Saudi Arabia, Item 15

Talking points for the Statement of Saudi Arabia at the Session of UN Committee on the Peaceful Uses of Outer Space.

Agenda Item 15. Space exploration and innovation.

Chair, distinguished delegates,

Space exploration is one of humanity’s most ambitious and inspiring pursuits. It’s crucial in enhancing our understanding of what is beyond our planet. For Saudi Arabia, Space exploration plays a crucial role in the realization of Vision 2030, whose objective is to transform Saudi Arabia into a knowledge-based economy that promotes innovation, creativity, and entrepreneurship. Our program is aimed at advancing technologies, scientific research, and international collaboration. This push into space also serves as a beacon for young Saudis, stirring their passion for STEM fields that will fuel innovation for generations to come. Ultimately, Saudi Arabia’s space ambitions represent a giant leap forward, paving the way for a future fueled by scientific discovery and economic prosperity.

Mr. Chair,

In 2023, history was made with the launch of the Human Space Flight Program, sending the first Arab woman astronaut, Rayanah Bawami, alongside astronaut Ali Alqarni on a historic mission to the International Space Station. This inspired generations to come as well as millions of students and women globally. During the 10-day mission, the astronauts conducted 11 scientific and 3 outreach experiments that contributed to various fields.

Out of the 11 experiments, 6 neuroscience research experiments were conducted to study the effects of the low-gravity environment on the brain and nervous system of astronauts. These experiments involved the use of innovative technologies for the first time in space.

Cell science was also investigated with 4 experiments to study inflammatory and other related conditions using a cellular model of disease at the ISS. This advanced our understanding of how ISS environment and space microgravity affect biological processes at the molecular level.

Saudi Arabia is also the first country to investigate Cloud Seeding in the Low Earth Orbit, with the aim of helping scientists and researchers devise new ways to provide suitable living conditions such as "artificial rain" in Moon and Mars. The experiment results also enhance our understanding of cloud seeding technology on Earth which could help increase precipitation rates in many countries.

Furthermore, and as part of Saudi Arabia’s goals of inspiring future generations, 3 educational outreach experiments were conducted by 12,000 students across 47 different locations. These experiments were performed during a live call with the Saudi astronauts aboard the ISS. Recently, Saudi Arabia has also introduced "MADAK" space competition, where the Saudi Space Agency has announced a total of 80,000 applications received from 22 countries.

Mr. Chair, Saudi Arabia’s future in space exploration is promising. We are currently expanding our participation with a focus on both manned and unmanned space exploration missions, setting goals for our exploration of Moon and Mars, and building the capabilities and the research and innovation efforts in this regard. Most notably, Saudi Arabia demonstrated its commitment by signing the Artemis Accords in July 2022, joining the global efforts to ensure peaceful exploration, sustainable practices, and international cooperation towards Space Exploration. Saudi Arabia’s commitment to the Artemis Accords highlights a desire to contribute to a peaceful and sustainable future in space, not as a passive bystander, but as an active partner.

In conclusion, Saudi Arabia is committed to Space exploration not as a passive bystander, but as an active partner. This is evident in its commitment to the Artemis Accords and its participation in various space exploration initiatives. The ongoing efforts are aimed at transforming Saudi Arabia into a knowledge-based economy that promotes innovation, creativity, and entrepreneurship. We are committed to advancing technologies, scientific research, and international collaboration, and we will continue to push the boundaries of space exploration, inspired by the drive for knowledge and discovery.
a partner, and the United Nations Office for Outer Space Affairs (UNOOSA) as a content partner. The conference was aimed at securing the Future Growth of the Global Space Economy by bringing nations together to create and raise awareness about space challenges, discuss essential legislative and policy elements and promote the creation of multi-prong research. Saudi Arabia calls upon all nations to come together to work towards not only exploring space and advancing research and innovation, but also doing so responsibly and collaboratively and ensure that space is sustainable for future generations.

Breakdown of talking points:

- **Introduction & Why is Saudi pursuing space exploration?**

  ● Mapped out, the Saudi government has long been one of the world’s leaders in terms of space exploration. The country has been a key player in international space programs, collaborating with numerous countries and organizations to advance its space goals.

  ● Chair, distinguished delegates,

    السعيد الرئيس، والوفود المحترمة،

    Space exploration is one of humanity’s most ambitious and inspiring pursuits. It’s crucial in enhancing our understanding of what is beyond our planet. Space exploration drives scientific discovery, sparks technological innovation, and addresses critical challenges on Earth, from climate monitoring to global communications. Most importantly, it unites nations in peaceful pursuits and inspires future generations.

    A primary objective of Vision 2030 is to transform Saudi Arabia into a knowledge-based economy that promotes innovation, creativity, and entrepreneurship. Space exploration plays a crucial role in the realization of Vision 2030. Our program is aimed at advancing technologies, scientific research, and international collaboration. This push into space also serves as a beacon for young Saudis, stirring their passion for STEM fields that will fuel innovation for generations to come. Ultimately, Saudi Arabia’s space ambitions represent a giant leap forward, paving the way seeds for a future fueled by scientific discovery and economic prosperity.

- **What has Saudi Arabia done in this regard?**

  ● **Innovation**
    - AX-2
  ● **Human Capital Development**
    - AX-2
    - Madak

  ● **What were the success stories and spillovers of past exploration missions?**

  ● **How do we ensure that space exploration is sustainable?**

  ● **What is the impact of space exploration on the global economy?**

  ● **What is the role of space exploration in promoting international cooperation?**

Mr. Chair,

In 2023, history was made when the launch of the Human Space Flight Program, sending the first Arab woman astronaut, Rayanah Barnawi, alongside astronaut Ali Alqarni on a historic mission to the International Space Station. This inspired generations to come as well as millions of girls and women globally. During the 10-day mission, the astronauts conducted 11 valuable scientific experiments that advanced human life, material science, innovative technologies and our understanding of space travel itself.

Out of the 11 experiments, six neuroscience research experiments were conducted to study the effects of the low-gravity environment on the brain and nervous system of astronauts. These experiments involved the use of innovative technologies for the first time in space.

Cell science was also investigated with 4 experiments to study inflammatory and other related conditions using a cellular model of disease at the International Space Station (ISS). This advanced our understanding of how ISS environment and space microgravity affect biological processes at the molecular level.

In other words, this mission was a significant step forward in the field of space exploration and a testament to the ingenuity and determination of the Saudi Arabian people.

Hamid Alqarni on a historic mission to the International Space Station. In 2023, history was made with the launch of the Human Space Flight Program, aimed at transforming Saudi Arabia into a knowledge-based economy that promotes innovation, creativity, and entrepreneurship. Space exploration plays a crucial role in realizing Vision 2030, which is the country’s vision to transform Saudi Arabia into a knowledge-based economy that promotes innovation, creativity, and entrepreneurship. Space exploration drives scientific discovery, sparks technological innovation, and addresses critical challenges on Earth, from climate monitoring to global communications. Most importantly, it unites nations in peaceful pursuits and inspires future generations.

A primary objective of Vision 2030 is to transform Saudi Arabia into a knowledge-based economy that promotes innovation, creativity, and entrepreneurship. Space exploration plays a crucial role in the realization of Vision 2030. Our program is aimed at advancing technologies, scientific research, and international collaboration. This push into space also serves as a beacon for young Saudis, stirring their passion for STEM fields that will fuel innovation for generations to come. Ultimately, Saudi Arabia’s space ambitions represent a giant leap forward, paving the way seeds for a future fueled by scientific discovery and economic prosperity.

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Out of the 11 experiments, six neuroscience research experiments were conducted to study the effects of the low-gravity environment on the brain and nervous system of astronauts. These experiments involved the use of innovative technologies for the first time in space.

Cell science was also investigated with 4 experiments to study inflammatory and other related conditions using a cellular model of disease at the International Space Station (ISS). This advanced our understanding of how ISS environment and space microgravity affect biological processes at the molecular level.
Saudi Arabia is also the first country to investigate Cloud Seeding in the Low Earth Orbit, with the aim of helping scientists and researchers devise new ways to provide suitable conditions for humans, including artificial rain, allowing for human presence in Moon and Mars. The results of the Cloud Seeding in Microgravity experiment also enhance our understanding of cloud seeding technology on Earth which could help increase precipitation rates in many countries. These experiments mark Saudi Arabia's commitment to Research, Development and Innovation.

Furthermore, and as part of Saudi Arabia's goals of inspiring future generations, 3 educational outreach experiments were conducted by 12,000 students across 47 different locations. These experiments were performed during a live call with the Saudi astronauts aboard the ISS. This helped students understand space science and its potential to improve life on Earth by comparing their results with those of the Saudi crew' experiments aboard the ISS.

These activities inspired several educational initiatives, including introducing a "Earth & Space Science" school curriculum, and the launch of a scholarship program that will help more students pursue higher education in space-related fields. Local university programs for boys and girls in space-related fields were also launched.

Recently, Saudi Arabia has also introduced "MADAK" space competition where the Saudi Space Agency announced that students aged 6-18 in the Middle East and North Africa (MENA) region could participate. A total of 80,000 applications were received from 22 countries for the MADAK competition, which demonstrated its global impact and inspired widespread interest in space, with 18,000 full submissions received and 10 winners selected. These activities aim to inspire future scientists who will contribute to society with their creativity, innovation, and discoveries in the future.

**What is Saudi Arabia currently doing in space exploration?**

- **Programs**

Saudi Arabia is currently expanding its participation with a focus on both manned and unmanned space exploration, setting goals for its exploration of Moon and Mars, and building the capabilities and the research, development and innovation efforts in this regard. On the human spaceflight side, the successful 2023 mission wasn't a one-off endeavor; the program is planning to train new astronaut cohorts and explore the possibility of longer space missions. Meanwhile, unmanned space exploration is also gaining momentum. The Saudi Space Agency is also planning to collaborate with international partners and private companies to develop and launch its own missions.

- **Artemis Accords**

Most notably, Saudi Arabia demonstrated its commitment by signing the Artemis Accords in July 2022, joining the global efforts to ensure peaceful exploration, sustainable practices, and international cooperation towards Space Exploration. Saudi Arabia's commitment to the Artemis Accords highlights a desire to contribute to a peaceful and sustainable future in space, not as a passive bystander, but as an active partner.

What is the message of Saudi Arabia to the international community in this regard?

• ما رسالة المملكة العربية السعودية للمجتمع الدولي في هذا؟

Option 1: The exploration of outer space has brought nations together to explore the unknown, and as we venture towards this goal we must strive to do it responsibly. To ensure sustainability Saudi Arabia hosted the first Space Debris

Option 2: With the goal of peaceful space exploration, the Artemis Accords aim to establish a framework for international cooperation and responsible use of space. Saudi Arabia's involvement in the Accords reflects its commitment to ensuring space remains a peaceful domain for all nations to explore and utilize.

• Why is the message of Saudi Arabia to the international community important?

The message of Saudi Arabia to the international community is important because it demonstrates the country's commitment to peaceful space exploration and cooperation with other nations. By signing the Artemis Accords, Saudi Arabia is showing its readiness to contribute to the development of international space law and policies, which is crucial for the sustainable use of outer space.

• What are the implications of Saudi Arabia's involvement in the Artemis Accords for the future of space exploration?

Saudi Arabia's involvement in the Artemis Accords has several implications for the future of space exploration. Firstly, it highlights the growing interest of countries in peaceful space activities and the desire for international cooperation. Secondly, it sets a precedent for the role of new space actors in the global space community. Lastly, it contributes to the development of international space law, ensuring that space remains a domain of peace and mutual benefit.

• How does Saudi Arabia's participation in the Artemis Accords align with its national goals and aspirations?

Saudi Arabia's participation in the Artemis Accords aligns with its national goals and aspirations of becoming a global leader in space exploration. By engaging in international cooperation, Saudi Arabia aims to enhance its technological capabilities, contribute to peaceful space activities, and inspire future generations to pursue careers in space-related fields.
Conference (SDC) with the International Telecommunications Union (ITU) as a partner and the United Nations Office for Outer Space Affairs (UNOOSA) as a content partner. The conference was aimed at securing the Future Growth of the Global Space Economy by bringing nations together to create and raise awareness about space challenges to discuss essential legislative and policy elements and promote the creation of multi-prong research. Saudi Arabia calls upon all nations to come together to work towards not only exploring space and advancing research and innovation, but also doing so responsibly and collaboratively and ensure that space is sustainable for future generations.

Option 2. Saudi Arabia’s message to the international community regarding space exploration underscores its commitment to innovation, collaboration, and progress. Positioned at the forefront of technological advancements in the Middle East, Saudi Arabia aims to demonstrate its dedication to scientific exploration beyond terrestrial boundaries. Embracing space as a frontier for growth and discovery, the Kingdom calls for global cooperation in space research and development and partnerships that transcend geopolitical boundaries. Based on the commitment to the Artemis Accords, the outreach and educational programs further underscore this message – fostering young Arab minds not only their own program but injects fresh perspectives and diverse talent into the global space conversation. Ultimately, Saudi Arabia aspires to bridge the gap between established spacefaring nations and the developing world, promoting a future where the vast potential of space exploration is explored and exploited for the betterment of all humanity.

Microgravity detailed input:

Below you will find the summary achievements of Madak Competition and the 14 experiments conducted during the Ax-2 mission (SSA-HSF1)

Madak Competition:
“MADAK” is a space competition where the Saudi Space Agency announced that students aged 6-18 in the Middle East and North Africa (MENA) region could participate. It was aimed to inspire future scientists who would contribute to society with their creativity, innovation, and discoveries in the future. In the competition, three main tracks are offered: Arts, Agriculture, and Design. A total of 80,000 applications were received from 22 countries for the MADAK competition, which demonstrated its global impact and inspired widespread interest in space, with 18,000 full submissions received and 10 winners selected.

Axiom-2 (SSA-HSF1)

(1)(2)(3)(4)(5)(6) Six neuroscience experiments (Nebula):
The Nebula R&D company proposed six neuroscience research experiments to study the effects of the low-gravity, high-radiation environment of space on the brain and nervous system of astronauts.

Experiment titles:

- Blood-based brain biomarkers
- Telomere length dynamics
- Automated Pupillometry
- Optic Nerve Sheath Diameter Ultrasound
- Electroencephalogram (EEG)
- Functional Near Infrared Spectroscopy (fNIRS)

Impact:

- 8 publications in high-impact journal
- Some of the technologies such as the automated pupillometry were used for the first time in space.

The highlighted neuroscience experiments were as follows:

- Automated Pupillometry
- Electroencephalogram (EEG)
- Functional Near Infrared Spectroscopy (fNIRS)

These technologies were used for the first time in space, highlighting the importance of innovative research and development in the field of neuroscience.
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Mixed Reality Space Innovation Lab was opened at KAUST Research and Technology Park

(7)(8)(9)(10) Four cell science experiments (KFSHRC):

The KFSHRC Team proposed a study of inflammatory and other related conditions using a cellular model of disease at the International Space Station (ISS) in collaboration with Saudi Space Agency (SSA). This research advances our understanding of how ISS environment and space microgravity affect biological processes at the molecular level.

Results and discoveries:

• Example I: Predicted Cardiovascular Diseases for long flights.
• Example II: Alterations in Sensory System
• Example III: Reduced Inflammatory Response & predicting reduced associated diseases.
• Example IV: Predicting antiviral responses.

Impact:

• Publication in high-impact journal
• World Accessible web-based database
• IP/Patents
  • A method for determining the activity of a drug or drug candidate under conditions of microgravity.
  • International PCT application and counterpart local and foreign (pending)
  • Assignees: Saudi Space Agency and King Faisal Specialist Hospital and Research Centre

(11) cloud-seeding (KFUPM):

An experiment to investigate cloud seeding in microgravity conditions aboard the ISS was designed by King Fahd University of Petroleum & Minerals (KFUPM) and the Saudi Space Agency. The aim of the experiment was to help scientists and researchers devise new ways to create a suitable environment for humans to live under microgravity conditions.

Results and discoveries:

• Data shows promising results on the possibility of cloud seeding in microgravity environment.

Impact:

• The results of the Cloud Seeding in Microgravity experiment enhance our understanding of cloud seeding technology on Earth which could help increase precipitation rates in many countries.
• The cloud seeding experiment can help scientists and international space agencies devise new ways to provide suitable conditions for humans, including artificial rain, to live in future settlements on the Moon and Mars.
• Saudi Arabia is the first country investigated cloud seeding in the Low Earth Orbit.

(12)(13)(14) Three educational outreach experiments:

12,000 students conducted three scientific experiments across 47 different locations. These experiments were performed during a live call with Saudi
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<th>Results and discoveries:</th>
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<td>- Experiments participation of 12,000 students across 47 different locations live with Saudi crew aboard the ISS.</td>
<td>- تجارب شملت مشاركة 12 ألف طالب من 47 موقعًا مختلفًا تواصلوا مع الطاقم السعودي على متن محطة الفضاء الدولية.</td>
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<th>Impact:</th>
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<td>- The Ministry of Education has approved the teaching of the book “Earth and Space Science” as part of the school curriculum.</td>
<td>- وافقت وزارة التربية والتعليم على تدريس كتاب “علوم الأرض والفضاء” ضمن المنهج الدراسي.</td>
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<td>- Saudi Arabia has launched a scholarship program that will help more students pursue higher education in space-related fields.</td>
<td>- أطلقت المملكة العربية السعودية برنامجًا للمنح الدراسية لمساعدة المزيد من الطلاب على مواصلة التعليم العالي في المجالات ذات الصلة بالفضاء.</td>
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<td>- King Abdulaziz University opened Aerospace Engineering program for women.</td>
<td>- افتتحت جامعة الملك عبد العزيز برنامج هندسة الطيران للنساء.</td>
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