**Topic 1: The Environment and Space Activity**

As human industry and population has grown, the environment has suffered. Temperatures are rising, ice caps are melting, and the environment of the earth and of orbital space is threatened by humanity’s space activity; primarily by orbital debris and black carbon.

Orbital debris – or space debris – are mostly now-useless fragments of objects (like defunct satellites and shuttle fragments) that were created by collisions with other pieces of debris, explosions, or missile tests. NASA estimates that up to 500 thousand objects larger than 1 centimeter and 135 million over 1 millimetre are orbiting the earth.[[1]](#footnote-1) But there are also millions of pieces of debris that are too small to track, and those pose the greatest risk to space missions, as all pieces of space debris are travelling at speeds up to 30 thousand kilometres[[2]](#footnote-2); so any could badly damage a satellite or even the International Space Station. In fact, the ISS had to maneuver three times in 2014 to avoid space debris.[[3]](#footnote-3) But the scariest part of space debris is the fact that they could start a catastrophic chain reaction at any time: A large collision between space debris that creates more pieces of space debris, that spreads and collides with other pieces of space debris and creates more and so on sounds like the plot of a recent blockbuster movie and is also known as Kessler Syndrome. If this did occur, countless satellites would be damaged, the ISS too, and lives could be lost. With the increase of space debris, earth’s orbital space could become unusable. Space debris is relevant to all countries, as it affects everyone who uses satellites due to the risk the debris pose to them; and to ISS as a worldwide endeavour. Guatemala supports current research and development of new technologies to remove space debris, as these varied ideas all provide different and creative solutions to this important problem. Guatemala also wants more countries to commit to working on this urgent issue and collaborate with each other to rapidly find solutions as the possibility of the Kessler Syndrome is continuously present. Guatemala also wants to amend the Outer Space Treaty or create a new treaty about space debris to restrict post-mission deorbiting time of all new satellites to 25 years, restrict the creation of new space debris by states and restrict the creation of space debris by private companies. Guatemala also wants amendments to allow states to remove pieces of debris that is not theirs if it is proof of an immediate threat to necessary satellites of if there is an immediate threat to human life. This is due to the complexity of active space debris removal, as “not only do you have to identify, locate and approach each piece of junk, but space treaties require permission form the original owner before anyone can do anything to it.”[[4]](#footnote-4) From technologies like lasers and magnetized nets, to deorbiting satellites, Guatemala believes in what humanity can create together, and the preventative measures we can put in place, to protect out orbital space.

Black carbon is what makes soot black, and it comes from jet planes, fireplaces, industrial factories, etc. but has never been seen to be an issue before. This is because only recently it was known to be the second largest contributor to climate change, due to the short lifespan of it in the lower atmosphere.[[5]](#footnote-5) With carbon dioxide being the largest contributor to climate change, it is not surprising that that is what has been most often thought of and considered when it came to exhaust from rocket launches. But with the finding of black carbon being such a large contributor, rocket exhaust has been looked at again. Various rocket types inject black carbon directly into the stratosphere, where it lingers for 3-5 years due to the lack of atmospheric factors like rain.[[6]](#footnote-6) This increases radiative forcing, so increasing the amount of ultraviolet rays absorbed from the sun. At the current number of rocket launches per year the amount of black carbon being put in the stratosphere is not deadly, but with the coming increase of space travel it will be necessary to reduce these emissions so they do not reach catastrophic levels. Climate change and the increase of black carbon emissions affect everyone on earth, because if the planet heats up too much it will be unlivable; and human technology is not yet advanced enough for us to leave the planet. Guatemala has signed numerous agreements related to climate change, most recently the Paris Agreement. Guatemala wants to create a new treaty or agreement that would regulate the number of worldwide launches per year in advance of the increase in space travel, as well as reduce the number of kerosene and hybrid rockets due to their exhaust having been found to contain the most black carbon. Guatemala also wants to encourage countries and corporations to switch to cryogenic rockets due to them releasing the least harmful emissions out of all five rocket types. Guatemala also wants to propose the future addition of an international cooperative organization equivalent to the ICAO that would act in the same way for spacecraft, either as a completely separate organization or part of the ICAO. Guatemala truly believes that collaborating to regulate black carbon emissions before that regulation is truly needed is the best course of action, as preventative measures are much simpler than attempting to tackle the problem once it is more prevalent (and more expensive).

**Topic 2: The Militarization of Space and International Law**

Where there are humans there is conflict; that has been true for centuries and is still true now. The only thing that has changed is the “art” of warfare, from swords to rifles to tanks and drones. While the Outer Space Treaty calls for space to remain demilitarized, various states choose to ignore it. These states are in the process of or already have built anti-satellite weapons (ASATs), or are trying to devise ways to disable satellites through cyber-attacks; both being highly dangerous as “the disabling of satellites would have a disastrous impact on society, knocking out GPS navigation systems and time signals”[[7]](#footnote-7), and could cause many infrastructures like power and telecommunications to fail. Even worse, states using or threatening to use these things could create a space arms race, which would threaten every useful piece of technology in orbit. There is also no distinct overall laws relating to armed conflict and space; while International Humanitarian Law (IHL) can be applied, it cannot be done so easily and completely. Russia and China have multiple times submitted and have had fail their draft Treaty on the Prevention of the Placement of Weapons in Outer Space (PPWT); it has failed due to multiple states opposing various definitions in the treaty, and thinking it is lacking in other areas.[[8]](#footnote-8) The European Union has tried to get their International Code of Conduct for Outer Space Activities (ICoC) to be passed, but numerous states opposed it due to the EU wishing to “retain exclusive control over which suggestions emerging from consultations were reflected in the revisions and which were not”[[9]](#footnote-9). The potential militarization of space is extremely relevant to Guatemala, due to the negative effect a space arms race would have on satellites and on country relations, especially since this arms race would likely occur between the United States, China, and Russia; all three of which Guatemala has foreign relations with, and two who are close allies. Guatemala wants to introduce a treaty similar to the PPWT proposed by Russia and China without the questionable definitions and addressing the lacking issues like the creation of space debris by ASATs and ensuring that space debris removing technology is only used for that purpose. Guatemala also wants to collaborate with other countries to write an ICoC like proposed by the EU but within the framework of the United Nations. Guatemala also wants to write a version of IHL to apply to space, by keeping the fundamental Rule of Law and altering the other pieces; while integrating restatement of law as applied to new technologies, following the examples of the San Remo Manual on International Law Applicable to Armed Conflict at Sea, the Harvard manual on international Law Applicable to Air and Missile Warfare, and the Tallin Manual on International Law and Cyber Warfare. Guatemala believes that collaborating to create new treaties and transfer existing laws to outer space is the best way to prevent potential space warfare.

**Topic 3: Space Commercialization**

Because space has always been fascinating to humanity, it is no surprise that everyone wants to visit space, and that people want to exploit its resources. With commercialism being such a large thing on earth, it isn’t surprising either that with growing technologies space commercialization is growing too. Asteroid mining and space tourism are two booming industries, with companies already selling seats on incomplete spaceships and planning to mine asteroids. With much of these endeavours being taken by private companies the lack of regulations pertaining to them gives them free reign to do whatever they please. The solution is not as simple as just amending the Outer Space Treaty to include these companies, as that treaty has not been updated since its creation in 1967[[10]](#footnote-10), so multiple parts of articles are out of date. There is also unclear delegation for liability for accidents, pertaining to states and private companies alike, which can cause financial struggles for certain parties and allow others to escape responsibility completely. These issues are extremely relevant to Guatemala, especially with making liability clear, as various states and private companies set up facilities and operations in developing states, and when mishaps occur those developing states are liable; as a developing state Guatemala does not want this to happen to them or other states like them. Guatemala wants to collaborate with other countries to create regulations for states and private companies operating in other states – especially developing states – to ensure the operation-base state is either not liable or not completely liable for accidents or damage in space, and that the operating company or state is at least partly liable. Guatemala also wants to regulate private companies who plan to exploit space resources like asteroids to ensure sustainable use of space and to make this regulation fair to states and companies alike, as it would be unfair if private companies could utilize asteroids in space for resources but states could not, and is unfair if only states that have space programs could access and utilize these things; this is why collaboration between many countries is key. Guatemala also wants to ensure private companies cannot claim space territory as their own by using Antarctica as a model or implementing something else to ensure this. With how quickly these industries are growing, implementing regulations and amending existing treaties is the best way to keep these companies in check, in order to have them grow sustainably.

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