# 1NC

### 1NC – OFF

#### The role of the ballot is to vote for the debater who proves the truth or falsity of the resolution.

#### [1] Logic- Debate is fundamentally a game with rules, which requires the better competitor to win. Every other ROTB is just a reason why there are other ways to play the game but are not consistent enough with the purpose of the game to vote on, just like you don’t win a basketball game for shooting the most 3s.

#### [2] Textuality – Five Dictionaries[[1]](#footnote-1) define to affirm as to prove true[[2]](#footnote-2) and negate as to deny the truth of which means the sole judge jurisdiction is to vote on the resolution’s truth or falsity. This outweighs on common usage – it is abundantly clear that our roles are verified.

### 1NC – OFF

#### Permissibility and presumption negate

#### 1] Obligations- the resolution indicates the affirmative has to prove an obligation, and permissibility would deny the existence of an obligation

#### 2] Falsity- Statements are more often false than true because proving one part of the statement false disproves the entire statement. Presuming all statements are true creates contradictions which would be ethically bankrupt.

#### 3] Negating is harder – A] Aff gets first and last speech which control the direction of the debate B] Affirmatives can strategically uplayer in the 1ar giving them a 7-6 time skew advantage, splitting the 2nr C] 2ar judge psychology adv

#### 4] Affirmation theory- Affirming requires unconditionally maintaining an obligation

Affirm [is to]: maintain as true.

That’s Dictionary.com- “affirm” https://www.dictionary.com/browse/affirm

#### In order to determine the undoubtable moral truth, we have to doubt everything and anything. That means reject all assumptions and start from the bottom. Prefer:

#### [1] Philosophers have been arguing over morality for thousands of years with no progress – that means we aren’t getting anywhere close to the truth. Starting from the bottom ensures that we can end this debate by determining the actual truth.

#### [2] Logic – if we argue based on unjustified assumptions, then we are not being logical – logic key because we can only evaluate logical arguments.

#### Sinnott-Armstrong 15 Sinnot-Armstrong, Walter, (Philosopher), “Moral Skepticism”, Stanford Encyclopedia of Philosophy. 17/9/15. <https://plato.stanford.edu/entries/skepticism-moral/#MorExp>. //LHP AV

The final kind of argument derives from René Descartes (1641). I do not seem justified in believing that what I see is a lake if I cannot rule out the possibility that it is a bay or a bayou. Generalizing**, if there is any contrary hypothesis that I cannot rule out, then I am not justified in believing** that **what I see** is a lake. **This is** supposed to be **a common standard for justified belief**. When this principle is applied thoroughly, **it leads to skepticism**. **All a skeptic needs to show is that, for each belief, there is some contrary hypothesis that cannot be ruled out**. It need not be the same hypothesis for every belief, but skeptics usually buy wholesale instead of retail, so they seek a single hypothesis that is contrary to all (or many common) beliefs and which cannot be ruled out in any way.

#### That implies that in order for the aff to fulfill their burden, they have to make it 100% sure that they are right – otherwise you negate

#### Negate – [1] you can’t be sure anything besides yourself exists – three possible contrary hypotheses

#### a) we could be dreaming or in a simulation so the whole world could be nonexistent

#### b) there could be an all-powerful demon controlling your thoughts

#### Sinnott-Armstrong 2 Sinnot-Armstrong, Walter, (Philosopher), “Moral Skepticism”, Stanford Encyclopedia of Philosophy. \*\*Bracketed for clarity\*\* 17/9/15. <https://plato.stanford.edu/entries/skepticism-moral/#MorExp>. //LHP AV

The famous Cartesian hypothesis is of **[Consider]** **a demon who deceives me in all of my beliefs about the external world, while also ensuring that my beliefs are completely coherent.** **This** possibility **cannot be ruled out by any experiences or beliefs, because of how the deceiving demon is defined**. This hypothesis is also contrary to my beliefs about the lake. So **my beliefs** about the lake **are not justified**, according to the above principle. And there is nothing special about my beliefs about the lake. **Everything I believe about the external world is incompatible with the deceiving demon hypothesis.** Skeptics conclude that **no** such **belief is justified.**

#### c) solipsism is true and is the only way to account for our low-entropy universe

**Albrecht 8** [Andreas Albrecht and Lorenzo Sorbo (Department of Physics, UC Davis) “Can the universe afford inflation?” February 1st 2008 <http://arxiv.org/pdf/hep-th/0405270v2.pdf> JW 1/22/15]

A century ago Boltzmann considered a “cosmology” where the observed universe should be regarded as a rare ﬂuctuation out of some equilibrium state. The prediction of this point of view, quite generically, is that we live in a universe which maximizes the total entropy of the system consistent with existing observations. Other universes simply occur as much more rare ﬂuctuations. This means as much as possible of the system should be found in equilibrium as often as possible. From this point of view, it is very surprising that we ﬁnd the universe around us in such a low entropy state. In fact, the logical conclusion of this line of reasoning is utterly solipsistic. The most likely ﬂuctuation consistent with everything you know is simply your brain (complete with “memories” of the Hubble Deep ﬁelds, WMAP data, etc) ﬂuctuating brieﬂy out of chaos and then immediately equilibrating back into chaos again. This is sometimes called the “Boltzmann’s Brain” paradox.

**Reject uncarded responses—theoretical physics requires deep scientific knowhow.**

#### 2. Good Samaritan – in order to say I want to fix x problem, you must say that you want x problem to exist, since it requires the problem exist to solve, which makes an moral attempt inherently immoral

### 1NC – OFF

#### Ethics begin a posteriori.

#### 1. Knowledge is based on experience – I wouldn’t know 2+2=4 without experience of objects nor the color red without some experience of color. We can’t obtain evidence of goodness without experience.

#### 2. Indifference – Even if there are apriori moral truths, I can choose to ignore them. Cognition is binding – if I put my hand on a hot stove, I can’t turn off my natural aversion to it.

#### Pleasure and pain are intrinsic value and disvalue – everything else regresses – robust neuroscience.

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**Pleasure** is not only one of the three primary reward functions but it also **defines reward.** As homeostasis explains the functions of only a limited number of rewards, the principal reason why particular stimuli, objects, events, situations, and activities are rewarding may be due to pleasure. This applies first of all to sex and to the primary homeostatic rewards of food and liquid and extends to money, taste, beauty, social encounters and nonmaterial, internally set, and intrinsic rewards. Pleasure, as the primary effect of rewards, drives the prime reward functions of learning, approach behavior, and decision making and provides the **basis for hedonic theories** of reward function. We are attracted by most rewards and exert intense efforts to obtain them, just because they are enjoyable [10]. Pleasure is a passive reaction that derives from the experience or prediction of reward and may lead to a long-lasting state of happiness. The word happiness is difficult to define. In fact, just obtaining physical pleasure may not be enough. One key to happiness involves a network of good friends. However, it is not obvious how the higher forms of satisfaction and pleasure are related to an ice cream cone, or to your team winning a sporting event. Recent multidisciplinary research, using both humans and detailed invasive brain analysis of animals has discovered some critical ways that the brain processes pleasure [14]. Pleasure as a hallmark of reward is sufficient for defining a reward, but it may not be necessary. A reward may generate positive learning and approach behavior simply because it contains substances that are essential for body function. When we are hungry, we may eat bad and unpleasant meals. A monkey who receives hundreds of small drops of water every morning in the laboratory is unlikely to feel a rush of pleasure every time it gets the 0.1 ml. Nevertheless, with these precautions in mind, we may define any stimulus, object, event, activity, or situation that has the potential to produce pleasure as a reward. In the context of reward deficiency or for disorders of addiction, homeostasis pursues pharmacological treatments: drugs to treat drug addiction, obesity, and other compulsive behaviors. The theory of allostasis suggests broader approaches - such as re-expanding the range of possible pleasures and providing opportunities to expend effort in their pursuit. [15]. It is noteworthy, the first animal studies eliciting approach behavior by electrical brain stimulation interpreted their findings as a discovery of the brain’s pleasure centers [16] which were later partly associated with midbrain dopamine neurons [17–19] despite the notorious difficulties of identifying emotions in animals. Evolutionary theories of pleasure: The love connection BO:D Charles Darwin and other biological scientists that have examined the biological evolution and its basic principles found various mechanisms that steer behavior and biological development. Besides their theory on natural selection, it was particularly the sexual selection process that gained significance in the latter context over the last century, especially when it comes to the question of what makes us “what we are,” i.e., human. However, the capacity to sexually select and evolve is not at all a human accomplishment alone or a sign of our uniqueness; yet, we humans, as it seems, are ingenious in fooling ourselves and others–when we are in love or desperately search for it. It is well established that modern biological theory conjectures that **organisms are** the **result of evolutionary competition.** In fact, Richard Dawkins stresses gene survival and propagation as the basic mechanism of life [20]. Only genes that lead to the fittest phenotype will make it. It is noteworthy that the phenotype is selected based on behavior that maximizes gene propagation. To do so, the phenotype must survive and generate offspring, and be better at it than its competitors. Thus, the ultimate, distal function of rewards is to increase evolutionary fitness by ensuring the survival of the organism and reproduction. It is agreed that learning, approach, economic decisions, and positive emotions are the proximal functions through which phenotypes obtain other necessary nutrients for survival, mating, and care for offspring. Behavioral reward functions have evolved to help individuals to survive and propagate their genes. Apparently, people need to live well and long enough to reproduce. Most would agree that homo-sapiens do so by ingesting the substances that make their bodies function properly. For this reason, foods and drinks are rewards. Additional rewards, including those used for economic exchanges, ensure sufficient palatable food and drink supply. Mating and gene propagation is supported by powerful sexual attraction. Additional properties, like body form, augment the chance to mate and nourish and defend offspring and are therefore also rewards. Care for offspring until they can reproduce themselves helps gene propagation and is rewarding; otherwise, many believe mating is useless. According to David E Comings, as any small edge will ultimately result in evolutionary advantage [21], additional reward mechanisms like novelty seeking and exploration widen the spectrum of available rewards and thus enhance the chance for survival, reproduction, and ultimate gene propagation. These functions may help us to obtain the benefits of distant rewards that are determined by our own interests and not immediately available in the environment. Thus the distal reward function in gene propagation and evolutionary fitness defines the proximal reward functions that we see in everyday behavior. That is why foods, drinks, mates, and offspring are rewarding. There have been theories linking pleasure as a required component of health benefits salutogenesis, (salugenesis). In essence, under these terms, pleasure is described as a state or feeling of happiness and satisfaction resulting from an experience that one enjoys. Regarding pleasure, it is a double-edged sword, on the one hand, it promotes positive feelings (like mindfulness) and even better cognition, possibly through the release of dopamine [22]. But on the other hand, pleasure simultaneously encourages addiction and other negative behaviors, i.e., motivational toxicity. It is a complex neurobiological phenomenon, relying on reward circuitry or limbic activity. It is important to realize that through the “Brain Reward Cascade” (BRC) endorphin and endogenous morphinergic mechanisms may play a role [23]. While natural rewards are essential for survival and appetitive motivation leading to beneficial biological behaviors like eating, sex, and reproduction, crucial social interactions seem to further facilitate the positive effects exerted by pleasurable experiences. Indeed, experimentation with addictive drugs is capable of directly acting on reward pathways and causing deterioration of these systems promoting hypodopaminergia [24]. Most would agree that pleasurable activities can stimulate personal growth and may help to induce healthy behavioral changes, including stress management [25]. The work of Esch and Stefano [26] concerning the link between compassion and love implicate the brain reward system, and pleasure induction suggests that social contact in general, i.e., love, attachment, and compassion, can be highly effective in stress reduction, survival, and overall health. Understanding the role of neurotransmission and pleasurable states both positive and negative have been adequately studied over many decades [26–37], but comparative anatomical and neurobiological function between animals and homo sapiens appear to be required and seem to be in an infancy stage. Finding happiness is different between apes and humans As stated earlier in this expert opinion one key to happiness involves a network of good friends [38]. However, it is not entirely clear exactly how the higher forms of satisfaction and pleasure are related to a sugar rush, winning a sports event or even sky diving, all of which augment dopamine release at the reward brain site. Recent multidisciplinary research, using both humans and detailed invasive brain analysis of animals has discovered some critical ways that the brain processes pleasure. Remarkably, there are pathways for ordinary liking and pleasure, which are limited in scope as described above in this commentary. However, there are **many brain regions**, often termed hot and cold spots, that significantly **modulate** (increase or decrease) our **pleasure or** even **produce the opposite** of pleasure— that is disgust and fear [39]. One specific region of the nucleus accumbens is organized like a computer keyboard, with particular stimulus triggers in rows— producing an increase and decrease of pleasure and disgust. Moreover, the cortex has unique roles in the cognitive evaluation of our feelings of pleasure [40]. Importantly, the interplay of these multiple triggers and the higher brain centers in the prefrontal cortex are very intricate and are just being uncovered. Desire and reward centers It is surprising that many different sources of pleasure activate the same circuits between the mesocorticolimbic regions (Figure 1). Reward and desire are two aspects pleasure induction and have a very widespread, large circuit. Some part of this circuit distinguishes between desire and dread. The so-called pleasure circuitry called “REWARD” involves a well-known dopamine pathway in the mesolimbic system that can influence both pleasure and motivation. In simplest terms, the well-established mesolimbic system is a dopamine circuit for reward. It starts in the ventral tegmental area (VTA) of the midbrain and travels to the nucleus accumbens (Figure 2). It is the cornerstone target to all addictions. The VTA is encompassed with neurons using glutamate, GABA, and dopamine. The nucleus accumbens (NAc) is located within the ventral striatum and is divided into two sub-regions—the motor and limbic regions associated with its core and shell, respectively. The NAc has spiny neurons that receive dopamine from the VTA and glutamate (a dopamine driver) from the hippocampus, amygdala and medial prefrontal cortex. Subsequently, the NAc projects GABA signals to an area termed the ventral pallidum (VP). The region is a relay station in the limbic loop of the basal ganglia, critical for motivation, behavior, emotions and the “Feel Good” response. This defined system of the brain is involved in all addictions –substance, and non –substance related. In 1995, our laboratory coined the term “Reward Deficiency Syndrome” (RDS) to describe genetic and epigenetic induced hypodopaminergia in the “Brain Reward Cascade” that contribute to addiction and compulsive behaviors [3,6,41]. Furthermore, ordinary “liking” of something, or pure pleasure, is represented by small regions mainly in the limbic system (old reptilian part of the brain). These may be part of larger neural circuits. In Latin, hedus is the term for “sweet”; and in Greek, hodone is the term for “pleasure.” Thus, the word Hedonic is now referring to various subcomponents of pleasure: some associated with purely sensory and others with more complex emotions involving morals, aesthetics, and social interactions. The capacity to have pleasure is part of being healthy and may even extend life, especially if linked to optimism as a dopaminergic response [42]. Psychiatric illness often includes symptoms of an abnormal inability to experience pleasure, referred to as anhedonia. A negative feeling state is called dysphoria, which can consist of many emotions such as pain, depression, anxiety, fear, and disgust. Previously many scientists used animal research to uncover the complex mechanisms of pleasure, liking, motivation and even emotions like panic and fear, as discussed above [43]. However, as a significant amount of related research about the specific brain regions of pleasure/reward circuitry has been derived from invasive studies of animals, these cannot be directly compared with subjective states experienced by humans. In an attempt to resolve the controversy regarding the causal contributions of mesolimbic dopamine systems to reward, we have previously evaluated the three-main competing explanatory categories: “liking,” “learning,” and “wanting” [3]. That is, dopamine may mediate (a) liking: the hedonic impact of reward, (b) learning: learned predictions about rewarding effects, or (c) wanting: the pursuit of rewards by attributing incentive salience to reward-related stimuli [44]. We have evaluated these hypotheses, especially as they relate to the RDS, and we find that the incentive salience or “wanting” hypothesis of dopaminergic functioning is supported by a majority of the scientific evidence. Various neuroimaging studies have shown that anticipated behaviors such as sex and gaming, delicious foods and drugs of abuse all affect brain regions associated with reward networks, and may not be unidirectional. Drugs of abuse enhance dopamine signaling which sensitizes mesolimbic brain mechanisms that apparently evolved explicitly to attribute incentive salience to various rewards [45]. Addictive substances are voluntarily self-administered, and they enhance (directly or indirectly) dopaminergic synaptic function in the NAc. This activation of the brain reward networks (producing the ecstatic “high” that users seek). Although these circuits were initially thought to encode a set point of hedonic tone, it is now being considered to be far more complicated in function, also encoding attention, reward expectancy, disconfirmation of reward expectancy, and incentive motivation [46]. The argument about addiction as a disease may be confused with a predisposition to substance and nonsubstance rewards relative to the extreme effect of drugs of abuse on brain neurochemistry. The former sets up an individual to be at high risk through both genetic polymorphisms in reward genes as well as harmful epigenetic insult. Some Psychologists, even with all the data, still infer that addiction is not a disease [47]. Elevated stress levels, together with polymorphisms (genetic variations) of various dopaminergic genes and the genes related to other neurotransmitters (and their genetic variants), and may have an additive effect on vulnerability to various addictions [48]. In this regard, Vanyukov, et al. [48] suggested based on review that whereas the gateway hypothesis does not specify mechanistic connections between “stages,” and does not extend to the risks for addictions the concept of common liability to addictions may be more parsimonious. The latter theory is grounded in genetic theory and supported by data identifying common sources of variation in the risk for specific addictions (e.g., RDS). This commonality has identifiable neurobiological substrate and plausible evolutionary explanations. Over many years the controversy of dopamine involvement in especially “pleasure” has led to confusion concerning separating motivation from actual pleasure (wanting versus liking) [49]. We take the position that animal studies cannot provide real clinical information as described by self-reports in humans. As mentioned earlier and in the abstract, on November 23rd, 2017, evidence for our concerns was discovered [50] In essence, although nonhuman primate brains are similar to our own, the disparity between other primates and those of human cognitive abilities tells us that surface similarity is not the whole story. Sousa et al. [50] small case found various differentially expressed genes, to associate with pleasure related systems. Furthermore, the dopaminergic interneurons located in the human neocortex were absent from the neocortex of nonhuman African apes. Such differences in neuronal transcriptional programs may underlie a variety of neurodevelopmental disorders. In simpler terms, the system controls the production of dopamine, a chemical messenger that plays a significant role in pleasure and rewards. The senior author, Dr. Nenad Sestan from Yale, stated: “Humans have evolved a dopamine system that is different than the one in chimpanzees.” This may explain why the behavior of humans is so unique from that of non-human primates, even though our brains are so surprisingly similar, Sestan said: “It might also shed light on why people are vulnerable to mental disorders such as autism (possibly even addiction).” Remarkably, this research finding emerged from an extensive, multicenter collaboration to compare the brains across several species. These researchers examined 247 specimens of neural tissue from six humans, five chimpanzees, and five macaque monkeys. Moreover, these investigators analyzed which genes were turned on or off in 16 regions of the brain. While the differences among species were subtle, **there was** a **remarkable contrast in** the **neocortices**, specifically in an area of the brain that is much more developed in humans than in chimpanzees. In fact, these researchers found that a gene called tyrosine hydroxylase (TH) for the enzyme, responsible for the production of dopamine, was expressed in the neocortex of humans, but not chimpanzees. As discussed earlier, dopamine is best known for its essential role within the brain’s reward system; the very system that responds to everything from sex, to gambling, to food, and to addictive drugs. However, dopamine also assists in regulating emotional responses, memory, and movement. Notably, abnormal dopamine levels have been linked to disorders including Parkinson’s, schizophrenia and spectrum disorders such as autism and addiction or RDS. Nora Volkow, the director of NIDA, pointed out that one alluring possibility is that the neurotransmitter dopamine plays a substantial role in humans’ ability to pursue various rewards that are perhaps months or even years away in the future. This same idea has been suggested by Dr. Robert Sapolsky, a professor of biology and neurology at Stanford University. Dr. Sapolsky cited evidence that dopamine levels rise dramatically in humans when we anticipate potential rewards that are uncertain and even far off in our futures, such as retirement or even the possible alterlife. This may explain what often motivates people to work for things that have no apparent short-term benefit [51]. In similar work, Volkow and Bale [52] proposed a model in which dopamine can favor NOW processes through phasic signaling in reward circuits or LATER processes through tonic signaling in control circuits. Specifically, they suggest that through its modulation of the orbitofrontal cortex, which processes salience attribution, dopamine also enables shilting from NOW to LATER, while its modulation of the insula, which processes interoceptive information, influences the probability of selecting NOW versus LATER actions based on an individual’s physiological state. This hypothesis further supports the concept that disruptions along these circuits contribute to diverse pathologies, including obesity and addiction or RDS.

#### Thus, the standard is maximizing expected well-being or act hedonistic util. Prefer additionally –

#### 1] Death is bad and outweighs – a) agents can’t act if they fear for their bodily security which constrains every ethical theory, b) it destroys the subject itself – kills any ability to achieve value in ethics since life is a prerequisite which means it’s a side constraint since we can’t reach the end goal of ethics without life

#### 2] Actor spec—governments must use util because they don’t have intentions and are constantly dealing with tradeoffs—outweighs since different agents have different obligations—takes out calc indicts since they are empirically denied.

### 1NC – OFF

#### CP Text – Space-Faring States should:

#### Establish a multilateral agreement and body to govern and foster the expansion of appropriation that applies to private entities in all countries.

#### Clarifies and establishes transferrable property rights on celestial bodies.

#### Mandate that private entities engaging in Asteroid Mining must not harm the Environment.

#### Clarify conflict resolution should be resolved through the Outer Space Treaty and adjudicated by the International Court of Justice.

#### Limit Asteroid Mining to only within the Asteroid’s orbit.

#### Completely solves the aff – establishes rule of law that solves their arbitrariness advantage and clarifies conflict resolution which solves cooperation.

#### Solves Un-Regulated appropriation - CP solves ambiguity that makes appropriation valuable and solves conflicts.

Coffey 9 – Sarah, B.A., Alfred University, J.D., Case Western Reserve University School of Law, “ESTABLISHING A LEGAL FRAMEWORK FOR PROPERTY RIGHTS TO NATURAL RESOURCES IN OUTER SPACE”, CASE W. RES. J. INT’L L. , Vol. 41:119, <https://scholarlycommons.law.case.edu/cgi/viewcontent.cgi?article=1238&context=jil>

Drawing on the strengths of the proposals discussed above, this Note suggests a new proposal for governing property rights to outer space resources. This proposal falls within the bounds set by the Outer Space Treaty and avoids many of the problems that prevented the Moon Treaty from being widely ratified. Both developed and developing nations will benefit from the proposal. In addition, it encourages the exploration and exploitation of resources from space. First, an international agreement should be made that clarifies property rights on celestial bodies and establishes a limited international body to oversee its execution and implementation. The agreement should clearly state the rule that the Outer Space Treaty is widely understood to have indirectly stated that: nations, companies, and individuals may not own real estate on celestial bodies, but may have property rights to resources they derive from the moon or other celestial bodies. Stating this outright in a new treaty will prevent the types of ongoing debates that arise from the imprecise or ambiguous language of agreements such as the Outer Space Treaty and the Moon Agreement. Since the OST is widely understood to have this meaning anyway, nations are likely to assent to this portion of the treaty. It solidifies the rights of expeditions to legally claim the resources they extract from the moon, and the knowledge that they are acting within a stable legal framework should encourage nations to send expeditions without fear that the resources will be confiscated or deemed illegal. The agreement should establish an authoritative body to be formed under the already existing U.N. Office of Outer Space Affairs. The body would serve limited functions, so it would not be overly difficult, time consuming, or costly to initiate and maintain. It would have a council on which every space-faring nation or nations otherwise involved with a space would be guaranteed a seat, with limited seats reserved for developing nations. The body would serve limited functions in that it would oversee the general execution of the agreement and be the contact point for participating nations, but under normal circumstances it would not make everyday decisions regarding which country may use what areas and resources. Instead, the credit system would be used. Each nation would be allocated a certain number of credits representing tonnage of resources to be extracted from the lunar surface for a given period of time. The credits would be allocated to all member countries with additional credits given to developing nations.164 The credits would be freely transferable, so nations without space-faring capabilities could benefit by selling their credits, leasing them while retaining ownership, or creating novel agreements that benefit the nation.165 Nations may sell their credits to their own citizens, or if all the nation’s credits are already in use, facilitate in purchasing them from other nations. Individuals and corporations must still go through the appropriate channels in their nation, per the OST, because it is the nation that is ultimately responsible for their safety and actions.166 The members of the new space property treaty will need to determine what exactly the credits represent. For example, particular plots of land on the moon could be permanently tied to a particular nation’s credits, or the credits may represent tonnage that has no fixed location until a nation extracts it on a first come basis. The former would provide some features of real property rights and discourage wasteful use the land.167 The latter, however, seems to better comport with the idea that the moon is the “common heritage of mankind” and no section is owned by a nation or person. This allows expeditions to prospect freely, as they do under the International Seabed Authority,168 and use their credits only when they decide on a location to begin extraction. When a nation exercises its credits on land, that land will become the exclusive economic zone of that nation, with other parties free to pass through as long as they do not disturb it or take resources from it. Like the ISS model, nations may collaborate and form agreements among themselves regarding particular issues without needing to go through the authoritative body so long as the agreements do not violate the overarching agreement on property rights. The natural resources extracted could be taxed by the ton to encourage nations not to take more than they need and to fund the operations of the authority governing the new agreement. There may even be a time or tonnage limit for staying on a piece of land so that particularly rich areas of resources will not be monopolized by any one country without giving other nations the opportunity to compete. Additionally, the authority may establish environmental rules to ensure that the mining does not harm the environment and that the mining and its effects would not be visible from earth. Any conflicts arising from lunar activities would be governed by article XIII of the Outer Space Treaty, which calls for issues regarding outer space to be resolved between State parties to the treaty or between a party and the international organization that oversees the activities.169 Applying that provision to this legal framework, if member parties have a dispute they must first try to resolve the issues through independent negotiation or by working with the authoritative body. Further, article III of the OST states that parties shall comply with international law, including the U.N. charter.170 The implication is that disputes arising in space law should be resolved in the same way as disputes in other areas of international law.171 Chapter IV of the U.N. charter states that parties shall “seek a solution by negotiation, enquiry, mediation, conciliation, arbitration, judicial settlement, resort to regional agencies or arrangements, or other peaceful means of their own choice.”172 If such action is successful, chapter XIV of the U.N. Charter provides that nations may bring their disputes to the International Court of Justice or make agreements to bring their issues to another tribunal.173 Therefore, in the event of a dispute under this legal framework the parties must first negotiate between themselves to resolve it. For the foreseeable future, there will likely not be enough space activity to necessitate a special space law tribunal, and if parties are unable to successfully resolve their dispute through diplomatic channels they may bring their dispute to the International Court of Justice. If at some future time there is enough space activity and disputes that an international space tribunal is necessary, one may be created at that time.

#### Commercial mining solves extinction from scarcity, climate, terror, war, and disease.

Pelton 17—(Director Emeritus of the Space and Advanced Communications Research Institute at George Washington University, PHD in IR from Georgetown).. Pelton, Joseph N. 2017. The New Gold Rush: The Riches of Space Beckon! Springer. Accessed 8/30/19.

Are We Humans Doomed to Extinction? What will we do when Earth’s resources are used up by humanity? The world is now hugely over populated, with billions and billions crammed into our overcrowded cities. By 2050, we may be 9 billion strong, and by 2100 well over 11 billion people on Planet Earth. Some at the United Nations say we might even be an amazing 12 billion crawling around this small globe. And over 80 % of us will be living in congested cities. These cities will be ever more vulnerable to terrorist attack, natural disaster, and other plights that come with overcrowding and a dearth of jobs that will be fueled by rapid automation and the rise of artifi cial intelligence across the global economy. We are already rapidly running out of water and minerals. Climate change is threatening our very existence. Political leaders and even the Pope have cautioned us against inaction. Perhaps the naysayers are right. All humanity is at tremendous risk. Is there no hope for the future? This book is about hope. We think that there is literally heavenly hope for humanity. But we are not talking here about divine intervention. We are envisioning a new space economy that recognizes that there is more water in the skies that all our oceans. Th ere is a new wealth of natural resources and clean energy in the reaches of outer space—more than most of us could ever dream possible. There are those that say why waste money on outer space when we have severe problems here at home? Going into space is not a waste of money. It is our future. It is our hope for new jobs and resources. The great challenge of our times is to reverse public thinking to see space not as a resource drain but as the doorway to opportunity. The new space frontier can literally open up a “gold rush in the skies.” In brief, we think there is new hope for humanity. We see a new a pathway to the future via new ventures in space. For too long, space programs have been seen as a money pit. In the process, we have overlooked the great abundance available to us in the skies above. It is important to recognize there is already the beginning of a new gold rush in space—a pathway to astral abundance. “New Space” is a term increasingly used to describe radical new commercial space initiatives—many of which have come from Silicon Valley and often with backing from the group of entrepreneurs known popularly as the “space billionaires.” New space is revolutionizing the space industry with lower cost space transportation and space systems that represent significant cost savings and new technological breakthroughs. “New Commercial Space” and the “New Space Economy” represent more than a new way of looking at outer space. These new pathways to the stars could prove vital to human survival. If one does not believe in spending money to probe the mysteries of the universe then perhaps we can try what might be called “calibrated greed” on for size. One only needs to go to a cubesat workshop, or to Silicon Valley or one of many conferences like the “Disrupt Space” event in Bremen, Germany, held in April 2016 to recognize that entrepreneurial New Space initiatives are changing everything [ 1 ]. In fact, the very nature and dimensions of what outer space activities are today have changed forever. It is no longer your grandfather’s concept of outer space that was once dominated by the big national space agencies. The entrepreneurs are taking over. The hopeful statements in this book and the hard economic and technical data that backs them up are more than a minority opinion. It is a topic of growing interest at the World Economic Forum, where business and political heavyweights meet in Davos, Switzerland, to discuss how to stimulate new patterns of global economic growth. It is even the growing view of a group that call themselves “space ethicists.” Here is how Christopher J. Newman, at the University of Sunderland in the United Kingdom has put it: Space ethicists have offered the view that space exploration is not only desirable; it is a duty that we, as a species, must undertake in order to secure the survival of humanity over the longer term. Expanding both the resource base and, eventually, the habitats available for humanity means that any expenditure on space exploration, far from being viewed as frivolous, can legitimately be rationalized as an ethical investment choice. (Newman) On the other hand there are space ethicists and space exobiologists who argue that humans have created ecological ruin on the planet—and now space debris is starting to pollute space. Th ese countervailing thoughts by the “no growth” camp of space ethicists say we have no right to colonize other planets or to mine the Moon and asteroids—or at least no right to do so until we can prove we can sustain life here on Earth for the longer term. However, for most who are planning for the new space economy the opinion of space philosophers doesn’t really fl oat their boat. Legislators, bankers, and aspiring space entrepreneurs are far more interested in the views of the super-rich capitalists called the space billionaires. A number of these billionaires and space executives have already put some very serious money into enterprises intent on creating a new pathway to the stars. No less than five billionaires with established space ventures—Elon Musk, Paul Allen, Jeff Bezos, Sir Richard Branson, and Robert Bigelow—have invested millions if not billions of dollars into commercializing space. They are developing new technologies and establishing space enterprises that can bring the wealth of outer space down to Earth. This is not a pipe dream, but will increasingly be the economic reality of the 2020s. These wealthy space entrepreneurs see major new economic opportunities. To them space represents the last great frontier for enterprising pioneers. Th us they see an ever-expanding space frontier that offers opportunities in low-cost space transportation, satellite solar power satellites to produce clean energy 24h a day, space mining, space manufacturing and production, and eventually space habitats and colonies as a trajectory to a better human future. Some even more visionary thinkers envision the possibility of terraforming Mars, or creating new structures in space to protect our planet from cosmic hazards and even raising Earth’s orbit to escape the rising heat levels of the Sun in millennia to come. Some, of course, will say this is sci-fi hogwash. It can’t be done. We say that this is what people would have said in 1900 about airplanes, rocket ships, cell phones and nuclear devices. The skeptics laughed at Columbus and his plan to sail across the oceans to discover new worlds. When Thomas Jefferson bought the Louisiana Purchase from France or Seward bought Alaska, there were plenty of naysayers that said such investment in the unknown was an extravagant waste of money. A healthy skepticism is useful and can play a role in economic and business success. Before one dismisses the idea of an impending major new space economy and a new gold rush, it might useful to see what has already transpired in space development in just the past five decades. The world’s first geosynchronous communications satellite had a throughput capability of about 500 kb / s. In contrast, today’s state of the art Viasat 2 —a half century later— has an impressive throughput of some 140 Gb/s. Th is means that the relative throughput is nearly 300,000 greater, while its lifetime is some ten times longer (Figs. 1.1 and 1.2 ). Each new generation of communications satellite has had more power, better antenna systems, improved pointing and stabilization, and an extended lifetime. And the capabilities represented by remote sensing satellites , meteorological satellites , and navigation and timing satellites have also expanded their capabilities and performance in an impressive manner. When satellite applications first started, the market was measured in millions of dollars. Today commercial satellite services exceed a quarter of a billion dollars. Vital services such as the Internet, aircraft traffi c control and management, international banking, search and rescue and much, much more depend on application satellites. Th ose that would doubt the importance of satellites to the global economy might wish to view on You Tube the video “If Th ere Were a Day Without Satellites?” [ 2 ]. Let’s check in on what some of those very rich and smart guys think about the new space economy and its potential. (We are sorry to say that so far there are no female space billionaires, but surely this, too, will come someday soon.) Of course this twenty-fi rst century breakthrough that we call the New Space economy will not come just from new space commerce. It will also come from the amazing new technologies here on Earth. Vital new terrestrial technologies will accompany this cosmic journey into tomorrow. Information technology, robotics, artificial intelligence and commercial space travel systems have now set us on a course to allow us humans to harvest the amazing riches in the skies—new natural resources, new energy, and even totally new ways of looking at the purpose of human existence. If we pursue this course steadfastly, it can be the beginning of a New Space renaissance. But if we don’t seek to realize our ultimate destiny in space, Homo sapiens can end up in the dustbin of history—just like literally millions of already failed species. In each and every one of the five mass extinction events that have occurred over the last 1.5 billion years on Earth, some 50–80 % of all species have gone the way of the T. Rex, the woolly mammoth, and the Dodo bird along with extinct ferns, grasses and cacti. On the other hand, the best days of the human race could be just beginning. If we are smart about how we go about discovering and using these riches in the skies and applying the best of our new technologies, it could be the start of a new beginning for humanity. Konstantin Tsiokovsky, the Russian astronautics pioneer, who fi rst conceived of practical designs for spaceships, famously said: “A planet is the cradle of mankind, but one cannot live in a cradle forever.” Well before Tsiokovsky another genius, Leonardo da Vinci, said, quite poetically: “Once you have tasted flight, you will forever walk the earth with your eyes turned skyward, for there you have been, and there you will always long to return.” The founder of the X-Prize and of Planetary Resources, Inc., Dr. Peter Diamandis, has much more brashly said much the same thing in quite diff erent words when he said: “The meek shall inherit the Earth. The rest of us will go to Mars.” The New Space Billionaires Peter Diamandis is not alone in his thinking. From the list of “visionaries” quoted earlier, Elon Musk, the founder of SpaceX; Sir Richard Branson, the founder of Virgin Galactic; and Paul Allen, the co-founder of Microsoft and the man who financed SpaceShipOne, the world’s first successful spaceplane have all said the future will include a vibrant new space economy. Th ey, and others, have said that we can, we should and we soon shall go into space and realize the bounty that it can offer to us. Th e New Space enterprise is today indeed being led by those so-called space billionaires , who have an exciting vision of the future. They and others in the commercial space economy believe that the exploitation of outer space may open up a new golden age of astral abundance. They see outer space as a new frontier that can be a great source of new materials, energy and various forms of new wealth that might even save us from excesses of the past. Th is gold rush in the skies represents a new beginning. We are not talking about expensive new space ventures funded by NASA or other space agencies in Europe, Japan, China or India. No, these eff orts which we and others call New Space are today being forged by imaginative and resourceful commercial entrepreneurs. Th ese twenty-fi rst century visionaries have the fortitude and zeal to look to the abundance above. New breakthroughs in technology and New Space enterprises may be able to create an “astral life raft” for humanity. Just as Columbus and the Vikings had the imaginative drive that led them to discover the riches of a new world, we now have a cadre of space billionaires that are now leading us into this New Space era of tomorrow. These bold leaders, such as Paul Allen and Sir Richard Branson, plus other space entrepreneurs including Jeff Bezos of Amazon and Blue Origin, and Robert Bigelow, Chairman of Budget Suites and Bigelow Aerospace, not only dream of their future in the space industry but also have billions of dollars in assets. These are the bright stars of an entirely new industry that are leading us into the age of New Space commerce. These space billionaires, each in their own way, are proponents of a new age of astral abundance. Each of them is launching new commercial space industries. They are literally transforming our vision of tomorrow. These new types of entrepreneurial aerospace companies—the New Space enterprises—give new hope and new promise of transforming our world as we know it today. The New Space Frontier What happens in space in the next few decades, plus corresponding new information technologies and advanced robotics, will change our world forever. These changes will redefi ne wealth, change our views of work and employment and upend almost everything we think we know about economics, wealth, jobs, and politics. Th ese changes are about truly disruptive technologies of the most fundamental kinds. If you thought the Internet, smart phones, and spandex were disruptive technologies, just hang on. You have not seen anything yet. In short, if you want to understand a transition more fundamental than the changes brought to the twentieth century world by computers, communications and the Internet, then read this book. There are truly riches in the skies. Near-Earth asteroids largely composed of platinum and rare earth metals have an incredible value. Helium-3 isotopes accessible in outer space could provide clean and abundant energy. There is far more water in outer space than is in our oceans. In the pages that follow we will explain the potential for a cosmic shift in our global economy, our ecology, and our commercial and legal systems. These can take place by the end of this century. And if these changes do not take place we will be in trouble. Our conventional petro-chemical energy systems will fail us economically and eventually blanket us with a hydrocarbon haze of smog that will threaten our health and our very survival. Our rare precious metals that we need for modern electronic appliances will skyrocket in price, and the struggle between “haves” and “have nots” will grow increasingly ugly. A lack of affordable and readily available water, natural resources, food, health care and medical supplies, plus systematic threats to urban security and systemic warfare are the alternatives to astral abundance. The choices between astral abundance and a downward spiral in global standards of living are stark. Within the next few decades these problems will be increasingly real. By then the world may almost be begging for new, out of- the-box thinking. International peace and security will be an indispensable prerequisite for exploitation of astral abundance, as will good government for all. No one nation can be rich and secure when everyone else is poor and insecure. In short, global space security and strategic space defense, mediated by global space agreements, are part of this new pathway to the future.

#### Resource scarcity coming now and causes extinction—asteroid mining is the only way to solve

Crombrugghe 18 – Guerric, Business Development Manager Brussels, Brussels Capital Region, “Asteroid mining as a necessary answer to mineral scarcity”, LinkedIn, 1/11/2018, <https://www.linkedin.com/pulse/asteroid-mining-necessary-answer-mineral-scarcity-de-crombrugghe>

We need minerals, and we always will. Yet, our reserves are finite and a 100% end-of-life recycling rate is impossible to achieve. Eventually, new entrants will therefore be required to sustain our system. While the business case for asteroid mining can obviously not be closed with current technologies, it will someday become a necessity. We may as well start preparing ourselves. Scarcity of resources, the challenge of the 21st century According to the World Bank, in 2016 humanity's growth rate was of 1.18% in terms of population, and 2.50% in terms of GDP. Both of these, in turn, drive our staggering resource consumption: there are more of us, and each of us needs more. On the other, the Earth is a closed system, and resources are only available in a finite amount. We all know by now that there is only this much oil & gas, but the same can actually be said for water, arable land, minerals, etc. These two simple observations have sparkled the debate around the scarcity of resources. Even with the best intentions, mathematics teaches us that it is impossible to indefinitely extract resources from a given finite supply [1]. The problem arising in the short-term is the exhaustion of the existing supply. That limit is actually coming in fast. In a paper published in 2007, Stephen Kessler demonstrates that the global mineral reserves are only sufficient for the next 50 years. The figure on the right shows the ratio of known global reserve to global annual consumption, given a rough indication of adequacy in years. It dates from an earlier paper, published in 1994. Since then, the development of environmental-friendly technologies (e.g. batteries, electric engines, etc.) has drastically increased the consumption rate of high-tech metals such as cobalt, platinum, rare earths, or titanium. On the other hand, exploration programs have allowed to discover new deposits, notably of gold and diamond. We will certainly be able to continue to increase - or at least sustain - our reserves, but only temporarily. Recycling and other temporary fixes An obvious solution is recycling, i.e. rejuvenating our stocks. A popular concept to illustrate this idea is that of urban mining: retrieving the ores present in smartphones and other electronic devices. It may prove to be not only more environmental-friendly, be also safer and more cost-effective. Nevertheless, every solution based on recycling is, again, nothing more than a temporary fix, buying us a finite amount of time. The United Nations Environment Programme studied in a report the current recycling rate of 60 metals. More than half of them have an end-of-life recycling rate below 1%, and less than one-third are above 50%. Nickel, for example, is relatively easy to retrieve, with and end-of-life recycling rate of up to 63% under the best conditions. At that rate, less than 1% of the initial stock is available after only 10 cycle. Even with a staggering 99% efficiency, the same 1% limit is achieved in less than 460 cycles. Not bad, of course, but still not enough. Should our hunger for resources continue, and even with the most optimised recycling techniques, a second problem will arise in the longer term: the amount of resources needed at a given time will simply exceed the total available stock. Unless we manage to find growth vectors that do not require raw materials, that tipping point is an impassable limit. Its proximity obviously depends on our consumption rate. Asteroid mining? No matter which way we look at it, we will thus be short on resources, either through sheer exhaustion (i.e. transformation in an unrecoverable form) or because the demand will exceed the total reserves. We can - and should - talk about recycling, dematerialisation, and other more ethically questionable solutions such as bio-engineering. Nonetheless, no matter how good they are, these are only temporary fixes. If we don't radically change our lifestyle, we will sooner or later have to address the elephant in the room: the Earth is a closed system, we need new entrants. How can space help? Short answer: all these minerals can be found in space. Some are difficult to obtain, others are even more difficult, none are straightforward. The most accessible destination is near-Earth asteroids, a reservoir of over 17,000 known - and counting - giant rocks that regularly cross the orbit of our planet. They are commonly classified in three main families. The most interesting one, for our case, is that of the S-type asteroids. These are metallic bodies, containing first and foremost nickel, iron and cobalt, but also gold, ores from the platinum group. But the list doesn't stop there, many other minerals can be found in smaller amounts: iridium, silver, osmium, palladium, rhenium, rhodium, ruthenium, manganese, molybdenum, aluminium, titanium, etc. How do we get there? Let's take an example: Ryugu, formerly known as 1999 JU3. It's a C-type asteroid measured to be approximately one kilometre in size [2]. In addition to nickel, iron and cobalt, it also contains a fair share of water, nitrogen, hydrogen, and ammonia. Its total value is estimated to be approximately 80 billion USD. Fantastic! But how do we get there and, most importantly, how much does it cost? Well, we may have the start of an answer to these questions. Reaching Ryugu is a technological challenge, but it is feasible. In December 2014, the Japanese space agency has launched a spacecraft, Hayabusa2, heading to the asteroid. Its mission includes the collection of a small sample which will be sent back to the Earth, with a landing planned for December 2020. The target for the sample size is at least 100 µg. The total cost of the mission was projected to be around 200 million USD. That's 2 trillion USD per gram. Let's be optimistic and assume that the sample retrieved is pure gold. At today's rate, it is worth 42.5 USD per gram. That's a difference of over 10 orders of magnitude. Some may argue that Hayabusa2 has many other objectives that retrieving a sample. The mission does indeed include multiple landers, thorough scientific investigations, etc. There is actually another asteroid sample return mission underway, which we could you as a second point of comparison: OSIRIS-Rex, from NASA. It's heading for Bennu, also a C-type asteroid, which it will reach in August 2018. Total cost of the mission: 980 million USD. Target sample size: at least 60 g. We achieve thus roughly speaking 16 million USD per gram. Better, but still 6 orders of magnitude off compared to pure gold. It's pretty much as good as it gets with existing state-of-the-art technologies. Not much of a business case. Should we forget about it? Referring back to our earlier conclusion on resource scarcity, we had two options. Either we drastically reduce our resource consumption, to such a degree that reserves can last for longer than humanity itself, or we extend our closed system, the Earth, to nearby asteroids. In the current state of affairs, I am honestly not sure which course of action is the easiest. As they get increasingly rare, the cost of minerals will go up. On the other hand, as explained in a previous article, we can expect the cost of space activities to go steadily down. Step by step, these 6 orders of magnitude will slowly get munched away from both ends, until eventually asteroid mining becomes a viable operation. In other words: it will only become financially interesting once minerals become a thousand times more expensive and space activities a thousand times cheaper. As a point of reference, the introduction of reusable rockets by SpaceX, widely considered as one of the few truly disruptive changes in the aerospace sector in the last few decades, has "only" brought a cost reduction of 30%. While it's clearly amazing, we still need at least 220 innovations of the same calibre [3] before we can make it work (again: assuming the price of minerals simultaneously goes up by a factor of a thousand). It's therefore quite likely that space mining will not take place within our lifetime [4]. How can we accelerate the process? Firstly, we can only celebrate and support the numerous private initiatives which contribute to make that reality happen, either indirectly (e.g. launchers, space systems, etc.) or directly (e.g. in-space manufacturing, lunar exploration, etc.). Shout out to all the folks who manage to keep the flame of space exploration burning while generating profit for their investors. Secondly, space agencies and other institutional actors should continue to act as promoters of pioneering mission such as Hayabusa2, OSIRIS-REx, or DART. We can only regret that the Asteroid Redirect Mission from NASA and the Asteroid Impact Mission from ESA were not funded. From my perspective, these should actually be amongst the top priorities of our space exploration agenda. Not only are they instrumental to our understanding of the solar system, but they are also essential if we want to avoid the same fate as the dinosaurs. It's a question of survival. As a bonus, they also pave the way towards cost-efficient asteroid mining. In the meantime, we might want to consume existing resources a bit more efficiently.

#### Resource Shortages Exacerbate Conflict

Wingo 13 - Dennis Wingo, Former CTO of the Orbital Recovery Corporation, Founder & CEO of Skycorp Inc, and Greentrail Energy Inc., Co-Founder & CTO of Orbital Recovery Inc. Leader of NASA's the Lunar Orbiter Image Recovery Project (LOIRP), First in history to rescue and operate a spacecraft (ISEE-3) in interplanetary space, and University of Alabama in Huntsville Consortium for Materials Development in Space Researcher At University of Alabama in Huntsville Consortium for Materials Development in Space “Commentary | The Inevitability of Extraterrestrial Mining”, *Space News*, 7/29/2013, https://spacenews.com/36511the-inevitability-of-extraterrestrial-mining/

I am honored to provide the counterpoint to my esteemed colleague Ambassador Roger Harrison’s negative contention concerning the mining of extraterrestrial materials off of planet Earth. Let’s begin with his ending: “The conclusion is inescapable, though liable to be escaped, i.e., that raw materials will never be mined in space and sold profitably within the atmosphere or anywhere else. … Asteroids will continue unvexed in their obits, and the Moon too.” I bring a different quote, from the book “Empire Express,” the story of the intercontinental railroad, from U.S. Army Lt. Zebulon Pike, for whom Pike’s Peak is named: “In various places there were tracts of many leagues, where the wind had thrown up sand in all the fanciful forms of the ocean’s rolling wave, and on which not a spear of vegetable matter existed.” Pike’s visions of sand dunes, pathless wastes and sterile soils were reported, widely read and faithfully believed by geographers. The myth became innocently embellished by subsequent visitors, especially those in the party of Maj. Stephen H. Long, who traversed the whole area in 1820. It was reported to be “an unfit residence for any but a nomad population … forever to remain the unmolested haunt of the native hunter, the bison, and the jackal.” The delicious irony is that Mr. Harrison today lives in the shadow of Pike’s Peak, and the U.S. Air Force Academy where he teaches is in the middle of the confidently prophesied unmolested haunt. When Long’s report was written, the Erie Canal across New York was five years from completion and it was another 31 years before the first railroad was completed across the state. Mr. Harrison’s technical objections are for the most part valid today for his scenario, just as objections to a railroad across the North American continent were valid in the 1820s. However, technology is being developed today that will enable extraterrestrial mining, manufacturing and development just as technology was developed that would enable the creation of the national railroad. Mr. Harrison says it is an illusion that we are running out of resources. He is correct. That is not our claim. The claim is that extraction costs of economically viable terrestrial resources are rising dramatically and may soon exceed the cost of extraction from much more plentiful extraterrestrial sources. Today rapidly advancing costs and diminishing returns are rapidly redefining mining due to diminishing ore grades. This fact is developed in a 2012 distinguished lecture by Dan Wood before the Society of Environmental Geologists, “Crucial Challenges to Discovery and Mining — Tomorrow’s Deeper Ore Bodies.” This is a vitally important issue to solve as resource conflict has been the impetus for most wars in human history. We live in a global civilization of over 7 billion people, which will expand to over 9 billion before plateauing in mid-century. While American politicians are not paying attention to what this means, the rest of the world is noticing. Gross domestic product (GDP) growth and increasing global resource demand are addressed in “Iron Ore Outlook 2050,” a report commissioned for the Indian government. The GDP of the major powers (the United States, Europe, China, India and Japan) is forecast to rise from $48 trillion in 2010 to $149 trillion by 2050. The report’s substance is that with this massive increase in global GDP, an intensifying scramble for metal resources is inevitable. If the trend of resource consumption demand increase continues unabated, there are three likely potential outcomes. The first is collapse, forecast by the “Limits to Growth” school of thought. The second and more likely scenario is fierce national economic competition leading to wars over diminishing resources. The third, and most desirable, is to increase the global resource base by the economic and industrial development of the inner solar system. Mr. Harrison uses cost as the primary reason that extraterrestrial mining will never happen by focusing on a straw man argument related to mining asteroids in orbits far from Earth. Just as the U.S. railroad infrastructure began on shorter routes with lower capital requirements and shorter payback periods, asteroid mining can begin with our nearest neighbor, the Moon, where telepresence robotics, high-bandwidth communications and a short three-day trip for humans negate his premise. We know from the Apollo samples that plentiful metallic asteroidal materials exist in the lunar highlands. We also know from several missions that extensive water, titanium, thorium, uranium, aluminum and native iron all exist on the Moon, in easily separable oxide form. Improvements in remote sensing data from current missions and computer modeling continue to increase the amount of potential asteroidal material on the Moon, increasing confidence in the Moon first premise. The extensive resources of the Moon become the catalyst for an inner solar system-wide economy providing fuel, vehicles and the all-important experience in developing an industrial infrastructure off planet. The asteroids then become the force multiplier of inner solar system development with billions of tons of water, metals and free space energy from solar power. Mars figures in here as well as the second home of humanity, creating further demand for asteroidal resources, and providing something else that is becoming increasingly scarce on the Earth: hope for the future. The technical barriers that Mr. Harrison points to are being overcome just as those of the 19th century were. New technology developments in 3-D printing, additive manufacturing and advanced robotics are breaking down the final barriers to exploiting off-planet resources and indeed the industrial development of the inner solar system. It is not a question if, it is a question of when, and by whom. Just as the Pacific Railway Act of 1862 was a primary catalyst for a century of American economic growth, it should be the role of government to develop policies and concrete legislation to support this development for the continued health of the American economy and the future of all mankind.

#### Those Conflicts go Nuclear

Klare 13 – Michael T., professor emeritus of peace and world-security studies at Hampshire College and senior visiting fellow at the Arms Control Association in Washington, DC, " How Resource Scarcity and Climate Change Could Produce a Global Explosion", *The Nation*, 4/22/2013, <https://www.thenation.com/article/how-resource-scarcity-and-climate-change-could-produce-global-explosion/> JHW

Resource Shortages and Resource Wars Start with one simple given: the prospect of future scarcities of vital natural resources, including energy, water, land, food and critical minerals. This in itself would guarantee social unrest, geopolitical friction and war. It is important to note that absolute scarcity doesn’t have to be on the horizon in any given resource category for this scenario to kick in. A lack of adequate supplies to meet the needs of a growing, ever more urbanized and industrialized global population is enough. Given the wave of extinctions that scientists are recording, some resources—particular species of fish, animals and trees, for example—will become less abundant in the decades to come, and may even disappear altogether. But key materials for modern civilization like oil, uranium and copper will simply prove harder and more costly to acquire, leading to supply bottlenecks and periodic shortages. Oil—the single most important commodity in the international economy—provides an apt example. Although global oil supplies may actually grow in the coming decades, many experts doubt that they can be expanded sufficiently to meet the needs of a rising global middle class that is, for instance, expected to buy millions of new cars in the near future. In its 2011 World Energy Outlook, the International Energy Agency claimed that an anticipated global oil demand of 104 million barrels per day in 2035 will be satisfied. This, the report suggested, would be thanks in large part to additional supplies of “unconventional oil” (Canadian tar sands, shale oil and so on), as well as 55 million barrels of new oil from fields “yet to be found” and “yet to be developed.” However, many analysts scoff at this optimistic assessment, arguing that rising production costs (for energy that will be ever more difficult and costly to extract), environmental opposition, warfare, corruption and other impediments will make it extremely difficult to achieve increases of this magnitude. In other words, even if production manages for a time to top the 2010 level of 87 million barrels per day, the goal of 104 million barrels will never be reached and the world’s major consumers will face virtual, if not absolute, scarcity. Water provides another potent example. On an annual basis, the supply of drinking water provided by natural precipitation remains more or less constant: about 40,000 cubic kilometers. But much of this precipitation lands on Greenland, Antarctica, Siberia and inner Amazonia where there are very few people, so the supply available to major concentrations of humanity is often surprisingly limited. In many regions with high population levels, water supplies are already relatively sparse. This is especially true of North Africa, Central Asia and the Middle East, where the demand for water continues to grow as a result of rising populations, urbanization and the emergence of new water-intensive industries. The result, even when the supply remains constant, is an environment of increasing scarcity. Wherever you look, the picture is roughly the same: supplies of critical resources may be rising or falling, but rarely do they appear to be outpacing demand, producing a sense of widespread and systemic scarcity. However generated, a perception of scarcity—or imminent scarcity—regularly leads to anxiety, resentment, hostility and contentiousness. This pattern is very well understood, and has been evident throughout human history. In his book Constant Battles, for example, Steven LeBlanc, director of collections for Harvard’s Peabody Museum of Archaeology and Ethnology, notes that many ancient civilizations experienced higher levels of warfare when faced with resource shortages brought about by population growth, crop failures or persistent drought. Jared Diamond, author of the bestseller Collapse, has detected a similar pattern in Mayan civilization and the Anasazi culture of New Mexico’s Chaco Canyon. More recently, concern over adequate food for the home population was a significant factor in Japan’s invasion of Manchuria in 1931 and Germany’s invasions of Poland in 1939 and the Soviet Union in 1941, according to Lizzie Collingham, author of The Taste of War. Although the global supply of most basic commodities has grown enormously since the end of World War II, analysts see the persistence of resource-related conflict in areas where materials remain scarce or there is anxiety about the future reliability of supplies. Many experts believe, for example, that the fighting in Darfur and other war-ravaged areas of North Africa has been driven, at least in part, by competition among desert tribes for access to scarce water supplies, exacerbated in some cases by rising population levels. “In Darfur,” says a 2009 report from the UN Environment Programme on the role of natural resources in the conflict, “recurrent drought, increasing demographic pressures, and political marginalization are among the forces that have pushed the region into a spiral of lawlessness and violence that has led to 300,000 deaths and the displacement of more than two million people since 2003.” Anxiety over future supplies is often also a factor in conflicts that break out over access to oil or control of contested undersea reserves of oil and natural gas. In 1979, for instance, when the Islamic revolution in Iran overthrew the Shah and the Soviets invaded Afghanistan, Washington began to fear that someday it might be denied access to Persian Gulf oil. At that point, President Jimmy Carter promptly announced what came to be called the Carter Doctrine. In his 1980 State of the Union Address, Carter affirmed that any move to impede the flow of oil from the Gulf would be viewed as a threat to America’s “vital interests” and would be repelled by “any means necessary, including military force.” In 1990, this principle was invoked by President George H.W. Bush to justify intervention in the first Persian Gulf War, just as his son would use it, in part, to justify the 2003 invasion of Iraq. Today, it remains the basis for US plans to employ force to stop the Iranians from closing the Strait of Hormuz, the strategic waterway connecting the Persian Gulf to the Indian Ocean through which about 35 percent of the world’s seaborne oil commerce passes. Recently, a set of resource conflicts have been rising toward the boiling point between China and its neighbors in Southeast Asia when it comes to control of offshore oil and gas reserves in the South China Sea. Although the resulting naval clashes have yet to result in a loss of life, a strong possibility of military escalation exists. A similar situation has also arisen in the East China Sea, where China and Japan are jousting for control over similarly valuable undersea reserves. Meanwhile, in the South Atlantic Ocean, Argentina and Britain are once again squabbling over the Falkland Islands (called Las Malvinas by the Argentinians) because oil has been discovered in surrounding waters. By all accounts, resource-driven potential conflicts like these will only multiply in the years ahead as demand rises, supplies dwindle and more of what remains will be found in disputed areas. In a 2012 study titled Resources Futures, the respected British think-tank Chatham House expressed particular concern about possible resource wars over water, especially in areas like the Nile and Jordan River basins where several groups or countries must share the same river for the majority of their water supplies and few possess the wherewithal to develop alternatives. “Against this backdrop of tight supplies and competition, issues related to water rights, prices, and pollution are becoming contentious,” the report noted. “In areas with limited capacity to govern shared resources, balance competing demands, and mobilize new investments, tensions over water may erupt into more open confrontations.” Heading for a Resource-Shock World Tensions like these would be destined to grow by themselves because in so many areas supplies of key resources will not be able to keep up with demand. As it happens, though, they are not “by themselves.” On this planet, a second major force has entered the equation in a significant way. With the growing reality of climate change, everything becomes a lot more terrifying. Normally, when we consider the impact of climate change, we think primarily about the environment—the melting Arctic ice cap or Greenland ice shield, rising global sea levels, intensifying storms, expanding desert and endangered or disappearing species like the polar bear. But a growing number of experts are coming to realize that the most potent effects of climate change will be experienced by humans directly through the impairment or wholesale destruction of habitats upon which we rely for food production, industrial activities or simply to live. Essentially, climate change will wreak its havoc on us by constraining our access to the basics of life: vital resources that include food, water, land and energy. This will be devastating to human life, even as it significantly increases the danger of resource conflicts of all sorts erupting. We already know enough about the future effects of climate change to predict the following with reasonable confidence: \* Rising sea levels will in the next half-century erase many coastal areas, destroying large cities, critical infrastructure (including roads, railroads, ports, airports, pipelines, refineries and power plants) and prime agricultural land. \* Diminished rainfall and prolonged droughts will turn once-verdant croplands into dust bowls, reducing food output and turning millions into “climate refugees.” \* More severe storms and intense heat waves will kill crops, trigger forest fires, cause floods and destroy critical infrastructure. No one can predict how much food, land, water and energy will be lost as a result of this onslaught (and other climate-change effects that are harder to predict or even possibly imagine), but the cumulative effect will undoubtedly be staggering. In Resources Futures, Chatham House offers a particularly dire warning when it comes to the threat of diminished precipitation to rain-fed agriculture. “By 2020,” the report says, “yields from rain-fed agriculture could be reduced by up to 50%” in some areas. The highest rates of loss are expected to be in Africa, where reliance on rain-fed farming is greatest, but agriculture in China, India, Pakistan and Central Asia is also likely to be severely affected. Heat waves, droughts and other effects of climate change will also reduce the flow of many vital rivers, diminishing water supplies for irrigation, hydro-electricity power facilities and nuclear reactors (which need massive amounts of water for cooling purposes). The melting of glaciers, especially in the Andes in Latin America and the Himalayas in South Asia, will also rob communities and cities of crucial water supplies. An expected increase in the frequency of hurricanes and typhoons will pose a growing threat to offshore oil rigs, coastal refineries, transmission lines and other components of the global energy system. The melting of the Arctic ice cap will open that region to oil and gas exploration, but an increase in iceberg activity will make all efforts to exploit that region’s energy supplies perilous and exceedingly costly. Longer growing seasons in the north, especially Siberia and Canada’s northern provinces, might compensate to some degree for the desiccation of croplands in more southerly latitudes. However, moving the global agricultural system (and the world’s farmers) northward from abandoned farmlands in the United States, Mexico, Brazil, India, China, Argentina and Australia would be a daunting prospect. It is safe to assume that climate change, especially when combined with growing supply shortages, will result in a significant reduction in the planet’s vital resources, augmenting the kinds of pressures that have historically led to conflict, even under better circumstances. In this way, according to the Chatham House report, climate change is best understood as a “threat multiplier…a key factor exacerbating existing resource vulnerability” in states already prone to such disorders. Like other experts on the subject, Chatham House’s analysts claim, for example, that climate change will reduce crop output in many areas, sending global food prices soaring and triggering unrest among those already pushed to the limit under existing conditions. “Increased frequency and severity of extreme weather events, such as droughts, heat waves and floods, will also result in much larger and frequent local harvest shocks around the world….These shocks will affect global food prices whenever key centers of agricultural production area are hit—further amplifying global food price volatility.” This, in turn, will increase the likelihood of civil unrest. When, for instance, a brutal heat wave decimated Russia’s wheat crop during the summer of 2010, the global price of wheat (and so of that staple of life, bread) began an inexorable upward climb, reaching particularly high levels in North Africa and the Middle East. With local governments unwilling or unable to help desperate populations, anger over impossible-to-afford food merged with resentment toward autocratic regimes to trigger the massive popular outburst we know as the Arab Spring. Many such explosions are likely in the future, Chatham House suggests, if current trends continue as climate change and resource scarcity meld into a single reality in our world. A single provocative question from that group should haunt us all: “Are we on the cusp of a new world order dominated by struggles over access to affordable resources?” For the US intelligence community, which appears to have been influenced by the report, the response was blunt. In March, for the first time, Director of National Intelligence James R. Clapper listed “competition and scarcity involving natural resources” as a national security threat on a par with global terrorism, cyberwar and nuclear proliferation. “Many countries important to the United States are vulnerable to natural resource shocks that degrade economic development, frustrate attempts to democratize, raise the risk of regime-threatening instability, and aggravate regional tensions,” he wrote in his prepared statement for the Senate Select Committee on Intelligence. “Extreme weather events (floods, droughts, heat waves) will increasingly disrupt food and energy markets, exacerbating state weakness, forcing human migrations, and triggering riots, civil disobedience, and vandalism.” There was a new phrase embedded in his comments: “resource shocks.” It catches something of the world we’re barreling toward, and the language is striking for an intelligence community that, like the government it serves, has largely played down or ignored the dangers of climate change. For the first time, senior government analysts may be coming to appreciate what energy experts, resource analysts and scientists have long been warning about: the unbridled consumption of the world’s natural resources, combined with the advent of extreme climate change, could produce a global explosion of human chaos and conflict. We are now heading directly into a resource-shock world.

## Case

### Framework

Reject “justice” – collapses to util because the only impact of being unjust is that it hurts some while helping others, which can only be calculated through util

Waldron – a] assumes we should only care about justice which we shouldn’t b] there isn’t always a single determinate community position so their ideal theory wouldn’t work

Ripstein – consequences come first because they’re the only binding thing – we can choose to ignore justice but if we put a hand on a hot stove we’re compelled to lift it up

Bingham – just says that laws are good but the reason they’re created is to maximize wellbeing

Nagel – we don’t have a shared institution of moral theories – their thesis is too abstract and doesn’t apply to real world

### Advantage

#### Interdependence checks space war.

**Hall 15** [Luke Penn-Hall 15, Analyst at The Cipher Brief, M.A. from the Johns Hopkins School for Advanced International Studies, B.A. in International Relations and Religious Studies from Claremont McKenna College, “5 Reasons “Space War” Isn’t As Scary As It Sounds”, The Cipher Brief, 8/18/2015, <https://www.thecipherbrief.com/article/5-reasons-%E2%80%9Cspace-war%E2%80%9D-isn%E2%80%99t-scary-it-sounds>] recut Adam

* If you are also reading the Pavur evidence then unhighlight the debris stuff

The U.S. depends heavily on military and commercial satellites. If a less satellite-dependent opponent launched an anti-satellite (ASAT) attack, it would have far greater impact on the U.S. than the attacker. However, it’s not as simple as that – for the following reasons:

1. An ASAT attack would likely be part of a larger, terrestrial attack. An attack on space assets would be no different than an attack on territory or other assets on earth. This means that no space war would stay limited to space. An ASAT campaign would be part of a larger conventional military conflict that would play out on earth.

2. Every country with ASAT capabilities also needs satellites. While the United States is the most dependent on military satellites, most other countries need satellites to participate in the global economy. All countries that have the technical ability to play in this space – the U.S., Russia, China and India - also have a vested interest in preventing the militarization of space and protecting their own satellites. If any of those countries were to attack U.S. satellites, it would likely hurt them far more than it would hurt the United States.

3. Destruction of satellites could create a damaging chain reaction. Scientists warn that the violent destruction of satellites could result in an effect called an ablation cascade. High-velocity debris from a destroyed satellite could crash into other satellites and create more high-velocity debris. If an ablation cascade were to occur, it could render certain orbital levels completely unusable for centuries.

4. Any country that threatened access to space would threaten the global economy. Even if a full-blown ablation cascade didn’t occur, an ASAT campaign would cause debris, making operating in space more hazardous. The global economy relies on satellites and any disruption of operations would be met with worldwide disapproval and severe economic ramifications.

5. International Prohibits the Use of ASAT Weapons. Several international treaties expressly prohibit signatory nations from attacking other countries’ space assets. It is generally accepted that space should be treated as a global common area, rather than a military domain.

While it remains necessary for military planners to create contingency plans for a, space war it is a highly unlikely scenario. All involved parties are incentivized against attacking. However, if a space war did occur, it would be part of a larger conflict on Earth. Those concerned about the potential for war in space should be more concerned about the potential for war, period.

#### Deterrence solves.

**Evanoff 19** [Kyle Evanoff, Kyle is a research associate in international economics and U.S. foreign policy at the Council on Foreign Relations “Big Bangs, Red Herrings, and the Dilemmas of Space Security”, Council on Foreign Relations, 6/27/2019, <https://www.cfr.org/blog/big-bangs-red-herrings-and-dilemmas-space-security> accessed 12/11/21] Adam

More important, U.S. policymakers should avoid making decisions on the basis of a possible, though highly improbable, space Pearl Harbor. They should recognize that latent counterspace capabilities—as exemplified in 2008’s Operation Burnt Frost, which saw the United States repurpose a ballistic missile interceptor to destroy a satellite—are more than sufficient to deter adversaries from launching a major surprise attack in almost all scenarios, especially in light of the aforementioned deep interdependence in the space domain. Adding to the deterrence effect are uncertain offensive cyber capabilities. The United States continues to launch incursions into geopolitical competitors’ critical systems, such as the Russian power grid, and has demonstrated a willingness to employ cyberattacks in the wake of offline incidents, as it did after Iran shot down a U.S. drone last week. Unlike in the nuclear arena, where anything short of the prospect of nuclear retaliation holds limited dissuasive power, space deterrence can stem from military capabilities in various domains. For this reason, an attack on a U.S. satellite could elicit any number of responses. The potential for cross-domain retaliation, combined with the high strategic value of space assets, means that any adversary risks extreme escalation in launching a major assault on American space architectures. Again, well-conceived diplomatic efforts are useful in averting such scenarios altogether.

#### Space systems are distributed and resilient---the U.S. knows that and won’t jump straight to the nuclear rung of the escalation ladder

Zack Cooper 18, Senior Fellow for Asian Security at the Center for Strategic and International Studies, and Thomas G. Roberts, Research Assistant and Program Coordinator for the Aerospace Security Project at CSIS, “DETERRENCE IN THE LAST SANCTUARY”, War on the Rocks, 1/2/2018, https://warontherocks.com/2018/01/deterrence-last-sanctuary/

Until recently, resilience in space was largely an afterthought. It was assumed that a conflict in space would likely lead to or precede a major nuclear exchange. Therefore, the focus was on cost-effective architectures that maximized satellite capabilities, often at the cost of resilience. Recently, however, some have hoped that new architectures could enhance resilience and prevent critical military operations from being significantly impeded in an attack. Although resilience can be expensive, American investments in smaller satellites and more distributed space architectures could minimize adversary incentives to carry out first strikes in space.

In the late 20th century, minor escalations against space systems were treated as major events, since they typically threatened the superpowers’ nuclear architectures. Today, the proliferation of counter-space capabilities and the wide array of possible types of attacks means that most attacks against U.S. space systems are unlikely to warrant a nuclear response. It is critical that policymakers understand the likely break points in any conflict involving space systems. Strategists should explore whether the characteristics of different types of attacks against space systems create different thresholds, paying particular attention to attribution, reversibility, the defender’s awareness of an attack, the attacker’s ability to assess an attack’s effectiveness, and the risks of collateral damage (e.g., orbital debris). Competitors may attempt to use non-kinetic weapons and reversible actions to stay below the threshold that would trigger a strong U.S. response. The 2017 National Security Strategy warns:

Any harmful interference with or an attack upon critical components of our space architecture that directly affects this vital U.S. interest will be met with a deliberate response at a time, place, manner, and domain of our choosing.

In order to fulfill this promise, the United States will want to ensure that it has capabilities to respond both above and below various thresholds to ensure a full-spectrum of deterrence options for the full range of potential actors.

#### Expanding PTD per their contention 2 shatters the entire legal-regulatory balance – that turns case

Huffman 15 [James L. Huffman is Dean Emeritus of Lewis & Clark Law School and a Visiting Fellow at the Hoover Institution. He holds degrees from Montana State University (BS), The Fletcher School of Tufts University (MA) and the University of Chicago (JD). "WHY LIBERATING THE PUBLIC TRUST DOCTRINE IS BAD FOR THE PUBLIC." https://law.lclark.edu/live/files/19611-45-2huffman]

Since the beginning of the modern environmental movement in the 1960s, environmental advocates have been in search of ways to circumvent the twin obstacles of political compromise and vested property rights. In a 1970 article, Professor Joseph Sax suggested that the common law public trust doctrine might provide an avenue for judicial intervention in the name of claimed public rights in a wide array of natural resources. Because the traditional doctrine was narrowly limited in terms of both public rights and affected resources, Sax published a second article ten years later, calling for courts to liberate the public trust doctrine from its historical parameters. While a few judges responded with generally limited extensions of the doctrine, Sax’s plea has been ignored by most courts—but not by academics. A flood of law review articles have resorted to shoddy history, retrospective theorizing about the origins and purposes of the doctrine, appeals to higher law and moral imperatives, and confusion of the idea of public trust in representative government with the public rights protected by the public trust doctrine in efforts to persuade courts to liberate the doctrine. Implicit, if not explicit, in all of these arguments is the claim that the common law origins of American law and the American judicial system vest courts with authority to amend old law and make new law. At risk in this vast and imaginative effort to liberate the public trust doctrine from its common law confines are the constitutional separation of powers, the rule of law, due process and secure property rights, and the economic prosperity on which environmental protection ultimately depends.

1. <http://dictionary.reference.com/browse/negate>, <http://www.merriam-webster.com/dictionary/negate>, <http://www.thefreedictionary.com/negate>, <http://www.vocabulary.com/dictionary/negate>, <http://www.oxforddictionaries.com/definition/english/negate> [↑](#footnote-ref-1)
2. *Dictionary.com – maintain as true, Merriam Webster – to say that something is true, Vocabulary.com – to affirm something is to confirm that it is true, Oxford dictionaries – accept the validity of, Thefreedictionary – assert to be true* [↑](#footnote-ref-2)