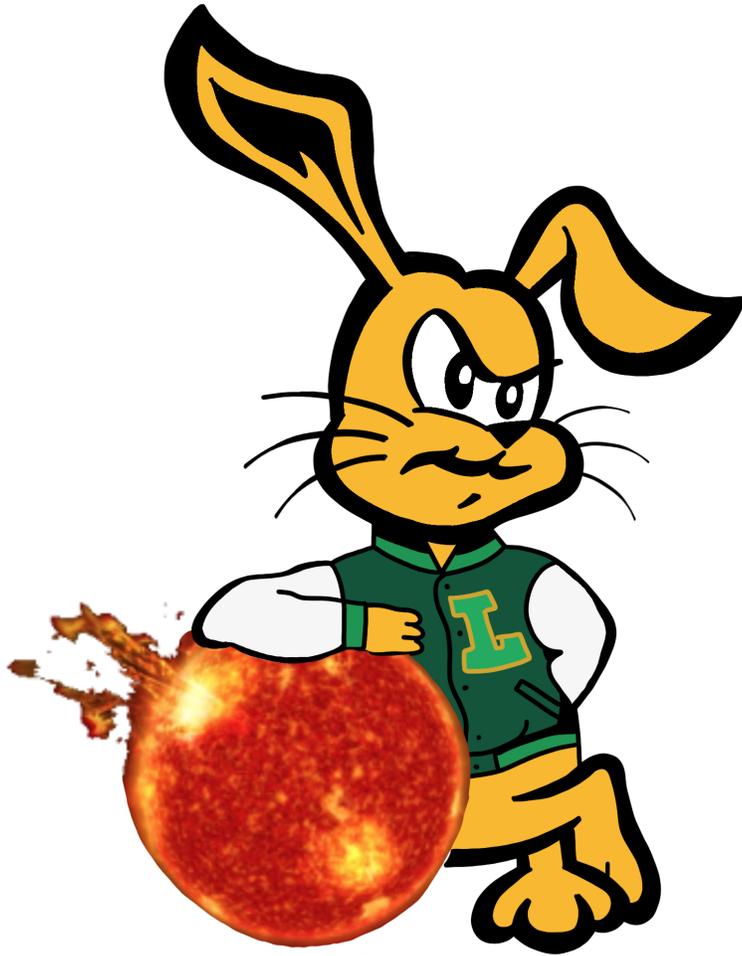


Crisis Committee: Solar Flare



JACKRABBITMUN III

L.B. POLY - MAY 22nd

BACKGROUND GUIDE TABLE OF CONTENTS

Head Chair Letter.....	3
Crisis Director Letter.....	4
Position Paper Guidelines.....	5
Introduction and Committee Background.....	6
The Science of Solar Flares.....	10
Political Effects.....	14
Character List: World Leaders Link.....	16
Character List: Top Scientists Link.....	16
Works Cited Link.....	16
Questions to Consider.....	16



HEAD CHAIR LETTER

Dear Delegates,

Welcome to the future and the Solar Flare committee! My name is Inanna Khansa, and I am honored to have the pleasure of chairing this committee and navigating you all through this impending crisis. I am currently a Junior at Poly and have been in the MUN program for three years. Through these years, I have gained a deep appreciation for policy and global issues as well as a love for writing and debating. Outside of MUN, I am the co-president of the Speech and Debate team and competed in Student Congress at the state level. Additionally, I am an avid musician, a member of the Poly math team, and the CAD lead for FRC team 7042. For fun, I enjoy watching anime, listening to music in foreign languages, and hanging out with friends.

At Jackrabbit MUN, we expect our delegates to actively participate, be diplomatic in debate, and follow their character policy to stay true to the sheer crisis of the room. Delegates participating in this committee should come with an understanding of the future world, the science involved, and their character's view and keep in mind the main goal of this committee: mitigate the crisis and save the world. While this is a serious room, I sincerely hope the uniqueness of this committee and your creativity with solutions will make for an exciting and stimulating conference! In your preparation, if you have any questions, please do not hesitate to email me.

Get ready to jump into the future, face the crisis, and change the future of our world!

Best,

Inanna Khansa

Solar Flare Head Chair

inannakhansa@gmail.com



CRISIS DIRECTOR LETTER

Esteemed Delegates,

Hello and welcome to the Solar Flare committee! My name is Jomar Hontiveros and I am very excited to say I have the privilege of being your Head Crisis for this crisis which me and my fellow daias have been working hard on. I am a Junior and have been going three years strong in my school's lovely Model UN Club. I've discovered, refined, and executed my affinity to public speaking while diving deep into the background of every topic that I've been dealt with. Outside of Model UN I am very much a nerd in the sense that I am highly involved with the local aviation community, outside of my friend group of fun for planespotting (photography of aircraft) I am involved in volunteering with the local Experimental Aviation Association Chapter and their community outreach programs such as Young Eagles (provides free flights for children) and at the Long Beach Festival of Flight. For fun, I must admit I am very much a PC Gamer with many venn diagrams to be drawn towards my interest in politics and transportation such as the Democracy franchise and Train Sim World.

Echoing the words of my fellow Dias we do hope to see you thrive amongst this unique and interesting Crisis, mitigating and hopefully overcoming this major issue that is presented. The diplomatic prowess about to be unleashed will be great to witness while melding with the decorum that comes with MUN. The serious nature of this room should not serve as chains to restrain creativity, after all it is the unique thought processes of individuals which have allowed humanity to overcome some of the greatest issues presented so far. I cannot quantify my excitement to see how you as the delegates will handle this issue as it changes and melds to the actions put into the world by you.

The world is there, ever changing, and ready for you to jump in and react to!

Sincerely,

Jomar Hontiveros

Solar Flare Crisis Director

jomarhontiveros@protonmail.com



POSITION PAPER GUIDELINES

JACKRABBITMUN POSITION PAPER GUIDELINES

- Position Papers are due at 11:59 PM on **Sunday, May 16th, 2021** in order to be eligible for **research AND committee awards**.
- Position Papers are due at 11:59 PM on **Friday, May 21st, 2021** in order to be eligible for **committee awards ONLY**.
- Position Papers can be submitted through the committee email:
 - Email to: solarflarejackrabbitmun@gmail.com
- At the top of each paper, include your character's name, first and last name, committee.

Axel Kicillof
First Last
Solar Flare

- Papers should be emailed as a PDF file.
 - Paper content should also be copied and pasted into the body of the email so it can still be graded in the event of any technical difficulties
 - Please name file and subject line of email [Committee_Character/Country Name]
 - Ex. Solar Flare_Axel Kicillof
- Papers should be 1-2 pages in length with any additional pages for citations.
- Papers should be single-spaced in Times New Roman 12 pt. font and include no pictures or graphics.
- Please include the following sections for each committee topic:
 - Background
 - Position of your Country/Character
 - Possible Solutions
 - Note: Since this is a futuristic committee, additional events pertaining to your character from 2020 onwards mentioned in your position paper will be treated as canon, within reason

If you have any questions or concerns, please email your chair (inannakhansa@gmail.com)



INTRODUCTION & COMMITTEE BACKGROUND

Committee Introduction

Welcome to Earth in 2040 that is at risk of no longer being the same world as we know it. Your job is to ensure that our society persists and is preserved throughout this crisis. But what can you do to stop the divine powers of the heavens?

But first, you must quickly gain an understanding of the impending crisis: a solar flare of an unprecedented scale. What is it and what are its effects? More importantly, how will those effects impact Earth and the people you rule over? Luckily, the current world leaders have the help of their leading solar scientists and research facilities to call upon as experts.

Now, comes your objective which is to first and foremost prepare for the looming crisis and after the solar flare hits, mitigate its effects. Is your nation prepared for such a level of mobilization. How will you cooperate with neighboring nations? Will your actions even be effective?

Meanwhile, you must consider the people who will be affected. In Montreal, you are safe along with your advisors and other G20 members, who all contain the knowledge of this impending crisis. As of now, this crisis is a secret, so will you be the one to inform your citizens or will the widespread chaos precede you? Furthermore, what will be the consequences of your transparency or lack thereof?

These are all factors to consider when delving into this world and this crisis. To solve such a complex issue, the entire committee must come together in a cumulative effort to effectively solve the crisis. But the path to that issue will not be easy and there will be many unforeseen impacts. Are you ready to save the world?



Earth in 2040

By 2040, the world has greatly changed since the beginning of the 21st century, the most notable of which (since Jackrabbit MUN I in 2019) is the end of the coronavirus pandemic. Throughout the early 2020s, the United States, People's Republic of China, and the United Kingdom organized a global vaccination effort in addition to COVAX, which overcame vaccine skepticism and successfully eradicated the disease.*

After overcoming this great feat, the world succeeded in addressing other issues, namely the lack of developments in heliology. In 2022, China launched its Advanced Space-based Solar Observatory or ASO-S, and the world followed, with European Space Agency launching a more advanced sun mission in 2025, NASA following a year later, and Japan at the beginning of 2029. These missions focused on studying solar events, predominantly solar flares, as scientists began to fear a larger sun cycle after two historically weak ones. With this new technology, scientists all around the world achieved a new capacity for predicting such events and their magnitude by recording precise data from the Sun and analyzing it through advanced software.

Moreover, advances were not just restricted to the celestial heavens above, but towards bettering life on Earth. Due to the global economic devastation as a result of the COVID-19 pandemic, many nations chose to reinvest in their nation's infrastructure as a means to revive the economy. Such advances were especially made in renewable energies. Thus, in two decades, the world achieved 67% of its goal of eliminating fossil fuels by 2050, under the leadership of the European Union, Americas, and some Asian nations, which have continued to develop in a green direction due to a United States-led Green Belt and Road Initiative. That said, development has unevenly favored industrialized nations who could afford the transition to entirely renewable powered grids in some provinces, and left behind much of Asia and Africa, who were still industrializing in the 2020s.

May 22nd, 2040

However, early morning on May 22nd, 2040, a Japanese solar satellite anticipated that a solar flare of an unprecedented scale was projected to hit Earth in three days. The top



heliologists of other world nations soon reached the same conclusion, but luckily the G20 nations are already assembled for the annual conference. By then, all world leaders have been informed secretly by their government space agencies, and now, the docket has been entirely cleared save for one essential item: how to lead Earth through this solar flare. Immediately, world leaders called in their top experts on the topic to add an intelligent, scientific perspective to the frightening politics. As they are all assembled together in the same location and are equipped with adequate emergency energy sources, the world leaders and leading scientists will be largely unaffected by the solar flare, but the same cannot be said for the rest of their nations. Can this committee come together and save the world?



*COVID-19 will NOT return in this committee, so all directives that suggest this will immediately fail.

The G20

The Group of Twenty or G20 is a group of nineteen countries and the European Union, originally established in 1999 to discuss fiscal policy related to international stability. After the 2008 Great Recession, George Bush called on the G20 to solve the economic crisis, and since then, its purpose has expanded to act as a means of communication between Heads of State to address global issues in a coordinated effect. In this committee, the G20 are assembled in Montreal, Canada, and have the unique addition of scientists due to the urgency of the situation. Furthermore, since all delegates have already assembled in one location, there will be no communication issues between the members of the committee due to the solar flare. However, the same cannot be said about communication with the rest of the world. Additionally, there are backup electrical generators, surplus food and water, as well as emergency medical equipment and staff during this meeting, guaranteeing the safety of all attendees, including essential advisors and staff that are present.





THE SCIENCE OF SOLAR FLARES

What is a solar flare?

Space weather is the general term for the dynamic conditions outside of Earth, and this is largely due to the Sun and solar winds. Heliophysicists specialize in studying this and focusing on the Sun, whose structure causes these events. In its essence, the Sun is a ball of Hydrogen gas, ignited by tremendous amounts of energy. Because of the movement of the Sun around its axis, a magnetic field is generated, leading to a multitude of effects that can be felt on Earth.

A solar flare is a burst of radiation and light from the Sun due to a build up of magnetic energy. These celestial occurrences are associated with active regions on the Sun at which there are regions of low temperatures called sunspots. Sunspots are areas of high magnetic fields from the plasma moving in the Sun's atmosphere, and solar flares occur

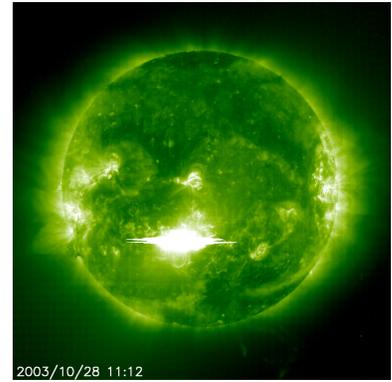


when the small magnetic fields there collide and reorganize, creating an explosion. Like Earth, the Sun has its own magnetic field that undergoes reversals where its polarity changes. In the middle of the 11 year cycle, solar maximums occur, which are areas with a high amount of solar activities and sunspots; this is

proportional with the peak of solar flare occurrences. Recent solar flares have been weaker than average, with the most recent Solar Cycle 24 peaking at 114 sunspots, much lower than the 179 average from before. The year 2020 marked a minimum and the start of Solar Cycle 25, which was also weaker. Additionally, the chances of a solar flare making impact with earth is low, as most of them do not release enough radiation to seriously affect the planet. That said, a solar flare can vary dramatically in size and power, the largest being thousands of kilometers wide and having a power thousands of times greater than the most powerful volcanic eruptions and Hydrogen bombs. This level of power has caused NASA to classify



solar flares as the solar system's largest explosive events. Solar flares are detected and classified into three categories: C-Class, M-Class and X-Class. Each class represents a tenfold increase in energy output and within each class, there is a classification level from one to nine. The strongest category of solar flares are the X-Class flares; flares in this category can exceed the maximum number of nine. In fact, the strongest solar flare recorded with modern technology was categorized as X28 in 2003.



Another set of occurrences of note are coronal mass ejections (CME), which are large scale expulsions of plasma and magnetic fields from the Sun's outer layer. There are several key differences between them and solar flares, the most prominent being that CME events expel not just massive amounts of radiation but coronal material that carry magnetic fields much stronger than the background solar wind. They are also usually much slower than solar flares, taking from several hours to several days to reach Earth, while the latter can take well under a day. Furthermore, their different nature leads to different effects. Solar flares mostly interrupt the radio in the place of contact with Earth, while the particles released from CMEs can affect Earth's magnetic fields, and when combined at the extreme, much damage can occur.

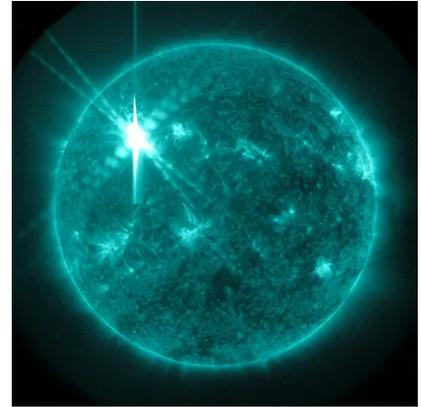
Past Solar Flares

Previously, there have been many past solar flares; however, since society at the time did not rely on technology as we do now, their effects were simply an inconvenience. In fact, they are so frequent that solar flares can occur up to 4 times every day but their harmful radiation either misses the Earth, is reflected by the ozone layer of the atmosphere, or disperses before it can reach the planet. That said, if a solar flare is large enough some radiation will make it through the ozone and damage electronics. The ozone layer reflects solar radiation constantly and when a solar flare occurs the amount of radiation is greatly increased. Small solar flares don't increase the radiation level enough to pass through the



ozone and thus their effects do not reach earth. Solar radiation that passes through the ozone and affects electronics causes power surges and electric overloads.

The largest solar flare to hit earth in the digital age was in 1989. This solar flare was small compared to those in the more distant past, but it showed their destructive capabilities. This solar flare caused a geomagnetic storm and damaged all electronics within its impact radius. Moreover, the minimal effects of this solar flare compelled the world to look into solar flares and their effects. For instance, the United states launched the Deep space climate observatory satellite (DSCOVR) to predict flares and monitor solar activity. In the distant past the largest solar flare ever recorded hit Earth in 1859, and its magnitude was so large that it was dubbed a Carrington class event for English astronomer, Richard Carrington, who observed it with his own eyes. This massive solar flare infiltrated the ozone and caused telegraph lines to have power surges, shocked the operators and caused small fires. The effects of this extraordinarily large solar flare were greatly diminished because of the minimal reliance on electricity by society at that time. However, one can infer by the records of that time citing sightings of aurora as far South as the Caribbean, that such a storm is to be feared.



Potential Effects of the Predicted Solar Flare

With the large scale solar flare, there will be drastic effects that will have an immense impact on humanity. While it will have no measurable impact on Earth's temperature, the flare will hit the Atlantic Ocean and extend all over the globe, shutting everything down. All over the globe, lights, internet, heating, air conditioning, and any other device that draws current from the wall will go out, eliminating all forms of communication. Additionally, in places with electronic-controlled municipal water supplies — such as most modern cities — toilets and sewage treatment systems would also stop working. This in turn would cause a revival of diseases such as Cholera or Malaria, depending on the climate of the city affected. Perishable food and medication would be lost, ATMs would be rendered useless, and gas



pumps would be damaged. As a result, there may likely be an increase of crime in pursuit of resources. Outside of Earth, any spaceships, including the International Space Station (ISS) will be disabled and without sufficient materials to repair them in time, would probably result in the deaths of all astronauts on board. Moreover, hospitals will be down without abundant power reserves saved for the Carrington-class flare. The radiation of a solar flare would be strong enough to produce a large CME, reaching Earth after the initial shock. These are the most dangerous but are slow moving and easy to anticipate, making them easier to anticipate. Nevertheless, CMEs contribute to temporary blackouts and overpower electrical currents on Earth, due to their power and charge. They can also cause radiation poisoning with enough exposure; people who absorb large doses of radiation have little chance of recovery. Depending on the severity of illness, death can occur within two days or two weeks. People with a lethal radiation dose cannot receive medications to control pain, nausea, vomiting and diarrhea due to the hospitals being rendered ineffective.

Ultimately, the area affected by solar flares would be utterly devastated in all terms of society and many human lives will be lost amidst the lack of infrastructure, immense radiation poisoning, and sheer chaos. These effects will be heavily concentrated around the area where the solar flare directly hit and will affect the rest of the Earth in a milder manner.

Helpful Links

- <https://www.nasa.gov/feature/goddard/2020/solar-superstorms-past-help-nasa-scientists-understand-risks-for-satellites-orbital-drag>
- https://www.nasa.gov/mission_pages/sunearth/spaceweather/index.html
- <https://www.scientificamerican.com/article/geomagnetic-storm-march-13-1989-extreme-space-weather/>
- <https://www.nbcnews.com/mach/space/how-we-ll-safeguard-earth-solar-storm-catastrophe-n760021>
- <https://www.businessinsider.com/solar-storms-could-damage-electronics-2018-6#:~:text=The%20biggest%20solar%20storms%20can,it%27s%20happened%20several%20times%20before>



POLITICAL EFFECTS

Corruption in Politics

Many forms of political corruption will come about from this solar flare. Rich billionaires and other government insiders want to hide the solar flare while gathering resources to only save themselves. Scientists who wanted to speak out faced the potential of persecution by corrupt governments in China and Russia. Meanwhile, nations may be pitted against each other with Russia blaming China and worsening their relationship through widespread propaganda. At the beginning of this conference, this information is confidential, with only the scientists involved and world leaders having this crucial knowledge. However, there is incentive, monetary and otherwise, for the information to be leaked to those who can pay for it, and that corruption can be revealed to a much alarmed public. Despite all these conflicts, countries must work together to solve the issue of the solar flare.



Social Unrest

As a result of the effects of the solar flare, flights will be down as citizens of countries protest, especially those who may be abroad and cannot return to their homeland. There are also those who may deny the idea of solar flare of this magnitude reaching Earth, instead dubbing it a government hoax. There is also mass confusion as “Some startled people who had never seen an aurora before even feared that nuclear war had broken out”⁽¹⁾

This will result in social unrest, after the solar flare strikes and widespread public panic in the hours leading up to it. There is fighting amongst citizens over water, prepackaged food, and other essentials. There will be an extreme rise in crime due to no



policing and laws being ignored because of the crisis. There will be an extreme loss of life for those unable to access food, water, and medication, especially in rural areas, and even more



falling ill from failed sewer systems making living areas more unhygienic. Fires from power lines causing even more chaos and unrest (unless shut down somehow beforehand). If information about corruption is released to the public, there will be violent civilian uprising. The political situation of 2040 is bound to be more turbulent than that of 2021, especially due to mounting government strife with

governments ignoring class disparities, so it may reach violence at levels comparable to the Mongols or the French Revolution. People will also begin to question society's dependence on technology and how with a simple small solar flare everything will shut down, the Luddite movement will grow as well.

Science Skepticism

There will be mounting skepticism in the scientific community. Since the short flare happened, people begin to doubt the scientific community due to not receiving a prediction for it. With the millions spent on science, people wonder why could it not be predicted weeks in advance? As a result, riots happen all over the globe. This, combined with the loss of internet connection, leads to widespread misinformation among individuals in affected areas.



Under the weight of the situation, the international committee tries to blame NASA instead of their inability to work together.



CHARACTER LIST: WORLD LEADERS LINK

https://drive.google.com/file/d/1ox3Pd-xUn8GII5GkWC24nd8OcimSK_3q/view?usp=sharing

CHARACTER LIST: TOP SCIENTISTS LINK

<https://drive.google.com/file/d/1pPTfoGwtNMgF1kC22Gjz38qtuOcovtIu/view?usp=sharing>

WORKS CITED LINK

<https://drive.google.com/file/d/1GhKv5GIdiWfnjhc7AVlKhq5gyv-H2coR/view?usp=sharing>

QUESTIONS TO CONSIDER

1. What are the possible impacts of this solar flare on your nation?
2. What other characters align with you and would most work with? What can you do together to achieve them?
3. How will your country launch a unified preparation impact and how would citizens react?
4. Will your character drift towards transparency with the issue or attempt to conceal the reality?
5. What are the possible mitigation efforts to ameliorate the effects?
6. How have your characters actions since 2020 shaped their power and popular perception?

