

RichMUNd II

National Aeronautics and Space Administration: 2025

Sashank Sankar
Chair

Anish Bachhu
Vice-Chair

Delegates-

It is my distinct honor to welcome you to RichMUNd II! My name is Sashank Sankar, and I am your chair for the National Aeronautics and Space Administration, or simply put, NASA 2025. My vice chair and I are extremely excited to be chairing for you all, and I look forward to great debate on the topics we have prepared for you!

I am currently a junior at Henrico High School, and have been in Model UN now for 3 years, and it has given me so many opportunities to learn. Apart from Model UN, I participate in TSA as both a chapter and regional officer, and play Varsity Tennis for Henrico High School. I am a big fan of movies, my favorite being *The Shawshank Redemption*, partly because my name is somewhat in it. I also watch sports, as I am an avid fan of the Pittsburgh Steelers and the Cleveland Cavaliers, and yes, I was a fan of the Cavs before LeBron came back. I like R&B and Rap music, although I do listen to indie folk now and again.

My vice chair and I have created topics that we truly hope you enjoy debating, and I expect some great debate to come from this committee. If you have any questions, don't be afraid to send me a quick email at thekidsofva@gmail.com. Once again, I am truly honored to be your chair for NASA 2025, and welcome to RichMUNd II! I look forward to meeting you all!

Sincerely,

Sashank Sankar

Chair

Dear Delegates,

It is with great honor that I welcome you to RichMUNd II. My name is Anish Bachhu and I will be serving as your vice-chair for the very special National Aeronautics and Space Administration. This is my first time chairing and I am very excited for this opportunity! As so is my Chair. We will be looking forward to this exciting day and the high level of debate ahead of us on the presented topics.

I am currently a sophomore at Henrico High School, and have been in the I.B program since 6th grade. I first started Model U.N in 8th grade at Moody Middle School under the direction of Mr. Snow. I have attended quite a few conferences in my time, but never have I been a chair. This is an exciting opportunity to experience the other side of Model U.N. Besides Model U.N I partake in many other clubs. Debate club, Newspaper, and the Medical Club. I am third in charge of editing on the Newspaper team. I am also play soccer for Henrico High School. I am a big fan of sports and challenge any one of you to a debate on anything in sports. I would prefer something about either the Los Angeles Lakers, New York Giants, or the New York Yankees. Yes, it was a sad day when Jeter retired hang in there Yankee Fans. I also watch a lot of horror movies, my favorite being Chernobyl Diaries and any of the Saw Movies. My favorite type of music is R&B or rap music, and my favorite artist is Trey Songz or August Alsina. I read many books as well my favorite series being the Alex Rider series.

My chair and I are once again are very ecstatic and cannot wait to meet you all! I once again extend a warm hand in welcoming you all to RichMUNd II. We both expect a high level of debate and some serious thinking/preparation for this committee. Good Luck!

Thanks,

Anish Bachhu

Vice-Chair

Introduction

First, it is important to note that this is a committee that occurs in the future (specifically, 2025); therefore, important events have been created for the gap that occurs between 2014 and 2025 to assist you in your research. This committee will focus on those events, as well as events that have actually occurred in history (i.e., before 2014). Since these created events will not be found on the Internet, it is highly recommended to carefully read the background guide for valuable information. These events should be treated as fact for the purpose of the committee. It is also important, though, to recognize trends in order to move ahead in committee - which will require research outside this background guide! We would like to have all of these missions be conducted in the most cost-effective way. The committee will involve many people from NASA, including engineers, financial experts, chief administrators, pilots, and scientists.

Today, in the year 2025, NASA, and space research/exploration in general, holds a much bigger role throughout the world than it did 10 years ago. With China conducting a successful manned mission to the Moon in 2016, and India and other countries currently in its planning stages for a mission to the moon, the world has increased its interest in space travel dramatically since 2014. However, the recession of 2018 had slowed down the progress of many space programs, and in fact was one of the reasons the planned manned mission to Mars by NASA in 2018 was cancelled.

In 2014, NASA's budget was \$17.4 billion, less than 1% of the total budget for the U.S government. However, during the unmanned mission to Europa, one of Jupiter's moons, in 2021, explorers discovered micro-organisms living in a vast

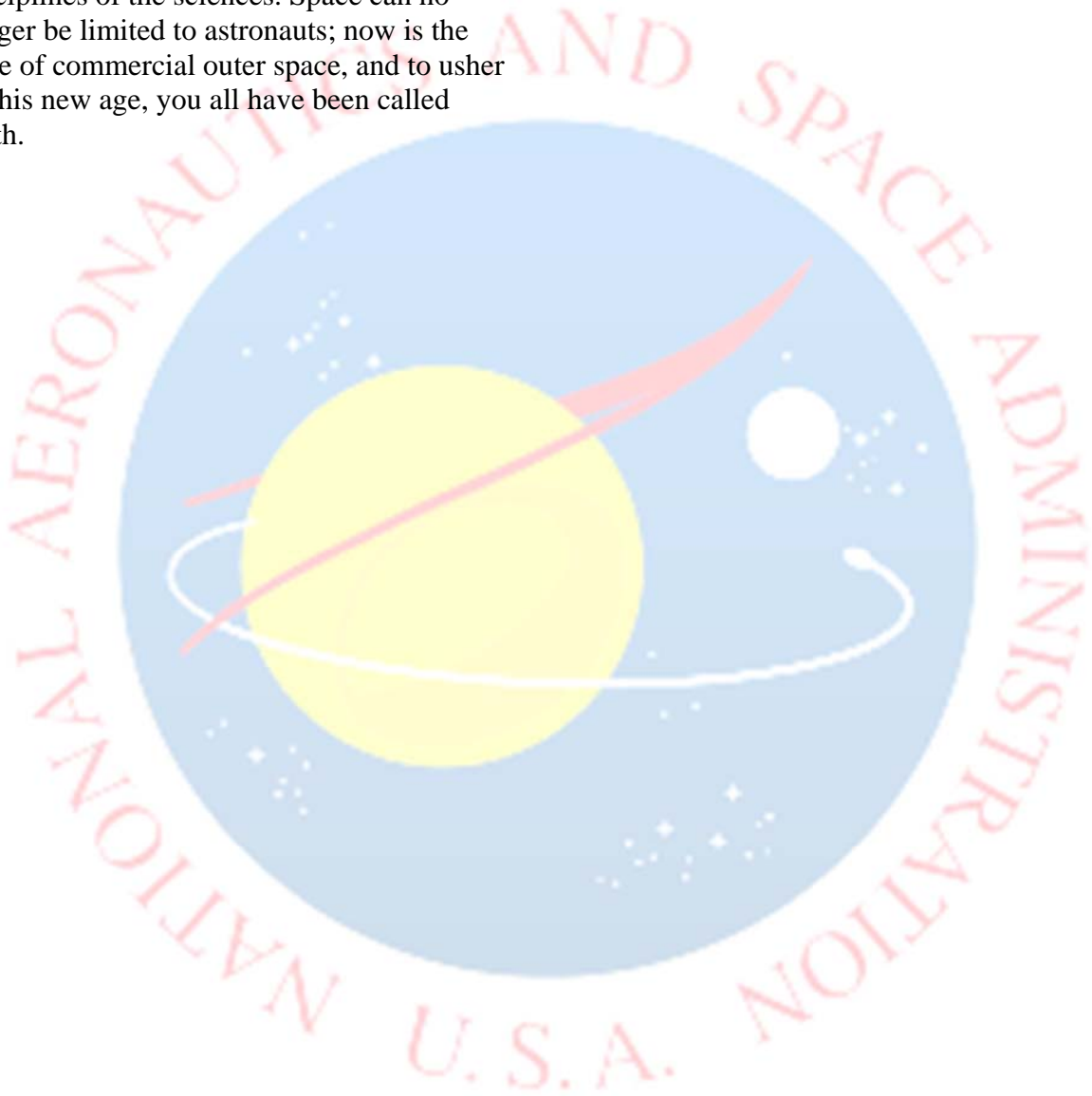
ocean underneath its icy surface; as a result, public as well as political interest in space travel dramatically increased. Four years after this discovery, NASA's budget is now currently around 8.8% of the U.S government's total budget - a staggering \$31.9 billion.

The aforementioned planned manned mission to Mars was cancelled in 2018, just 7 months before the November launch date. While the recession of 2018 played a large role in its cancellation, there were many other factors that played into its cancellation. One of these factors was the time and cost of the mission. While the rocket that was built was, at the time, the most powerful rocket ever constructed, the timetable for the trip did not change as much as NASA wanted it to. The original trip was supposed to last around 6 months to Mars, then a few days on Mars, then another 6 months back to Earth. Also, the cost of the trip proved to be too much for NASA, with the budget still being relatively small, coupled with the recession that occurred in January 2018. However, with the budget increase, the stabilization of the economic market, and the introduction of a more powerful rocket that will take the astronauts there and back quicker, NASA is once again considering a Manned Mission to Mars.

As mentioned earlier, China conducted a Manned Mission to the Moon in 2016, and many other countries, such as India, Russia, and the UK, have been in the planning stages for a Manned Mission to the Moon for many years. In 2023, Congress passed the Exploration Act, and one of the things it called for was the increase in research for space exploration and colonization, and increased NASA's budget dramatically. Since the act officially took effect, NASA has focused their attention on space colonization, especially colonizing the moon, considering that it is the closest body to Earth. However, other nations have yet to

agree to help back the colonization of the Moon, as the cost and risk would undoubtedly be very, very high.

It is for these reasons that NASA has convened not only its chief members, but also representatives of the government, as well as professionals in the various disciplines of the sciences. Space can no longer be limited to astronauts; now is the time of commercial outer space, and to usher in this new age, you all have been called forth.



Topic 1

Manned Mission to Mars

Background

In 2014, NASA announced that they were in the planning stages of a manned mission to the planet of Mars, which was set to launch in November 2018, a little over 4 years from the announcement date. They also announced that the ship taking the astronauts there would be the most powerful rocket ever created. However, with the recession of January 2018 took a massive toll on the U.S government, which, in turn, took a massive toll on NASA, which unfortunately had to scrap their plans for a November 2018 launch date. This economic crisis also affected NASA for the following 2 years, with it getting less and less money every year. However, with the Exploration Act of 2023, NASA's budget increased exponentially, and now are looking at another possible shot at the Red Planet.

Over the past few years, the rocket technology used in space travel has improved drastically. The Space Launch System rocket (SLS), the rocket that was originally supposed to carry mankind to Mars in 2018, could carry a maximum of 130 metric tons into space, and go as fast as 50,000 mph. However, the *Martian*, a newly designed rocket, can carry over 300 metric tons and go as fast as 300,000 mph. Considering the fact that these two rockets are only seven years apart, this shows how much rocket technology, as well as technology as a whole, has evolved over the past few years. However, this rocket is extremely expensive to construct and launch, costing around \$700 million, while the SLS costs around \$500 million. NASA must decide whether to choose cost over quality when it comes to rockets, as other factors, such as safety, are more or less identical between the two spacecraft.

Adding to the cost of the mission is the actual module that will carry the astronauts to the surface of Mars. The module must contain various scientific equipment for research, as well as a rover to be able to roam the surface of the planet. It must also have sufficient power to take off from the surface of Mars. While the lunar module used in the Apollo missions did not need tremendous power to remove itself from the Moon, the gravity on Mars is much, much higher than the Moon, and thus requires more power to leave the Red Planet. The module must also contain food and water, beds, and restroom facilities, as the astronauts will be staying there for a few days to a week at most.

Since the Exploration Act was put into effect in 2023, NASA has been receiving upwards of \$31.9 billion to increase scientific research and space exploration and colonization. However, the main financial purpose of the act was to search for life on other space bodies in our solar system, not for a manned mission to Mars. If NASA decides to move forward with plans for a manned mission to Mars, it would cost around \$6 billion, taking a big chunk of money out of money designated for research for extraterrestrial life. This would put NASA in a predicament with Congress, and may result in Congress removing money from NASA's budget, which, in the long term, puts NASA in a negative position in terms of research and space exploration. One of the ways that NASA may be able to avoid this is to look for a more cost effective way to send astronauts to the moon by choosing the less powerful rocket and a cheaper lunar module to Mars. However, this would mean that NASA would not be able to send all of the scientific equipment they want to, and NASA would not be able to stay there as long as they may want to stay to conduct tests.

Questions to Consider

1. What are the long-term costs to conducting a Manned Mission to Mars if NASA is to lose money from the Federal Government?
2. Is the mission worth the risk and costs to NASA?
3. Is the mission worth the benefits that could be gained to NASA?



Topic 2

Space Colonization

Background

Billions of years ago there was no land life on this land that today we call home. Yet in a phenomenal turnaround 400 million years later we have explored all there is on Earth. The year is now 2025 and a combination of technological advancements in aerospace propulsion and resource extraction has initiated a massive surge of investment in the exploration of space. Specifically the conception of space colonies. While space colonization is not the only way to sustain Earth's growing human population, space colonies are arguably the most ideal way to do so, as the human population of Earth is increasing to dangerously high levels.

Space colonization is also known as extraterrestrial colonization or permanent human habitation off Earth. The reason for space colonization is dual in nature: it is an excellent way to ensure continued propagation of the human race, and if successful, it will also be a huge boost for NASA's reputation and consequently its budget. A key advantage is the ability to build new land or the expansion of humanity without war or devastation. If moon colonization succeeds and becomes popular, it is certain that in the near future, asteroids can be used as building materials to make orbital land. This can subsequently be divided into millions of colonies supporting hundreds of billions of people.

Theoretical physicist and cosmologist Stephen Hawking stated almost 20 years ago that the human race would become extinct in the next two hundred years unless residential units are built on other planets. Since the 1950s, space colonies on the Moon, Mars, and other

worlds orbiting Earth have been suggested. With the advancements made in technology made over the past decade, NASA feels ready to colonize another body. Along with the cultural and scientific benefits of colonizing the moon, NASA must also consider the risks in both cost and safety, as well as having to build habitable structures in order to sustain human life.

After answering the question of space colonization, another question arises: Where? The clearest answer is Earth's moon, as here are many benefits of establishing a colony there. This is the first place NASA feels is safe enough for space colonization - it is close to home, and therefore it is the most familiar celestial body for astronauts and civilians alike. The construction of lunar bases for scientific research and mining is another added benefit to establishing human settlement on the Moon. It would begin with about a dozen people manning the initial post, but eventually expanding to a community of thousands. A lunar outpost could also provide information on the long term health effects on humans living in space for an extended period of time.

On the Moon, mining can commence for the purpose of potentially obtaining precious resources and begin building power satellites. These satellites could be used to replace power plants. There is an abundance of raw materials, solar power, and microgravity that can be used to create products that are cannot be produced on Earth. In space, solar energy is about 625 million times more powerful than that which is available on Earth.

One problem that arises with space colonization is creating living quarters capable of prolonged human habitation. First we must solve the medical problems of microgravity or weightlessness, as well as the high levels of radiation that astronauts are exposed to. Only then will it be feasible

to create living quarters that are capable of sustaining human life. The proposed plans are to build cylindrical habitation modules made of durable lightweight materials. They would be buried underground to for structural stability and the lunar soil would protect humans from exposure to solar cosmic radiation. Still there are many other questions to answer. Such as what would be stored in these modules, how would we recycle these essentials on the Moon, how will constructions work, and etc. Constructions would be perhaps the biggest issue to address.

Questions to Consider

1. Should NASA begin more programs to really start bringing awareness to the idea of colonizing in space?
2. How can we transport all these materials needed to build things in space?
3. How will we transport workers to space?
4. Where will NASA get the money to begin all this?

Topic 3

Extraterrestrial Life

Background

In 2017, NASA launched the Europa Mission, a 5 year mission to the Jupiter moon named Europa. The goal was to land safely on the moon's icy surface, and then drill underneath to the vast ocean that lay beneath. Then, various instruments and probes would descend into the ocean, collect samples, and then test them for signs of life. In 2021, the craft reached Europa ahead of schedule, and began drilling on the ice surface. After a month of drilling, the craft finally got deep enough and hit the ocean. The probes came back with a positive test: they indeed found microorganisms living underneath the surface of Europa. The world erupted in celebration, and through the Exploration Act of 2023, NASA received more funding for research into extraterrestrial life. There are three bodies in the solar system that NASA has identified as having a significant chance to hold extraterrestrial life of some sort. However, it will likely only choose one of these for a possible unmanned mission.

The first body that NASA is looking to explore is a comet, named 81P/Wild, which makes a full orbit of the sun every six years. If chosen, NASA would target a launch date of 2033, hopefully to reach the comet and land a probe on it by the middle of 2034 by the latest. Some of the advantages of sending the unmanned mission to 81P/Wild are that it is located in the inner solar system, so the project as a whole would cost less, and if the project were to be delayed, it would not hurt the project as much as it would a comet located outside the inner solar system. However, a disadvantage of choosing 81P/Wild to send an unmanned mission to would be that there may not be enough ice left over when the

module lands to collect sufficient data. Comets usually go in an elliptical orbit around the sun, and as the comet gets closer to the sun, the ice starts to melt, and refreezes as the comet moves away from the sun.

The second planetary body that NASA is looking to explore is one of Saturn's many moons, Titan. If chosen, NASA would launch around 2030, with the craft reaching Titan around 2034. One of the advantages of sending a craft to Titan is that it would not cost much for protective materials. Titan's air pressure is very similar to that of Earth's, which allows for liquid lakes of methane and other materials, which may provide sufficient needs for some microorganisms. However, one of the major disadvantages of sending a craft to Titan would be that the chances of actually finding microorganisms is very slim, as the atmosphere and the environment as a whole on Titan is very harsh, as it consists of 98.4% nitrogen and almost no oxygen.

The third planetary body that NASA is looking to explore is another one of Saturn's moons, Enceladus. If chosen, like Titan, NASA would launch around 2030, with the craft reaching Titan around 2034. One of the advantages of sending a probe to Enceladus is the fact that the probe might not even have to drill into the surface of the moon. On Enceladus, there are thousands of geysers launching liquid water into space, which provides the probe with plenty of samples to collect and analyze. Because of this, the expedition to Enceladus would also not cost as much, since the probe would not have to drill. However, one disadvantage of sending a probe to Enceladus is the fact that there is not much of an atmosphere surrounding the moon, meaning that the probe could very well be destroyed by a meteorite or some other descending celestial object.

Questions to Consider

1. Should NASA spend money on a mission that might turn up with no evidence for more life?

2. Does NASA have the money necessary to spend money on a mission for Life, along with space colonization and a manned mission to Mars?



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