that threatens not just the future prosperity of the U.S., but the **survival of the entire global village**. The fact is that climate change will result in a range of catastrophic consequences, including **extreme heat waves**, the **spread of infectious disease**, **megadroughts**, coastal **flooding**, **desertification**, **food supply disruptions**, **widespread biodiveristy loss** (e.g., the sixth mass extinction), **mass migrations**, **social unrest** and **political instability** — to name just a few. And multiple high-ranking U.S. officials have affirmed a causal connection between climate change and terrorism. For example, John Brennan, the current Director of the CIA, recently stated that “the impact of climate change” is one of the “deeper causes of this rising instability” in countries like Syria, Iraq, Ukraine, Yemen and Libya. Similarly, Chuck Hagel, the former secretary of defense, describes climate change as a “threat multiplier” that “has the potential to exacerbate many of the challenges we are dealing with today — from infectious disease to terrorism.” And the Department of Defense notes in a 2015 report that “Global climate change will aggravate problems such as poverty, social tensions, environmental degradation, ineffectual leadership and weak political institutions that threaten stability in a number of countries.” Consider some recent data that underline the fact that climate change is a “clear and present danger.” As of this writing, the hottest month on record was last February. It completely “obliterated” the previous “all-time global temperature record” set by — take a guess — January 2016. And January 2016 beat the previous records set by October, November and December 2015. Similarly, the hottest 16 years on record have all occurred since 2000, with only a single exception (1998). The current record-holder is 2015, followed by 2014, 2010 and 2013, but it appears that 2016 could be even hotter than 2015. This being said, climate change isn’t just a “present” danger with implications for human well-being this century. As a 2016 paper published in Nature points out, the fossil fuels that we’re burning right now could affect **future generations for up to 10,000 years**. We are, in other words, “imposing adverse changes on more humans than have ever existed.” To quote the study, co-authored by more than 20 scientists from around the world, at length: “The next few decades offer **a brief window of opportunity** to minimize **large-scale and** potentially catastrophic climate change that will extend **longer than the entire history of human civilization thus far.** Policy decisions made during this window are likely to result in changes to Earth’s climate system **measured in millennia rather than human lifespans**, with associated socioeconomic and ecological impacts that will exacerbate the risks and damages to society and ecosystems that are projected for the twenty-first century and propagate **into the future for many thousands of years.”**