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

**And value justice which is defined to give people what they are due.**

**My value criterion is Utilitarianism, which seeks to uphold the most well being for the greatest amount of people.**

1. **Death is the worst possible scenario because ontologically destroys the subject and prevents us from making moral decisions that benefit for ourselves**

1. **Degrees of wrongness -- If you were given to either lie or kill an innocent person, you would obviously choose to lie. Only util can quantify the ethical difference between different actions. Otherwise we can’t weigh between different actions so their ethical framework can’t guide action.**

**Merriam webster defines appropriation as**

 https://www.merriam-webster.com/dictionary/appropriate

**: to take exclusive possession of :** ANNEX

**Contention 1: Innovation**

**Contention one is the growth of economy and innovation**

**Going to space drives for innovation which causes the economy to grow**

**Robinson 13**:[Julie Robinson Ph.D was the former Chief Scientist for the international space station October 24th 2013, nasa.gov Benefits from steaming from Space Exploration] Acessed: July 14th 2021 <https://www.nasa.gov/sites/default/files/files/Benefits-Stemming-from-Space-Exploration-2013-TAGGED.pdf>Page 7

**Space exploration** thus **supports innovation and economic prosperity by stimulating advances** in science and technology, as well as motivating the global scientific and technological workforce, thus **enlarging the sphere of human economic activity.**

**World Economic Forum 18:** [**http://reports.weforum.org/future-of-jobs-2018/shareable-infographics/**](http://reports.weforum.org/future-of-jobs-2018/shareable-infographics/)

**The** [**world economic forum 18**](http://reports.weforum.org/future-of-jobs-2018/shareable-infographics/) **(add nuke card to show terminal impact)**

**states by the year 2022 there will be 133 million new jobs due to innovation.**

**This Innovation is greatly important because it supports our framework of utilitarianism.**

**Space appropriation also promotes competition**

**Lynn 18** [Barry Lynn, the head of the Open Markets Institute. August 7th 2018, The Economist “Why competition matters” Accessed: July 14th

[<https://www.economist.com/open-future/2018/08/07/why-competition-matters>]

Head of Open Markets Institute

There are two ways to think about competition: good competition and bad competition. Under **good competition**, we **get businesses and powerful people to compete for everyone else’s sak**e. Imagine that there are ten car companies, all competing to put out better cars. That is good. **Competition helps promote better safety, innovation and technology—and lower prices. Workers benefit too**. With ten companies, even if you don’t have good labour laws, there is an impulse to work cooperatively. Firms need to treat workers well in order to get them to work well. You want happy workers; you want the best workers.

Pushes for technology to advance at a rapid rate

Daly 20

<https://www.ibm.com/blogs/industries/ibm-space-tech-business-innovation-space-exploration/> IBM October 27, 2020 accessed July 15th 2021 James Daly writer for IBM

“How space exploration is now being fueled by business innovation”

Innovations in the terrestrial corporate world—both in products and practices—are spurring the exploration of our solar system and beyond.

NASA RELIANT ON PRIVATE:

**Markovich et al. 21** Steven J. Markovich, writer for council of foreign relations [<https://www.cfr.org/backgrounder/space-exploration-and-us-competitiveness>]  February 23, 2021 Council of Foreign Relations, Markovich et al.  writers for cfr, Accessed July 15, 2021

Historically, **85 to 90 percent of NASA’s budget went to private contractors—largely to design and manufacture rockets and spacecraf**t—while NASA maintained close oversight and operated the equipment. But now NASA often privatizes operations as well. Advocates of space commercialization believe[**private firms**](http://www.washingtonpost.com/wp-srv/special/national/nasa-newspace/)such as SpaceX and Orbital Sciences, both of which won contracts to ferry ISS cargo, can provide routine LEO access at a lower cost. They say NASA could then focus more on missions that push scientific and exploration frontiers. Some go further to suggest that NASA become more like the U.S. Defense Advanced Research Projects Agency or the National Science Foundation by setting objectives, such as capturing an asteroid, and then giving grants to private firms. But critics of privatization argue that development grants and limited competition will yield scant savings. Astrophysicist Neil deGrasse Tyson believes that while private enterprises can handle routine space flight, they are [unable to bear](https://bigthink.com/videos/neil-degrasse-tyson-bringing-commercial-space-fantasies-back-to-earth) the large and unknown risks of advancing the space frontier.

WE IMPACT ECONOMIC GROWTH:

<https://www.space.com/nasa-produces-65-billion-dollar-economic-impact-2019>

“NASA efforts had a $65 billion economic impact last year, agency report shows” Published October 13, 2020 Acessed July 29th 2021

**Howell 20**

"In this new era of human spaceflight, **NASA is contributing to economies locally and nationally,** fueling growth in industries that will define the future, and **supporting tens of thousands of new jobs** in America," NASA Administrator Jim Bridenstine [said in a statement](https://www.nasa.gov/press-release/nasa-report-details-how-agency-significantly-benefits-us-economy). "With an investment of just one-half of 1% of the federal budget, **NASA generates significant total economic output annually."**

The report estimates that NASA supported more than 312,000 jobs across the U.S., including 69,000 jobs in the agency's "[moon to Mars](https://www.space.com/mars-habitats-on-should-be-tested-on-moon.html)" initiative, which includes Artemis. As for economic impact, the report estimates NASA generated more than $64.3 billion in total economic output, with roughly 20% ($14 billion) of that coming from the moon to Mars initiative.

**​​Solar Storms destabilize entire power grids, food sources and national security–private appropriation solves**

**Basulto 14** [Dominic Basulto, the editor of Fortune’s Business Innovation Insider and a founding member of Corante.com, one of the Web's first blog media companies. He also shares his thoughts on innovation on the Big Think Endless Innovation blog and is working on a new book on innovation called "Endless Innovation, Most Beautiful and Most Wonderful.” “Extreme solar storms spark a need for innovation”. 7-31-2014. Washington Post. https://www.washingtonpost.com/news/innovations/wp/2014/07/31/extreme-solar-storms-spark-a-need-for-innovation/. Accessed 7-28-2021]

Extreme solar storms are the new killer asteroids – the intergalactic calamity that has the potential to send the human race back to the Victorian age. A solar storm wouldn’t cause physical damage the way an asteroid hurtling through space would, but it would likely cause planes to crash and power grids to fail. **A massive solar storm** similar to the one in 2012 could **wipe out GPS, satellite communication, the power grid, the Internet** – just about anything that would be affected by a sufficiently large direct electromagnetic blast from the sun. The good news is that, just as **NASA** started the ball rolling on ways to protect Earth from the threat of a rogue asteroid tumbling through space, it is now **working on a plan to protect the earth from solar storms**. Called “Solar Shield,” it’s an experimental forecasting system rigged up with a few satellites already in space. These satellites constantly monitor the surface of the sun and track the size and shape of especially large coronal mass ejections (CMEs) heading away from the sun, enabling researchers to predict where and when solar storms might hit the Earth. It’s still in testing phase, but the Solar Shield might be able to deliver advance warning of 30 minutes to power grid operators, enabling them to protect their large-scale transformers. That’s a pretty cool idea, but it’s essentially just an early warning system. It’s like telling you there’s 30 minutes until an asteroid hits your town. What’s there really to do if you’re not a power grid operator – head down to your underground bunker, unplug your electronics and wait it out? One thing that could be done now is to launch a competition to attract the best ideas from the scientific community, similar to what NASA does with its Innovative Advanced Concepts program. That’s how NASA came up with its WRANGLER scheme to capture asteroids. There are also private sector prize competitions, like the XPrize. Current XPrize competitions include the Google Lunar XPrize, which awards $30 million to the first team that can send a robot to the moon capable of performing certain tasks. The basic idea of any prize competition is relatively simple: Put out a description of what needs to be done, set defined goals, put funding against it to attract the most innovative minds, and then let them come up with a truly creative concept. Surely, a lot of the ideas for protecting the Earth from a solar storm would be purely experimental and theoretical, but there’s time to figure this out. But maybe not as much time as you might think. Researchers say the **chances of an extreme solar storm hitting the earth within the next decade are close to 12 percent**. **These storms tend to come in 200-year cycles**, and **the last big solar storm** (the Carrington event) **hit the earth back in 1859**, which was, you guessed it, **almost 200 years ago**. Northern lights were spotted as far south as Cuba and Hawaii, telegraph lines sparked and exploded, and the Victorians oohed and aahed about natural effects in the soil and in the air. Just imagine what would happen in today’s Internet era, when just about everything runs on electricity, is hooked up to the Internet, or is tracked by satellites. It’s time now to start thinking of a solution. A 12 percent chance of a massive Carrington event hitting the Earth within the next decade is scary. The **cost of a Carrington event could be close to $2 trillion** – that’s the equivalent of **20 Hurricane Katrinas.** Those are just the projected costs – we don’t really know what will happen if a Carrington event occurs in the modern Internet era, but it could **affect food and water** supplies, **health and medical facilities and** even **national security.** **As a result, the U.S. needs to be earmarking more research money** for fields like heliophysics (i.e. the physics of the sun). We now know, for example, that a **natural** “**plasma shield**” appears to protect the Earth from the direct brunt of a solar storm. A New Scientist article recently described how the Earth has a type of “plasma shield” that it uses to protect itself. It’s been noticed that, in the event of extreme solar activity, the Earth’s magnetosphere adjusts in response to the CMEs from the sun. Maybe that system **could be exploited or augmented by man-made means to create a shield that powers up or powers down anytime** NASA’s early-warning system detects unusual activity.

**Contention 2: Inequality**

**Contention two is the inequality of resources**

**The shortage of commonplace and multi use minerals prove we need to look into space for answers now**

**Cohen 07** [David Cohen, President of the Academic Board Field of Research: Exploration and environmental geochemistry. Earths Natural Wealth: An Audit, NEW SCIENTIST, May 23, 2007, at 3441, available at https://www.newscientist.com/article/mg19426051.200-earths-natural -wealth-an-audit/ Accessed July 14, 2021]

This could prove lucrative, but Prichard is motivated by something far more significant than the chance of a quick buck. **Platinum is a vital component not only of catalytic converters but also of fuel cells – and supplies are running out.** It has been estimated that if all the 500 million vehicles in use today were re- equipped with fuel cells, operating losses would mean that all the world's sources of platinum would be exhausted within 15 years. Unlike with oil or diamonds, there is no synthetic alternative: platinum is a chemical element, and once we have used it all there is no way on earth of getting any more. What price then pollution-free cities? It's not just the world's platinum that is being used up at an alarming rate. The same goes for many other rare metals such as indium, which is being consumed in unprecedented quantities formaking LCDs for flat-screen TVs, and the tantalum needed to make compact electronic devices like cellphones. How long will global reserves of uranium last in a new nuclear age? Even reserves of such commonplace elements as zinc, copper, nickel and the phosphorus used in fertiliser will run out in the not-too-distant future. So just what proportion of these materials have we used up so far, and how much is there left to go round? Perhaps surprisingly, given how much we rely on these elements, we can't be sure. For a start, the annual global consumption of most precious metals is not known with any certainty. Estimating the extractable reserves of many metals is also difficult. For rare metals such as indium and gallium, these **figures**are **kept a closely guarded secret by mining companies**. Governments and academics are only just starting to realise that there could be a problem looming, so studies of the issue are few and far between. Armin Reller, a materials chemist at the University of Augsburg in Germany, and his colleagues are among the few groups who have been investigating the problem. He estimates that we have, at best, 10 years before we run out of indium. Its impending scarcity could already be reflected in its price: in January 2003 the metal sold for around **$60 per kilogram**; by August 2006 the price had shot up to over **$1000 per kilogram**. Uncertainties like this pose far-reaching questions. In particular, they call into doubt dreams that the planet might one day provide all its citizens with the sort of lifestyle now enjoyed in the west. A handful of geologists around the world have calculated the costs of new technologies in terms of the materials they use and the implications of their spreading to the developing world. All agree that the **planet's booming population and rising standards of living** are **set to put unprecedented demands on the materials that only Earth** itself can provide. Limitations on how much of these materials is available could even mean that some technologies are not worth pursuing long term. Take the metal gallium, which along with indium is used to make indium gallium arsenide. This is the semiconducting material at the heart of a new generation of solar cells that promise to be up to twice as efficient as conventional designs. Reserves of both metals are disputed, but in a recent report René Kleijn, a chemist at Leiden University in the Netherlands, concludes that current reserves “would not allow a substantial contribution of these cells” to the future supply of solar electricity. He estimates gallium and indium will probably contribute to less than 1 per cent of all future solar cells – a limitation imposed purely by a lack of raw material.

**The plethora of asteroid resources means asteroid mining will not be fruitless**

**Erlank 16** [Wian Erlank, North-West University "Property Rights in Space: Moving the Goal Posts so the Players don't Notice" PER / PELJ 2016(19) - DOI http://dx.doi.org/10.17159/1727- 3781/2016/v19n0a1505 11-16-16 Accessed Jul 13, 2021]

The first aspect of mining in space that is usually mentioned in literature, and especially in the popular media, is that **asteroids contain** precious m**etals such as platinum, gold**, rhodium, **iridium**, rhenium, osmium, ruthenium, **palladium**, and germanium, which have been found in meteorites and will therefore also be found in asteroids.44 Iron ore is also expected to be extremely bountiful.45 **This** is of **interest** to **mining companies not** only **because the metals** and other **minerals** are present on the asteroids, **but** because **they are present in extremely high concentrations.** For example, **Planetary Resources estimates** that platinum-rich asteroids 500 meters across could contain more than the total known reserves of platinum on Earth; and a **200 km wide Asteroid, 16 Psyche**, from the asteroid belt between Mars and Jupiter, **is estimated to contain enough nickel-iron ore to satisfy demand for millions of years**.46 Even **small asteroids** could **meet** the **demand** **for** such metals for **centuries**. Questions have been raised (and answered)47 about the commercial viability of such space-mining operations,48 since the number of platinum ore-bx`earing near-Earth asteroids has been estimated by Elvis (using an impressive mathematical formula) to be 10.49 However, the number of asteroids containing water is a much more impressive 9000.50 Elvis also notes that "... the knowledge of which NEOs are ore-bearing could itself become commercially valuable intellectual property".51 This astute observation raises some rather difficult questions about the non- appropriation principle and if this principle should extent to such intellectual property.

**Asteroid mining is both economically and environmentally better–hurting the earth for minimal resource repletion isn’t just**

**MacWhorter 16** [MacWhorter, Kevin, J.D. Candidate, William & Mary Law School. “Sustainable Mining: Incentivizing Asteroid Mining in the Name of Environmentalism”. 02-2016. William & Mary Law School Scholarship Repository. https://scholarship.law.wm.edu/cgi/viewcontent.cgi?article=1653&context=wmelpr. Accessed 7-12-2021]

One may question whether asteroid mining is desirable, or even possible. There are many compelling reasons to suggest that it is: **mining on Earth is incredibly destructive to the environment** and to many societies;9 the private space industry is booming with investment and government contracts;10 and technology has come far enough to warrant serious inquiry into the future of space mining.11 This section examines each point in turn. In the next sixty years, scientists predict that certain elements crucial to modern industrysuch as **platinum, zinc, copper, phosphorous, lead, gold, and indiumcould be exhausted** on Earth.12 **Many** of these **have no synthetic alternative**, unlike chemical elements such as oil or diamonds.13 Liquid-crystal display (LCD) televisions, cellphones, and laptops are among the various consumer technologies that use precious metals.14 Further, green technologiesincluding wind turbines, solar pan- els, and catalytic convertersrequire these rare elements.15 As demand rises for both types of technologies, and as reserves of rare metals fall, prices skyrocket.16 Demand for nonrenewable resources creates conflict, and consumerism in rich countries results in harsh labor treatment for poorer countries.17 In general, the mining industry is extremely destructive to Earthsenvironment.18 In fact, depending on the method employed, **mining can destroy** entire **ecosystems** by **polluting water sources and contributing to deforestation**.19 It is by its nature an unsustainable practice, because it involves the extraction of a finite and non-renewable resource.20 Moreover, by extracting tiny amounts of metals from relatively large quantities of ore, the mining industry contributes the largest portion of solid wastes in the world.21 **The Environmental Protection Agency** (EPA) **describes**the **industry** as the **source of** more **toxic and hazardous** waste than any other industrial sector [in the United States], **costing billions of dollars to address** the **public health** and environmental **threats** to communities.22 Poor regulations and oxymoronic corporate definitions of sustainability, however, make it unclear as to just how much waste the industry actu- ally produces.23 **Platinum** provides an excellent case study of the issue, because it **is a**n extremely **rare and expensive metal**an **ore** expected to exist in vast quantities in asteroids.24 Further, production of platinum has increased sharply in the past sixty years in order to keep up with growing demand for use in new technologies.25 In fact, despite their high costs, **platinum** group **metals** **are** so **useful** **that [one] of [four] industrial goods on Earth require them in production**.26 Scholars do not expect demand to slow any time soon.27 Among other technologies, industries use platinum in prod- ucts such as catalytic converters, jewelry production, various catalysts **for chemical processing, and hydrogen fuel cells**.28 While there is no con- sensus on how far the Earths reserves of platinum will take humanity, many scientists agree that platinum ore reserves will deplete in a rela- tively short amount of time.29 With the rate of mining at an all-time high,30 it is increasingly clear that historical patterns of mineral resources and development cannot simply be assumed to continue unaltered into the future.31 The **platinum mining industry**, however, has a strong incentive to increase its rate of extraction as profits grow with the rate of demand. Without any alter- native, this destructive practice will continue into the future.32 So-called platinum-group metal (PGM) ores are mined through underground or open cut techniques.33 Due to these practices, all but a very small fraction of themined platinum ore is disposed of as solid waste.34 The environmental consequences of platinum production are thus quite significant, but like **the mining industry** in general, **the amount of waste is typically under-reported**.35 While this is due to high production levels at the moment, those levels will only increase given the estimated future demand of platinum.36 In spite of the negative consequences, mining continues unabated because it is economically important to many areas.37 The future environmental costs provide a major challenge in creating a sustainable system. Rele- gating at least some mining companies to near-Earth asteroids would reduce the negative effects of future mininglevels on Earth. The economic benefits of mining need not be sacrificed for the sake of the environment.38 For most of the Space Age, the role of private companies has been as that of government contractors.39 During the past fifteen years, how- ever, space flight has become increasingly the realm of private industry.40

**Earth Mining destabilizes the earth’s environment, contaminates water sources and permanently ruins the soil**

**Earth.org 20** [Earth.org, Environmental News, Data Analysis, Research & Policy Solutions. “How Rare-Earth Mining Has Devastated China's Environment”. 07-14-20. Earth.Org - Past | Present | Future. https://earth.org/rare-earth-mining-has-devastated-chinas-environment/. Accessed 7-18-2021]

It’s challenging to mine and process rare earths without harming the environment. The problems are related to the two primary extraction methods. The first involves removing the topsoil, transporting it to a leaching pond, **and adding chemicals** (such as ammonium sulfate and ammonium chloride) to separate out the metals. The chemicals used in this separation process can **create air pollution, cause erosion, and leach into groundwater.** The **second** processing method involves **drilling holes into the ground,** inserting PVC pipes and rubber hoses **and pumping chemicals** to flush out earth. The resulting slurry is then pumped into leaching ponds to separate out the rare-earth metal. This method **creates** the same problems as with **topsoil removal** with the addition of the PVC pipes, rubber hoses and other sundry used by mining crews remaining littered in the mines. Abandoned mines pose ongoing environmental hazards. **Remaining chemicals** can **continue to leach into groundwater.** Mines may also contain pools of wastewater that can potentially pour into local waterways. For example, **in** its **2016 report**, **China Water Risk highlighted** an **abandoned mine in Ganzhou where** untreated **chemicals flow from leaching ponds** when it rains. Problems in China The **pollution** resulting **from rare-earth** mining has **created soil** **incapable of** supporting **crops** and water supplies have been contaminated. Chinese officials have attempted to counteract these threats by shutting down a large number of mines, especially the smaller and the illegal ones, but there are still severe, large-scale threats that remain unresolved.