# 1nc

## 1

#### a] interpretation: “THE appropriation of outer space” is a generic indefinite singular. The aff may not defend a subset of appropriation of outer space by private entities being unjust.

#### The definite article “the” makes the rez a definite singular – it’s generic

CCC n.d. [Capital Community College, a nonprofit 501 c-3 organization that supports scholarships, faculty development, and curriculum innovation.] “Articles, Determiners, and Quantifiers.” Capital Community College. <http://grammar.ccc.commnet.edu/grammar/determiners/determiners.htm#articles> TG

The three articles — a, an, the — are a kind of adjective. The is called the definite article because it usually precedes a specific or previously mentioned noun; a and an are called indefinite articles because they are used to refer to something in a less specific manner (an unspecified count noun). These words are also listed among the noun markers or determiners because they are almost invariably followed by a noun (or something else acting as a noun). caution CAUTION! Even after you learn all the principles behind the use of these articles, you will find an abundance of situations where choosing the correct article or choosing whether to use one or not will prove chancy. Icy highways are dangerous. The icy highways are dangerous. And both are correct. The is used with specific nouns. The is required when the noun it refers to represents something that is one of a kind: The moon circles the earth. The is required when the noun it refers to represents something in the abstract: The United States has encouraged the use of the private automobile as opposed to the use of public transit. The is required when the noun it refers to represents something named earlier in the text. (See below..) If you would like help with the distinction between count and non-count nouns, please refer to Count and Non-Count Nouns. We use a before singular count-nouns that begin with consonants (a cow, a barn, a sheep); we use an before singular count-nouns that begin with vowels or vowel-like sounds (an apple, an urban blight, an open door). Words that begin with an h sound often require an a (as in a horse, a history book, a hotel), but if an h-word begins with an actual vowel sound, use an an (as in an hour, an honor). We would say a useful device and a union matter because the u of those words actually sounds like yoo (as opposed, say, to the u of an ugly incident). The same is true of a European and a Euro (because of that consonantal "Yoo" sound). We would say a once-in-a-lifetime experience or a one-time hero because the words once and one begin with a w sound (as if they were spelled wuntz and won). Merriam-Webster's Dictionary says that we can use an before an h- word that begins with an unstressed syllable. Thus, we might say an hisTORical moment, but we would say a HIStory book. Many writers would call that an affectation and prefer that we say a historical, but apparently, this choice is a matter of personal taste. For help on using articles with abbreviations and acronyms (a or an FBI agent?), see the section on Abbreviations. First and subsequent reference: When we first refer to something in written text, we often use an indefinite article to modify it. A newspaper has an obligation to seek out and tell the truth. In a subsequent reference to this newspaper, however, we will use the definite article: There are situations, however, when the newspaper must determine whether the public's safety is jeopardized by knowing the truth. Another example: "I'd like a glass of orange juice, please," John said. "I put the glass of juice on the counter already," Sheila replied. Exception: When a modifier appears between the article and the noun, the subsequent article will continue to be indefinite: "I'd like a big glass of orange juice, please," John said. "I put a big glass of juice on the counter already," Sheila replied. Generic reference: We can refer to something in a generic way by using any of the three articles. We can do the same thing by omitting the article altogether. A beagle makes a great hunting dog and family companion. An airedale is sometimes a rather skittish animal. The golden retriever is a marvelous pet for children. Irish setters are not the highly intelligent animals they used to be. The difference between the generic indefinite pronoun and the normal indefinite pronoun is that the latter refers to any of that class ("I want to buy a beagle, and any old beagle will do.") whereas the former (see beagle sentence) refers to all members of that class.

#### The upward entailment test and adverb test determine the genericity of a definite singular

Leslie 16 [Sarah-Jane Leslie, Ph.D., Princeton, 2007. Dean of the Graduate School and Class of 1943 Professor of Philosophy. Served as the vice dean for faculty development in the Office of the Dean of the Faculty, director of the Program in Linguistics, and founding director of the Program in Cognitive Science at Princeton University.] “Generic Generalizations.” Stanford Encyclopedia of Philosophy. April 24, 2016. <https://plato.stanford.edu/entries/generics/> TG

1. Generics and Logical Form In English, generics can be expressed using a variety of syntactic forms: bare plurals (e.g., “tigers are striped”), indefinite singulars (e.g., “a tiger is striped”), and definite singulars (“the tiger is striped”). However, none of these syntactic forms is dedicated to expressing generic claims; each can also be used to express existential and/or specific claims. Further, some generics express what appear to be generalizations over individuals (e.g., “tigers are striped”), while others appear to predicate properties directly of the kind (e.g., “dodos are extinct”). These facts and others give rise to a number of questions concerning the logical forms of generic statements. 1.1 Isolating the Generic Interpretation Consider the following pairs of sentences: (1)a.Tigers are striped. b.Tigers are on the front lawn. (2)a.A tiger is striped. b.A tiger is on the front lawn. (3)a.The tiger is striped. b.The tiger is on the front lawn. The sentence pairs above are prima facie syntactically parallel—both are subject-predicate sentences whose subjects consist of the same common noun coupled with the same, or no, article. However, the interpretation of first sentence of each pair is intuitively quite different from the interpretation of the second sentence in the pair. In the second sentences, we are talking about some particular tigers: a group of tigers in ([1b](https://plato.stanford.edu/entries/generics/#ex1b)), some individual tiger in ([2b](https://plato.stanford.edu/entries/generics/#ex2b)), and some unique salient or familiar tiger in ([3b](https://plato.stanford.edu/entries/generics/#ex3b))—a beloved pet, perhaps. In the first sentences, however, we are saying something general. There is/are no particular tiger or tigers that we are talking about. The second sentences of the pairs receive what is called an existential interpretation. The hallmark of the existential interpretation of a sentence containing a bare plural or an indefinite singular is that it may be paraphrased with “some” with little or no change in meaning; hence the terminology “existential reading”. The application of the term “existential interpretation” is perhaps less appropriate when applied to the definite singular, but it is intended there to cover interpretation of the definite singular as referring to a unique contextually salient/familiar particular individual, not to a kind. There are some tests that are helpful in distinguishing these two readings. For example, the existential interpretation is upward entailing, meaning that the statement will always remain true if we replace the subject term with a more inclusive term. Consider our examples above. In ([1b](https://plato.stanford.edu/entries/generics/#ex1b)), we can replace “tiger” with “animal” salva veritate, but in ([1a](https://plato.stanford.edu/entries/generics/#ex1a)) we cannot. If “tigers are on the lawn” is true, then “animals are on the lawn” must be true. However, “tigers are striped” is true, yet “animals are striped” is false. ([1a](https://plato.stanford.edu/entries/generics/#ex1a)) does not entail that animals are striped, but ([1b](https://plato.stanford.edu/entries/generics/#ex1b)) entails that animals are on the front lawn (Lawler 1973; Laca 1990; Krifka et al. 1995). Another test concerns whether we can insert an adverb of quantification with minimal change of meaning (Krifka et al. 1995). For example, inserting “usually” in the sentences in ([1a](https://plato.stanford.edu/entries/generics/#ex1a)) (e.g., “tigers are usually striped”) produces only a small change in meaning, while inserting “usually” in ([1b](https://plato.stanford.edu/entries/generics/#ex1b)) dramatically alters the meaning of the sentence (e.g., “tigers are usually on the front lawn”). (For generics such as “mosquitoes carry malaria”, the adverb “sometimes” is perhaps better used than “usually” to mark off the generic reading.)

#### It applies to “the appropriation of outer space” – 1] upward entailment test – “the appropriation of outer space is unjust” doesn’t entail that “the use of outer space is unjust” because it doesn’t mean compulsory voting in dictatorships, 2] adverb test – “the appropriation of outer space is usually unjust” doesn’t mean anything substantially different

#### b] violation – they specify SETI

**1] Semantics outweigh: It’s the only stasis point we know before the round so it controls the internal link to engagement, and there’s no way to use ground if debaters aren’t prepared to defend it.**

#### c] vote neg:

#### 1] limits – they can pick any form of appropriation from internet satellites to asteroid mining to moon basing and there’s no universal disad since they’re all different and require different uses space – explodes neg prep and leads to random appropriation of the week affs which makes cutting stable neg links impossible. PICs don’t solve – it’s absurd to say neg potential abuse justifies the aff being flat out not T, which leads to a race towards abuse. Limits key to reciprocal engagement since they create a caselist for neg prep.

#### 2] precision ­– their interp justifies the aff getting away w random words in the res which decks neg ground and prep bc they’re no longer bounded by the res

#### TVA – read the aff as an advantage to a whole rez aff.

#### d] paradigm issues:

#### 1] accessibility – it is literally impossible for me to cut nc’s to every possible aff, esp bc i am not from a big school like hwl which has multiple competitors and coaches helping cut prep in between rounds

#### 2] fairness and edu r voters – it’s a prereq and why schools fund debate

#### 3] dtd to deter future abuse – dta makes no sense bc we indict their advocacy, use competing interps ­– reasonability invites arbitrary judge intervention, no rvis ­– you don’t win for being fair

## 2

#### A] interp – the Affirmative must only defend that appropriation of outer space is unjust.

#### B] violation: they say they defend a definite ban on seti appropriation in cx but then say its whats its in the doc – hold them accountable to whats in the doc but if the 1ar says “we ban”

#### C] standards – Effects and Extra-T which are voters for predictable limits and ground – allowing the Aff to defend implementation through any number of agreements/mechanisms explodes predictable limits – it shifts the topic to not appropriation good/bad but how we should end it which kills in-depth clash and makes prep impossible

c/a paradigm issues

## 3

#### CP: The appropriation of outer space for the Search of Extraterrestrial Intelligence by private entities is unjust except for megaconstellations in the lower earth orbit.

Don’t let them delink – first two cards prove the competition and cx

#### Coming in the LEO

Aleksey **Shtivelman n/d** SOLAR POWER SATELLITES: THE RIGHT TO A SPOT IN THE WORLD’S HIGHEST PARKING LOT <https://www.bu.edu/jostl/files/2015/02/Shtivelman_web.pdf> //SR

​​There are now several companies dedicated to successfully creating a solar power satellite system. Space Energy is a company that plans to develop the first solar power satellite and transmit electricity to the Earth’s surface by creating and launching a test satellite into low earth orbit.32 If the prototype works, Space Energy seeks to enter into power supply contracts with customers and launch larger scale satellites into orbit around the Earth.33 LaserMotive is a Seattle-based company that develops laser power beams to transmit electricity without wires.34 The company boasts various applications of wireless power transmission technology including powering unmanned aerial vehicles, launching rockets via laser power and beaming energy from satellites to the Earth.35

#### LEO is key

Aleksey **Shtivelman n/d** SOLAR POWER SATELLITES: THE RIGHT TO A SPOT IN THE WORLD’S HIGHEST PARKING LOT <https://www.bu.edu/jostl/files/2015/02/Shtivelman_web.pdf> //SR

One solution to the legal hurdle of orbital slot allocation described above may be to establish a new international agency to manage these satellite systems.13 Another answer may be to require launching countries to sign a separate international agreement related to orbital slot allocation for SBSP satellites.14 Finally, another technologically feasible alternative is to place SBSP satellites into a lower earth orbit, where slots are so abundant that they are not normally sought or allocated.15 This alternative would avoid an international debate regarding property rights in space and thereby bypass the slot allocation issue.

#### SBSP solves climate chance – private companies key

Chi 20, Joanna Chi, 11-21-2020, "Space-Based Solar Power," Medium, [https://medium.com/swlh/space-based-solar-power-804e301c8af2 /](https://medium.com/swlh/space-based-solar-power-804e301c8af2%20/)/wr tanya

At some point, we’ve probably all been reminded to not waste our energy — literally. Turn off the lights when you leave the room. Don’t leave the fan running if you aren’t hot. Make sure your air conditioning isn’t freezing when it’s 100 degrees outside. It’s a common mindset for many people to conserve as much energy as possible, and rightfully so: in 2019, fossil fuels comprised about 84% of the world’s energy consumption. And according to BP, a multinational oil company, our planet can only provide oil for about 50 more years and coal for 100 given the current energy demand. Despite our insatiable appetite for oil and coal, renewable resources exist in abundance, waiting to be harnessed. Take solar power, for instance — more solar energy reaches the earth in an hour than all of humanity uses in a year, yet only 1.11 percent of our energy consumption in 2019 was derived from solar power. The sun has an enormous potential to power our entire planet, but its energy is barely being harnessed! As deadlines regarding our use of fossil fuels continue to emerge, scientists are directing some of their research toward moving solar power off of Earth’s surface. By targeting issues such as efficiency and accessibility, we may be able to invest in space-based solar power (SBSP), saving the future of our planet. At first glance, harnessing the sun’s energy seems like an easy choice to make. Unlike fossil fuels, solar power does not emit the greenhouse gases that are accelerating global warming. Competition for water resources and farmland, which has been a growing concern in oil fracking, is also a non-issue when considering solar power. From a political perspective, solar power is also one of the safest sources of alternative energy. Tensions over the rights to existing oil and coal have given way to violent conflicts between different nations. If we defaulted to solar power instead, conflicts over nonrenewable resources might be resolved. Solar power centers would be both structurally and politically sound. Implementing solar power as an environmentally and politically low-risk system sure sounds nice, but our current methods of harnessing solar energy are disappointingly inefficient. As with any system that looks too good to be true, we need to analyze the current roadblocks to efficient solar power. When we think of the word “inefficient” in relation to solar energy, our minds might immediately begin questioning the efficacy of solar grids themselves. However, the root of the problem actually begins before sunlight even reaches Earth’s surface. According to NASA, roughly 29% of the sun’s energy is reflected back by Earth’s atmosphere and dissipates into space. On top of this, an additional 23% of solar energy is absorbed by water vapor, ozone, and dust while it travels through the atmosphere. In the end, only 48% of the solar energy that reaches our planet actually makes it to the surface in the first place. Due to the obstacle known as our atmosphere, solar grids on Earth are working with less than half of the energy that originally reached our planet. What’s worse, current solar panels max out at about 22% efficiency in non-laboratory conditions. This means that on a sunny day, at maximum efficiency, an Earth-based solar grid would only be able to convert 10 to 11 percent of the Sun’s energy into usable energy. And to top it all off, solar panels are severely constricted by limited daylight hours, bad weather, and inefficient transportation. All of these factors combined absolutely crush the viability of terrestrial solar power as our main source of energy. The answer? In the future, anyone may have access to energy generated by solar power! We just need to move our technology off of the surface and into space. Space-based solar power (SBSP) is fairly self-explanatory: it’s the concept of collecting solar power in space via satellite solar panels, then distributing it to Earth. Once we escape Earth’s atmosphere, we also escape the terrestrial constraints on solar power. We no longer need to worry about solar energy not reaching us — according to the European Space Agency (ESA), sunlight is up to 11 times more intense outside of the atmosphere. Satellite solar panels would have access to more energy than the human race could ever use. Furthermore, satellite panels would be free from bad weather, as well as the nighttime. They also wouldn’t be limited by a lack of sunlight in the winter, since satellites would not be restrained by the tilt of Earth’s axis. In space, solar panels would be able to beam energy to any location on Earth, so countries using SBSP would only need to launch their satellites to the optimal position for orbit. To make space-based solar power feasible on a global scale, there are two main technologies that we need. First, the launch vehicles to get materials into space need to be low-cost and eco-friendly. Most of the rockets that are currently used to deliver payloads are expendable, and they are extremely expensive and prone to causing pollution. As such, reusable rockets are vital to a sustainable SBSP model. Several private companies, including SpaceX, are in the process of developing cheaper, reusable rockets. Once we have the means to launch parts into space, the second facet of building satellite solar panels centers around the in-orbit construction of solar satellites. To collect the amount of energy that we need, satellite solar panels will need to be much larger than even the ISS, making them the largest spacecraft ever built. Luckily, satellite solar panels will also be much simpler to build than the ISS, as they would be built from many identical parts. In the long term, investments into space infrastructures such as asteroid mining may allow the construction of spacecraft to be completely removed from Earth, which would require only the energy receiving centers of SBSP to be built on Earth. For now, though, the main technologies needed to build satellite solar panels can be found on Earth, and they are reasonably attainable within the next few decades. If SBSP were to be implemented on a global scale, it could resolve not only energy issues but also multiple social and political conflicts. In the present day, many countries depend on other nations for fossil fuels, and the limited supply of oil and carbon has caused violent international conflicts. Abundant solar energy would provide energy independence to nations that currently rely on imported oil. Without having to worry about conflict over nonrenewable energy, countries could reallocate their resources to further developing different parts of their infrastructure. Additionally, since SBSP can be exported to virtually anywhere on the globe, it could be used to resolve a variety of problems on the local scale. For example, SBSP would generate enough energy to desalinate seawater, which could provide millions of people with access to clean water. Although it seems like we are a long way off from a sustainable future, space-based solar power is closer to our grasp than we think. SBSP has the potential to be a sustainable, safe source of power that could save the future of our planet from global warming. By prioritizing sustainable construction methods and distribution over the easy route of relying on fossil fuels, the future of Earth’s energy could lie in space-based solar power.

#### Solves climate change

Garretson 17, Lt. Col. Peter Garretson, 6-19-2017, "The Space Review: Better than Paris: space solar power," No Publication, https://www.thespacereview.com/article/3266/1 //wr tanya

A national program in space-based solar power (SBSP) could do more for solving climate change than the Paris Accord ever could. SBSP is the advanced energy source that “shovel ready,” is fully renewable, produces no greenhouse gasses, is not intermittent, has 24-hour availability, could be made-in-America and could scale to all global demand six times over. Within a generation, we could transform our society to abundant clean energy, enable a $300-trillion global economy, create five million new jobs, drive all carbon emissions to zero, and then have spare energy to suck carbon out of the air. Now if that’s technically feasible—and a lot of credible institutions have said that it is, including NASA, the Department of Energy, the Department of Defense, the International Academy of Astronautics, and the National Academies—then why isn’t this on the agenda? Maybe because our national space program has been run by public servants who think about flags and footprints to show off national plumage, and not businesspeople looking for new markets and competitive advantage. We need to go into space if we want to continue to have a growing civilization. If you take baseline energy usage on Earth and compound it at just 3 percent a year for 500 years you have to cover the entire surface of the Earth with solar cells. That's just not going to happen. If we want to continue to grow—another route would be to just face stasis and not continue to grow—I don't think that's as interesting, I don't think you want to survive on this planet, I think you want to–you know—thrive and do amazing things. And to do that we need to go out into the solar system… I predict that in the next few hundred years, all heavy industry will move off the planet. It will just be way more convenient to do it in space, where you have better access to resources, better access to 24-hour solar power. You know, solar power on Earth is not that great because the planet shades us half the time. In space you get power all the time. So there will be a lot of advantages to doing heavy manufacturing there, and Earth will end up zoned residential and light industry. You know, we want to go to space to save the Earth. Mike Snead, a visionary formerly at Air Force Research Lab noted that the Paris accords instantiated what were anticipated to be an annual transfer of $100 billion to nations considered “victims of climate change.” (See “A Trump Administration path to advance commercial space solar power”, The Space Review, December 12, 2016.) That $100 billion could be spent to much greater effect on space solar power. Past estimates have suggested that the total non-recurring capital to develop economic solar power satellites, build factories, and launch fleets to turn them out, one after another, would only be about $100 billion (spent over 10 years), with industry paying 90 percent of that, after less than $10 billion of taxpayer investment to help prove initial designs. That’s one-tenth the cost of the International Space Station, and less than America is spending on its Apollo-on-Steroids Space Launch System (SLS). It’s not even a percent of what we spent on our overseas adventures in Iraq and Afghanistan, not even a percent of what we are considering on national infrastructure. But private industry can only do so much. Major new markets require action on the part of the government to advance pre-competitive technology, establish clear policies, lower barriers to entry, and establish a business- and innovation-friendly environment of authorization, regulation, and liability. Government can accelerate US advantage and cultivate national strategic industries by using becoming anchor customers and making advanced purchases. At least until the actual stand-up of the National Space Council, the true center of gravity for comprehensive space power—and the only meaningful source of US government space leadership—is now Congress. Not NASA: they are tone deaf to anything that is not planting new flags and footprints or compelling new science. Not the Air Force, as they are entirely focused on warfighting, missing out entirely on the larger conversation about space industrialization. No, it only a few visionary leaders in Congress who are engaged and understand the vast opportunities for wealth and power afforded by the energy and material wealth of the inner solar system. Solar power has been a key part of humanity's clean energy repertoire. We spread masses of sunlight-harvesting panels on solar fields, and many people power their homes by decorating their roofs with the rectangles.  But there's a caveat to this wonderful power source. Solar panels can't collect energy at night. To work at peak efficiency, they need as much sunlight as possible. So to maximize these sun catchers' performance, researchers are toying with a plan to send them to a place where the sun never sets: outer space. Theoretically, if a bunch of solar panels were blasted into orbit, they'd soak up the sun even on the foggiest days and the darkest nights, storing an enormous amount of power. If that power were wirelessly beamed down to Earth, our planet could breathe in renewable clean energy, 24/7. That would significantly reduce our carbon footprint.

#### It’s try or die – climate change is a threat multiplier and causes extinction

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Climate Change

Humanity faces existential risks from the large-scale destruction of Earth’s natural environment making the planet less hospitable for humankind (Wallace-Wells 2019). The decline of some of Earth’s natural systems may already exceed the “planetary boundaries” that represent a “safe operating space for humanity” (Rockstrom et al. 2009). Humanity has become one of the driving forces behind Earth’s climate system (Crutzen 2002). The major anthropogenic drivers of climate change are the burning of fossil fuels (e.g., coal, oil, and gas), combined with the degradation of Earth’s natural systems for absorbing carbon dioxide, such as deforestation for agriculture (e.g., livestock and monocultures) and resource extraction (e.g., mining and oil), and the warming of the oceans (Kump et al. 2003). While humanity has influenced Earth’s climate since at least the Industrial Revolution, the dramatic increase in greenhouse gas emissions since the mid-twentieth century—the “Great Acceleration” (Steffen et al. 2007; 2015; McNeill & Engelke 2016)— is responsible for contemporary climate change, which has reached approximately 1°C above preindustrial levels (IPCC 2018). Climate change could become an existential threat to humanity if the planet’s climate reaches a “Hothouse Earth” state (Ripple et al. 2020). What are the dangers? There are two mechanisms of climate change that threaten humankind. The direct threat is extreme heat. While human societies possesses some capacity for adaptation and resilience to climate change, the physiological response of humans to heat stress imposes physical limits—with a hard limit at roughly 35°C wet-bulb temperature (Sherwood et al. 2010). A rise in global average temperatures by 3–4°C would increase the risk of heat stress, while 7°C could render some regions uninhabitable, and 11–12°C would leave much of the planet too hot for human habitation (Sherwood et al. 2010). The indirect effects of climate change could include, inter alia, rising sea levels affecting coastal regions (e.g., Miami and Shanghai), or even swallowing entire countries (e.g., Bangladesh and the Maldives); extreme and unpredictable weather and natural disasters (e.g., hurricanes and forest fires); environmental pressures on water and food scarcity (e.g., droughts from less-dispersed rainfall, and lower wheat-yields at higher temperatures); the possible inception of new bacteria and viruses; and, of course, large-scale human migration (World Bank 2012; Wallace-Well 2019; Richards, Lupton & Allywood 2001). While it is difficult to determine the existential implications of extreme environmental conditions, there are historic precedents for the collapse of human societies under environmental pressures (Diamond 2005). Earth’s “big five” mass extinction events have been linked to dramatic shifts in Earth’s climate (Ward 2008; Payne & Clapham 2012; Kolbert 2014; Brannen 2017), and a Hothouse Earth climate would represent terra incognita for humanity. Thus, the assumption here is that a Hothouse Earth climate could pose an existential threat to the habitability of the planet for humanity (Steffen et al. 2018., 5). At what point could climate change cross the threshold of an existential threat to humankind? The complexity of Earth’s natural systems makes it extremely difficult to give a precise figure (Rockstrom et al. 2009; ). However, much of the concern about climate change is over the danger of crossing “tipping points,” whereby positive feedback loops in Earth’s climate system could lead to potentially irreversible and self-reinforcing “runaway” climate change. For example, the melting of Arctic “permafrost” could produce additional warming, as glacial retreat reduces the refractory effect of the ice and releases huge quantities of methane currently trapped beneath it. A recent study suggests that a “planetary threshold” could exist at global average temperature of 2°C above preindustrial levels (Steffen et al. 2018; also IPCC 2018). Therefore, the analysis here takes the 2°C rise in global average temperatures as representing the lower-boundary of an existential threat to humanity, with higher temperatures increasing the risk of runaway climate change leading to a Hothouse Earth.

## 5

#### CP text: states ought to join the artemis accords. Solves the aff – safe exploration and prevents harmful interference

Rajagopalan 21, Rajeswari Pillai Rajagopalan, 6-8-2021, "The Artemis Accords and Global Lunar Governance," ORF, <https://www.orfonline.org/research/the-artemis-accords-and-global-lunar-governance/> //tanya

NASA, the U.S. civil space agency, announced the [Artemis Accords](https://www.nasa.gov/specials/artemis-accords/img/Artemis-Accords-signed-13Oct2020.pdf) in October 2020. It is an agreement for lunar exploration and beyond, with participation of both international partners and commercial players. The program envisages the landing of the first woman on the Moon by 2024. The Artemis Accords are guided by key principles of peaceful exploration, transparency, interoperability, emergency assistance, registration of objects, release of scientific data, preserving outer space heritage, preventing harmful interference, and safe disposal of space debris. These are also principles enshrined in the existing international space law including the foundational legal instrument, the Outer Space Treaty (OST) of 1967, and the accords thus can reinforce the existing international space regime. On May 31, New Zealand became the 11th country to sign the Artemis Accords. A few days earlier, on May 24, Republic of Korea signed the accords. These two countries join Australia, Canada, Italy, Japan, Luxembourg, the United Kingdom, the United Arab Emirates, Ukraine, and the United States. The U.S. lead on this issue is important, but many important space powers, including Russia, China, and India, are yet to sign on to the accords. With more countries and industries pursuing lunar missions, there is a need for basic rules governing these activities that will minimize damage and evolve a set of good practices that would contribute to responsible behavior during lunar operations. Nevertheless, developing new governance measures to guide such activities is not going to be an easy matter. With more countries and industries pursuing lunar missions, there is a need for basic rules governing these activities that will minimize damage and evolve a set of good practices that would contribute to responsible behavior during lunar operations. Nevertheless, developing new governance measures to guide such activities is not going to be an easy matter Welcoming New Zealand to the accords, NASA Administrator Bill Nelson [claimed](https://www.nasa.gov/feature/new-zealand-signs-artemis-accords) that the accords are “simple, universal principles [that] will enable the next generation of international partnerships for the exploration of the Moon and beyond.” Announcing New Zealand’s signing of the accords, Foreign Minister Nanaia Mahuta [also pointed](https://www.beehive.govt.nz/release/space-exploration-soars-artemis-accords) to principles such as “transparency, interoperability, release of scientific data, sustainable use of resources, safe disposal of debris, and prevention of harmful interference in other’s activities.” She also acknowledged another important aspect: Although international laws exist in these areas, there was a need for “additional rules or standards to ensure the conservation and long-term sustainability” of space. While the Artemis Accords have been developed primarily by the U.S. for pushing lunar exploration, its utility in the broader area of global governance is also important. It would be useful to have spacefaring powers agree upon and comply with a common set of principles, guidelines, and best practices, which could be greatly beneficial for safe and sustainable use of space and maintain space as common heritage for all humankind. This is only a political commitment for ensuring better compliance with the commitments that state parties have already made by being parties to the OST and its four subsidiary agreements. It would be useful to have spacefaring powers agree upon and comply with a common set of principles, guidelines, and best practices, which could be greatly beneficial for safe and sustainable use of space and maintain space as common heritage for all humankind One of the serious problems facing outer space activities is the absence of full compliance by states to their commitments under the existing legal framework. A fuller compliance to treaty commitments by state parties can immediately change the dynamics in terms of openness and transparency, which will help reduce suspicion between different space powers. The need for more confidence building measures that would reassure states of their policies and activities in outer space cannot be emphasized enough. Given that global politics has grown much more competitive, the major spacefaring powers (many of whom are also the major global powers) need to make significant investments in measures that would enhance trust and confidence in each other. Therefore, space powers need to contemplate the global governance challenges they face and how they might address these.

# Case

## Case

#### No solvency - Their own card saying that public has given up on finding aliens, states that NASA is funding contact with Aliens and improving the technology to contact aliens. Westridge reads yellow.

Frank 20 [(Adam, an astrophysicist and the Helen F. and Fred H. Gowen Professor at the University of Rochester. He most recent book is “Light of the Stars. Alien Worlds and the Fate of the Earth”) “A new frontier is opening in the search for extraterrestrial life,” The Washington Post, 12/31/20. <https://www.washingtonpost.com/outlook/2020/12/31/breakthrough-listen-seti-technosignatures/>] RR

SETI researchers are used to negative results, but they are trying harder than ever to turn that record around. Breakthrough Listen, the $100 million, 10-year, privately funded SETI effort Siemion leads, is lifting a field that has for decades relied on sporadic philanthropic handouts. Prior to Breakthrough Listen, SETI was "creeping along" with a few dozen hours of telescope time a year, Siemion says; now it gets thousands. It's like "sitting in a Formula 1 racing car," he says. The new funds have also been "a huge catalyst" for training scientists in SETI, says Jason Wright, director of the Penn State Extraterrestrial Intelligence Center, which opened this year. "They really are nurturing a community."

Breakthrough Listen is bolstering radio surveys, which are the mainstay of SETI. But the money is also spurring other searches, in case aliens opt for other kinds of messages—laser flashes, for example—or none at all, revealing themselves only through passive "technosignatures." And because the data gathered by Breakthrough Listen are posted in a public archive, astronomers are combing through it for nonliving phenomena: mysterious deep-space pulses called fast radio bursts and proposed dark matter particles called axions. "There are untapped possibilities here," says axion searcher Matthew Lawson of Stockholm University.

Perhaps the most important consequence of Breakthrough Listen is that it has nudged SETI, once considered fringe science, toward the mainstream. "Journals are relaxing and letting good technosignature papers be published," says astrobiologist Jacob Haqq-Misra of the Blue Marble Space Institute of Science. "The giggle factor is reducing." After nearly 3 decades of eschewing SETI, NASA organized a technosignature workshop in 2018. In June, it awarded a grant to model the detectability of possible technosignatures in the atmospheres of exoplanets, its first ever SETI-related grant not involving radio searches.

But some astronomers worry the funding boon is distorting science. Fernando Camilo, chief scientist of the South African Radio Astronomy Observatory, says Breakthrough Listen's voracious appetite for time on large telescopes leaves him uncomfortable. "It leaves less time to do astronomy." Others say SETI's high-risk, rush-for-the-prize approach could distract funders from a more rational, stepwise search for extraterrestrial life. "We do have a really thoughtful process on what gets funded and what doesn't," says Harvard University astronomer David Charbonneau. "That doesn't happen with rich individuals."

But SETI proponents don't see themselves as separatists. They are increasingly working hand in hand with those searching for exoplanets and studying astrobiology. "Looking for intelligence is the logical conclusion of this search for life," says astronomer David Kipping of Columbia University.

SETI STARTED SMALL. In 1960, astronomer Frank Drake pointed a 26-meter radio telescope in Green Bank, West Virginia, at two nearby Sun-like stars. He scanned frequencies around 1.42 gigahertz, which correspond to wavelengths of about 21 centimeters—the part of the spectrum where clouds of interstellar hydrogen emit photons. This 21-centimeter glow is ubiquitous, and Drake supposed it might be a universal channel on the cosmic dashboard, a natural place for a clarion "We are here!" But his targets, Tau Ceti and Epsilon Eridani, were expressionless. The survey, called Project Ozma, saw no sign of artifice, such as an intense spike squeezed into a narrow frequency band.

With funding from NASA and the National Science Foundation (NSF), however, searches continued, with bigger telescopes to listen for fainter signals and hardware that could scan thousands and eventually millions of narrow frequency channels at once. Drake devised his now famous, eponymous equation that estimates how many communicative extraterrestrial civilizations may exist in the Milky Way. It depends on seven variables, from the rate of star formation to the average lifetime of a civilization. Even though only one of the seven factors—star-formation rate—was known with any certainty, alien hunters were on the prowl.

In 1992, NASA decided to look harder, only to quickly reverse course. It embarked on the Microwave Observing Project, a 10-year, $100 million SETI search using several large telescopes. But the following year, the project was ridiculed and cut by lawmakers focused on reducing the federal budget deficit. Ever since, NASA has mostly shied away from SETI.

#### 1AC solves zero of the ilinks – you don’t ban lunar bases or ships or leos

#### Their own card says that one, we don’t have to worry about alien conflict, two, global warming is more of a threat and satellites could solve, and three, we need treaties to govern contact attempts. Westridge reads yellow-

Buchanan, 2021

Mark Buchanan is a physicist and science writer based in Europe. “Contacting aliens could end all life on earth. Let’s stop trying.”, June 10, 2021 at 10:00 a.m. UTC, <https://www.washingtonpost.com/outlook/ufo-report-aliens-seti/2021/06/09/1402f6a8-c899-11eb-81b1-34796c7393af_story.html>, accessed 12/2/21, sb

In April 2020, the Defense Department released videos recorded by infrared cameras on U.S. Navy aircraft that documented the planes’ encounters with a variety of “unidentified aerial phenomena.” Pilots reported seeing objects flying across the sky at hypersonic speeds and changing direction almost instantaneously, capabilities far beyond that of any known aircraft. What were the pilots seeing? Bizarre atmospheric phenomena? Alien spacecraft? Something else? Several branches of the government have been investigating the events, motivated in part by concern that adversaries such as Russia or China might have made some spectacular technological advance, and later this month, the government plans to publish a report revealing what they know. Reportedly, the government will say there’s no proof of extraterrestrial activity, but that the incidents remain unexplained. Chances are, though, that we should all be grateful that we don’t yet have any evidence of contact with alien civilizations. Attempting to communicate with extraterrestrials, if they do exist, could be extremely dangerous for us. We need to figure out whether it’s wise — or safe — and how to handle such attempts in an organized manner. Some scientific circles have already been debating questions around whether to try to contact other civilizations. It’s a topic of profound importance for the entire planet. For 60 years, scientists have been searching with radio telescopes, listening in for possible signals coming from other civilizations on planets orbiting distant stars. These efforts have largely been organized by the SETI institute in California — the acronym stands for Search for ExtraTerrestrial Intelligence — and so far, they’ve had no success. Getting impatient, some other scientists are now pushing for a more active program — METI, for Messaging ExtraTerrestrial Intelligence — that wouldn’t just listen, but actually send out powerful messages toward other stars, seeking to make contact. The search for aliens has reached a stage of technological sophistication and associated risk that it needs strict regulation at national and international levels. Without oversight, even one person — with access to powerful transmitting technology — could take actions affecting the future of the entire planet. That’s because any aliens we ultimately encounter will likely be far more technologically advanced than we are, for a simple reason: Most stars in our galaxy are much older than the sun. If civilizations arise fairly frequently on some planets, then there ought to be many civilizations in our galaxy millions of years more advanced than our own. Many of these would likely have taken significant steps to begin exploring and possibly colonizing the galaxy. Hence, it’s a profound mystery — known as the Fermi Paradox, after the Italian physicist Enrico Fermi — why we haven’t yet seen any such aliens. Many resolutions of the paradox have been proposed, among them the suggestion that all civilizations, once reaching sufficient technological capacity, eventually destroy themselves. Or perhaps aliens are so alien and unlike humans that we simply cannot interact with them. More alarming is the possibility that alien civilizations are remaining out of contact because they know something: that sending out signals is catastrophically risky. Our history on Earth has given us many examples of what can happen when civilizations with unequal technology meet — generally, the technologically more advanced has destroyed or enslaved the other. A cosmic version of this reality might have convinced many alien civilizations to remain silent. Exposing yourself is an invitation to be preyed upon and devoured. I’ve written about METI in the past, suggesting such activity takes a huge risk for very little gain. But these concerns don’t convince supporters of trying it, who have some counterarguments. Douglas Vakoch of METI International argues that it’s unrealistic to worry about the danger of an alien invasion. We have, after all, been sending radio and television emissions into space for a century, and a civilization far more advanced than our own will probably have already detected these. If they wanted to invade, they already would have. He also argues that, in assessing risks, it’s important not only to consider the risk coming from taking an action, but also from not taking that action. Our world faces a number of potentially existential threats, including global warming and destabilization of the environment, and it’s possible that far more advanced civilizations may have already faced these issues and found solutions. If we don’t send out signals, Vakosh writes, we risk “missing guidance that could enhance our own civilization’s sustainability.” It’s also conceivable, he suggests, that we’re making a spectacular misjudgment — and some super-advanced alien civilization may attack us precisely because we haven’t reached out. For obvious reasons, much of the thinking about these issues has to be rather speculative. The best way forward, perhaps, is to broaden the discussion. If all of humanity is exposed to the possible consequences trying to contact alien civilizations, then more people should be involved in making decisions about what is wise and what isn’t. It shouldn’t be left to a handful of radio astronomers. One vocal critic of the idea of reaching out to aliens proactively — astronomer John Gertz of SETI — has developed proposals to move toward more inclusive public consideration of these activities. What we need, he suggests, are laws and international treaties to govern more explicit contact attempts. Without prior broad agreement from some globally representative body, Gertz says, contacting extraterrestrials should be considered “as the reckless endangerment of all mankind, and be absolutely proscribed with criminal consequences, presumably as exercised at the national level, or administered through the International Court of Justice in The Hague.” Currently, no such prohibitions exist. Some informal protocols for interacting with alien civilizations have been adopted by researchers involved in SETI, but these are far from legally binding governmental regulations. That’s mostly because, up to now, talking about meeting or contacting aliens has seemed widely speculative — if not a little deranged — despite the apparent scientific plausibility of such an event. It’s not easy to weigh the pros and cons of activities around which so much remains unknown. We don’t know if there are any aliens. They might be friendly. They might not be. Given the potential risks involved with trying to make contact, perhaps it would be safer and wiser to just wait — we can always reach out later, and meanwhile, our abilities to do passive listening are rapidly growing more powerful. In 2015, SETI launched a new 10-year program called Breakthrough Listen, funded by a $100 million donation from Israeli-Russian billionaire Yuri Milner. As a result, SETI is now recording more signals than ever before, over a frequency range some tenfold larger, and bringing more computational power to bear on analyzing the recorded signals. It’s impossible to know how close or far from making a discovery we may be, but Gertz estimates that our chances are at least 100 times greater than they used to be. The search is also benefiting from astronomers’ knowledge of exoplanets — planets in orbit around stars other than the sun. Since the first exoplanet was found in 1992, we’ve identified nearly 5,000 more, and the rate of discovery is accelerating. Each one give SETI researchers new promising targets to scrutinize. Personally, all of this makes me dead-set against any experimentation with attempting to contact other civilizations. Why take cosmic risks when we may have a far safer pathway to discovering them, if they’re out there? Of course, even listening comes with some potentially fraught governance issues also: If and when someone really identifies an alien signal, we’ll need to decide if we should reply — and if so, how. Surely such an act — putting all of humanity at risk — ought to be the result of some collective decision. But there’s no mechanism to encourage that now. Any individual or nation could take the human response into their own hands. Both paths — listening for aliens or trying to call them — have reached the stage where they require broader public discussion, with an eye to developing sensible regulation. That’s going to take the efforts of leaders from many nations, presumably coordinated through the United Nations or some similar international body. It should happen now. Or soon. Before it’s too late.

#### **2] No solvency -- Climate change will already tip off aliens to the existence of humans. Sample ‘11**

Ian Sample is science editor of the Guardian. Before joining the newspaper in 2003, he was a journalist at New Scientist and worked at the Institute of Physics as a journal editor. He has a PhD in biomedical materials from Queen Mary's, University of London. Ian also presents the Science Weekly podcast. “Aliens may destroy humanity to protect other civilisations, say scientists”, Thu 18 Aug 2011 14.04 EDT, <https://www.theguardian.com/science/2011/aug/18/aliens-destroy-humanity-protect-civilisations>, accessed 12/7/21, sb

It may not rank as the most compelling reason to curb greenhouse gases, but reducing our emissions might just save humanity from a pre-emptive alien attack, scientists claim. Watching from afar, extraterrestrial beings might view changes in Earth's atmosphere as symptomatic of a civilisation growing out of control – and take drastic action to keep us from becoming a more serious threat, the researchers explain.

A2 Buchanan – a) this card has zero warrants, doesn’t even say aliens exist b) doesn’t say it causes exitinction

#### Your authors r hacks – its one dude theorizing abt nuke war and their studies assume an incorrect definition of a “habitable planet” -- new NASA research proves alien life is so improbable that the only ethical choice is to prioritize human crises we know exist.

Greene 19 Tristan Greene, 06-12-2019, "NASA research shows alien life is far less likely than previously thought," Next Web, <https://thenextweb.com/science/2019/06/12/nasa-research-shows-alien-life-is-far-less-likely-than-previously-thought/> SM

Scientists just threw a monkey wrench in the search for intelligent extraterrestrial life by redefining what a “habitable planet” is. A team of researchers led by NASA astrobiologist Edward Schwieterman recently published a study indicating that the habitable zone (HZ) for life includes far fewer planetary systems than scientists thought. Rented shoes are gross But bowling is fun! Join us for Bowlr, Amsterdam’s best networking event YEAH! According to the paper: Here we show that the HZ for complex aerobic life is likely limited relative to that for microbial life. We use a 1D radiative-convective climate and photochemical models to circumscribe a Habitable Zone for Complex Life (HZCL) based on known toxicity limits for a range of organisms as a proof of concept. Basically the scientists used the only model for life we have – Earth life – and came up with a solution for determining whether anything intelligent could evolve in the expected conditions of systems in the HZ. They concluded that a large number of planets thought capable of supporting life have toxic atmospheres unlikely to support any lifeforms beyond the most rudimentary organisms

#### Evolutionary biology means we’re totally alone in a bleak lifeless universe – hell yeah!

Hamill 19 Aliens don’t exist and we are totally alone in a bleak lifeless universe, scientist says Monday 21 Oct 2019 By Jasper Hamill, Science & Technology Reporter <https://metro.co.uk/2019/10/21/aliens-dont-exist-totally-alone-bleak-lifeless-universe-scientist-says-10958405/> SM

* Nick Longrich = University of Bath, Department of Biology and Biochemistry, PhD

Aliens don’t exist and we are totally alone in a bleak lifeless universe, scientist says Share this article via facebook Share this article via twitter 1.3k shares By Jasper Hamill, Science & Technology Reporter Monday 21 Oct 2019 7:11 pm If you think life on Earth is hard and grim, we have some terrible news for you: this could be as good as it gets. A top British scientist has claimed that humanity could be alone in a vast universe that’s totally devoid of alien life. Nick Longrich, a senior lecturer in palaeontology and evolutionary biology at the University of Bath, has said that the evolution of intelligent life on Earth (which means us, in case you’re wondering) is so spectacularly unlikely it may have happened just once. In an article for The Conversation, he wrote: ‘Are we alone in the universe? It comes down to whether intelligence is a probable outcome of natural selection, or an improbable fluke. [By definition, probable events occur frequently, improbable events occur rarely – or once. Our evolutionary history shows that many key adaptations – not just intelligence, but complex animals, complex cells, photosynthesis, and life itself – were unique, one-off events, and therefore highly improbable. ‘Our evolution may have been like winning the lottery … only far less likely. ‘The universe is astonishingly vast. The Milky Way has more than 100 billion stars, and there are over a trillion galaxies in the visible universe, the tiny fraction of the universe we can see. Even if habitable worlds are rare, their sheer number – there are as many planets as stars, maybe more – suggests lots of life is out there. ‘So where is everyone? This is the Fermi paradox. The universe is large, and old, with time and room for intelligence to evolve, but there’s no evidence of it.’ ‘Could intelligence simply be unlikely to evolve? Unfortunately, we can’t study extraterrestrial life to answer this question. But we can study some 4.5 billion years of Earth’s history, looking at where evolution repeats itself, or doesn’t.’ We have been totally unable to discover proof of alien life (Image: Getty) To illustrate just how lucky our species has been to have evolved to our current state of intelligence, he sketched a vivid picture of evolution which shows how many lucky breaks life was given here on Earth. He added: ‘Humans couldn’t evolve until fish evolved bones that let them crawl onto land. Bones couldn’t evolve until complex animals appeared. Complex animals needed complex cells, and complex cells needed oxygen, made by photosynthesis. None of this happens without the evolution of life, a singular event among singular events. ‘All organisms come from a single ancestor; as far as we can tell, life only happened once. ‘Curiously, all this takes a surprisingly long time. Photosynthesis evolved 1.5 billion years after the Earth’s formation, complex cells after 2.7 billion years, complex animals after 4 billion years, and human intelligence 4.5 billion years after the Earth formed. That these innovations are so useful but took so long to evolve implies that they’re exceedingly improbable. ‘These one-off innovations, critical flukes, may create a chain of evolutionary bottlenecks or filters. If so, our evolution wasn’t like winning the lottery. It was like winning the lottery again, and again, and again. On other worlds, these critical adaptations might have evolved too late for intelligence to emerge before their suns went nova, or not at all. ‘Imagine that intelligence depends on a chain of seven unlikely innovations – the origin of life, photosynthesis, complex cells, sex, complex animals, skeletons and intelligence itself – each with a 10% chance of evolving. The odds of evolving intelligence become one in 10 million. ‘But complex adaptations might be even less likely. Photosynthesis required a series of adaptations in proteins, pigments and membranes. Eumetazoan animals required multiple anatomical innovations (nerves, muscles, mouths and so on). So maybe each of these seven key innovations evolve just 1% of the time. If so, intelligence will evolve on just 1 in 100 trillion habitable worlds. If habitable worlds are rare, then we might be the only intelligent life in the galaxy, or even the visible universe. ‘And yet, we’re here. That must count for something, right? If evolution gets lucky one in 100 trillion times, what are the odds we happen to be on a planet where it happened? Actually, the odds of being on that improbable world are 100%, because we couldn’t have this conversation on a world where photosynthesis, complex cells, or animals didn’t evolve. That’s the anthropic principle: Earth’s history must have allowed intelligent life to evolve, or we wouldn’t be here to ponder it. ‘Intelligence seems to depend on a chain of improbable events. But given the vast number of planets, then like an infinite number of monkeys pounding on an infinite number of typewriters to write Hamlet, it’s bound to evolve somewhere. The improbable result was us.’

#### We’re alone -- Fermi’s paradox.

Parsons 19 Humans are likely alone in the universe, study concludes Jeff Parsons 26 Feb 2019 <https://metro.co.uk/2019/02/26/humans-likely-alone-universe-study-concludes-8747817/> SM

Humans are likely alone in the universe, study concludes Jeff ParsonsTuesday 26 Feb 2019 9:51 am Share this article via facebookShare this article via twitterShare this article via messenger 162 SHARES A team of international researchers have put the brakes on any idea of humankind coming into contact with extraterrestrials in the near future. In a new study published online they conclude that we are the only intelligent life in the known universe. The team used the famous Fermi paradox as the basis for their study. The paradox looks at the contradiction between the high probability of existence of alien civilisations and the overwhelming lack of evidence we’ve found since starting to scan the stars.

#### Don’t make us grapple with infinite “what if” -- they’re a product of scientific bias that overlooks hard data – answers Ananthaswamy

Faulkner 19 Dr. Danny R. Faulkner [believer in the GCB, Dr. Danny R. Faulkner joined the staff of Answers in Genesis after more than 26 years as professor of physics and astronomy at the University of South Carolina Lancaster.], 2-17-2019, "The Evidence Is In: We’re Alone in the Universe," Answers in Genesis, <https://answersingenesis.org/astronomy/alien-life/evidence-were-alone-universe/> SM

The Evidence Is In: We’re Alone in the Universe by Dr. Danny R. Faulkner on February 17, 2019 Audio Version Share: ET isn’t a mystery, if you’re willing to examine the data from 60 years of research and take it to its logical conclusion. Science Confirms The BibleShop Now Are we alone in the universe? Are other beings like us out there? Nearly everyone has contemplated this question, including many serious scientists. But after spending billions of dollars and devoting whole careers to the search, scientists refuse to admit there is no evidence. The problem isn’t a lack of data—we’re awash in it. And the problem is not that we don’t have any good tests. Several great scientific minds have already suggested some solid ways to test for the existence of extraterrestrial life. Let’s examine the three most famous tests, and we’ll discover that something more than cold, hard science is preventing them from reaching the logical answer. Why Aren’t They Here? (The Fermi Paradox) One of the most famous scientists to speculate on this topic is the physicist Enrico Fermi. Around 1950, he was having lunch with two colleagues when the topic of extraterrestrial life came up. At the time, most people realized that our civilization would soon be advanced enough to venture into space. But Fermi noted that, if intelligent life were common in the universe, it is unlikely that we are the most advanced civilization. He reasoned that if there were alien civilizations, many of them would have already conquered space. If so, eventually those civilizations would have ventured through space, colonizing as they went. But none of these alien civilizations have shown up on earth yet. So where are the aliens? After 70 years, the Fermi paradox, as this observation has come to be called, remains an enigma to those who believe that life is common in the universe. Where Are Their Radio Signals? (SETI) A decade after Fermi, the astronomer Frank Drake took a different tack to test whether intelligent life exists elsewhere in the universe. By Drake’s day, humans had been broadcasting radio waves for several decades. Many radio waves pass through the earth’s atmosphere and into space, so it should be possible for alien civilizations to pick them up and become aware of our existence. Drake turned this process around—he reasoned that if other civilizations could detect our broadcasts, we ought to be able to pick up theirs as well. In 1960, Drake conducted Project Ozma. He monitored the radio signals from two nearby solar-like stars, Tau Ceti and Epsilon Eridani. One hundred fifty hours of monitoring over a four-month period revealed no detections. In the 1970s, astronomers Ben Zuckerman and Patrick Palmer expanded Drake’s work in Ozma II. Over a four-year period, Ozma II intermittently monitored 670 nearby solar-like stars. Again, no detections of intelligent radio signals. In the 1980s, the pace of SETI (Search for Extra Terrestrial Intelligence), as this initiative came to be called, expanded greatly. Advances in technology made the search easier and more efficient. Government and eventually private funding increased. One long-lasting program is SERENDIP (Search for Extraterrestrial Radio Emissions from Nearby Developed Intelligent Populations). Since large research telescopes are expensive, SERENDIP piggybacks on existing astronomy research programs, sifting through their data to find possible intelligent signals. To keep costs down, their project SETI@home has enlisted the help of hundreds of thousands of volunteers who allow their desktop computers to assist in the sifting process. Another notable SETI project is the Allen Telescope Array (ATA) at the Hat Creek Radio Observatory in northern California. Funded by Microsoft cofounder Paul Allen, the ATA became operational in 2007 and consists of 42 6.1-meter radio telescopes. Although it has suffered some budget problems, it currently operates 12 hours per day. These are just some of the major SETI initiatives, and new ones are proposed all the time. Over the years the various SETI programs have generated terabytes of data without any hint of an alien transmission. Where Are the Other Earthlike Planets? (Exoplanets) Fascination with the possibility of life elsewhere in the universe has fueled a third test. Presumably, aliens, if they exist at all, must live on planets orbiting stars. From what we have learned about the other planets orbiting the sun, it is clear that we are alone in our solar system. But what about planets orbiting other stars? Until recently, we had no evidence of planets outside the solar system. Most people assumed that planets must be common but we just couldn’t detect them. That changed 25 years ago. Since then, the number of known exoplanets has swelled to nearly 4,000. The driving force behind the search for exoplanets has been to show that planetary systems are common. And not just any kind of planet will do: they presumably must be earthlike to support life. What has this treasure trove of exoplanets revealed? The data has shown that planets orbiting other stars, and even planetary systems, are indeed common. Moreover, reports claim that some of these exoplanets (though not many) are earthlike. Yet when you look closer, there are problems with each one. What must be true for a planet to be truly earthlike? First, it must be similar in size. If a planet is too large, its strong gravity is likely to retain the wrong kind of gases to support life. But if a planet is too small, its weak gravity is unlikely to hold onto any appreciable atmosphere. Therefore, only a very small range of mass can claim the title “earthlike.” Second, an earthlike planet must have a similar composition. The earth has a lot of iron and nickel, much of which is in its core. This produces a magnetic field, which is key for protecting life from deadly particles emitted from the stars they orbit and other sources in space. But other elements are necessary as well, such as silicon. Without silicon, any planet would likely be a gas giant like Jupiter or a watery world without land for life. Cedarville University The Masters UniversityAbeka Book Third, an earthlike planet must orbit within a narrow range called the “habitable zone.” If an exoplanet orbits its star too closely, the heat will boil away any liquid water necessary for life. But if an exoplanet is too far away, all its water will freeze, making it difficult for life to survive. But this brings up a fourth problem: orbiting the right kind of star. Even if a planet orbits within the habitable zone of its respective star, what good is that if the unstable star emits deadly radiation?

#### A2 Buchanan 16 – you don’t ban appropriation lol no 1ac solvency

#### A2 Gerts – flows neg, zero legislative action of the 1ac means you presume neg

#### A2 Neal – presume neg. zero scenaio planning of the 1ac and results in endless discussions where we think talking is enough