# 1NC TOC R5

## 1

**Interp: The affirmative must not defend a subset of outer space, but rather outer space as a general principle**

**Noncount nouns like outer space are generic without a determiner**

**Byrd** [“Generic Meaning,” Georgia State University, Transcript of lecture given by Pat Byrd, Department of Applied Linguistics & ESL]

Here are some things that we do know about these generic noun phrase types when they are used in context:1. The + singular: The computer has changed modern life This form is considered more formal than the others--and is not as likely to be used in conversation as the plural noun: Computers have changed modern life. Master (1987) found in the samp.le that he analyzed that this form with the was often used to introduce at topic--and came at the beginning of a paragraph and in introductions and conclusions.2. Zero + plural: Computers are machines. Computers have changed modern life. Probably the most common form for a generalization. It can be used in all contexts--including both conversation (Basketball players make too much money) and academic writing (Organisms as diverse as humans and squid share many biological processes). Perhaps used more in the hard sciences and social sciences than in the humanities. 3. A + singular: A computer is a machine. This generic structure is used to refer to individual instances of a whole group and is used to classify whatever is being discussed.The form is often used for definitions of terms. It is also often used to explain occupations. My sister is a newspaper reporter. I am a teacher. Use is limited to these "classifying" contexts. Notice that this form can't always be subtituted for the other: \*Life has been changed by a computer. \*A computer has changed modern life. 4. Zero + noncount: Life has been changed by the computer. The most basic meaning and use of noncount nouns is generic--they are fundamentally about a very abstract level of meaning. Thus, the most common use of noncount nouns is this use with no article for generic meaning. Zero Article and Generic Meaning: Most nouns without articles have generic meaning. Two types are involved.1. Zero + plural: Computers are machines. Computers have changed modern life.2. Zero + noncount: Life has been changed by the computer.

**1–Precision outweighs - anything outside the res is arbitrary and unpredictable because the topic determines prep, not being bound by it lets them jettison any word. 1ar reps arguments are drop the arg to let us learn from our mistake instead of being forced to defend a violent practice**

**2–Limits and Ground - decimates clash by exploding limits to infinite parts of infinite outer space, each with different astrological implications, political conditions, and economic benefits which makes contesting the aff with unifying neg ground impossible and means they can always pick the most aff skewed slice of the res.**

**3–TVA – read your aff as an advantage under whole res – we still get your content education and sufficient aff ground by switching up aff advantages, frameworks, implementation, etc. But, 1ar theory checks pics and they incentivize more of them cuz nothing but cheaty generics link. Independently, preemptive abuse doesn’t justify actual abuse, the same way you don’t get 50 a prioris for 40 condo pics**

**4–Vote neg if spec is good–they should lose for not specifying other things like private entities**

## 2

**Interp: The affirmative must only fiat a policy action by states, not private actors**

**Resolved means policy action**

**Louisiana State Legislature** (https://www.legis.la.gov/legis/Glossary.aspx) Ngong

A legislative instrument that generally is used for making declarations, stating policies, and making decisions where some other form is not required. A bill includes the constitutionally required enacting clause; a resolution uses the term "resolved". Not subject to a time limit for introduction nor to governor's veto. ( Const. Art. III, §17(B) and House Rules 8.11 , 13.1 , 6.8 , and 7.4 and Senate Rules 10.9, 13.5 and 15.1)

**Unjust demands legal action**

**The Law Dictionary, ND**, Def of Unjust, URL: <https://thelawdictionary.org/unjust/>

Contrary to right and justice, or to the enjoyment of his rights by another, or to the standards of conduct furnished by the laws.

**Violation–they fiat private entities not appropriating instead of a multilateral ban by states**

**Vote neg for strat skew and clash–the crux of this topic is space policy and how to enforce it–things like OST and moon treaty prove–they undermine political awareness through the exclusion of core topic discussions and destroy all neg ground especially for small affs like this such as concon and ICJ–we also lose debates about circumvention since they can just win by fiating utopian things like no country ever even even trying a certain operation which is unrealistic since it doesn’t just magically happen–we need discussions of how to make that a reality i.e. law–no point in discussing unrealistic politics**

**F/E are a voter, debate is a game w/ portable skills. DTD–T indicts the whole aff. No rvi - a) they’ll bait theory and prep it out with aff infinite prep—justifies infinite abuse and chilling us from checking abuse in fear of things like 2ar ethos which lets them recontextualize and always seem right on the issue b) forces the NC to go 7 minutes of theory because nothing else matters--outweighs because its the longest speech and the 2nr can never recover since the nc is our only route to generate offense. Competing interps–reasonability is arbitrary and causes a race to the bottom–finding the best model of debate is key to preserve the most substantive norms in the long terms but no frivolous race to the top since limited words in the res mean limited interps. T before 1ar theory–NC abuse was reactive and only 2 months to discuss T whereas we can discuss 1ar theory whenever**

## 3

**Uncertainty kills investment in He-3 mining.**

**Bilder 09** “A Legal Regime for the Mining of Helium-3 on the Moon: U.S. Policy Options” Richard B. Bilder [Foley & Lardner-Bascom Emeritus Professor of Law, University of Wisconsin Law School.] 10/8/2009<https://media.law.wisc.edu/m/wndnj/bilder1489273mining_helium-3ftns.pdf> SM

B. Should the U.S. Attempt to Establish an International Lunar Resource Regime Outside of the Framework of the Present Moon Agreement? While I have suggested that there are now good arguments for the U.S. – preferably, collectively with other space powers – to ratify and accede to the Moon Agreement under arrangements which would ensure that the legal regime established pursuant to Article 11 fully met U.S. requirements, the fact remains that such ratification by the U.S. may not currently be politically attainable. As was the case when the Agreement was first presented to the Senate subcommittee in 1980, influential and respected individuals and groups in the U.S. continue to strongly oppose U.S. ratification, remaining convinced that the Agreement’s fundamental cast – especially, its provisions characterizing lunar resources as the “common heritage of mankind” and mandating the establishment of an “international regime” – will in practice inhibit the productive development and exploitation of He-3 and other lunar resources, and, in particular, create such uncertainty for private enterprise as to effectively discourage, if not prevent, private investment and industry from playing any meaningful role in the exploitation of such resources – a role they believe essential to the successful commercial development of such resources.61 It may be argued that, given the risks and uncertainty necessarily involved in the development of lunar He-3-based fusion energy, the enormous investment certainly required, and the likely very long time horizon before any financial return can hope to be achieved, the prospect of private enterprises choosing to play a leading role in He-3 or other lunar resource development – at least without substantial government assistance – is open to question.62 However, the 1980 Senate Hearings and subsequent lack of administration interest in the Agreement suggest that, if such opposition persists, the prospect for Senate ratification of the Agreement at any time soon may remain uncertain.

**Heritage sites are quicker to mine**

**Glass 92** “Lunar Site Characterization and Mining” Charles E. Glass [registered professional geological engineer in the State of Arizona, this is from a NASA edited paper] 1992<https://space.nss.org/settlement/nasa/spaceresvol3/lscam1.htm> SM

Before resources are committed to lunar mining, a significant amount of information will be needed. I hope that our workshop group will illuminate some of the more obscure areas, such as the specific requirements of an ore processing facility. Other important information can be acquired only through onsite exploration and testing. Potential lunar mining sites can be divided into two general groups- generic sites and Apollo sites. Geologic data for both types of site are sparse and of poor spatial resolution Generic sites have not been visited. They are potential mine sites only because they are in lunar regions with mineralogic properties that are generally understood by comparison of remotely sensed data with data from analysis of Apollo site samples; e.g., mare sites, highland sites, or transition sites. See figure 15. Generic sites will require exploration at a variety of scales. Initial exploration using a satellite in lunar orbit will allow regional exploration of many generic sites. Polar sites, if suitable ones can be identified, have several advantages for a mining operation. First, the continuous solar radiation at the poles would enable continuous mining o perations under stable temperature and lighting conditions. (See figure 16.) Such an environment would eliminate the stress on mining equipment and personnel caused by the alternation of 2-week lunar nights and days at other sites. Second, the high thermal gradients encountered at the poles due to low Sun angles could help provide cryogenic storage for processing gases and product gases. Third, the potential occurrence of water frozen in the perpetually shadowed areas of the poles is an incentive for exploring polar sites. Exploration of generic sites at intermediate scales is required to bridge the gap between the low- resolution remote sensing data and the more intensive measurements made by human beings. This intermediate-scale exploration could be done by automated rovers, which should be able to cover relatively large areas rather rapidly. The automated nature of lunar exploration will demand advances in high-resolution sensing and in computer processing and integration of data acquired by different instruments on the same roving vehicle. Knowledge gained from terrestrial mineral exploration can be used for preliminary training of automated interpretation systems, but the unique conditions of the lunar environment will likely require an intelligent computer- vision system capable of "learning" and adjusting as new data become available. [Images omitted] Completion of these exploration programs should bring our knowledge of generic sites up to that of the Apollo sites, the second general category. Regional exploration is not deemed necessary for the Apollo sites because of the relatively extensive body of knowledge already assembled. However, detailed site investigations to obtain specific parameters for mine design will be required for the first mining attempt. In outlining these exploration requirements, our workshop group made several assumptions. First, we assumed that the prototype lunar mining venture should be an unqualified success. Second, we assumed that the startup product would be liquid oxygen, with the subsequent addition of such byproducts as metals for structural use, ceramics, and bulk materials for shielding. Third, we assumed that the mining operation wou[a excavate lunar regolith and deliver a well-graded feedstock to the processing facility. (No crushing is required, with oversized material being removed mechanically.) Specific Parameters for Mine Design The final stage of the exploration program-to acquire specific parameters for mine design-will begin only after a chosen site has been as thoroughly explored as an Apollo site. Even for the Apollo sites, information is insufficient to assure the success of our first lunar mine. Factors that affect mining include mineralogy, grain size distribution, abrasiveness, depth of loosely compacted regolith, and surface topography. How these factors vary from place to place is not well understood. The Apollo missions were never intended to be resource appraisals. Nevertheless, a restudy of Apollo samples and survey data with an eye toward resource appraisal would be a promising first step toward obtaining the needed site detail.

**It has the highest He-3 density**

**O’Reilly 16** LUNAR EXPLORATION FOR HE-3 Bryan O’Reilly The Ohio State University 2016<https://core.ac.uk/download/pdf/159567253.pdf> SM

Mare Tranquillitatis = science word for Sea of Tranquility

Schmitt (2006) summarized initial research on the exploration for lunar He-3 that identified potential areas of high He-3 concentration. Mare Tranquillitatis, for example, is considered a particularly attractive site for a manned lunar base and the mining of lunar He-3. This site also holds Fe, Ti, and other minerals important for cost-effective, on-site production of construction materials and O2 from mineralized oxygen. In siting a manned lunar base, water may be extracted atomically bound OH- and lunar ice, and other issues that need to be addressed in choosing a manned lunar base. The present research study further tests the recommended locations (e.g. Mare Tranquillitatis) of high He-3 concentrations. In particular, the utility of satellite-based Gamma Ray Spectrometers (GRS) is investigated to indirectly map He-3 abundances in terms of the surficial abundances of gamma-radiating elements like titanium, oxygen and iron that reflect distributions of lunar ilmenite (e.g., Hasebe et al., 2008). In addition, satellite microwave measurements may be used to estimate regolith thickness, maturity, and dielectric constants to help map out He-3 concentrations and other lunar mineral deposits (Wang, 2010). Satellite remote sensing data from past lunar missions are used to estimate TiO2 and hydrogen concentrations, and the solar wind flux over the crust to identify lunar He-3 prospects. These results may help constrain the fiscal and technological viability of mining lunar He-3. Current uses of helium-3 far outpace its supply and production on Earth. This shortage is detrimental to areas ranging from national security to important physics and medical research. The growing decrease of He-3 stores also drastically limits efforts to make He-3-D fusion a realistic energy source. However, the growing demand may well be satisfied with the He-3 concentrations hosted within the regolith of our closest celestial neighbor, the Moon. Indeed, the mining of He-3 on the Moon is an imminent, if not the next, giant leap for space exploration (Schmitt, 2006). Elements of this research were presented at the fall’15 Undergraduate Student Poster Forum and the spring’16 Denman Undergraduate Research Forum of The Ohio State University. Further aspects of this research were presented at the annual conferences of the Geologic Society of America (O’Reilly and von Frese, 2015) and NASA’s Lunar and Planetary Institute (O’Reilly and von Frese, 2016). METHODS National Aeronautics and Space Administration (NASA) data collection The elemental abundance data for this research were collected from NASA’s publicly available Planetary Data System (PDS) Geoscience Node. Specifically, the data were observed by the Lunar Prospector (LP) mission’s gamma ray and neutron spectrometer tools and processed by the LP Spectrometer Team as part of a NASA Lunar Data Analysis Program. Elemental abundances of Ti were derived from LP gamma ray spectrometer (Feldman et al., 1999) observations acquired during the high-altitude portion of the LP mission. For the Ti distribution, the data are given in units of elemental weight percent (Prettyman et al., 2002). The half-degree hydrogen abundances came from the LP neutron spectrometer epithermal neutron data that had been corrected by the thermal neutron data (Feldman et al., 2001). Equations 3 and 4 of Feldman et al. (2001) show how the corrected epithermal data were converted into hydrogen abundances as parts per million (ppm). Note, however, that these abundances can be unreliable in regions of high thorium and rare-Earth element abundances (Maurice et al., 2004). In general, using the above method yields an average ±1.7 wt% uncertainty in the TiO2 estimates (Elphic et al., 2002). Estimates from areas with higher levels of TiO2 are considered to be more reliable than those from lower TiO2 areas. Uncertainties in H estimates are typically less than 1% over latitudes ±70° and increase significantly towards the poles (Feldman et al., 2001). Estimates of H taken from large lunar craters in the South Pole showed uncertainties averaging around 50% (Feldman et al., 2001). Modeling The raw elemental abundance data were converted from the original ASCII files to Microsoft Excel through the “paste special” tool for import into MATLAB. Once imported, the data were processed by the scripts in Appendix A to produce various lunar abundance maps. The script in Figure A1 produces contour maps of the elemental data on the lunar near and far sides using the M\_Map MATLAB mapping package (Pawlowicz 2014). This script uses the sinusoidal map projection to produce equal-area representations of the abundance data. The script in Figure A2 produces stereographic projections of abundances in the lunar polar regions. Equation 1 (Fa and Ya-Qiu, 2007) was used to estimate crustal exposure to solar wind flux as a percentage in terms of lunar longitude (θ) and latitude (Φ) in degrees, and the constant flux (F0) at a subsolar point. Here, f represents the amount of time the lunar surface is fully shielded from solar winds by Earth’s magnetotail in the span of 28 days (one orbital period). To produce the normalized solar wind flux, the model assumed F0 = 0.5, and f = 0.25 based on the amount of time the moon is in the magnetotail. Equation 1 was implemented by the MATLAB script in Figure A3 to produce a contour map (Figure 2) of the lunar near and far side exposures in percent of the maximum solar wind flux over a single lunar orbital period. These maps in the sinusoidal map projection were obtained using the previously cited M\_map mapping package. 𝟐 + 𝒔𝒊𝒏(𝜽 − 𝒇𝝅) − 𝒔𝒊𝒏(𝜽 + 𝒇𝝅), |𝜽| ≤ 𝝅(. 𝟓 − 𝒇) 1) 𝑭(𝜱,𝜽)=𝑭𝟎𝒄𝒐𝒔(𝜱)∗{𝟏+𝒔𝒊𝒏(|𝜽|−𝒇𝝅),𝝅(𝟎.𝟓−𝒇)≤|𝜽|≤𝝅(.𝟓+𝒇) 𝟐, 𝝅(. 𝟓 + 𝒇) ≤ |𝜽| ≤ 𝝅 RESULTS Solar Flux Figure 2 shows that the Moon’s orbit around Earth largely affects the intensity of solar exposure on its surface, with the near side receiving significantly lower exposure than the far side. This is due to Earth’s magnetosphere which, during a full Moon when the near side is facing the Sun, rests within Earth’s magnetotail shielded from solar radiation. [Figure omitted] Figure 2. Solar flux as a percent of solar wind flux exposure per lunar cycle for the near (top) and far (bottom) sides of the lunar surface between 65°S - 65°N. Titanium Distribution The distribution of Ti correlates with large impact events (Schmitt, 2006), and thus the highest Ti concentrations are within the maria of the lunar near side (Figure 3). Mare Tranquillitatis, in particular, appears to have the highest overall concentration. On the moon, Ti occurs as the mineral ilmenite (FeTiO3) with the crystal structure that locks in the small He-3 atoms. The blank strip surrounding 180°E in Figure 3 reflects a no-data area due to lack of orbital coverage by the satellite (Feldman et al., 1999). Diurnal Heating Areas within ±60 ̊ latitudes experience large average daily temperature shifts. The Apollo 15 site (26.13224 N, 3.63400 E), for example, underwent a shift from 374 ̊K to 92 ̊K (Heiken et al., 1991). The areas around the poles typically stay within 10 ̊ of 115 ̊K with even smaller variations in permanently shadowed craters (Vasavada et al., 1999). Volatiles are essentially baked out of the regolith when subjected to these extreme temperature changes (Cocks, 2010). Polar Migration After volatiles are released from the lunar regolith, they are either redeposited on the lunar surface or released into space (Cocks 2010). Figure 4 shows the increase of hydrogen around the poles compared to lower longitudes. This measurable increase is attributed to permanently shadowed craters, which prevent massive temperature fluctuations and provide shielding from micrometeoroids. The blank strips surrounding 180°E in Figure 4 reflect areas with no data due to lack of orbital coverage by the satellite (Feldman et al., 1999). Wt. % AR = (5.6, 0) ASD = 0.8929 AM = 0.6560 CI = 0.5 [Figure omitted] Figure 3. Weight percent Ti distribution for the near (top) and far (bottom) sides of the lunar surface from 65°S - 65°N. Mare Tranquillitatis is highlighted (8.5°N, 31.4°E) as an area of high Ti. Map statistics include the amplitude range (AR) of (max, min) values, amplitude standard deviation (ASD), amplitude mean (AM), and contour interval (CI) in weight %. AR = (169.01, 0.0215) ASD = 23.04 AM = 57.06 CI = 20 ppm [Figure omitted] Figure 4. Volatile hydrogen concentrations in ppm for the lunar north pole (top left) from 90°N - 65°N, south pole (top right) from 90°S - 65°S, and the far side (bottom) from 90°W - 90°E and from 65°S - 65°N of the lunar surface. Map statistics include amplitude range (AR) of (max, min) values, amplitude standard deviation (ASD), amplitude mean (AM), and contour interval (CI) in ppm. DISCUSSION The data above contain implications for the search for large concentrations of He-3. The only method for deposition of He-3 is through exposure of the regolith to solar radiation carrying the isotope. Figure 5 shows the geometry of the Moon’s exposure to solar radiation over a single orbital period (28 days). Accordingly, most of this exposure occurs on the far side of the Moon when it is between the Sun and Earth outside the magnetosphere. In general, the areas of high solar exposure are also subject to extreme diurnal [Figure omitted] Figure 5. A 2-D geometric rendering of the relationship between the Sun (orange), Earth (large circle), and the moon (small circle) throughout a lunar orbital period. The moon is positioned outside the magnetosphere (green dashed line) during a new moon exposing the far side (light blue). The moon is positioned inside the protective magnetotail (red dashed line) during a full moon preventing exposure of the near side (dark blue). temperature fluctuations. During the lunar orbital period, these drastic temperature changes will occur due to the prolonged exposure or protection from solar radiation causing the deposited volatiles to leave the regolith and possibly be re-ionized and –deposited onto the lunar surface (Cocks, 2010). This implies that many of the volatiles initially deposited by solar wind exposure do not remain stably in place. The distribution of hydrogen measured in Figure 4 suggests that the volatiles in general may be concentrated around the poles. Much like hydrogen, He-3 is also deposited in the regolith through solar wind. However, exposing these elements to extreme temperature shifts causes them to vaporize and leave the lunar surface. Some of these volatiles are re-ionized due to subsequent solar wind exposure and possibly deposited again near the poles where they are better protected from temperature changes (Cocks, 2010). This mechanism could help explain the larger polar accumulations of volatiles. The lunar polar regions offer protection from extreme temperature variations, which also may be provided by the presence of permanently shadowed craters. These craters not only protect volatiles from vaporizing out of the regolith, but they also shield the regolith from micrometeorite impacts that disturb the surface encouraging the further release of volatiles. These polar regions are estimated by the Lunar Prospector team (Schmitt, 2000) to contain roughly 5 to 15 times more hydrogen. Figure 6 shows an example of the permanently shadowed Shackleton crater. [Figure omitted] Figure 6. The Shackleton crater located near the South Pole, where the colors indicate the percentage of time illuminated during a single lunar orbital period. The rim of the crater contains zero (white) and near zero illumination values which identify it as a permanently shadowed crater (Zuber et al., 2012). Another important aspect to consider is the relationship between titanium (Ti) and He-3. The majority of Ti on the Moon appears in the form of ilmenite (FeTiO3). Tests done on lunar ilmenite, olivine, pyroxene, and plagioclase show that for grains in the same size range from the same soil, ilmenite (FeTiO3) contains 10 to 100 more times as much He-3 (Fa and Ya-Qiu, 2007). The structure of ilmenite, seen in Figure 7, is better able to hold onto the small He-3 ions when subjected to extreme conditions. This suggests that He-3 is more protected from the effects of massive temperature shifts than other volatiles when high concentrations of Ti are present. Figure 3 shows that most of the Ti on the Moon appears in the large impact craters of the nearside. [Figure omitted] Figure 7. The crystal structure of Ilmenite. The alternating layers of Fe and Ti along with the rhombohedral shape shown above allow for tighter confinement of loose He-3 ions (Ribeiro and Lazaro, 2014). With all of these factors considered, two areas of particular interest are suggested for holding large concentrations of He-3. They include Mare Tranquillitatis (8.5 ̊N 31.4 ̊E) that has the highest concentration of Ti on the lunar surface, and thus also possible large He-3 stores. The second area of interest is the South Pole Aitken basin with large permanently shadowed craters that enhance its ability to hold volatiles like He-3 through diurnal heating shifts over the lunar orbital period. These permanently shadowed craters would protect the volatiles from temperature shifts and the regolith from being disturbed by micrometeorite impacts. CONCLUSIONS Lunar resource development is an extensive and expensive effort, however, this study seeks to introduce the need to explore for these resources. This study examined the shortage of available He-3 and the affected industries. Hopes in the distant future for clean fusion energy also rest on access to this valuable resource. As U.S. stockpiles diminish and demand continues, the economic incentive for the acquisition of He-3 deposits on the moon becomes an increasingly attractive option. The objective of this study was to use available satellite data to estimate possible locations of large lunar He-3 deposits. From the analysis of NASA’s satellite gamma ray data, two areas were targeted for possibly holding large concentrations of He-3. Specifically, Mare Tranquillitatis was identified as holding enhanced ilmenite concentrations and other elements that would be essential in any mining mission. The South Pole Aitken basin was also targeted due to its large permanently shadowed areas that enhance its ability to hold volatiles and prevent their migration due to diurnal heating. In general, these results are also consistent with previous lunar site recommendations for locating large He-3 concentrations (e.g. Schmitt, 2006).

**Lunar Mining solves Helium-3 – that solves Warming and the energy crisis**

**Whittington 21** Mark Whittington 2-29-2021 "Solving the climate and energy crises: Mine the Moon's helium-3?"<https://thehill.com/opinion/technology/540856-solving-the-climate-and-energy-crises-mine-the-moons-helium-3> (Mark Whittington, who writes frequently about space and politics, has published a political study of space exploration entitled Why is It So Hard to Go Back to the Moon? as well as "The Moon, Mars and Beyond." He blogs at Curmudgeons Corner. He is published in the Wall Street Journal, Forbes, The Hill, USA Today, the LA Times and the Washington Post, among other venues.)//Elmer

Recently, U.S. Nuclear Corp. and Solar System Resources Corporation signed a letter of intent that will either change the history of the world or be just a footnote in humanity’s quest to develop clean, abundant sources of energy. Solar System Resources has agreed to provide 500 kilograms of helium-3 mined from the Moon to U.S. Nuclear Corp. in the 2028-2032 timeframe. According to a paper published by Jeff Bonde and Anthony Tortorello, helium-3 is an isotope that has been deposited in lunar soil over billions of years by solar wind. Roughly 1.1 million metric tons of the isotope exists on the Moon down to a depth of several meters. Twenty-five metric tons of helium-3, about a quarter of the cargo capacity of a SpaceX Starship, would suffice to fuel all the power needs of the United States for a year. ADVERTISEMENT The announcement does not reveal how Solar System Resource proposes to mine the helium-3. The company’s website is very heavy on breathtakingly inspirational verbiage and light on how it intends to raise the money and develop the technology to mine the solar system’s resources. However, the paper suggests that a rover could scoop up lunar regolith, separate helium-3 along with oxygen and hydrogen, store them and eject the processed lunar soil. The gasses would be taken back to a lunar base where the oxygen and hydrogen would be put to good use and the helium-3 stored for later export to Earth. The announcement also does not reveal what U.S. Nuclear Corp. intends to do with the helium-3 once it takes delivery. The company, which builds radiation detection devices, has a subsidiary, Magneto-Inertial Fusion Technology, Inc., that is researching a fusion technology called staged Z-pinch. This would create a fusion reaction long enough and sustained enough to become a power source. Presumably, an abundant store of helium-3 could be an asset for those experiments. Fusion using helium-3 has advantages and disadvantages over using deuterium, an isotope of hydrogen and tritium, another isotope of hydrogen. Deuterium and tritium fusion releases radioactive neutrons that will damage and weaken the containment vessel. Periodically, a fusion reactor using this method would have to be taken offline for decontamination. Tritium is also radioactive, making its handling difficult and dangerous. A deuterium and helium-3 fusion creates helium and charged protons as byproducts and few or no radioactive particles. The main disadvantage of fusion using helium-3 is that it would take a far greater amount of energy to achieve it than the conventional deuterium and tritium variety. According to Open Mind, Frank Close, a physicist at the University of Oxford, regards fusion using helium-3 as “moonshine.” Close suggests that a deuterium and helium-3 fusion will still produce some radioactive neutrons. Gerald Kulcinski, director of the Fusion Technology Institute at the University of Wisconsin at Madison, disagrees. Close’s objection is based on using conventional fusion technology. The Fusion Technology Institute has achieved some progress in minimizing radioactive neutron production using different technology. Helium-3 fusion is an even more promising technology, albeit a more difficult and complicated one to develop. The consensus seems to be that such reactors will not be achieved for some decades, say mid-century. No one can guarantee that enough helium-3 will be mined from the Moon to jump-start serious development of technology using the isotope as a fusion fuel in the foreseeable future. There is no guarantee that such a development will see practical results anytime soon. However, the effort would be well worth pursuing, with substantial money and effort deployed behind it. If not the two aforementioned companies, someone should undertake the effort. Fusion using helium-3 as fuel would change the world in profoundly beneficial ways. The great problem civilization faces is access to clean, affordable and reliable energy. Recent events in Texas prove that not having energy, even for a few days, can be catastrophic. At the same time, humankind needs sources of energy that do not harm the environment, especially by emitting greenhouse gasses. It appears that humankind is returning to the Moon, at long last. President Trump started the Artemis Project. President Biden has thrown his support behind the effort. There are many reasons to return to the Moon, from science, to commerce, to soft political power. Solving the decades-long energy crisis could be the singular benefit for expanding human activity to Earth’s nearest neighbor.

**Extinction**

**Schultz 16** (Robert Schultz [Retired Professor and Chair of Computer Information Systems at Woodbury University] “Modern Technology and Human Extinction,” <http://proceedings.informingscience.org/InSITE2016/InSITE16p131-145Schultz2307.pdf>) RW

There is consensus that there is a relatively short window to reduce carbon emissions before drastic effects occur. Recent credible projections of the result of lack of rapid drastic action is an average temperature increase of about 10o F by 2050. This change alone will be incredibly disruptive to all life, but will also cause great weather and climate change. For comparison purposes, a 10 degree (Fahrenheit) decrease was enough to cause an ice layer 4000 feet thick over Wisconsin (Co2gether, 2012). Recently relevant information has surfaced about a massive previous extinction. This is the Permian extinction, which happened 252 million years ago, during which 95% of all species on earth, both terrestrial and aquatic, vanished. The ocean temperature after almost all life had disappeared was 15 degrees (Fahrenheit) above current ocean temperatures. Recent information about the Permian extinction indicates it was caused by a rapid increase in land and ocean temperatures, caused by the sudden appearance of stupendous amounts of carbon in the form of greenhouse gases (Kolbert, 2014, pp. 102-144). The origin of the carbon in these enormous quantities is not yet known, but one possibility is the sudden release of methane gases stored in permafrost. This is also a possibility in our current situation. If so, extinction would be a natural side effect of human processes. There is also a real but smaller possibility of what is called “runaway greenhouse,” in which the earth’s temperature becomes like Venus’ surface temperature of 800o The threat of extinction here is not entirely sudden. The threat is, if anything, worse. Changes in the atmosphere--mainly increases in the concentration of greenhouse gases in the atmosphere-- can start processes that can’t be reversed but which take long periods of time to manifest. “Runaway greenhouse” may be the worst. Once again, suggestions of technological solutions to this situation should be treated with some skepticism. These proposals are often made by technophiles ignoring all the evidence that technology is very much subject to unanticipated side effects and unanticipated failures. What has happened concerning the depletion of the ozone layer should be a clear warning against the facile uses of technology through geoengineering to alter the makeup of the entire planet and its atmosphere. The complicating factor in assessing extinction likelihood from climate change is corporations, especially American fossil fuel corporations such as Exxon-Mobil and Shell. Through their contributions, they have been able to delay legislation ameliorating global warming and climate change. As mentioned before, recently released papers from Exxon-Mobil show that the corporation did accept the scientific findings about global warming and climate change. But they concluded that maintaining their profits was more important than acting to ameliorate climate change. Since it is not a matter of getting corporations to appreciate scientific facts, the chances of extinction from climate change are good. To ameliorate climate change, it is important to leave a high percentage of fossil fuel reserves in the ground. But this is exactly what a profit-seeking fossil fuel corporation cannot do. One can still hope that because fossil fuel corporations are made up of individuals, increasingly bad consequences of global warming and climate change will change their minds about profits. But because of the lag in effects, this mind change will probably be too late. So I conclude we will probably see something like the effects of the Permian extinction perhaps some time around 2050. (The Permian extinction was 95% extinction of all species.) This assumes the release of methane from the arctic will take place around then.

**Energy crisis causes extinction**

**Greene 19** [Sherrell R. Greene Mr. Greene received his B.S. and M.S. degrees in Nuclear Engineering from the University of Tennessee. He is a recognized subject matter expert in nuclear reactor safety, nuclear fuel cycle technologies, and advanced reactor concept development. Mr. Greene is widely acclaimed for his systems analysis, team building, innovation, knowledge organization, presentation, and technical communication skills. Mr. Greene worked at the Oak Ridge National Laboratory (ORNL) for over three decades. During his career at ORNL, he served as Director of Research Reactor Development Programs and Director of Nuclear Technology Programs. . "Enhancing Electric Grid, Critical Infrastructure, and Societal Resilience with Resilient Nuclear Power Plants (rNPPs)."<https://ans.tandfonline.com/doi/pdf/10.1080/00295450.2018.1505357?needAccess=true> edited for ableist language in brackets[]]

Societies and nations are examples of large-scale, complex social-physical systems. Thus, societal resilience can be defined as the ability of a nation, population, or society to anticipate and prepare for major stressors or calamities and then to absorb, adapt to, recover from, and restore normal functions in the wake of such events when they occur. A nation’s dependence on its Critical Infrastructure systems, and the resilience of those systems, are therefore major components of national and societal resilience. There are a variety of events that could deal ~~crippling~~ [Incapacitating] blows to a nation’s Grid, Critical Infrastructure, and social fabric. The types of catastrophes under consideration here are “very bad day” scenarios that might result from severe GMDs induced by solar CMEs, HEMP attacks, cyber attacks, etc.5 As briefly discussed in Sec. III.C, the probability of a GMD of the magnitude of the 1859 Carrington Event is now believed to be on the order of 1%/year. The Earth narrowly missed (by only several days) intercepting a CME stream in July 2012 that would have created a GMD equal to or larger than the Carrington Event.41 Lloyd’s, in its 2013 report, “Solar Storm Risk to the North American Electric Grid,” 42 stated the following: “A Carrington-level, extreme geomagnetic storm is almost inevitable in the future…The total U.S. population at risk of extended power outage from a Carrington-level storm is between 20-40 million, with durations of 16 days to 1-2 years…The total economic cost for such a scenario is estimated at $0.6-2.6 trillion USD.” Analyses conducted subsequent to the Lloyd’s assessment indicated the geographical area impacted by the CME would be larger than that estimated in Lloyd’s analysis (extending farther northward along the New England coast of the United States and in the state of Minnesota),43 and that the actual consequences of such an event could actually be greater than estimated by Lloyd’s. Based on “Report of the Commission to Assess the Threat to the United States from Electromagnetic Pulse (EMP) Attack: Critical National Infrastructures” to Congress in 2008 (Ref. 39), a HEMP attack over the Central U.S. could impact virtually the entire North American continent. The consequences of such an event are difficult to quantify with confidence. Experts affiliated with the aforementioned Commission and others familiar with the details of the Commission’s work have stated in Congressional testimony that such an event could “kill up to 90 percent of the national population through starvation, disease, and societal collapse.” 44,45 Most of these consequences are either direct or indirect impacts of the predicted collapse of virtually the entire U.S. Critical Infrastructure system in the wake of the attack. Last, recent analyses by both the U.S. Department of Energy46 and the U.S. National Academies of Sciences, Engineering, and Medicine47 have concluded that cyber threats to the U.S. Grid from both state-level and substatelevel entities are likely to grow in number and sophistication in the coming years, posing a growing threat to the U.S. Grid. These three “very bad day” scenarios are not creations of overzealous science fiction writers. A variety of mitigating actions to reduce both the vulnerability and the consequences of these events has been identified, and some are being implemented. However, the fact remains that events such as those described here have the potential to change life as we know it in the United States and other developed nations in the 21st century, whether the events occur individually, or simultaneously, and with or without coordinated physical attacks on Critical Infrastructure assets.

## 4

**Xi is tightening control over the PLA but completing goals are critical.**

**Krishnan 21** – Ananth, 11/18/21, [‘Xi tightened control over the PLA’, TheHindu,<https://www.thehindu.com/news/international/xi-tightened-control-over-the-pla/article37549460.ece>] Justin

The new resolution on history passed last week by China’s ruling Communist Party has said that President Xi Jinping had tightened control over the military to address the party’s “obviously lacking” leadership of the armed forces under his predecessors. The full text of the resolution, released on Tuesday evening, listed some of the actions taken by the People’s Liberation Army (PLA) under Mr. Xi, who is also the chairman of the Central Military Commission. These included what the document described as “major operations related to border defence”. No specifics It did not specify what those major operations were. China has unresolved land borders with India and Bhutan. In April 2020, the PLA mobilised two divisions and carried out multiple transgressions across the Line of Actual Control (LAC) in Eastern Ladakh, sparking the worst crisis along the border in many years. Talks to resolve the tensions are still on-going. “The armed forces have remained committed to carrying out military struggles in a flexible manner to counter military provocations by external forces, and they have created a strong deterrent against separatist activities seeking ‘Taiwan independence,’” the resolution said. “They have conducted major operations related to border defence, protecting China’s maritime rights, countering terrorism and maintaining stability, disaster rescue and relief, fighting COVID-19, peacekeeping and escort services, humanitarian assistance, and international military cooperation.” Last week’s resolution on history was only third such document putting forth the official view on party history, following resolutions passed by Mao Zedong in 1945 and Deng Xiaoping in 1981. The new resolution dealt more with the future than the past. It essentially reaffirmed the official view on history, saying that the “basic points and conclusions” of past resolutions “remain valid to this day.” It repeated the conclusion reached in 1981 on Mao’s errors noting that “mistakes were made” and that “Mao Zedong’s theoretical and practical errors concerning class struggle in a socialist society became increasingly serious” leading to the disasters of the Cultural Revolution. Criticism of predecessors Much of the new resolution focuses on emphasising Mr. Xi’s leadership and calling for the party to support his “core” status. It only briefly mentioned Mr. Xi’s predecessors Jiang Zemin and Hu Jintao, and implicitly critcised some aspects of their leadership including on military matters. “For a period of time, the party’s leadership over the military was obviously lacking,” it noted. “If this problem had not been completely solved, it would not only have diminished the military’s combat capacity, but also undermined the key political principle that the party commands the gun.” The document said Mr. Xi’s leadership had tightened supervision on the military including boosting “troop training and battle preparedness”, and it repeated China’s stated goals of completing the modernisation of its armed forces by 2035 and building a “world class” military by 2050, which observers see as meaning on par with the U.S. ‘Working vigorously’ “To build strong people’s armed forces, it is of paramount importance to uphold the fundamental principle and system of absolute party leadership over the military, to ensure that supreme leadership and command authority rest with the party Central Committee and the Central Military Commission (CMC), and to fully enforce the system of the CMC chairman assuming overall responsibility,” the resolution said, adding that “setting their sights on this problem, the Central Committee and the CMC have worked vigorously to govern the military with strict discipline in every respect.”

**The commercial space sector is one of the PLAs central goals – the plan is a 180.**

**Bartholomew & Cleveland 19** – Carolyn and Robin, 4/25/19, Chairmen and Vice Chairmen. Section is written from Michael A. McDevitt, US Congressperson, [“HEARING ON CHINA IN SPACE: A STRATEGIC COMPETITION?,”<https://www.uscc.gov/sites/default/files/transcripts/April%2025%2C%202019%20Hearing%20Transcript%20%282%29.pdf>] Justin

As the Chairman said, China is determined to become a leading space power, which requires continuing to boost its innovation capabilities, both in its civilian and military sectors. The People’s Liberation Army is closely involved in most if not every aspect of China’s space program, from helping formulate and execute national space goals to overseeing China’s human spaceflight program. Coverage of China’s space program must treat seriously the implications of the reality that in many cases the boundaries between the military and civil silos of China’s program are thin, if they exist at all. Our second panel today will address the application of what China calls its “military-civil fusion” strategy to its space sector. Military-civil fusion, a strategic concept designed to harness civilian sector innovation to power China’s military and technological modernization with the goal of leapfrogging the United States and becoming a technological powerhouse. Space has been designated as an especially important sector for military-civil fusion, and the impacts of this campaign on China’s burgeoning commercial space sector—itself a recipient of generous government support and protection—will be crucial as Chinese companies increasingly seek to compete in the international marketplace. Military-civil fusion is especially worthy of attention due to its continued reliance on technology transfer, by hook or by crook, to fuel China’s industrial and military growth. Our third and final panel today will examine China’s military space and counterspace activities. Since its direct-ascent kinetic antisatellite test in 2007, which was responsible for a large amount of all space debris currently in Earth’s orbit, China has continued to invest in a variety of offensive antisatellite capabilities. Indeed, China’s counterspace arsenal contains many options: earlier this month, Acting Secretary of Defense Patrick Shanahan said China “has exercised and continues to develop” jamming capabilities; is deploying directed-energy counterspace weapons; has deployed an operational ground-based antisatellite missile system; and is prepared to use cyberattacks against U.S. space systems.

**Preservation of lunar heritage is viewed by China as a claim to sovereignty over the moon and killing Chinese space ambitions**

**Ji Et Al 1-20** Elliot Ji,, 1-20-2022, "What Does China Think About NASA’s Artemis Accords?," No Publication, https://thediplomat.com/2020/09/what-does-china-think-about-nasas-artemis-accords/SJKS

In May 2020, NASA announced a sweeping new set of principles designed to safeguard the use of outer space titled [the Artemis Accords](https://www.nasa.gov/specials/artemis-accords/index.html). Seeking to ensure transparency and peace in outer space, facilitate international cooperation, and encourage sustainable lunar resource extraction, the Accords “establish a common set of principles to govern the civil exploration and use of outer space.” These principles also include requirements that space activities are interoperable, scientific data is shared, nations commit to providing emergency assistance, and that [historical sites](https://daily.jstor.org/should-the-moon-landing-site-be-a-national-historic-landmark/) are preserved as artifacts. In contrast to the [1967 Outer Space Treaty](https://www.unoosa.org/oosa/en/ourwork/spacelaw/treaties/introouterspacetreaty.html) (OST) and the [1979 Moon Agreement](https://www.unoosa.org/oosa/en/ourwork/spacelaw/treaties/moon-agreement.html), the Artemis Accords are not a new multilateral treaty, but principles that build upon the legal foundations set by the OST. Moreover, NASA intends to enshrine these principles with partner nations through the process of [bilateral cooperation and general state practice](https://www.cfr.org/blog/artemis-accords-and-next-generation-outer-space-governance). In other words, the act of nations accepting these principles through their cooperative ventures with the United States will help [calcify norms into international law](https://spacewatch.global/2020/05/spacewatchgl-feature-the-space-law-context-of-the-artemis-accords-part-2/), even without a legal instrument. However, the purportedly noble goals of the Accords have not evaded skepticism among some spacefaring nations, particularly the People’s Republic of China. Chinese State Media Reacts Although the announcement of the Artemis Accords did not make major headlines in China, the Accords elicited a decisively negative response in Chinese news media. Characterizing the Accords as a disingenuous attempt to stymie Chinese space ambitions, many commentators pointed to the arrival of the announcement shortly after China’s successful test of the Long March 5B, a critical milestone for China’s manned spaceflight programs. Song Zhongping, a Chinese military and aerospace commentator, likened the Accords to the [enclosure movement](https://www.britannica.com/topic/enclosure) in 18th-century Great Britain, during which common land was privatized to the benefit of the wealthy. “The U.S. is developing a new space version of an ‘Enclosure Movement,’ in pursuit of colonization and claiming sovereignty over the moon,” Song [told the Global Times](https://www.globaltimes.cn/content/1187654.shtml), criticizing the “Cold War” mentality of the United States as it sought to outcompete China and Russia in outer space. Chinese central state television [echoed Song’s concerns](https://v.cctv.com/2020/05/07/VIDEKl9vLRJIDOJgL92sVBsW200507.shtml), stating that the Accords are a step toward the enclosure of outer space by a self-interested United States. Others cast doubt on whether the United States could legally justify the Accords under the extant international legal framework. Citing the OST and the Moon Treaty of 1979, critics argued that the Accords violate [key principles of international law, which restrict state sovereignty in outer space](https://www.guancha.cn/internation/2020_05_06_549365.shtml). In articles published by Guancha and the Global Times, observers called the Artemis Accord an unembellished and [“preposterous attempt](https://opinion.huanqiu.com/article/3yBculsgivq?qq-pf-to=pcqq.discussion)” to unilaterally [set ground rules](https://www.guancha.cn/internation/2020_05_06_549365.shtml) for lunar resource exploitation. Zhang Baoxin, a Chinese aerospace expert and chief editor of China Aviation News, also explained that, by excluding Russia and China, the Accords would encourage irresponsible use of lunar resources and instigate conflicts over lunar sovereignty.

**That triggers backlash – they don’t support restrictions on the space sector and will do everything to convince leaders not to do the plan.**

**Cheng 14** [Dean Cheng, Senior Research Fellow in the Asia Studies Center at the Heritage Foundation, Former Senior Analyst at the China Studies Division of the Center for Naval Analyses, Former Senior Analyst with Science Applications International Corporation, “Prospects for U.S.-China Space Cooperation”, Testimony before the Committee on Commerce, Science, and Transportation, United States Senate, 4/9/2014, https://www.heritage.org/testimony/prospects-us-china-space-cooperation]

At the same time, space is now a sector that enjoys significant political support within the Chinese political system. Based on their writings, the PLA is clearly intent upon developing the ability to establish “space dominance,” in order to fight and win “local wars under informationized conditions.”[8] The two SOEs are seen as key parts of the larger military-industrial complex, providing the opportunities to expose a large workforce to such areas as systems engineering and systems integration. It is no accident that China’s commercial airliner development effort tapped the top leadership of China’s aerospace corporations for managerial and design talent.[9] From a bureaucratic perspective, this is a powerful lobby, intent on preserving its interests. China’s space efforts should therefore be seen as political, as much as military or economic, statements, directed at both domestic and foreign audiences. Insofar as the PRC has scored major achievements in space, these reflect positively on both China’s growing power and respect (internationally) and the CCP’s legitimacy (internally). Efforts at inducing Chinese cooperation in space, then, are likely to be viewed in terms of whether they promote one or both objectives. As China has progressed to the point of being the world’s second-largest economy (in gross domestic product terms), it becomes less clear as to why China would necessarily want to cooperate with other countries on anything other than its own terms. Prospects for Cooperation Within this context, then, the prospects for meaningful cooperation with the PRC in the area of space would seem to be extremely limited. China’s past experience of major high-technology cooperative ventures (Sino–Soviet cooperation in the 1950s, U.S.–China cooperation in the 1980s until Tiananmen, and Sino–European space cooperation on the Galileo satellite program) is an unhappy one, at best. The failure of the joint Russian–Chinese Phobos–Grunt mission is likely seen in Beijing as further evidence that a “go-it-alone” approach is preferable. Nor is it clear that, bureaucratically, there is significant interest from key players such as the PLA or the military industrial complex in expanding cooperation.[10] Moreover, as long as China’s economy continues to expand, and the top political leadership values space efforts, there is little prospect of a reduction in space expenditures—making international cooperation far less urgent for the PRC than most other spacefaring states. [FOOTNOTE] [10]It is worth noting here that the Chinese Ministry of Foreign Affairs is not a part of the CCP Politburo, a key power center in China. Thus, the voice of the Ministry of Foreign Affairs is muted, at best, in any internal debate on policy. [END FOOTNOTE] If there is likely to be limited enthusiasm for cooperation in Chinese circles, there should also be skepticism in American ones. China’s space program is arguably one of the most opaque in the world. Even such basic data as China’s annual space expenditures is lacking—with little prospect of Beijing being forthcoming. As important, China’s decision-making processes are little understood, especially in the context of space. Seven years after the Chinese anti-satellite (ASAT) test, exactly which organizations were party to that decision, and why it was undertaken, remains unclear. Consequently, any effort at cooperation would raise questions about the identity of the partners and ultimate beneficiaries—with a real likelihood that the PLA would be one of them.

**An unhinged PLA triggers Himalayan war – goes global**

**Chellaney 17** [Dr. Brahma Chellaney, Professor of Strategic Studies at the Center for Policy Research and Fellow at the Robert Bosch Academy, PhD in International Studies from Jawaharlal Nehru University, “Why the Chinese Military’s Rising Clout Troubles Xi Jinping”, The National, 9/9/2017, https://www.thenational.ae/opinion/why-the-chinese-military-s-rising-clout-troubles-xi-jinping-1.626815?videoId=5754807360001]

China’s president Xi Jinping has stepped up his domestic political moves in the run-up to the critical 19th national congress of the Chinese Communist Party next month, but he is still struggling to keep the People’s Liberation Army (PLA) in line. China’s political system makes it hard to get a clear picture, yet Mr Xi’s actions underscore the troublesome civil-military relations in the country. Take the recent standoff with India that raised the spectre of a Himalayan war, with China threatening reprisals if New Delhi did not unconditionally withdraw its forces from a small Bhutanese plateau, which Beijing claims is Chinese territory. After 10 weeks, the face-off on the Doklam Plateau ended with both sides pulling back troops and equipment from the site on the same day, signalling that Beijing, not New Delhi, had blinked. The mutual-withdrawal deal was struck just after Mr Xi replaced the chief of the PLA’s joint staff department. This key position, equivalent to the chairman of the US joint chiefs of staff, was created only last year as part of Mr Xi’s military reforms to turn the PLA into a force “able to fight and win wars”. The Doklam pullback suggests that the removed chief, Gen Fang Fenghui, who has since been detained for alleged corruption, was an obstacle to clinching a deal with India. To be sure, this was not the first time that the PLA’s belligerent actions in the Himalayas imposed diplomatic costs on China. A classic case happened when Mr Xi reached India on a state visit in September 2014. He arrived on Indian prime minister Narendra Modi’s birthday with a strange gift for his host, a predawn Chinese military encroachment deep into India’s northern region of Ladakh. The encroachment, the worst in many years in terms of the number of intruding troops, overshadowed Mr Xi’s visit. It appeared bizarre that the military of an important power would seek to mar the visit of its own head of state to a key neighbouring country. Yet Chinese premier Li Keqiang’s earlier visit to New Delhi in 2013 was similarly preceded by a PLA incursion into another part of Ladakh that lasted three weeks. Such provocations might suggest that they are intentional, with the Chinese government in the know, thus reflecting a preference for blending soft and hard tactics. But it is also possible that these actions underscore the continuing “disconnect between the military and the civilian leadership” in China that then US defence secretary Robert Gates warned about in 2011. During his 2014 India trip, Mr Xi appeared embarrassed by the accompanying PLA encroachment and assured Mr Modi that he would sort it out upon his return. Soon after he returned, the Chinese defence ministry quoted Mr Xi as telling a closed-door meeting with PLA commanders that “all PLA forces should follow the president’s instructions” and that the military must display “absolute loyalty and firm faith in the party”. Recently Xi conveyed that same message yet again when he addressed a parade marking the 90th anniversary of the PLA’s creation on August 1, 1927. Donning military fatigues, Mr Xi exhorted members of his 2.3-million-strong armed forces to “unswervingly follow the absolute leadership of the party.” Had civilian control of the PLA been working well, would Mr Xi repeatedly be demanding “absolute loyalty” from the military or asking it to “follow his instructions”? China does not have a national army; rather the party has an army. So the PLA has traditionally sworn fealty to the party, not the nation. Under Mr Xi’s two immediate predecessors, Hu Jintao and Jiang Zemin, the PLA gradually became stronger at the expense of the party. The military’s rising clout has troubled Mr Xi because it hampers his larger ambition. As part of his effort to reassert party control over the military, Mr Xi has used his anti-corruption campaign to ensnare a number of top PLA officers. He has also cut the size of the ground force and established a new command-and-control structure. But just as a dog’s tail cannot be straightened, asserting full civil control over a politically ascendant PLA is proving unachievable. After all, the party depends on the PLA to ensure domestic order and sustain its own political monopoly. The regime’s legitimacy increasingly relies on an appeal to nationalism. But the PLA, with its soaring budgets and expanding role to safeguard China’s overseas interests, sees itself as the ultimate arbiter of nationalism. To make matters worse, Mr Xi has made many enemies at home in his effort to concentrate power in himself, including through corruption purges. It is not known whether the PLA’s upper echelon respects him to the extent to be fully guided by his instructions. In the past decade, the PLA’s increasing clout has led China to stake out a more muscular role. This includes resurrecting territorial and maritime disputes, asserting new sovereignty claims, and using construction activity to change the status quo. China’s cut-throat internal politics and troubled civil-military relations clearly have a bearing on its external policy. The risks of China’s rise as a praetorian state are real and carry major implications for international security.

**Extinction.**

**Caldicott 17** – Helen, 2017, Founder of Physicians for Social Responsibility [“The new nuclear danger: George W. Bush's military-industrial complex,” The New Press]//Elmer

The use of Pakistani nuclear weapons could trigger a chain reac­tion. Nuclear-armed India, an ancient enemy, could respond in kind. China, India's hated foe, could react if India used her nuclear weapons, triggering a nuclear [war] ~~holocaust~~ on the subcontinent. If any of either Russia or America's 2,250 strategic weapons on hair-trigger alert were launched either accidentally or purposefully in response, nuclear winter would ensue, meaning the end of most life on earth.

## 5

**CP Text: Private entities ought to cooperate to build a moon base with the purpose of scientific studies of Lunar Heritage.**

**Private entities are critical to building the moon base – otherwise it’s technologically infeasible.**

**Stuart 20** – Colin is an Astronomy Author and Speaker. 12/22/20. [Science Focus, “How to build a Moon base,” https://www.sciencefocus.com/space/how-to-build-a-moon-base/] Justin

Stage 1: Travelling to the Moon First things first: the less you take with you the better. It costs at least $10,000 to launch just 1kg of material into space, and that’s before you’ve even got it into lunar orbit and landed it on the Moon. “The big buzzword at the moment is ‘in situ resource utilisation’ or ISRU,” says University of Westminster astrobiologist Prof Lewis Dartnell. In other words, use what’s already there as much as possible to keep the costs down. Therefore, local resources will govern where the base should be located. Woerner’s idea is to start building on the far side of the Moon – the face that always points away from Earth. China also thinks this would be the best location. It would certainly be a good place to install telescopes, but the downside is that you’d need a system of relay satellites to maintain contact with Earth – a key psychological factor as it’s important not to feel too cut off. Plus, if you’re thinking purely in terms of resources, then close to the south pole of the Moon might be a better bet for an initial dwelling as there’s plenty of water ice there as well as other minerals. The Russians are currently looking into the feasibility of a base at Malapert Mountain in this region. The other upside to the south pole is the climate. The Moon is a very different place to the Earth, taking nearly a month to complete one rotation on its axis. So on most parts of the Moon, periods of day and night both last around two weeks. However, some regions of the Moon’s south pole are almost always illuminated, much like the our North Pole in summer. This means there aren’t huge changes in temperature, therefore allowing solar panels to soak up plenty of sunlight with which to power a potential lunar colony. If at first a manned lunar colony seems like too much of a risk, we might start with a robot-only base. That’s certainly the plan that Jaxa, the Japanese Space Agency, has in the pipeline. It hopes to have a permanent robotic enclave on the Moon by 2020, with machines gathering lunar samples up to 97km (60 miles) away before returning to the base and blasting their haul back to Earth via rockets. Stage 2: Building a Moon base The advent of 3D printing could be a game-changer. At the end of 2014, the design for a socket wrench was emailed to astronauts on the International Space Station (ISS), who then used their 3D printer to create it. Researchers are excited by the prospect of using a similar technique for bases on the Moon. ESA is already in consultation with architects Foster + Partners about the possibility of creating a large-scale infrastructure on the Moon by 3D printing it using lunar soil as the raw material. “We’ve already demonstrated that 3D printing can be a very efficient tool and that it is possible to process lunar regolith [loose material],” says Laurent Pambaguian, Materials Technology Engineer at ESA. It remains to be seen how the regolith would be collected in sufficient quantities and delivered to the printer, and Pambaguian warns of the need for an initial robotic mission to ensure the system works in the Moon’s reduced gravitational field. But should it be successful, in an emergency a key piece of equipment could be designed, transmitted to the Moon and printed within hours – much faster than the days it would take to dispatch it by rocket. In the concept by Foster + Partners, material would be 3D printed onto a light, inflatable scaffold. However, Bigelow Aerospace proposes the use of a small standalone inflatable pod and is already cooperating with NASA. Their first inflatable Moon bases will be in place by 2025, they say. The Russian plan to colonise Malapert Mountain is also being led by a private company – Lin Industrial. It believes the technology required for such a feat isn’t available now, but predicts it will be in as little as five years. A total of 50 rocket launches would make the base a reality, but at a cost of nearly $10bn. Stage 3: Living on the Moon When it comes to our fragile frames, the Moon presents a number of biological problems. Humans evolved to live on Earth, not a barren lump of rock over 380,000km (240,000 miles) away. We’d need to test out the effects of altered gravity on our biology too. “Zero gravity is totally devastating to the human body in terms of muscle wastage and the demineralisation of the skeleton,” says Dartnell. On the Moon, the gravity is only one-sixth of what we’re used to. “We don’t know if that’s strong enough for the human body to remain healthy,” he adds. Another key challenge colonisers will face is radiation. The Earth has an atmosphere and a magnetic field, both of which act as giant safety blankets protecting us from solar particles and cosmic rays from the Galaxy at large. With no natural protection from these dangers on the Moon, we’ll have to find a way to shield ourselves. Otherwise radiation will penetrate the astronauts’ skin and dump its energy into their DNA, leading to radiation sickness, cataracts and a much higher risk of cancer. The radiation shield would need to be a couple of metres thick. “You’ll need some form of lunar JCB, which you’d use to bury your habitat in material from the lunar regolith,” says Dartnell, sticking to the ISRU mantra. That’s enough to soak up the radiation before it reaches those living inside. The other essentials are water, oxygen and food. Luckily, the water ice present on parts of the Moon can supply the first two through melting the ice and splitting the H2O up to get at the oxygen. Food will likely come from indoor greenhouses growing fresh fruit and vegetables, something Dartnell believes will have importance beyond simple sustenance. “With Antarctica, even really simple things like growing tomatoes have been shown to be enormously beneficial for keeping people sane,” he says. That psychological angle shouldn’t be forgotten. The first inhabitants of a lunar colony are likely to be very small in number – the Russians, for example, plan to start with two people before boosting it to four. Working in a pressurised, cramped and alien environment takes its toll on the psyche. Lessons can be learnt from previous experiments, like the trips to the ISS and the Mars500 project, in which volunteers were locked away in isolation to recreate a potential trip to the Red Planet. What we can learn The scientific attraction is clear. The lunar samples returned to Earth by the Apollo astronauts have been an invaluable resource in understanding the inner workings and history of our celestial companion. Yet that knowledge is still limited, as only a small amount of material was returned from a few lunar locations. A team of permanent dwellers would send our ability to study the Moon into overdrive. “A good comparison is how a permanent human infrastructure in Antarctica has facilitated scientific research that wouldn’t have happened if we just parachuted in automatic payloads from time-to-time,” explains Prof Ian Crawford, a planetary scientist from Birkbeck, the University of London. Interestingly, lunar habitation could extend our knowledge of areas far beyond the Solar System – the Moon has long been regarded as an excellent place to build telescopes to peer out into the distant cosmos. Optical telescopes would have an unprecedented view of the centre of our Milky Way and radio telescopes would be free from the ever-increasing background hum of modern civilisation. Humans could be sent to build and service this suite of instruments, much as they do with the mountain-top telescopes on Earth. With so many untapped resources, the first Moon base may not be funded by government-led space agencies at all – private enterprise could be first to set up shop. A recent NASA study suggested that a public-private partnership could slash the cost of the mission by 90 per cent. With eyes also on a permanent Mars colony, the Moon would be an excellent place to test out nascent technologies. It’s certainly a lot safer – if things go wrong it only takes a few days to head for Earth’s safety. Alternatively, emergency supplies could be couriered quickly to the lunar surface. An outpost on Mars would be far more remote, leaving anyone in a colony there at least six months from help.

## 6

**Counterplan: Private entities ought to enter into a prior and binding consultation with indigenous nations over a proposal not to appropriate lunar heritage sites**

**Normal means excludes indigenous people but consultations are key to indigenous sovereignty**

Hilding **Neilson &** Elena **Cirkovic** Consulting Canadians on a Framework for Future Space Exploration Activities: A Response to the Canadian Space Agency (CSA) - Part I, Völkerrechtsblog, 28.07.**2021**, doi: 10.17176/20210728-135814-0. //SR

Canada’s position of support and leadership in space exploration has a positive and impressive history. From the development of the CanadaArm and the participation in work on the International Space Station (ISS) to the new scientific contributions with respect to lunar and Martian exploration, Canada has many reasons to be proud. However, it is worth noting that Canada’s role in space exploration has traditionally neglected to include Indigenous peoples, Indigenous knowledges, and Indigenous rights. In general, the history of Canadian participation in space exploration did not have a substantial and direct impact on Indigenous peoples’ rights in Canada. With accelerating technological developments in the past twenty years, space has become more accessible for humans. With these transformations, the current and proposed future of space exploration has the potential to negatively impact Indigenous peoples across Canada. One of the emerging issues for astronomers and various traditions including traditions of Indigenous peoples in Canada and elsewhere, is the launching of so-called satellite mega constellations, such as the SpaceX’s Starlink. Increasing the number of satellites in the Lower Earth’s Orbit (LEO), impacts further research. For various human cultures, Dark Skies have, among others, navigational and spiritual significance. Finally, the objective of our post is to emphasize the need for greater scientific understanding of the universe, which is achieved through research, education and outreach, and inclusion of multiple knowledges and ontologies. Without consultation with multiple knowledges of multicultural and multinational Canada, future space activities might contribute to the ongoing culture of colonization. We present arguments for the ethical and legal requirements for the CSA to consult with and to be inclusive of Indigenous rights and concerns as Canada moves to support the Artemis Accords. The Accords trigger a variety of issues in the outer space sector, which are beyond the scope of this brief post. The authors come to this work from two perspectives: the first being a Mi’kmaw astronomer who grew up in Newfoundland and is a status member of the Qalipu Nation, and co-author, a Bosnian-Canadian legal scholar. Thereby we stress that our contribution is an opinion and has no intent to speak for Indigenous peoples in general and/or any Indigenous-led organization in Canada, or any particular group or community in Canada. Please note that we will be using the terms Indigenous, and Aboriginal interchangeably as we engage with the language of domestic (Canadian) and international documents, publications, institutions, and relevant regulatory and/or administrative bodies. The terms Indigenous and Aboriginal refers to the three different categories of Indigenous peoples in Canada – First Nation, Inuit, and Métis. We reflect upon the CSA’s obligation to consult Indigenous peoples in Canada via two lenses: Firstly, where does Outer Space Law intersect with the modern and historic treaties between the First Nations and Canada (Crown)? Do these treaties include the skies and outer space? Secondly, considering its status as an international (and bilateral) agreement, where the Artemis Accords trigger the application of the United Nations Declaration on the Rights of Indigenous Peoples. Assuming that the Artemis Accords might, and in the situations where they do, trigger any responsibilities and obligations of Canada under the UNDRIP and its domestic laws to consult the First Nations, what are the CSA’s and Canada’s obligations to First Nation, Inuit, and Métis communities and Nations? We engage with these two points considering the following: That the questions of Indigenous rights and title in Canada, including the treaty rights, have significant impacts on how Canada consults with the First Nations and other communities and nations in Canada and pursues the ongoing and future space exploration accordingly; That these questions also require a revisiting of the allegedly prevailing narrative as proposed by some scholars and members of the global outer space sector, generally speaking, which treats space exploration as an analogy of the colonization of the Americas. The legal framework of our argument is that of Canadian Constitutional obligations towards indigenous peoples. The relevant cases are discussed and listed in the rest the following sections. Brief Consideration of Indigenous Rights in Canada Canada’s obligations to Indigenous peoples under the Canadian Constitution cannot be superseded or undermined by commitments under a bilateral agreement such as the Artemis Accords. These legal obligations include those recognized and affirmed by Section 35 of the Constitution Act, 1982, and those set out in self-government agreements. We recognize that, in 1985, the Supreme Court of Canada (SCC) concluded that treaties between Indigenous peoples and the Crown were not international treaties but were sui generis treaties (Simon v The Queen, [1985] 2 SCR 387 at para 33). However, it is worth considering that ‘[f]or many Indigenous peoples, treaties concluded with European powers…are, above all, treaties of peace and friendship, destined to organize coexistence in – not their exclusion from – the same territory and not to regulate restrictively their lives…under the overall jurisdiction of non-Indigenous authorities’ (para 117). While the United Nations, in documents including the UNDRIP, has recognized the potentially international character of Indigenous Crown treaties (UNDRIP Preamble, art 37(1)), we recognize that Canadian law has yet to consider this international recognition in domestic law. Nevertheless, as Henderson argues ‘any Crown authority over First Nations is limited to the actual scope of their treaty delegations. If no authority or power is delegated to the Crown, this power must be interpreted as reserved to First Nations, respectively, and is protected by prerogative rights and the common law since neither can extinguish a foreign legal system.’. There are plural and ongoing discussions on the status of Aboriginal title in Canada, as well as treaty obligations. It is beyond the scope of our comment to address the extensive international and domestic jurisprudence on the topic. However, we stress the existence of the Crown’s fiduciary duty to Aboriginal People as an aspect of various activities, including Canada’s activities in outer space (See, Annex I). Indeed, ‘The doctrine of Aboriginal rights exists… because of one simple fact: when Europeans arrived in North America, Aboriginal peoples were already here, living in communities on the land, and participating in distinctive cultures, as they had done for centuries. It is this fact, and this fact above all others, which separates Aboriginal peoples from all other minority groups in Canadian society and which mandates their special legal status.’ (Chief Justice Lamer in R. v. Van der Peet, para 30).

**Indigenous people say yes**

**Young**, M. J. (**1987**). “Pity the Indians of Outer Space”: Native American Views of the Space Program. Western Folklore, 46(4), 269. doi:10.2307/1499889 //SR \*brackets for problematic language]

Because Native Americans [indigenous people] have a different perspective of the world, they can offer us alternative ways of seeing ourselves in relationship to the natural world and help us answer the question of what constitutes appropriate behavior-in outer space, as well as on earth. Furthermore, some non-Native Americans realize that, as they look to the traditions of the Native Americans, they see their own heritage with increased clarity. Although this appreciation of Native Americans comes too late in America's history and could be construed as appropriating their ideas as we did their land, a significant number of Native Americans are receptive to the potential that now exists for a dialogue between traditions, both non-Native and Native American, perhaps because they are experiencing a parallel concern, a need to come to terms with their own emerging identity.2 Both groups have begun to realize that it is only through such a dialogue that the mistakes of the past can be avoided in the future. For non-Native Americans the justification for this inquiry is that through an analysis of the difference between the two understandings of space-Anglo and Native American-we can better "see" the ideological dimensions of our own, taken-for-granted mythology that legitimizes space exploration. Native American [indigenous] attitudes towards "outer space" often conflict with the attitudes of the proponents of the U.S. space program. Rather than applying the metaphor of the "new frontier" or even the term "outer" to this aspect of the cosmos, many Native Americans regard it as encompassed in "Father Sky," part of their network of symbolic associations that integrates all elements of the cosmos. A recent commercial called "Earth Pictures," produced by TRW, a firm that specializes in "aerial views" of portions of the earth's globe from outer space, aptly illustrates these differing attitudes.3 In this commercial, TRW representatives give members of the Navajo tribe a guided tour of the TRW laboratories and conclude by showing them a satellite picture (Landsat) of the Navajo reservation from outer space. With evident humor, the Navajos respond by holding up a picture of outer space from their reservation-a dry painting of Father Sky who contains within his body the sun, moon, and constellations. The commercial thus serves to illustrate Navajo beliefs about "outer space." According to Navajo worldview, which emphasizes harmonious relations with all elements of the cosmos-a sacred kinship among all aspects of experience, natural and supernatural-Father Sky is a living being, intimately related to humans who should, therefore, treat him with appreciation and respect. This example from the Navajo is representative of the cosmology of most Native American groups, a cosmology that is shaped by a belief in the unity and sacred nature of all life, the above and the below. As Joseph Epes Brown suggests, the Native American quality of seeing is based on "a polysynthetic metaphysic of nature, immediately experienced rather than dangerously abstracted."4 He describes this vision as a "message of the sacred nature of the land, of place."5 Place in this sense extends, of course, to outer space, or Father Sky, as well as to Mother Earth. This perspective contrasts sharply with that of enthusiasts of space exploration who regard space as something "out there," beyond everyday experience, through which we should travel to reach planets and other objects that we will investigate, and, if possible, use to meet our own needs.

**Solves the aff better**

**​​Barsh 93** Russel Lawrence Barsh 1993 “Native American Sovereignty” University of Michigan Journal of Law Reform, Winter, 1993, 25 U. MICH. J. L. REF. 671 (Professor of Native American Studies at the University of Lethbridge)//Elmer

There no longer seems to be much difference in the Westernization of the Third World and of the indigenous world. Indigenous societies are usually more isolated geographically, so the process of convergence is understandably slower. But they are catching up. While world leaders lament the loss of biological diversity, which holds the key to the renewal and survival of ecosystems, our planet rapidly is losing its cultural diversity, which holds the key to the renewal and survival of human societies. Scientists and scholars search for an alternative in their theories while real alternative cultures disappear. It will be a real struggle to reassert an indigenous perspective on social justice, democracy, and environmental security. The hardest part of the struggle will be converting words to action, going beyond the familiar, empty rhetoric of sovereignty and cultural superiority. The struggle will be hardest here in the United States, where the gaps between rhetoric and reality have grown greater than anywhere on earth. This is the best place to begin, however, because this is the illusory "demonstration" that is studied by the rest of the world, including the indigenous peoples of other regions. Are American Indians ready to accept this global responsibility? The current generation of tribal leadership appears unwilling to try. It is firmly committed by its actions to the materialist path, and it is neutralized by its dependence on a continuing financial relationship with the national government and developers. The next generation of American Indians may be another matter. Disillusioned and critical, they may yet find a voice of their own that is both modern and truly indigenous, and they may have the courage to practice the ideals that their parents merely sloganize. Let us hope so. There is no alternative for Indian survival or for global survival.

**Ought is immediate**

**Jovanović 19** Miodrag A. Jovanović, Professor of Jurisprudence at the Law Faculty University of Belgrade, “International Law as a Normative Order”, Cambridge University Press, pg. 78-155, April 2019, accessed: 12 December 2020, https://doi.org/10.1017/9781108608060.005, R.S.

Without going into detail, I will first clarify what we are trying to ascertain in the Kosovo case. Put in Kelsenian terms, a complete duty-imposing legal norm “is split into two separate norms, two ‘ought’ statements” – one directed at some subject who “‘ought’ to observe certain conduct,” and the other directed at a law-applying actor who “ought to execute a sanction in case the first norm is violated.”75 The aforesaid analysis of the UN Charter shows that there is a general duty of states to abstain from threatening or breaching the peace. The Security Council determined in two of its Resolutions, pursuant to Art. 39, that this general duty was violated in the case of Kosovo and that the “Federal Republic of Yugoslavia constitutes a threat to peace and security in the region.”76 In both of the resolutions, thus, the Security Council provided for more specific duties of all the involved actors, but primarily of the FRY government.77 In the course of January 1999 events in the village of Racˇak,78 the Security Council’s President issued a press statement, in which it was stated that “all of these events” were considered “violations of its resolutions and of relevant agreements and commitments calling for restraint.”79 After the failure of negotiations in Rambouillet80 and withdrawal of the OSCE Kosovo Verification Mission,81 NATO began airstrikes against the FRY. Therefore, the key question to be asked is whether this use of force can be deemed a valid sanctioning “measure” within the confines of Art. 42 of the UN Charter. [footnote 77 begins] 77 SC Resolution 1199 demands, inter alia, the FRY to “implement immediately the following concrete measures towards achieving a political solution to the situation in Kosovo” (par. 4). SC Resolution 1203 demands, inter alia, that the FRY “comply fully and swiftly with resolutions 1160 (1998) and 1199 (1998) and cooperate fully with the OSCE Verification Mission in Kosovo and the NATO Air Verification Mission over Kosovo,” which were agreed upon. (par. 2)