UNOOSA-ICAO Joint Session

The Environment and Space

United States of America

MAJOR KEYS TO INSIGHT ON ENIVERNMENTAL IMPACT OF SPACE ACTIVITY

With Earth’s atmospheric holes and climate crisis steadily growing the new exploration into spaces poses a question: how can we learn from our mistakes? Although space is already burdened with environmental issues including space debris and a steadily inclining amount of carbon emissions from rocket initiatives, its vast corners are majorly untouched.

The UN has been highly involved in space activity having dedicated a total branch to Outer Space in 1962 following the growing competition of the Space Race between the USA and Soviet Union. The United Nations then conducted UNISPACE I conference of 1968 followed by UNISAPCE II in 1082, and UNNISAPCE II in 1999.[[1]](#endnote-1) Under the UNISPACE III conference the Vienna Declaration on Space and Human Development was created that called for an increase in international cooperation as well as availability to space for developing countries along side the encouragement for smaller regional bloc meeting on outer space development.[[2]](#endnote-2) In June of 2016 the UNOOSA subcommittee crafted A/71/20 that is a precursor to what will soon be introduced as environmental guidelines to improve the sustainability of space exploration.[[3]](#endnote-3) The United Nations has also attacked space debris with its formal report of 1999.[[4]](#endnote-4)

The United States of America as is known in common knowledge is the world leader in space exploration and orbital initiatives. The USA began its space leadership in the cold war with the rise of the space race and we launched the first American satellite in 1958.[[5]](#endnote-5) In 1961 we launched our second ever human space flight program the Gemini Project that lead us to having astronaut maneuver vessels in space and learn how to control themselves outside of their crafts, this project set the USA up to lead in the space race. [[6]](#endnote-6) Only July 20 of 1969 America won the space race by having the first men on the moon, Neil Armstrong and Buzz Aldrin.[[7]](#endnote-7) However seeing our head start into the world of celestial bodies the environmental ramifications have become even more advanced as a result of them. Thus The USA has been experimenting with new alternative fuel propellants with largely benign components to protect against this growth of volatile chemicals being the only means in which we can lead new research of space.[[8]](#endnote-8) Also within the developments of space debris the US has been formulating newer technology domestically to defense against the threat of collisions.

The topic of environmental impact from space exploration is rather ironic seeing that the further we make efforts to seek out special initiative the more we harm our selves whether it be through the collection of black carbon, gas emissions for rocket fuels, or the collection of space debris in Earth orbit. The United States of America with its extensive technology and experience in outer space is excited to refute this irony and specifically targets all of these issues in our comprehensive solutions.

Traditional rocket fuel is majorly based from volatile chemicals and liquid hydrogen[[9]](#endnote-9) resulting in not only an escape of massive black carbon particles within our atmosphere but also the release of about 230 tons of hydrochloric acid which is utterly corrosive and has been killing plant live around launch sites.[[10]](#endnote-10) To address this threat of harmful rocket emissions we confidently suggest the Low Emission Fuel Theory (LEFT). LEFT uses newly developed hybrid engine technology developed at the NASA Ames Research Center utilizing paraffin wax. This candle wax is used in conjunction with a liquefied oxidizer that is gasified before entering the engine combustion chamber of the solid fuel. Upon ignition the flame causes the wax to evaporate and sustain the high combustion rate that is approximately three times higher than those of other alternative fuel methods.[[11]](#endnote-11) Additionally, the benefits from LEFT are incredibly notable seeing the only components rendered by this kind of engine is water vapor and carbon dioxide.

To then address the hazard that is space debris the United States believes that our technological advances of this modern era ought to be harnessed in order to best combat this growing conflict. There is an estimated more than 500,00 pieces of debris in Earth’s orbit only causing more collisions and thus more debris and forcing operational bodies like the International Space Station (ISS) and other domestic satellites to make adjustments in order to avoid decimation by impact.[[12]](#endnote-12) Therefore we introduce the Canaveral Coalition that uses high technology to target threatening debris. The Canaveral Coalition suggests a joint platform of the most especially active bodies to convene seeing that it is majorly their operational vessels that are causing these collisions. Under the Canaveral Coalition, active bodies like the National Air and Space Agency (NASA), the European Space Agency (ESA), the Russian Federal Space Agency (RKA), Canadian Space Agency (CSA), and Japan Aerospace Exploration Agency (JAXA) among others can identify the largest debris threat and decide the urgency of their evacuation. To evacuate the identified bodies the Canaveral Coalition will use ESA tested technology e.Deorbit that launches a satellite with an anti gravity net capability to grab the object and safely pull it into low orbit so that it can be burn in re-entrance to the atmosphere.[[13]](#endnote-13)By using the Canaveral Coalition the USA is hopeful that we can take a step towards the decline in space debris and improve multilateral communication on the platform of space.

Again with the escalation of harmful chemicals being emitted into our atmosphere as a result of rocket launches we would like to amend such harmful results with ALICE. ALICE uses two harmless and common components: aluminum and ice. Nano-Aluminum powder with ice cold water to create an gas escape and kick off, these nano-aluminum pieces prove more effective seeing their small size combust more rapidly and thus provide a greater propel up.[[14]](#endnote-14) Additionally the usage of hydrogen in the form of water makes it far more stable but more accessible as a component for smaller nations with developing space agencies. When developed by Purdue University and Pennsylvania State University they were confident that because of the simplicity of its ingredients in could become a more efficient fuel in the sense that it could be replicated on the Moon, Mars, and other celestial bodies with water on their surfaces.[[15]](#endnote-15) Additionally, ALICE fuel offers even more notable praise that it could become even more efficient than the traditional liquid hydrogen based rockets of today with the addition of oxidizers.[[16]](#endnote-16)

The United States finally agrees with previous United Nations calls for more international cooperation in order to best sustain the growth of space. Thus we have seen major success within our domestic Department of Defense and NASA joint space debris database and hope to replicate such a system on a multilateral level and collision guidelines.[[17]](#endnote-17) Thus we propose the Pizza Box Project that stems from our own evasive action guidelines that calls all crafts to draw an imaginary “pizza box” around them that is a mile deep 30 miles across and 30 miles high surrounding the vessel.[[18]](#endnote-18) Should any debris from our collective databases be predicted to enter within the box a debris avoidance maneuver would be prudently planned by the nation’s space agency or mission control. With the greater compilation of data from multiple nations and sharing of technology we can ensure a steep decline in collisions that can lead to the decimation of lives, valuable technology, and information all while preventing more space debris that are product of these collisions.

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Space Militarization

United States of America

COMPRHENSIVE ACTION ADVOCATING THE DECLINE OF SPACE MILITARIZATION

It is estimated that it would take any where from 50-100 nuclear super bombs to destroy our human race. Today we have more that 270 times that collectively around the globe. These are all land-bound bombs though, with limited target reaches. With the development of space militarization satellites are quickly developing the technology to hold these volatile weapons, threatening the safety and peace of the international community. The United States of America like any other strives to lessen this escalation of tension and protect ourselves and cooperative partners with our highly developed technology.

The United States is admittedly one of the catalyzing factors behind the militarization of space as we overcame major technological barriers in the cold war propelling ourselves towards leadership in the field as we developed surveillance satellites and practical tools including GPS and satellite television.[[19]](#endnote-19) Under the threat of Soviet nuclear warfare the USA has developed as highly advanced and accurate Anti-Satellite (ASAT) systems that can also be used to ward of any incoming threat of ballistic missiles etc.[[20]](#endnote-20) Additionally, the US was actively involved in militarization with the establishment of the Strategic Defense Initiative or Star Wars under the Reagan Administration.[[21]](#endnote-21) Although it was highly criticized the idea was carried out through many of the next presidencies finally being morphed into the National Missile Defense Agency that provided a three part interception methodology that is supported by space tracking and satellite surveillance systems.[[22]](#endnote-22) The US has also shown its prowess in dismantling non-operational spacecrafts during countless missions including Operation Burnt Frost that successfully intercepting the falling vessel before it could release harmful hydrazine propellant into the atmosphere.[[23]](#endnote-23) Also, the US was involved in using satellite reconnaissance to gain information on military movements throughout the Persian Gulf War proving such technology to be an invaluable resource.[[24]](#endnote-24) Although the activity of the United States in space militarization has been highly scrutinized we would like to stress that all of these actions have been in order to maintain national security and fortify our defense systems.

We want to lead the deterrence of military conflict with in space by implementing the Alderaan Platform. The Alderaan Platform utilizes past American missile interception research from the Kinetic Energy Interceptor plan and Ballistic Missile Defense System to create a holistic interception plan. The USA also asks that in the interest of other nations needed protection from the threat of celestial warfare become Mutual Defense Treaty (MDT) nations in conjunction with Alderaan. As a joint operation all nations willing to contribute their technological advancements and military presence/vessels will be guaranteed protection from outside forces with the Alderaan satellite. To delve into specifics, Alderaan has a three part plan that aide in most effectively locking on to potential misses. The three components are an international surveillance satellite, the Alderaan satellite that has laser capabilities, and sea vessels with backup traditional missile interceptors themselves. The main Alderaan Satellite will use Chemical oxygen iodine laser (COIL) that was successfully used in America’s YAL-1 Airborne laser test to destroy two missile targets in 2010.[[25]](#endnote-25) Seeing that the development of an X-Ray laser has not yet been tested or confirmed COIL uses the reaction of hydrogen peroxide and chlorine among other chemicals to catalyze heat energy in a gaseous stream that is transmitted as laser waves.

Space in all of its glory and flaws is in fact a new frontier. With this limited access new frontier comes a lack of law, clarity, and specificity. In the case of space warfare we are quite unprepared seeing that the only leading law is by International Human law and it’s gaps filled by Martin’s clause. Should military actions breakout it could be catastrophe due to the lack of unified and agreed upon legalities. Thus the US believes the preventative measure of creating an agreed upon space law in proactive motion for warfare is critical. With that said, we suggest the conference of nations at UNISPACE IV summit in order to solve this, the last UNISPACE meeting was in 1999, and our lack of communication is clearly a product of this. This UNISPACE IV would outline the ways to avoid unnecessary destruction and civilian affliction in the case of special war seeing that without clear laws this could be highly blurred with the use of IHL now. UNISPACE IV would also shed light on the imbalance lesser-developed nations lack of activity in space hoping to stress their need of equality in this field. UNISPACE IV would call for the prohibition of armed astronauts and space combatants as seen with the Russian cosmonauts.[[26]](#endnote-26) Finally, UNISPACE IV needs to address that satellites with military versus civilian function must be divided seeing that should a combined satellite be attacked not only would it hurt in war circumstance but possibly shut down internet, GPS, weather, and other critical functions in said nation. With the rising possibility of the nest world war being in space the USA finds it compulsory to have dedicated laws and guidelines to prevent chaos in its place.

As mentioned previously the imbalance in space technology is only widening with the growth of the USA among China and Russia. However with our new technological advancements we hope to offer smaller nations the opportunity to explore space too. Like previously stated the USA would strive to implement Project Sheppard that strives to reduce cost of space agencies through new technology. Project Sheppard would endorse ALICE fuel technology in smaller and less adept nations to encourage a far more fiscally responsible and attainable method as ALICE’s two components are nano-aluminum powder and water. ALICE would give the opportunity of space exploration on the same caliber as larger nations. ALICE fuels would also work in conjunction with one of SpaceX’s newest developments: the reusable rocket.[[27]](#endnote-27) This would allow smaller nations to pay far less for their initiatives while also maintaining environmental alongside fiscal responsibility. By utilizing Project Sheppard the United States is confident that we can narrow that gap of space programs and allow all nations the opportunity to utilize space.

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Space Commercialization

United States of America

INITIATIVES TO SUPPORT THE GROWTH OF SPACE COMMERCIALIZATION

It’s constantly written about in novels, spoken in TV shows, and directed in movies; space commercialization has become far more reality than it is science fiction. Within the past couple of decades the growth of the private sector in space activity has skyrocketed exponentially. The United States of America firmly believes that a competitive commercial space sector is vital to continued progress in space. Within our own National Spacy Policy we encourage the principle of a robust commercial space sector being critical to our continual progress in space.[[28]](#endnote-28) We believe in the active promotion of a globally prosperous commercialized companies as seen in the companies that have been able to export to and service the International Space Station (ISS).[[29]](#endnote-29) Most recently the USA has come under fire due to the support and pass of our congressionally approved 2015 SPACE Bill. The SPACE bill states that any activity of private bodies or individuals to possess of utilizes celestial bodies and space resources would not be in opposition with our government nor face any domestic opposition however some say this is in conflict with our support of the Outer Space Treaty we believe this to be semantics as this bill does not endorse the sovereign taking of any bodies.

With the greater competition and growth fro companies offering commercial space flight we endorse a central flight post designed purely for this cause in each nation with such activity occurring. With these dedicated flight fields we can less invasive action from the federal government however still maintain high levels of security and proactive measures. This has taken place within New Mexico’s Spaceport America that is home to Virgin Galactic.[[30]](#endnote-30) Although the strip faced massive setback after a vessel’s crash this idea is still viable especially in the near future where multiple commercial flight routes can take place in one certain area alongside even other more industrial flights like SpaceX’s exports to various stations.

The USA being one of the largest proponents for a strong private interest in space commercialization advocates for domestic tax breaks and subsidies for those companies helping governmental missions or international space entities.

The USA also sees the concerns posed for civilian safety in the field of commercial space flight and space tourism. AS a result we advocate for the institution of the Voyage Guidelines that are enacted to ensure the highest caliber of safety by private companies offering flight. The Voyage Guidelines claims that all companies offering spaceflight must have indemnification for all of its participants in the case of a third part disaster or loss of life. The Voyage Guidelines then call for all companies carrying participants to be approved and licensed by a their federal space agency or an international space entity to ensure the highest degree of precaution is taken fro its passengers. The Voyage Guidelines then ask that the medical history of all participants be released to the company and under their judgment will they be allowed or denied keeping in mind that it is the company’s responsibility in case of deaths or accidents.

The USA is a strong believer that the future of renewable resources lies in the development of asteroid mining. We strongly support the activity of corporations of Deep Space and Planetary Resources and the idea that any private entity should have the ability to exploit and asteroid for resources should it have the means necessary without the involvement of the government. Thus we also encourage the national investment into these companies. However, asteroid mining is certainly not only limited to the private sector. With the NASA Asteroid Redirect Mission (ARM) launch our own federal government will soon be involved with the sampling of asteroid resources ourselves. We encourage all other nations to follow in this track using the Orion Plan. The Orion Plan utilizes a robotic spacecraft that will capture a boulder off a large asteroid using a robotic arm and redirecting the vessel with the boulder in tow to moon orbit.[[31]](#endnote-31) Once in moon orbit astronauts aboard other vessels would be enabled to collect sample of the asteroids mass and begin greater study of the resources that asteroid possess. By doing this we can maps the certain resources an asteroid has and claim the said resources for the federal government one the vessels are sent back to the main asteroid after testing.

As space tourism and commercialization of flights becomes more predominant in popular culture and civilian norms the United Sates finds it necessary to have established bases with availability of resources and other coexisting groups. The United States support’s the ESA’s focused movement on wanting to colonize the moon but as Americans we go big or go home, we want to colonize the Venusian atmosphere. Venus has proven to have the most Earth-like mass and similarity in gravity, about 90% of what Earth’s is decimating the side effect of muscle atrophy among other within zero gravity situations.[[32]](#endnote-32)The USA’s NASA will partner will private industries including SpaceX among other commercial bodies to ensure the safety and technology of this advancement. The Venusian atmosphere is not only far closer to Earth than say Mars but also has the plentiful resources and conceptual technology from NASA to achieve such a mission. NASA has been involved with idea through the High Altitude Venus Operational Concept (HAVOC) that suggests the tethering of light space blimps unfolding upon entrance to the high atmosphere and tethering together to form a Cloud City-esque structure. Although often seen as hot and angry the Venusian atmosphere about 30 miles up offers Mediterranean temperatures and unique environment. [[33]](#endnote-33)Seeing that this would be fortified by private sector companies funding will be provided by civilians trying to explore space, venture capitalists, small budgetary supplements from the federal government, and the corporations themselves. With the further development into the future we will use the reusable rocket booster technology made successful by SpaceX to maintain efficiency that will help bolster the private sector’s fiscal competition. By colonizing the Venusian atmosphere with the private sector and other multilateral bodies we can ensure a base for reusable planetary resources that are utterly valuable.[[34]](#endnote-34)

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