## 1AC - "Plan"

#### Plan - The appropriation of outer space by private entities through asteroid mining is unjust.

## 1AC - Advantage

#### Mining is inevitable down the line regardless of capital limits because of oligopolistic consolidation

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The proliferation of a lunar economy rests upon patient access to capital and fostering innovative ideas for large-scale development. At the moment, capital requirements for lunar miners are too high for companies to succeed in a perfectly competitive market. For the lunar economy, the emergence of large, vertically integrated companies will lead to the economies of scale necessary for proliferation. Terrestrially, when an industry becomes mature and beholden to traditional economics, like scarcity, a focus on profit margins takes over, and limitations emerge in the form of price manipulation and a lack of competition. As mentioned, the lunar economy will operate privately, and independent of scarcity, using profit margins to increase cash flow for innovation. An oligopoly of dedicated space holding companies, each comprised of diverse companies along the value chain, funded by the parent company and incentivized by prizes, will maintain a culture of innovation and competition. Rather than a few concentrated entities, each sacrificing their identity to their acquirer, the lunar economy will be an oligopoly of teams.

#### Commercialized proximity mining operations create dual-use deflection risks – inherent interoperability makes dangerous repurposing easy and likely

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Extensive and prolonged proximity operations will be an essential element of most types of planetary defense mitigation missions. The most technologically mature method for fragmentation or deflection of a hazardous object is through a surface, subsurface, or stand-off nuclear explosion: The tremendous impulsive force of the blast and resulting surface ablation could, in one moment, deliver the necessary velocity change to the body to miss its future collision with Earth. Time permitting, to assure exact positioning and maximum deflective or fragmentation effect, the nuclear device would be buried, anchored to the surface, or orbiting just above the asteroid, an effort that would involve precise proximity operations.

On the opposite end of the spectrum for deflecting an inbound body are the “slow push" methods, which would deliver a minute but steady deflective force to the asteroid or comet, over time providing a cumulative change in velocity. With few exceptions, every proposed slow push technique would be dependent on extended operations in close proximity to the body. Gravity tractors would hover a spacecraft near the asteroid for years or decades, slowly imparting a deflective gravitational force; an enhanced gravity tractor would first collect boulders or regolith from the threatening body, to increase the mass and gravitational pull of the spacecraft. Laser or solar ablation methods would require the stationing of a spacecraft near the asteroid to direct the ablative beam. Using thrusters or a space tug would require direct physical contact with the body for years on end, nudging it to alter its velocity. Mass driver systems would land and anchor a robotic mining apparatus on the asteroid’s surface, to cast a steady stream of regolith into space and produce a minute but steady deflective counterforce.

Similarly, asteroid or comet mining would rely entirely on the ability to conduct reliable, long-term, repetitive proximity operations. Several mining concepts have been analyzed. The most common concept would land and anchor robotic mining and support systems on the asteroid or comet; these systems would methodically drill, scrape, crush, lift, or scoop the desired minerals or ice from the body. Support systems would discard unwanted tailings and transport the ore to a processing station or collection facility. The mining operation could occur on the surface, in pits, or in caverns cut into the interior of the asteroid or comet.

Alternative mining methods include leaching minerals through the injection of high pressure steam, fully encapsulating a small asteroid or comet and capturing the escaping water as the container is heated by the Sun, and collecting water vapor from a passing comet using a spacecraft stationed in a trailing position behind it. Each of these activities would require the ability to operate on and near the surface of the body for long periods.

The commonalities between planetary defense and asteroid mining are extensive for the wide range of proximity operations. For both endeavors, hovering, orbiting, landing, and anchoring on the space body are essential competencies. The same base technologies that can be used to mine metals could be employed in burying a nuclear device to fragment an asteroid, or as a mass driver apparatus used in deflection. The technologies that could be employed to secure thrusters or a solar sail to a tumbling asteroid to change its orbit could be adapted to anchor a full suite of mining equipment to the surface of a resource-rich body.

#### That increases the risk of accidental collisions, astro-terror, and space weaponization

Mares 15 [Miroslav Mares, Professor, at the Division of Security and Strategic Studies, Masaryk University, Czech Republic. Jakub Drmola PhD student, at the Divison of Security and Strategic Studies, Masaryk University, Czech Republic. Revisiting the deflection dilemma. October 1, 2015. https://academic.oup.com/astrogeo/article/56/5/5.15/235650]

Sooner or later, in order to avoid the fate of the dinosaurs, humanity needs to develop scientific and technological capabilities to prevent extinction-level impact events. But most solutions bring about new challenges, because new technologies rarely have only one application. Here lies the dilemma: any technology allowing us to deflect asteroids from a collision trajectory with the Earth could also be used to direct them towards the Earth. This means we could potentially turn any future near-miss into an impact, with all its devastating consequences.

Sagan & Ostro (1994b) concluded that this is a risk not worth taking. Considering the very low probabilities of impacts with objects larger than 1 km (generally less than 1 in 5000 for a given century), they were more worried about the misuse of such trajectory-altering technology than the undiverted asteroids themselves. Humans visited a great deal of violence upon each other during the 20th century; war has been prevalent and increasingly technological. The beginning of the 21st century does not seem overly promising either. The risk that one of humanity's irrational totalitarian powers decides to have some nearby asteroid steered towards Earth might simply be too high. Many people still see the default cosmic odds as preferable to the lessons of recent history.

Later on, a modification of sorts to the deflection dilemma appeared, positing that the “real” dilemma (Schweickart 2004, Morrison 2010) lies in putting various parts of the Earth and its population in harm's way during a deflection attempt. Inevitably, any mission to deflect an object that is on a collision course with the Earth will involve moving its supposed point of impact across the surface until it misses the planet entirely. Should such a deflection attempt fail to modify the trajectory sufficiently, the impact would still occur, albeit in a different area. This could expose to risk countries that were not originally threatened by the asteroid (depending on its size and path), while diminishing the risk to those living near the original point of impact. The damage and casualties around this new and modified point of impact would then, to some extent, be caused by those who tried but failed to deflect the asteroid. The repercussions of such an event would certainly be grave.

Privatization and industry

Both of these versions of the deflection dilemma are essentially state-centric and neither presumes that this technology might be wielded by private companies and non-state actors. But the current trend of greater involvement of private companies in space suggests that states might be unable (or unwilling) to maintain their exclusive hold on the advanced space technologies. The private sector is currently hot on the heels of national and international space agencies in exploring feasible and economically viable options. At the moment, private companies are already in the business (or at least in the process of making it a profitable business) of resupplying the International Space Station, taking tourists to the edge of space and operating communication satellites. And, recently, a new area of potential commercialization of space, asteroid mining, has received increased attention and investment. It has already spawned private companies (such as Deep Space Industries and Planetary Resources, Inc.); this industry is highly relevant to the deflection dilemma (Ostro 1999).

While the idea of mining asteroids carries with it an air of science fiction (as all space-based endeavours do, at some stage), it is based on science fact. One of the most significant facts on which to base a space mining industry is the apparent abundance of highly valued raw materials in asteroids. Platinum, rhodium and other precious metals are extremely useful because of their catalytic and electrical properties, but are also exceedingly rare in the Earth's crust. While such metals sank deep into the planet during core formation, asteroids retained their original composition and even delivered much of the accessible reserves to our planet in the form of meteorite bombardment (Willbold et al. 2011). Some of the largest known deposits of these metals on Earth are found within ancient impact craters. Platinum-group metals are deemed critical to our modern technology-based civilization, without substitutes in many applications, and their supply is at risk of “geopolitical machinations” (Graedel 2013). The combination of natural scarcity and industrial demand leads to their high price, which easily rivals that of gold. Because space missions are inherently expensive, these precious metals are prime high-value candidates for economically viable asteroid mining. Since the projected market value of these metals within an asteroid is in the order of billions or even hundreds of billions of US dollars (depending on the size of the asteroid), the success of the industry comes down to developing technically feasible and cost-effective methods of mining them and retrieving them (Blair 2000, Gerlach 2005). The other interesting and potentially worthwhile resource we could harvest from asteroids is water. Not only is liquid water required by astronauts to survive, but it can also be broken down into oxygen and hydrogen to be used as fuel. And, while water is abundant and cheap here on Earth, it is very expensive to transport it to orbit. It costs $3000–$10 000 per kilogramme to launch water (or anything else) to low Earth orbit and about two or three times more for geostationary transfer orbit (Jain & Trost 2013). It is not the prospect of procuring something we covet here on the surface of the Earth that makes this venture attractive, but rather the idea of not having to wage an expensive battle with Earth's gravity each time we want to make use of something as mundane as water in space. If the costs associated with mining water from asteroids can be brought below the cost of launching water from Earth, this seemingly counter-intuitive industry might take off and become profitable. Additionally, through the use of some form of refuelling depots, it would probably in turn make space endeavours more affordable and sustainable. The same would apply if some of the more common metals found in asteroids (such as iron or nickel) were used to build structures directly in orbit instead of launching them from the Earth. The risks of mining asteroids There are two basic ways to go about moving the resources contained within a given asteroid to the Earth. They can be extracted from the asteroid during its natural orbit and then transported to the Earth, or the entire asteroid might be moved closer to a more convenient location before starting mining. Thus repositioned, it might even be used as a shielded habitat, once hollowed out (Ostro 1999). There are different speculative costs and benefits associated with either option, which would vary with the size, orbit and composition of the asteroid. But, crucially, the second option would entail putting asteroids into orbit around the Earth, the Moon or possibly at one of the Earth's Lagrangian points. Indeed, NASA has already planned a mission to capture a small asteroid and place it in a high cislunar orbit, where it would serve as a destination for future manned missions and experiments. This “Asteroid Redirect Mission” is to take place in the next decade and is being pitched mainly as a stepping stone towards a future mission to Mars (see box “NASA's Asteroid Redirect Mission”; Brophy et al. 2012, Burchell 2014, Gates et al. 2015).

Programmes to redirect asteroids and, especially, plans to mine asteroids on an industrial scale essentially resurrect the deflection dilemma. But it is no longer a matter of superpowers intentionally misusing technology designed to prevent dangerous impacts. It becomes an issue of proliferation among private entities. Once private mining companies acquire the technical ability to redirect suitable NEOs (Baoyin et al. 2011) in order to extract platinum or water from them, perilous inflections become more likely.

The probability of accidents will rise with the number of asteroids whose trajectories we decide to manipulate. Such accidents might be very unlikely, but even a tiny technical or human error in the execution of an inflection meant to place an asteroid into the lunar or geocentric orbit might send it crashing into the Earth with potentially devastating consequences. And while we might find solace in the low probabilities associated with such an accident, even contemporary industries which are considered very safe suffer from unlikely tragedies. Despite being dependable and reliable, airliners do crash; there are a lot of them flying and very improbable accidents do happen if the dice are rolled often enough. Undoubtedly, we will not be steering as many asteroids as we steer planes any time soon, but industries tend to be more accident-prone during their infancy. Furthermore, a single asteroid can do a lot more damage than a single plane. And who is to say how much metal or water we are going to need in space over the course of the 21st century, or the next?

The second source of risk is the intentional misuse, similar to the original deflection dilemma. But the entry barrier for asteroid weaponization gets much lower if mining them and moving them around becomes a common industrial activity. This is in stark contrast to the original scenario which envisioned this technology to be used solely for planetary defence and under control of a very small number of the most powerful countries (Morrison 2010). If such a powerful technology becomes widely and commercially available, even rogue states and well-funded terrorist groups might be tempted to use it for an unexpected and devastating attack. In addition, an active asteroid mining industry would make it more difficult to detect any hostile inflection attempts among the number of legitimate and benign ones.

#### The dilemma causes the most power WMD ever – it’s more likely than natural hits and structurally outweighs

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While asteroids loom large in the horizons of habitat and some military expansionists, they receive little attention from arms controllers and most global security thinkers. As a planetary defense project, diverting asteroids seems a logical part of a Whole Earth Security program and international space infrastructure security cooperation, but opponents of military space expansion are sharply divided about asteroidal diversion. In part these disputes carry over from Cold War nuclear debates, with Edward Teller, Darth Vader for arms controllers, pushing nuclear solutions to the asteroid threat, and arms controllers raising alarms.

An important analysis of the dangers inherent in the deflection of asteroidal bodies is provided by Carl Sagan and Stephen Ostro.67 Few figures of the Space Age have been as productive and prominent as Sagan, a planetary astronomer, science educator, and SF author.68 Over the later decades of the twentieth century Sagan’s work on planetary science, particularly Mars, his television series Cosmos, and his science fiction, most notably Contact (coauthored with Ann Druyan), made him an international celebrity and influential voice for science and space exploration. Unlike virtually all other space scientists and engineers of his era, Sagan also was active in advancing nuclear arms control, studying— and publicizing—the “nuclear winter” hypothesis and promoting cooperation in space to improve Soviet-American relations.69 Although a strong supporter of the larger habitat expansionist vision, Sagan insists large-scale space activities should occur only after nuclear disarmament and planetary habitat stability have been achieved because of an ominous asteroid “deflection dilemma.”70

The essence of the deflection dilemma is simple: species and civilizational survival inevitably will eventually require the development of the ability to deflect asteroids and comets away from Earth, but this technology also inherently creates the possibility that such objects could be directed toward the Earth. The existential stakes are clear: “the destructive energy latent in a large near-Earth asteroid dwarfs anything else the human species can get its hands on,” making them potentially “the most powerful weapon of mass destruction ever devised”71 (see Table 7.4. A and B).72 Once the population of these bodies is fully mapped, and technologies to deflect them are developed, Sagan argues, the prospects for collision increase over the natural rate due to the possibility of intentional bombardment. Given these possibilities, perhaps the reason the dinosaurs lasted for nearly two hundred million years is because they did not have a space program.

In his major book on the human space future, Pale Blue Dot, Sagan lays out several scenarios for intentional collisions. His arguments are essentially the arguments of nuclear arms controllers. Madmen exist, and some “achieve the highest levels of political power in modern industrial nations.”'3 Recalling the extreme destruction caused by Hitler and Stalin, Sagan posits the possibility that a “misanthropic psychopath” or a “megalomaniac lusting after ‘greatness’ or glory, a victim of ethnic violence bent on revenge, someone in the grip of severe testosterone poisoning, some religious fanatic hastening the Day of Judgment, or just some technicians incompetent or insufficiently vigilant” will bring about a catastrophic collision.74 Earth-approaching asteroids amount to “30,000 swords of Damocles hanging over our heads,” for which “there is no acceptable national solution.”75 And, like Cole and Salkeld (not mentioned), Sagan points to the possibilities of clandestine use of this technology.

#### Deflection attacks outweigh conventional hits –strikes bypass deterrence because attribution and detection are impossible

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Ignoring accidental deflection, which might occur when an asteroid is moved to an Earth or Lunar orbit for research or mining purposes (see this now scrapped proposal to bring a small asteroid in to Lunar orbit), there are two categories of actors that might maliciously deflect such a body; state actors and terrorist groups.

A state actor might be incentivised to authorise an asteroid strike on an enemy or potential enemy in situations where they wouldn’t necessarily authorise a nuclear strike or conventional invasion. For example, let us consider an asteroid of around 20 m in diameter. Near Earth orbit asteroids of around this size are often only detected several hours or days before passing between Earth and the Moon. If a state actor is able to identify an asteroid that will pass near Earth in secret before the global community has, they can feasibly send a mission to alter its orbit to intersect with Earth in a way such that it would not be detected until it is much too late. Assuming the state actor did its job well enough, it would be impossible for anyone to lay blame on them, let alone even guess that it might have been caused by malicious intent.

An asteroid of this size would be expected to have enough energy to cause an explosion 30 times the strength of the nuclear bomb dropped over Hiroshima in WWII.

Footnote

\* An ‘existential threat’ typically refers to an event that could kill either all human life, or all life in general. A ‘catastrophic threat’ refers to an event that would cause substantial damage and suffering, but wouldn’t be expected to kill all human life, which would eventually rebuild.

#### Even limited deflection failures cause nuke war because they look like preemptive strikes and the risk is inversely proportion to size

Lovett 19, [Richard Lovett is a Cosmos contributor, The biggest danger about an asteroid strike? Lawyers, Blasting away at incoming space rock raises real risks of nuclear war, experts say. Richard A Lovett reports, May 7, https://cosmosmagazine.com/space/the-biggest-danger-about-an-asteroid-strike-lawyers]

Governments and space agencies seeking to protect the Earth by changing the courses of potentially hazardous asteroids might face major legal hurdles, even if our planet is in the crosshairs of a bolide big enough to kill millions, experts say. One problem is what would happen if one country, worried about protecting its own citizens, attempted to deflect the asteroid, screwed up, and accidentally dumped it on a neighbour. Space law, says David Koplow of Georgetown University Law Centre, Washington DC, is based on the principle of strict liability. “The concept is that space activities are hazardous and therefore the harm should not fall on an innocent bystander,” Koplow says. Another problem stems from the fact that only a few countries have the technological ability to deflect an incoming asteroid, and there is, at present, no international authority tasked with making sure everyone else is represented in the decision-making process. In fact, says Cordula Steinkogler, a space law expert at the University of Vienna, Austria, current treaties don’t even require nations to share information about such hazards, let alone act to protect each other. She notes, however, that the United Nations charter does establish a “very general” duty for them to act toward solving international problems that affect economic, social, cultural, educational, and health wellbeing. Failure to share information can be more than just an inconvenience. To start with, says Petr Boháček, of Charles University in Prague in the Czech Republic, it could make countries wonder if, instead of international cooperation, the rule is actually everyone for themselves. It’s a particularly important problem, he says, because the nations at risk of being hit by an asteroid may not be the ones with the greatest geopolitical power. “Asteroids do not discriminate,” he notes. The nation-state concept of sovereignty, he adds, dates back several hundred years. “I’m not sure how many concepts from the seventeenth century you use in your decision-making,” he says, “but making decisions for planetary defence based on this dinosaur method of decision-making may not be the best choice.” Another problem is that the nation hit by an asteroid might see it as an attack by a foe, and retaliate. “[It] could look like the damage of a nuclear attack,” says Seth Baum, executive director of the Global Catastrophic Risk Institute, a US-based think tank, “so the prospect [of] a counterattack seems like something worth taking very seriously.” Ironically, the risk of this is probably inversely proportional to the size of asteroid. A big asteroid, capable of wiping out an enormous swath of territory, would be seen coming well in advance, and have generated a media frenzy (assuming people didn’t brand it as “fake news”).

were damaged, but amazingly nobody was killed. We’re still trying to work out how often events like this happen. Our information on the frequency of the larger impacts is pretty limited, so estimates can vary dramatically. Typically, people argue that Tunguska-sized impacts happen [every few hundred years](https://academic.oup.com/astrogeo/article/50/1/1.18/201316), but that’s just based on a sample of one event. The truth is, we don’t really know. **What can we do about it?** Over the past couple of decades, a concerted effort has been made to search for potentially hazardous objects that pose a threat before they hit Earth. The result is the [identification of thousands of near-Earth asteroids](https://cneos.jpl.nasa.gov/stats/totals.html) upwards of a few metres across. Once found, the orbits of those objects can be determined, and their paths [predicted into the future](https://cneos.jpl.nasa.gov/ca/), to see whether an impact is possible or even likely. The longer we can observe a given object, the better that prediction becomes. But as we saw with Chelyabinsk in 2013, and again in December, we’re not there yet. While the catalogue of potentially hazardous objects continues to grow, many still remain undetected, waiting to catch us by surprise. If we discover a collision is pending in the coming days, we can work out where and when the collision will happen. That happened for the first time in 2008 when astronomers discovered the tiny [asteroid 2008 TC3](https://cneos.jpl.nasa.gov/news/2008tc3.html), 19 hours before it hit Earth’s atmosphere over northern Sudan. For impacts predicted with a longer lead time, it will be possible to work out whether the object is truly dangerous or would merely produce a spectacular but harmless fireball (like 2008 TC3). For any objects that truly pose a threat, the race will be on to deflect them – to turn a hit into a miss. **Searching the skies** Before we can quantify the threat an object poses, we first need to know that the object is there. But finding asteroids is hard. Surveys scour the skies, [looking for faint star-like points moving against the background stars](https://spaceguardcentre.com/what-are-neos/finding-and-observing-asteroids/). A bigger asteroid will reflect more sunlight, and therefore appear brighter in the sky - at a given distance from Earth. As a result, the smaller the object, the closer it must be to Earth before we can spot it. Objects the size of the Chelyabinsk and Bering Sea events (about 20 and 10 metres diameter, respectively) are tiny. They can only be spotted when passing very close to our planet. The vast majority of the time they are simply undetectable. As a result, having impacts like these come out of the blue is really the norm, rather than the exception! The Chelyabinsk impact is a great example. Moving on its orbit around the Sun, it approached us in the daylight sky - totally hidden in the Sun’s glare. For larger objects, which impact much less frequently but would do far more damage, it is fair to expect we would receive some warning. **Why not move the asteroid?** While we need to keep searching for threatening objects, there is another way we could protect ourselves. Missions such as [Hayabusa](https://solarsystem.nasa.gov/missions/hayabusa/in-depth/), [Hayabusa 2](http://www.hayabusa2.jaxa.jp/en/) and [OSIRIS-REx](https://www.asteroidmission.org/) have demonstrated the ability to travel to near-Earth asteroids, land on their surfaces, and move things around. From there, it is just a short hop to being able to deflect them – to change a potential collision into a near-miss. Interestingly, ideas of asteroid deflection dovetail nicely with the [possibility of asteroid mining](https://theconversation.com/mining-asteroids-could-unlock-untold-wealth-heres-how-to-get-started-95675). The technology needed to extract material from an asteroid and send it back to Earth could equally be used to alter the orbit of that asteroid, moving it away from a potential collision with our planet. We’re not quite there yet, but for the first time in our history, we have the potential to truly control our own destiny.

#### Yes miscalc – best studies

Baum 18 (Seth Baum is Executive Director of the Global Catastrophic Risk Institute, Uncertain Human Consequences in Asteroid Risk Analysis and the Global Catastrophe Threshold, July 28, https://papers.ssrn.com/sol3/papers.cfm?abstract\_id=3218342&download=yes)

There is one important type of indirect effect that has received some attention in the broader asteroid literature, though not in any risk analysis. That is the prospect of an asteroid explosion being misinterpreted as a hostile attack with human-made explosives, thereby triggering violent conflict (Morrison 1992, p.9; NRC 2010, p.26). Were such an event to occur, the secondary effects could be much more severe than the direct effects.

Remarkably, there is precedent for the concern of asteroid collision triggering conflict via the 2013 Chelyabinsk event. Harris et al. (2015, p.838) explain:

If it had been cloudy in Chelyabinsk that morning, it may not have been immediately apparent to locals or outsiders that this was a cosmic airburst. The bright flash and huge blast, followed by the sound of heavy artillery, and parts of the city shrouded in dark smoke, could have been misperceived as an act of aggression. Snezhinsk, to the north, is the Russian equivalent of Lawrence Livermore National Laboratory in the U.S., and the region is of nuclear strategic importance. Russia, unlike its neighbor Kazakhstan in the direction from which the asteroid came, is still a nuclear-armed state. It is hard to know what would happen in the heat of the moment when there is great uncertainty about the cause of a half-megaton explosion over a Russian city.

Could such an event lead to conflict, even nuclear war? A careful study of the history of nuclear war suggests that yes, this is a possibility. In the decades since nuclear weapons were first developed, there have been several incidents in which non-military events were misinterpreted as a possible nuclear attack, initiating nuclear weapon launch decision procedures. These events include a moonrise, an ill-timed passage of a satellite, an unusual reflection of sunlight off clouds, and the launch of a scientific weather rocket (Baum et al. 2018). How close these incidents came to actual nuclear war is a matter of historical debate (Lewis et al. 2014; Tertrais 2017). Regardless, if these seemingly innocuous events can get at least partway to nuclear war, then it is not unreasonable to believe that an asteroid explosion could get all the way.

#### The mining itself increases the risk of asteroid collisions

Byers and Boley 19 [Michael Byers, Professor of Political Science at the University of British Columbia, BA in Political Studies and Phd in International Law from Cambridge, Byers has written a number of op-ed articles on space issues. Relax: An asteroid will just miss hitting Earth. But our actions could still have a deep impact. March 19, 2019. https://www.theglobeandmail.com/opinion/article-relax-an-asteroid-will-just-miss-hitting-earth-but-our-actions-could/]

Beyond the battle over resource extraction lies a more existential threat: the act of removing large quantities of mass from an asteroid could change its trajectory, potentially leading to a human-caused Earth impact. For this reason, any asteroid mining will have to be fully informed by astrodynamics, and closely regulated under international rules. And while the U.S., Luxembourg and Russia might regulate asteroid-mining companies closely with the involvement of planetary scientists, what would happen if a mining company were to incorporate a “flag of convenience state” such as Panama or Liberia? Would the same respect be paid to science and safety?

#### The collision causes extinction and outweighs everything

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US Secretary of State Rex Tillerson has just finished his visit in Moscow to discuss Syria and the threat of terrorism and other related issues with the Russian officials, but conspicuously absent from the agenda of his visit is the real and clear danger posed by the threat from space, that is, the asteroids, one of which is due to brush past earth on Wednesday, April 19. In fact, Russia and US have become allies against the asteroid threat since the signing of an anti-asteroid agreement in 2013, initiated by the then energy secretary and scientist Ernst Muniz. This agreement calls for cooperation on research on asteroid defense, raising the prospect of a US-Russia nuclear cooperation, given the potential feasibility of nukes in deflecting or destroying an incoming asteroid — for good reason. The asteroid due for a close flyby next week at a speed of some 60,000 miles per hour is over one mile long and capable of releasing the equivalent of almost 2000 Hiroshima bombs; if it hits the earth, it would cause massive tsunamis and giant fireballs wiping out a good chunk of humanity. In a twist of irony, the NASA officials have reassured us that there is “zero chance” of earth’s collision by this giant asteroid and, yet simultaneously, brand it as a “potentially hazardous object” since it is considered a “near-earth” object and also because of a small uncertainty about its size and orbit, i.e., its path’s trajectory in space, which has its own version of air pockets that can affect an asteroid’s direction, just as its collision with another asteroid can do so, as was the case with the meteor that exploded 27 miles about the ground in Russia in 2014, causing extensive damage and came by undetected from the Sun’s direction; this new one is apparently 60 times bigger, and was detected only 2011. Clearly, humanity is at risk by the asteroid threat and inaction is not an option. World’s scientists including some NASA scientists such as Joseph Nuth have recently lamented our planetary lack of adequate defence against this threat, which has been completely overshadowed by humanity’s other priorities, which pale in comparison when considering the fact that our species survival depends on an effective anti-asteroid defence — that may require the use of nuclear weapons. Yet, despite some feeble initiatives to track and monitor the asteroids, NASA had admitted that some ten percent of the incoming asteroids, i.e., over 10,000, are still not covered by their system, which requires a great deal more funding and human resources, such as increased number of observation points around the world. What is more, the present efforts in asteroid prevention are still in the stage of infancy and initial testing, basically proceeding at snail speed, again mainly due to the woefully inadequate resources committed to these projects, decried by the world’s scientists, some of whom are adamant about the need for nuclear-ready space missions as part of a contingency plan vis-à-vis any asteroid on a collision course with our vulnerable planet. This is one of several options studied at the moment, all of which are still on paper and, on the whole, out of sync with the urgency of the matter that calls for a massive allocation of new resources that, in turn, can even boost the economy by producing new jobs. Hence, it is only logical that US and Russia, which have also collaborated in promoting a UN-based asteroid information network, put aside their present cold war differences and enhance their cooperation for the sake of planetary survival. It is in the vital national interests of both nations to do so, given the common concern about the asteroid threat, that eclipses any human threat such as terrorism by a huge margin. This problem is, unfortunately, sidelined due to the preoccupation with geopolitical considerations, pointing at humanity’s folly.

#### They cause nuke war, miscalc, and extinction

Baum 19 (Executive director of the Global Catastrophic Risk Institute,“Risk-Risk Tradeoff Analysis of Nuclear Explosives for Asteroid Deflection,” May 31, 2019, https://onlinelibrary.wiley.com/doi/epdf/10.1111/risa.13339.)

The most severe asteroid collisions and nuclear wars can cause global environmental effects. The core mechanism is the transport of particulate matter into the stratosphere, where it can spread worldwide and remain aloft for years or decades. Large asteroid collisions create large quantities of dust and large fireballs; the fire heats the dust so that some portion of it rises into the stratosphere. The largest collisions, such as the 10km Chicxulub impactor, can also eject debris from the collision site into space; upon reentry into the atmosphere, the debris heats up enough to spark global fires (Toon, Zahnle, Morrison, Turco, & Covey, 1997). The fires are a major impact in their own right and can send additional smoke into the stratosphere. For nuclear explosions, there is also a fireball and smoke, in this case from the burning of cities or other military targets.

While in the stratosphere, the particulate matter blocks sunlight and destroys ozone (Toon et al., 2007). The ozone loss increases the amount of ultraviolet radiation reaching the surface, causing skin cancer and other harms (Mills, Toon, Turco, Kinnison, & Garcia, 2008). The blocked sunlight causes abrupt cooling of Earth’s surface and in turn reduced precipitation due to a weakened hydrological cycle. The cool, dry, and dark conditions reduce plant growth. Recent studies use modern climate and crop models to examine the effects for a hypothetical IndiaPakistan nuclear war scenario with 100 weapons (50 per side) each of 15KT yield. The studies find agriculture declines in the range of approximately 2% to 50% depending on the crop and location.11 Another study compares the crop data to existing poverty and malnourishment and estimates that the crop declines could threaten starvation for two billion people (Helfand, 2013). However, the aforementioned studies do not account for new nuclear explosion fire simulations that find approximately five times less particulate matter reaching the stratosphere, and correspondingly weaker global environmental effects (Reisner et al., 2018). Note also that the 100 weapon scenario used in these studies is not the largest potential scenario. Larger nuclear wars and large asteroid collisions could cause greater harm. The largest asteroid collisions could even reduce sunlight below the minimum needed for vision (Toon et al., 1997). Asteroid risk analyses have proposed that the global environmental disruption from large collisions could cause one billion deaths (NRC, 2010) or the death of 25% of all humans (Chapman, 2004; Chapman & Morrison, 1994; Morrison, 1992), though these figures have not been rigorously justified (Baum, 2018a).

The harms from asteroid collisions and nuclear wars can also include important secondary effects. The food shortages from severe global environmental disruption could lead to infectious disease outbreaks as public health conditions deteriorate (Helfand, 2013). Law and order could be lost in at least some locations as people struggle for survival (Maher & Baum, 2013). Today’s complex global political-economic system already shows fragility to shocks such as the 2007- 2008 financial crisis (Centeno, Nag, Patterson, Shaver, & Windawi, 2015); an asteroid collision or nuclear war could be an extremely large shock. The systemic consequences of a nuclear war would be further worsened by the likely loss of major world cities that serve as important hubs in the global economy. Even a single detonation in nuclear terrorism would have ripple effects across the global political-economic system (similar to, but likely larger than, the response prompted by the terrorist attacks of 11 September 2001).

It is possible for asteroid collisions to cause nuclear war. An asteroid explosion could be misinterpreted as a nuclear attack, prompting nuclear attack that is believed to be retaliation. For example, the 2013 Chelyabinsk event occurred near an important Russian military installation, prompting concerns about the event’s interpretation (Harris et al., 2015).

The ultimate severity of an asteroid collision or violent nuclear conflict use would depend on how human society reacts. Would the reaction be disciplined and constructive: bury the dead, heal the sick, feed the hungry, and rebuild all that has fallen? Or would the reaction be disorderly and destructive: leave the rubble in place, fight for scarce resources, and descend into minimalist tribalism or worse? Prior studies have identified some key issues, including the viability of trade (Cantor, Henry, & Rayner, 1989) and the self-sufficiency of local communities (Maher & Baum, 2013). However, the issue has received little research attention and remains poorly understood. This leaves considerable uncertainty in the total human harm from an asteroid collision or nuclear weapons use. Previously published point estimates of the human consequences of asteroid collisions12 and nuclear wars (Helfand, 2013) do not account for this uncertainty and are likely to be inaccurate.

Of particular importance are the consequences for future generations, which could vastly outnumber the present generation. If an asteroid collision or nuclear war would cause human extinction, then there would be no future generations. Alternatively, if survivors fail to recover a large population and advanced technological civilization, then future generations would be permanently diminished. The largest long-term factor is whether future generations would colonize space and benefit from its astronomically large amount of resources (Tonn, 1999). However, it is not presently known which asteroid collisions or nuclear wars (if any) would cause the permanent collapse of human civilization and thus the loss of the large future benefits (Baum et al., 2019). Given the enormous stakes, prudent risk management would aim for very low probabilities of permanent collapse (Tonn, 2009).

However, cosmologists and other experts estimate that the current catalog of known asteroids accounts for **only** about **25 percent** of all such objects in the solar system. This means that almost 70,000 more NEOs of this size remain to be found. It seems we still have quite a long way to go before we can safely say that we have a firm handle on this threat.

#### Nuking asteroids fails

Andrews ’19 - PhD in experimental volcanology, \*\* citing a study from Charles El Mir who researches asteroid destruction at Johns Hopkins Robin George Andrews, “If We Blow Up an Asteroid, It Might Put Itself Back Together,” The New York Times, March 8, 2019, sec. Science, https://www.nytimes.com/2019/03/08/science/asteroids-nuclear-weapons.html.

Faced with the prospect of a sizable asteroid heading toward Earth and causing doomsday, humanity has come up with various responses.

Hollywood may reckon that the best way to destroy an errant space rock is with nuclear weapons. This is rarely the preferred option of experts, but using some sort of spacecraft system to smash an asteroid into small, harmless pieces is seen as a real-world possibility. A new study, looking at a gigantic space rock-on-space rock clash, hints at how utterly ineffective this type of asteroid assassination attempt may be.

Using computer models, scientists simulated a 4,000-foot asteroid smashing into a 15.5-mile asteroid at 11,200 miles per hour. Immediately after colliding, the large asteroid cracked considerably, with debris flowing outward like a cascade of Ping-Pong balls. Despite some deep fractures, the heart of the asteroid was not comprehensively damaged.

As time went on, the gravitational pull of the asteroid’s resilient core was able to pull back ejected shards. It seems that asteroids don’t just absorb mind-boggling amounts of damage, but, as previous work has hinted, they also are able to rebuild themselves.

Charles El Mir, who studies asteroid annihilation at Johns Hopkins University and is the paper’s lead author, said his findings “could be interpreted as an argument against ‘blowing up’ an asteroid as a defensive strategy.”

Asteroid collisions and demolitions have been simulated many times in recent decades. Earlier studies suggested that large asteroids are full of internal scars because of their violent history, and that a fast enough impact would completely shatter them.

The new study, published this month in the journal Icarus, tried a different simulation.

K.T. Ramesh, director of the Hopkins Extreme Materials Institute, said that Andy Tonge, a former graduate student, had developed a computational model that looked at how materials like bulletproof vests respond to impacts. Realizing that Dr. Tonge’s model could simulate asteroid impact events, the team merged it with another model that also replicated the effects of a large asteroid’s gravitational field.

This hybrid model allowed them to more realistically see how an asteroid responds to being hit by a powerful projectile. It captured previously missing but vital small-scale details, including where fractures would appear and precisely how they would spread.

Michele Bannister, a planetary astronomer at Queen’s University Belfast, described the research as “a nice upgrade on modeling the complex physical realities” of the solar system’s enigmatic rocky monsters.

The study has limitations. Both asteroids are modeled as simple, nonrotating chunks of rock, whereas real asteroids are far more variable. In addition, the larger asteroid, despite featuring a starting collection of cracks, did not have a history of multiple impacts as true asteroids would. A large space rock smashing into a humongous space rock also differs from a missile onslaught, or an atomic bomb exploding on or beneath an asteroid’s surface while a popular rock band plays.

The study doesn’t rule out using projectiles to destroy an incoming asteroid, Dr. El Mir said. But, he added, shattering a large asteroid may end up causing more problems than it solves. Turning a cannonball into shotgun-shell fragments could still result in Armageddon if the shards strike Earth.

NASA’s Planetary Defense Coordination Office, which keeps an eye on asteroids and comets that will one day pass close to Earth, instead suggests changing a space rock’s trajectory by giving it a small nudge well in advance of reaching our world. NASA and others aim to test this strategy in 2022 with the Double Asteroid Redirection Test, in which a spacecraft will deliberately crash into the smaller member of a binary asteroid system in an attempt to change its orbit around the larger body.

Ultimately, the choice between deflection and destruction largely depends on how quickly an incoming asteroid is spotted.

“A successful deflection becomes more difficult to execute as warning time decreases,” said Megan Bruck Syal, a planetary defense researcher at the Lawrence Livermore National Laboratory. “For the shortest warning times, robust disruption and dispersal of the fragments may be the only viable option to prevent the impact.”

#### Motive exists

Miller 19 — (Gregory D. Miller, Gregory Miller is Chair of the Department of Spacepower and Director of the Schriever Scholars program at the Air Command and Staff College, Maxwell AFB, AL. His research interests include International Relations (especially alliances, reputation, and deterrence); terrorism; strategy; and space., Space Pirates, Geosynchronous Guerrillas, and Nonterrestrial Terrorists: Nonstate Threats in Space, 8-27-19, Available Online at https://www.airuniversity.af.edu/Portals/10/ASPJ/journals/Volume-33\_Issue-3/F-Miller.pdf, accessed 3-25-2022, HKR-AR)

Guerrillas are often domestic groups targeting their own government with the goal of establishing an independent state, or they are engaged in a struggle against a foreign power that they view as an occupying force.17 Historically, many of these types of groups were motivated by a revolutionary cause (the Marxist-Leninist ideology of the Revolutionary Armed Forces of Colombia, as an example, or the Maoist ideology of Peru’s Shining Path), where they sought a dramatic change in society and the government. Others are motivated by a desire for independence (like the Liberation Tigers of Tamil Eelam (LTTE) in Sri Lanka).18 They may receive aid or support from outside parties, which can include financial, ideological, and military support and even personnel, but they typically have local rather than global goals. As a result, attacks in space by guerrillas would likely target their own government’s capabilities or states that appear to be meddling in their national affairs. One example was the insurgency’s use of jamming during Operation Iraqi Freedom. According to the “Space Threat Assessment 2018,” insurgents deliberately jammed commercial satellite communications links used by the US military.19 As long as those actors stuck to purely military targets, they would remain—at least in an academic sense—guerrillas.

Because most guerrillas would like the international community to view them as having legitimacy, and they would like to govern themselves at some point, either as a separate state or in a newly reconstituted state, they often refrain from attacks that are potentially costly to the civilian population, though there are exceptions where guerrilla groups engaged in terrorist activities. Also, guerrillas often value the sympathy or support of other states and of the international community. As a result, it is unlikely that groups that fall closer to the guerrilla side of the spectrum will engage in attacks against space interests that have long-term and broader consequences. For instance, these groups are unlikely to use kinetic weapons to attack space assets. Such attacks would create a debris field that could subsequently damage other states’ assets and potentially hurt or inconvenience civilian populations. Such consequences would weaken international support and so guerrilla groups will likely refrain from such activities. That does not mean kinetic attacks will not happen, just that they are more likely to be the work of terrorists who are less concerned with international perceptions. Instead, attacks by guerrillas are more likely to focus on effects like degrading an orbit, disabling a capability (like a state’s communications satellites), or blinding a surveillance satellite to reduce a state’s military advantage when engaging with the guerrilla forces.

Because of the similarities between space and cyberspace, we should also expect groups to engage in multidomain attacks using any available new technologies. As early as 1999, hackers seized control of a British military communications satellite with a home computer.20 Guerrilla groups historically engage in a variety of cyber attacks, mostly to harass governments or to deny service to government agencies. For example, the LTTE, the now-inactive Tamil insurgent group in Sri Lanka referenced earlier, often engaged the Sri Lankan military in guerrilla warfare but also carried out terrorist attacks. It had a cyber unit as early as 1997 that frequently targeted the government. Beyond using its own website for propaganda and financing, the LTTE hacked government networks, engaged in denial of service attacks, and engaged in propaganda and counterpropaganda by hacking websites. In 2007, they even pirated a US satellite to send broadcasts to other countries.21 Similar types of attacks are likely to occur against space assets as more groups gain the capability to do so.

Terrorist attacks against space capabilities could come in a variety of forms based on numerous motivations. Terrorist motivations could be driven by nationalism or a revolutionary ideology, similar to what motivates guerrillas but targeting civilians to achieve the group’s goals. Groups also use terrorism for a variety of other reasons that may be local, regional, or global. Examples include religious differences, for **antitechnological purposes**, or simply as part of a neoanarchist movement hoping to prevent governments from becoming even more powerful through the exploitation of space.

Terrorists engage in several different types of tactics, against a variety of targets, though the target is often linked to the broader goals of the group. For instance, Marxist groups are more likely than others to target private businesses, religious groups are more likely than other types of groups to target other religions, and white supremacist groups often attack minorities or minority businesses. Given that terrorists—and guerrillas, for that matter—generally attack targets that are consistent with their strategic goals, what would motivate groups to target a country’s space assets? It could simply be a group that wants to reduce the power of the state or a group that opposes the state’s ideology. Also possible are attacks by groups that oppose the weaponization of space or that oppose technology more broadly, focusing on a state’s policies in space rather than the nature of the state itself, much as single-issue terrorists focus on a state’s treatment of animals or its abortion laws. Many Americans oppose spending money on space when there are economic or social problems at home, so it is not too much of a stretch to expect violence in opposition to using resources on space.22

#### Mining causes resource competition and space war

Fengna Xu 20, Law School, Xi’an Jiaotong University, “The approach to sustainable space mining: issues, challenges, and solutions,” Fengna Xu 2020 IOP Conf. Ser.: Mater. Sci. Eng. 738 012014

3.1. Conflicts between multiple States Space resources, as res communis [3], can be appropriated to some extent on the basis of freedom of exploration and use of the outer space. However, it is likely to follow a ‘first come, first served’ approach to space resources activities. In fact, the ‘first come, first served’ approach drove early and rapid development of oil industry of the US in the 19th century, although a frenetic race among surface owners followed and led to an extraordinary waste of oil and gas. Given that so far there are no agreement or property rights on space resources, they are essentially in a ‘state of nature’. Allocation by the ‘first come, first served’ approach is simple and requires very little government involvement to deter another one (called a ‘junior’) from displacing the rightful first comer (called a ‘senior’). However, overprotecting the senior by priority rights could run the risk of disorder, waste, inequality, and even monopoly. The Outer Space Treaty, requires State parties to conduct all their activities in outer space ‘with due regard to the corresponding interests of all other States Parties’. Without specific coordinating rules, conflicts between multiple States are likely to happen. Private entities may choose to arm themselves to safeguard their own interests. In extreme cases, States may also protect them by placing weapons of mass destruction in outer space if necessary [4]. As a result, priority rights should not be absolute but subjected to some arrangements. 7

#### Resources won’t be equitably distributed to solve scarcity, and benefits are impossible to predict.

Matt Davis 09/28/2018 [“Will asteroid mining be an outer-space gold rush?”] [DS] [https://bigthink.com/hard-science/economic-impact-of-asteroid-mining/]

HOW WILL THIS AFFECT EARTH?

As stated earlier, today most of the mineral wealth on Earth comes from a finite supply delivered by comets and meteorites. Part of what makes these minerals valuable is the very fact that they are finite. What’s going to happen when a $10,000 quadrillion asteroid is mined for its resources?

Well, the short answer is we don’t really know. Once this science-fiction story becomes fact, it’s going to fundamentally transform our economies in ways we can’t really predict.

There is some concern that the vast amount of mineral wealth available in space will cause commodity prices to drop precipitously, tanking the economy. This likely won’t be an issue. Only a handful of companies will have a foothold in space, and because of their oligopoly, they won’t flood the market with, say, platinum. That would drive the value of platinum down so low that they couldn’t make any money. As an example of how this will likely play out, we can look at the diamond market. Diamonds are actually quite abundant on Earth, but the De Beers organization has such a monopoly on the market that they only release just enough diamonds to satisfy demand. Since the “supply” was artificially made to always meet demand, De Beers could ensure their continued profits. (Note that the De Beers monopoly has since been broken up).

So, the economy won’t collapse. But this also means that inequality on Earth will become more extreme. Right now, a handful of billionaires are betting on asteroid mining, and, if it pays off, they’re the ones who will reap the benefit. The rags-to-riches conditions of the gold rush aren’t going to be replicated out in space: there will be no Space Dream to match the California Dream.

On the other hand, mining operations will likely take place in space and correspondingly grow and develop in space. As more mineral resources are found in space and less on Earth, mining operations here won’t be as appealing, which is a profoundly good thing. Mining is incredibly damaging to the environment, and in developing countries, mines are often worked by child labor. On a theoretical asteroid mining operation, most of the work would likely be automated, and any pollutants would be shot off into outer space.

The most optimistic perspective on asteroid mining is that it will propel us towards a post-scarcity society, one where the incredible abundance of water and minerals and asteroids will enable virtually limitless development. Gathering water from asteroids, in particular, would represent a tremendous boon. Unfortunately, selling water to thirsty humans isn’t likely what’s going to happen; instead, it’ll be used to make rocket fuel for further asteroid mining ventures.

## Framing

#### The Standard is Maximizing Expected Well-Being

#### 1] Only it can explain degrees of wrongness- it is worse to kill thousands than to lie to a friend- either ethical theories cannot explain comparative badness, or it collapses

#### 2] Reducing existential risks is the top priority in any coherent moral theory

**Pummer, PhD, 15** (Theron, Philosophy @St. Andrews http://blog.practicalethics.ox.ac.uk/2015/05/moral-agreement-on-saving-the-world/)

There appears to be lot of disagreement in moral philosophy. Whether these many apparent disagreements are deep and irresolvable, I believe there is at least one thing it is reasonable to agree on right now, whatever general moral view we adopt: that it is very important to reduce the risk that all intelligent beings on this planet are eliminated by an enormous catastrophe, such as a nuclear war. How we might in fact try to reduce such existential risks is discussed elsewhere. My claim here is only that we – whether we’re consequentialists, deontologists, or virtue ethicists – should all agree that we should try to save the world. According to consequentialism, we should maximize the good, where this is taken to be the goodness, from an impartial perspective, of outcomes. Clearly one thing that makes an outcome good is that the people in it are doing well. There is little disagreement here. If the happiness or well-being of possible future people is just as important as that of people who already exist, and if they would have good lives, it is not hard to see how reducing existential risk is easily the most important thing in the whole world. This is for the familiar reason that there are so many people who could exist in the future – there are trillions upon trillions… upon trillions. There are so many possible future people that reducing existential risk is arguably the most important thing in the world, even if the well-being of these possible people were given only 0.001% as much weight as that of existing people. Even on a wholly person-affecting view – according to which there’s nothing (apart from effects on existing people) to be said in favor of creating happy people – the case for reducing existential risk is very strong. As noted in this seminal paper, this case is strengthened by the fact that there’s a good chance that many existing people will, with the aid of life-extension technology, live very long and very high quality lives. You might think what I have just argued applies to consequentialists only. There is a tendency to assume that, if an argument appeals to consequentialist considerations (the goodness of outcomes), it is irrelevant to non-consequentialists. But that is a huge mistake. Non-consequentialism is the view that there’s more that determines rightness than the goodness of consequences or outcomes; it is not the view that the latter don’t matter. Even John Rawls wrote, “All ethical doctrines worth our attention take consequences into account in judging rightness. One which did not would simply be irrational, crazy.” Minimally plausible versions of deontology and virtue ethics must be concerned in part with promoting the good, from an impartial point of view. They’d thus imply very strong reasons to reduce existential risk, at least when this doesn’t significantly involve doing harm to others or damaging one’s character. What’s even more surprising, perhaps, is that even if our own good (or that of those near and dear to us) has much greater weight than goodness from the impartial “point of view of the universe,” indeed even if the latter is entirely morally irrelevant, we may nonetheless have very strong reasons to reduce existential risk. Even egoism, the view that each agent should maximize her own good, might imply strong reasons to reduce existential risk.It will depend, among other things, on what one’s own good consists in. If well-being consisted in pleasure only, it is somewhat harder to argue that egoism would imply strong reasons to reduce existential risk – perhaps we could argue that one would maximize her expected hedonic well-being by funding life extension technology or by having herself cryogenically frozen at the time of her bodily death as well as giving money to reduce existential risk (so that there is a world for her to live in!). I am not sure, however, how strong the reasons to do this would be. But views which imply that, if I don’t care about other people, I have no or very little reason to help them are not even minimally plausible views (in addition to hedonistic egoism, I here have in mind views that imply that one has no reason to perform an act unless one actually desires to do that act). To be minimally plausible, egoism will need to be paired with a more sophisticated account of well-being. To see this, it is enough to consider, as Plato did, the possibility of a ring of invisibility – suppose that, while wearing it, Ayn could derive some pleasure by helping the poor, but instead could derive just a bit more by severely harming them. Hedonistic egoism would absurdly imply she should do the latter. To avoid this implication, egoists would need to build something like the meaningfulness of a life into well-being, in some robust way, where this would to a significant extent be a function of other-regarding concerns (see chapter 12 of this classic intro to ethics). But once these elements are included, we can (roughly, as above) argue that this sort of egoism will imply strong reasons to reduce existential risk. Add to all of this Samuel Scheffler’s recent intriguing arguments (quick podcast version available here) that most of what makes our lives go well would be undermined if there were no future generations of intelligent persons. On his view, my life would contain vastly less well-being if (say) a year after my death the world came to an end. So obviously if Scheffler were right I’d have very strong reason to reduce existential risk. We should also take into account moral uncertainty. What is it reasonable for one to do, when one is uncertain not (only) about the empirical facts, but also about the moral facts? I’ve just argued that there’s agreement among minimally plausible ethical views that we have strong reason to reduce existential risk – not only consequentialists, but also deontologists, virtue ethicists, and sophisticated egoists should agree. But even those (hedonistic egoists) who disagree should have a significant level of confidence that they are mistaken, and that one of the above views is correct. Even if they were 90% sure that their view is the correct one (and 10% sure that one of these other ones is correct), they would have pretty strong reason, from the standpoint of moral uncertainty, to reduce existential risk. Perhaps most disturbingly still, even if we are only 1% sure that the well-being of possible future people matters, it is at least arguable that, from the standpoint of moral uncertainty, reducing existential risk is the most important thing in the world. Again, this is largely for the reason that there are so many people who could exist in the future – there are trillions upon trillions… upon trillions. (For more on this and other related issues, see this excellent dissertation**).** Of course, it is uncertain whether these untold trillions would, in general, have good lives. It’s possible they’ll be miserable. It is enough for my claim that there is moral agreement in the relevant sense if, at least given certain empirical claims about what future lives would most likely be like, all minimally plausible moral views would converge on the conclusion that we should try to save the world. While there are some non-crazy views that place significantly greater moral weight on avoiding suffering than on promoting happiness, for reasons others have offered (and for independent reasons I won’t get into here unless requested to), they nonetheless seem to be fairly implausible views. And even if things did not go well for our ancestors, I am optimistic that they will overall go fantastically well for our descendants, if we allow them to. I suspect that most of us alive today – at least those of us not suffering from extreme illness or poverty – have lives that are well worth living, and that things will continue to improve. Derek Parfit, whose work has emphasized future generations as well as agreement in ethics, described our situation clearly and accurately: “We live during the hinge of history. Given the scientific and technological discoveries of the last two centuries, the world has never changed as fast. We shall soon have even greater powers to transform, not only our surroundings, but ourselves and our successors. If we act wisely in the next few centuries, humanity will survive its most dangerous and decisive period. Our descendants could, if necessary, go elsewhere, spreading through this galaxy…. Our descendants might, I believe, make the further future very good. But that good future may also depend in part on us. If our selfish recklessness ends human history, we would be acting very wrongly.” (From chapter 36 of On What Matters)

#### 3] Non util ethics are impossible, science proves util is inescapable and captures their offense

Greene 10 – Joshua, Associate Professor of Social science in the Department of Psychology at Harvard University (The Secret Joke of Kant’s Soul published in Moral Psychology: Historical and Contemporary Readings, accessed: www.fed.cuhk.edu.hk/~lchang/material/Evolutionary/Developmental/Greene-KantSoul.pdf)

What turn-of-the-millennium science is telling us is that human moral judgment is not a pristine rational enterprise, that our moral judgments are driven by a hodgepodge of emotional dispositions, which themselves were shaped by a hodgepodge of evolutionary forces, both biological and cultural. Because of this, it is exceedingly unlikely that there is any rationally coherent normative moral theory that can accommodate our moral intuitions. Moreover, anyone who claims to have such a theory, or even part of one, almost certainly doesn't. Instead, what that person probably has is a moral rationalization. It seems then, that we have somehow crossed the infamous "is"-"ought" divide. How did this happen? Didn't Hume (Hume, 1978) and Moore (Moore, 1966) warn us against trying to derive an "ought" from and "is?" How did we go from descriptive scientific theories concerning moral psychology to skepticism about a whole class of normative moral theories? The answer is that we did not, as Hume and Moore anticipated, attempt to derive an "ought" from and "is." That is, our method has been inductive rather than deductive. We have inferred on the basis of the available evidence that the phenomenon of rationalist deontological philosophy is best explained as a rationalization of evolved emotional intuition (Harman, 1977). Missing the Deontological Point I suspect that rationalist deontologists will remain unmoved by the arguments presented here. Instead, I suspect, they will insist that I have simply misunderstood what Kant and like-minded deontologists are all about. Deontology, they will say, isn't about this intuition or that intuition. It's not defined by its normative differences with consequentialism. Rather, deontology is about taking humanity seriously. Above all else, it's about respect for persons. It's about treating others as fellow rational creatures rather than as mere objects, about acting for reasons rational beings can share. And so on (Korsgaard, 1996a; Korsgaard, 1996b). This is, no doubt, how many deontologists see deontology. But this insider's view, as I've suggested, may be misleading. The problem, more specifically, is that it defines deontology in terms of values that are not distinctively deontological, though they may appear to be from the inside. Consider the following analogy with religion. When one asks a religious person to explain the essence of his religion, one often gets an answer like this: "It's about love, really. It's about looking out for other people, looking beyond oneself. It's about community, being part of something larger than oneself." This sort of answer accurately captures the phenomenology of many people's religion, but it's nevertheless inadequate for distinguishing religion from other things. This is because many, if not most, non-religious people aspire to love deeply, look out for other people, avoid self-absorption, have a sense of a community, and be connected to things larger than themselves. In other words, secular humanists and atheists can assent to most of what many religious people think religion is all about. From a secular humanist's point of view, in contrast, what's distinctive about religion is its commitment to the existence of supernatural entities as well as formal religious institutions and doctrines. And they're right. These things really do distinguish religious from non-religious practices, though they may appear to be secondary to many people operating from within a religious point of view. In the same way, I believe that most of the standard deontological/Kantian self-characterizatons fail to distinguish deontology from other approaches to ethics. (See also Kagan (Kagan, 1997, pp. 70-78.) on the difficulty of defining deontology.) It seems to me that consequentialists, as much as anyone else, have respect for persons, are against treating people as mere objects, wish to act for reasons that rational creatures can share, etc. A consequentialist respects other persons, and refrains from treating them as mere objects, by counting every person's well-being in the decision-making process. Likewise, a consequentialist attempts to act according to reasons that rational creatures can share by acting according to principles that give equal weight to everyone's interests, i.e. that are impartial. This is not to say that consequentialists and deontologists don't differ. They do. It's just that the real differences may not be what deontologists often take them to be. What, then, distinguishes deontology from other kinds of moral thought? A good strategy for answering this question is to start with concrete disagreements between deontologists and others (such as consequentialists) and then work backward in search of deeper principles. This is what I've attempted to do with the trolley and footbridge cases, and other instances in which deontologists and consequentialists disagree. If you ask a deontologically-minded person why it's wrong to push someone in front of speeding trolley in order to save five others, you will get characteristically deontological answers. Some will be tautological: "Because it's murder!" Others will be more sophisticated: "The ends don't justify the means." "You have to respect people's rights." But, as we know, these answers don't really explain anything, because if you give the same people (on different occasions) the trolley case or the loop case (See above), they'll make the opposite judgment, even though their initial explanation concerning the footbridge case applies equally well to one or both of these cases. Talk about rights, respect for persons, and reasons we can share are natural attempts to explain, in "cognitive" terms, what we feel when we find ourselves having emotionally driven intuitions that are odds with the cold calculus of consequentialism. Although these explanations are inevitably incomplete, there seems to be "something deeply right" about them because they give voice to powerful moral emotions. But, as with many religious people's accounts of what's essential to religion, they don't really explain what's distinctive about the philosophy in question.