SPACE GENERATION ADVISORY COUNCIL

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SPACE SAFETY AND SUSTAINABILITY PROJECT GROUP

Earthrise, Photo taken by Late Astronaut Bill Anders from Lunar Orbit during Apollo 8 mission

SPACE SAFETY AND SUSTAINABILITY PROJECT GROUP

NEWSLETTER-JUNE 2024

Welcome to the latest edition of our Space Safety and Sustainability Newsletter! In an era where the cosmos is becoming increasingly crowded and accessible, ensuring the safety and sustainability of our space activities is more critical than ever. According to the European Space Agency, over 34,000 pieces of space debris larger than 10 cm are currently orbiting Earth, posing significant risks to satellites and space missions. The rapid deployment of mega-constellations has led to a 10% increase in night sky brightness, impacting astronomical research. Additionally, international efforts like the Artemis Accords, underscore the growing commitment to responsible and sustainable space exploration.

Our newsletter is dedicated to keeping you informed about these pressing issues and more. From the latest research on mitigating space debris and innovative sustainability practices to updates on international collaborations and policy developments, we cover a broad spectrum of topics essential for anyone invested in the future of space exploration. Stay informed, stay engaged, and be part of the conversation that is driving responsible and forward-thinking space activities.

In this newsletter, we'll dive into a captivating selection of topics including...

- News essential
- Previous and upcoming important launches
- Launch stats
- Scholarship, competitions and SGAC vacancies
- Upcoming events
- Recent webinars conducted by Space Safety and Sustainability (SSS) Project Group
- Few important definitions
- Member spotlights covering the achievements of the members of our Project Group

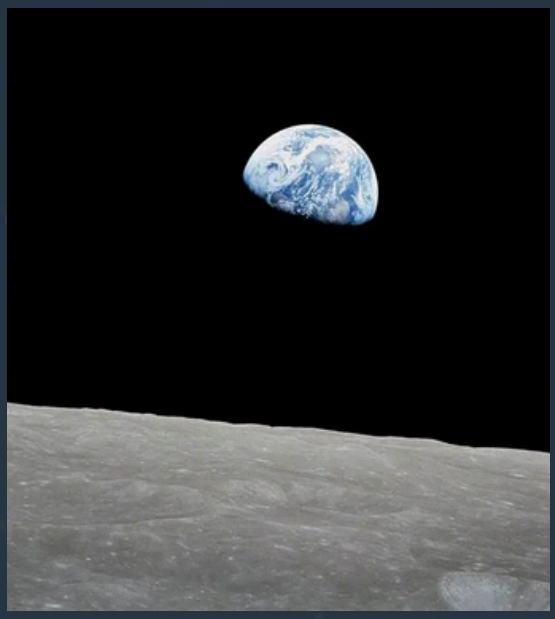
WORLD IN BRIEF: TODAY'S NEWS ESSENTIAL

THE SIGNATORIES TO THE ARTEMIS ACCORDS ARE INCREASING!

On May 30th, Peru and Slovakia joined the Artemis Accords, bringing the total signatories to 43 as of June 2024. These non-binding principles guide civil space exploration and use in the 21st century. Grounded in the 1967 Outer Space Treaty, the accords mandate that space activities be conducted peacefully and in line with international law. They emphasize transparency, interoperability, emergency assistance, orbital debris mitigation, and safe spacecraft disposal.

APOLLO-8 ASTRONAUT BILL ANDERS DIES AT 90 IN PLANE CRASH

Retired Maj. Gen. William Anders, Apollo 8 astronaut and photographer of the iconic 1968 "Earthrise" image, **died of multiple blunt-force injuries** in a plane crash off Jones Island. Anders was one of the first three humans to orbit the moon, and his photo, the first color image from space, became one of the most famous in history, inspiring a new perspective on Earth and environmental activism.



SPACE SAFETY & SUSTAINABILITY AT UN COPUOS

UN COPUOS sessions guide international norms for the safe and responsible use of space. At the 61st **Scientific and Technical Subcommittee** (STSC) session, concerns about mega-constellations and Low Earth Orbit (LEO) congestion were highlighted, with calls for cooperation on space debris and access to monitoring technologies. The 'Dark and Quiet Skies' proposal raised concerns about mega-constellations' impact on astronomical observations and space sustainability. During the 63rd **Legal Subcommittee** session, it was strongly expressed that the growing volume of space debris is environmentally and commercially unsustainable, requiring swift and shared cleanup actions. Active debris removal was emphasized as key, with regulatory frameworks needed to support these activities.

COPUOS

ESA

ZERO DEBRIS CHARTER AIMS TO BOOST INTERNATIONAL COOPERATION ON CLEANING UP EARTH'S SPACE JUNK PROBLEM

Although the Charter is non-binding, it is one of the first international agreements to clearly mind the debris that missions leave behind. The Charter delineates a list of goals to be achieved by 2030. Its signatories aim to reduce the risk that a mission will produce debris from collisions and the risk of a re-entering object causing a human casualty to 1 in 10,000 or lower. Signatories also promise to clear orbits after missions, using "external means" and to better share debris tracking data.

LISBON DECLARATION FOR OUTER SPACE WAS PRESENTED BY PORTUGAL AND UNOOSA

The Declaration aimed to establish basic principles for future space governance, including managing space traffic, mitigating debris, and coordinating resource exploitation. It outlines six key points for a sustainable space future, highlighting youth participation, the roles of COPUOS and UNOOSA in international coordination, and the need for transparency, clarity, and consistency in policies and regulations across various forums and initiatives.

CHINA UNVEILS INTERNATIONAL LUNAR RESEARCH STATION DETAILS

The International Lunar Research Station (ILRS) will consist of sections on the lunar surface, sections in lunar orbit and sections on Earth, and it will be built in two phases, said Wu Weiren, chief designer of China's lunar exploration program. According to Wu, the first phase of the ILRS construction project will see a basic station built by 2035 in the lunar south pole region. This basic station will have comprehensive scientific facilities with complete basic functions and supporting elements to carry out regular scientific experiments, and develop and utilize resources on a limited scale. The second phase will see the expansion of the station, set for completion by 2045, with a moon-orbiting space station as the hub and facilities featuring complete functions, considerable scale and stable operation. It will carry out comprehensive lunar-based scientific research and resource development and utilization, and conduct technical verification as well as scientific experiments and research for a manned landing on Mars.

IMPORTANT LAUNCHES

1. **Name:** Tianlong-3 Maiden Flight
Launch site: Wenchang Commercial Spaceport LC-2 Launch Complex
Launch Date: July 2024
Description: Tianlong-3, a medium-lift orbital launch vehicle by Chinese private aerospace manufacturer Space Pioneer, is set for its maiden flight in July 2024 from Wenchang Commercial Spaceport's LC-2 launch complex. It will carry a payload to a sun-synchronous orbit (SSO).

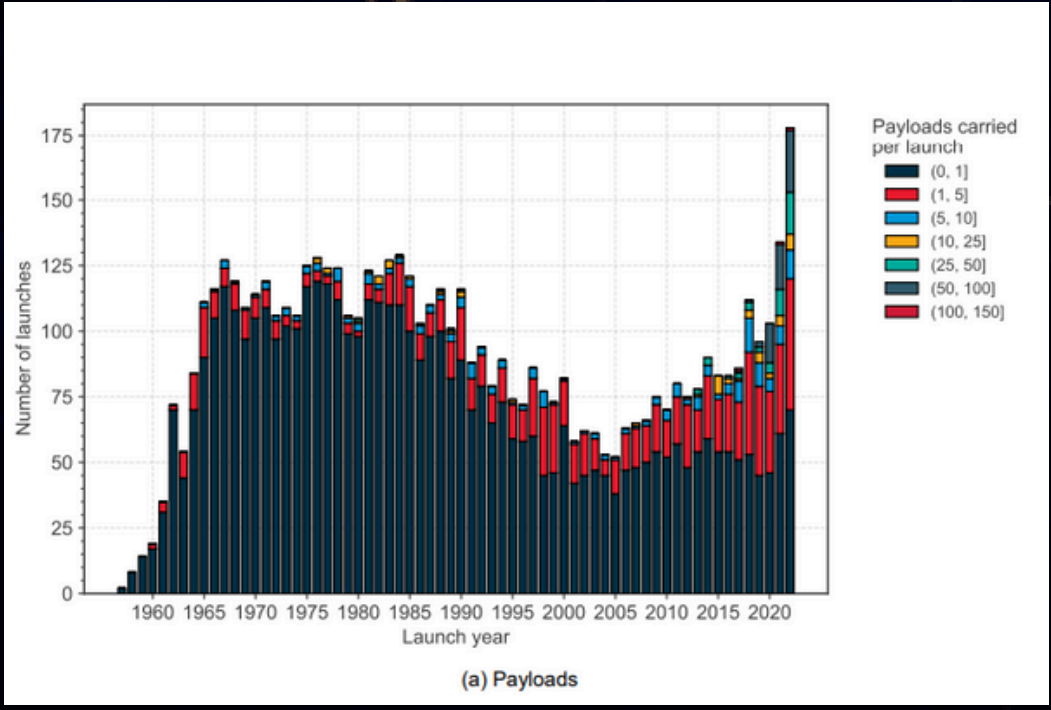
2. **Name:** Falcon Heavy 'Goes U'
Launch site: LC-39A, Kennedy Space Center, Florida
Launch Date: 25 June 2024
Description: A SpaceX Falcon Heavy will launch the fourth and final satellite of the next-generation series of geostationary weather satellites for NASA and NOAA. GOES-U will orbit 22,300 miles above the equator to monitor weather conditions across the United States. The satellite will be renamed GOES-19 once it reaches its operational orbit.

3. **Name:** Ariane 6 Inaugural Flight
Launch site: European Spaceport French Guinea
Launch Date: 09 July 2024
Description: Ariane 6, Europe's new heavy-lift launch vehicle replacing Ariane 5, is modular and agile with a re-ignitable upper stage for multiple missions on different orbits. Originally planned for a 2020 launch to ensure a smooth transition, Ariane 6 faced delays due to technical issues, COVID-19, and design changes.

4. Name: Electron “No Time Toulouse”
Launch site: Launch Complex 1, Mahia Peninsula, New Zealand
Launch Date: 19 June 2024
Description: A Rocket Lab Electron rocket launched the “No Time Toulouse” mission, the first of five dedicated flights on behalf of Kinéis, a French Internet-of-Things company, which also has financial backing from France’s space agency, CNES (Centre National d’Études Spatiales). The rocket carried the first five Internet-of-Things (IOT) satellites of a 25-satellite constellation.

LAUNCH STATS FOR YOU

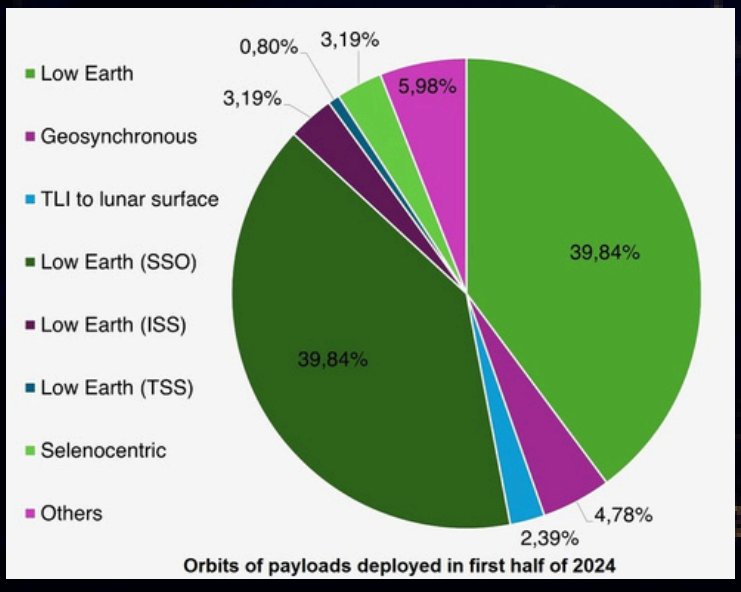
Globally, we've average ~25% increase in launches year-over-year since 2020. At our current rate we are on track to launch 3-4x the number of launches as there were at the end of the shuttle program and approximately double the rate of the cold war. It is also now the norm to launch satellites with more than 1 payloads



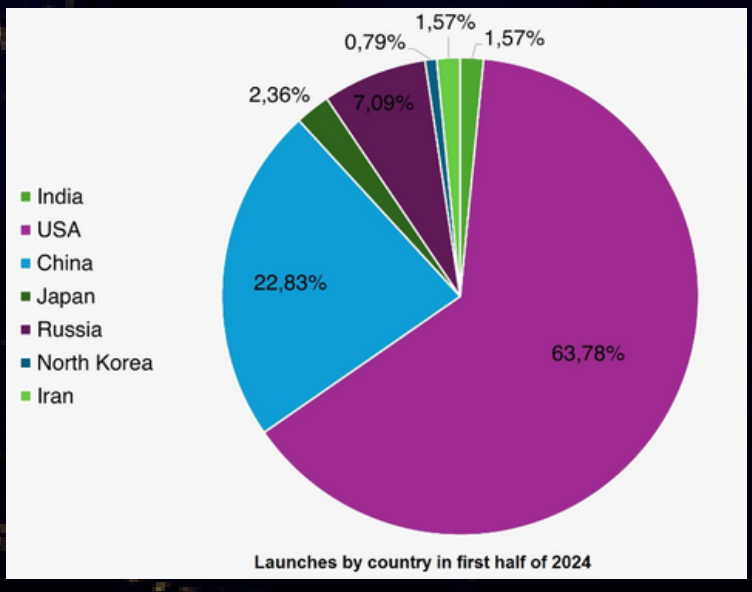
Data depicting the varying no. of launches each year

LAUNCH STATS FOR YOU

- Total **126 Orbital Launches** were made in first half of 2024. To put that in perspective, Most successful orbital launches in a single year is 211 in 2023.
- 84% of the launches were made in LEO, 4.78% in GEO and 2.39% in Trans-Lunar Injection (TLI) to Lunar Surface
- 84% of the payloads launched this year comes from USA
- 64% of the launches are made **making use of USA's launchers** (Includes Electron Launches from Mahia, Newzealand)
- At the turn of 21st century, only 14 countries operated the satellites. As of 01 July, 2024 operating **satellites are registered in 105 countries or multinational organizations** underscoring the importance of safe and sustainable usage of space



Orbits of payloads



Launches by each country

SGAC Vacancies are announced **here**

Name	**Award**	**Deadline**
[SGC-IAC 2024] ESA - SGAC Scholarship	Attendance 22nd Space Generation Congress and the 75th International Astronautical Congress	22.07.2024
2024 Humans In Space Challenge	Equity investment, on-orbit experiment, accelerator program, and networking opportunities	27.06.2024
DREAM	Payload aboard Firefly	19.07.2024
ESA Space Omics Hackathon	NASA GeneLab internship, ESA publication, ESA tour, and NASA-AWG Symposium presentation	10.07.2024
National Point of Contacts for SGAC 2024	----------	14.07.2024
Mars mission scenario with Starship	Open access lecture (Scientific paper)	Anytime

SOME IMPORTANT DEFINITIONS

Space safety involves measures and practices to prevent accidents, protect human life, and ensure spacecraft integrity in the harsh, unpredictable environment of outer space. It includes collision avoidance and safe spacecraft operation to minimize risks to space missions and terrestrial life.

Space sustainability is all about using space wisely for the future i.e. for the long term. This means managing space junk, acting responsibly in space, and developing tech for continued exploration and use.

Space debris includes non-functional, human-made objects orbiting Earth, such as defunct satellites, spent rocket stages, and fragments from disintegration or collisions. This debris poses collision risks to operational spacecraft and can create more debris through subsequent impacts.

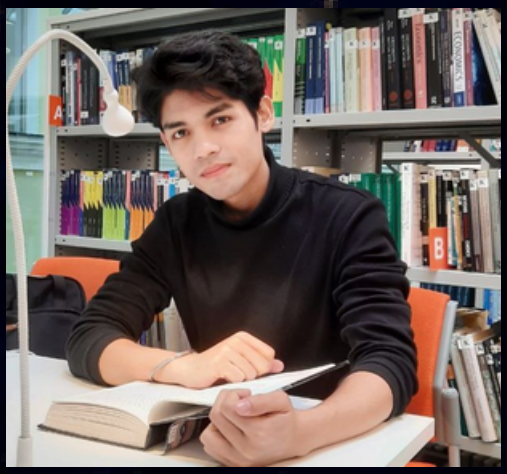
Space weather refers to the environmental conditions in space influenced by the Sun and solar wind, including solar flares, geomagnetic storms, and cosmic rays. These conditions can affect the performance, reliability, and safety of space assets and pose risks to astronauts' health.

Large Satellite Constellations Many small satellites working together to provide comprehensive coverage for Earth with services like global communications, navigation, and Earth imaging. These constellations consisting of hundreds or thousands strongly boost connectivity but raise concerns about space safety and sustainability due to their growing numbers in Low Earth Orbit.

MEMBERS SPOTLIGHTS

Congratulations to **Salman Ali Thepdawala** 🤦‍♂️ who won the Diverse Dozen Award. Salman is the Partnership Lead for our Project Group. This award is a recognition to people who have visionary and impactful ideas to deal with issues in space safety, security, and sustainability. The winners of this award are invited to share their diverse and unique voices with the community.

Congratulations to **Nishita Sanghvi** 🤦‍♂️ for becoming an Emerging Space Leader. Nishita is PR and Communications Coordinator for our Project Group. This is an acknowledgement to students and young professionals interested in pursuing careers involving the development, application and use of space systems, space science research, the policy and other similar subjects.



Congratulations to **Subhrajit Barua** 🤦‍♂️ for being awarded member of the month. Subhrajit is our Public Relations and Communications Coordinator at SSS PG, has been selected as Member of the Month. Since joining SGAC in January 2023, Subhrajit's phenomenal contributions have positively impacted SSS across various aspects. The committee acknowledges his dedication and hard work, and we're thrilled to celebrate his success.

RECENT WEBINARS CONDUCTED BY SPACE SAFETY AND SUSTAINABILITY PROJECT GROUP

Fast and Accurate Probability of Collision Toolkits for Neart-Earth and Cislunar Applications

- Yashica Khatri presented this seminar, which focused on an introduction to Space Situational Awareness SSA, collision prediction methods, and the semi-analytical toolkit developed to achieve fast and accurate probabilities of collision. The target audience were students and young professionals with an interest in SSA research and tools.

Abstracts, Applause, and Academia: My Journey to Conferences and research

- Throughout the Webinar, the audience gained valuable insights into the speaker's journey, including the highs and lows of navigating the academic community as a newcomer. The narrative will not only focused on the speaker's personal experiences but also on their graduate research, providing a comprehensive understanding of the academic landscape.

Future of SmallSat: Design and Sustainability in Space

- Throughout the webinar, the opportunity was explored to engage in insightful discussions with industry experts, gaining valuable knowledge about the future of space exploration.

Africa's Participation in Space Safety and Sustainability

- The purpose of the webinar was to Foster networking and collaboration, build partnerships for our forthcoming Regional event; The 8th Africa Space Generation Workshop 2024, at Abuja, this November.

Terraforming Ascension

- In this talk, the directors and expert contributors to the Documentary 'Terraforma' discussed the lessons we can draw from the story of Ascension island as we enter a new age of space exploration and colonisation.

Webinar 'Terraforming Ascension' by SSS PG in progress

MARK YOUR CALENDARS: UPCOMING EVENTS

SPACETIDE 2024
- July 8-10
- Tokyo, Japan

COSPAR 2024
- July 13 - 21
- Busan, Korea

AIAA ASCEND 2024
- July 30-Aug 01
- Las Vegas, USA

38TH ANNUAL SMALL SATELLITE CONFERENCE 2024
- Aug 03-08
- University of Utah, USA

6TH SUMMIT FOR SPACE SUSTAINABILITY
- JULY 11-12
- TOKYO, JAPAN

COSPAR SYMPOSIUM
- August 3-7
- Utah, USA

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