



SPACE GENERATION
ADVISORY COUNCIL



Volume 3 - August 2024

SPACE SAFETY AND SUSTAINABILITY PROJECT GROUP

**Boeing's Starliner spacecraft is docked to the
harmony module of ISS**

SPACE SAFETY AND SUSTAINABILITY PROJECT GROUP

NEWSLETTER-AUGUST 2024

Welcome to the latest edition of our Space Safety and Sustainability Newsletter!

As the space industry continues to grow, so does the financial commitment to ensuring the safety and sustainability of space operations. The global space economy is projected to reach \$1 trillion by 2040, with a significant portion of this growth dedicated to mitigating risks and managing the burgeoning population of satellites and debris in orbit. Meanwhile, mega-constellation operators are expected to spend upwards of \$10 billion over the next decade on safety measures to comply with emerging international regulations. The costs of inaction are also rising; space insurance premiums have surged by 20-30% in recent years due to the increased risk of collisions. To sustain this rapid growth and protect valuable assets, industry stakeholders are adopting more robust space situational awareness programs, enhanced debris monitoring, and advanced maneuvering technologies.

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...

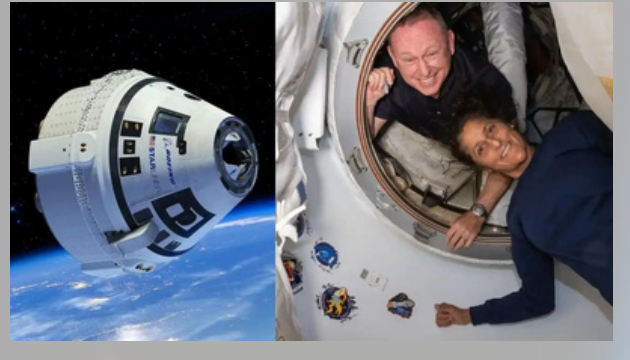
In this newsletter, we'll dive into a captivating selection of topics including...

- News essential
- Previous and upcoming important launches
- Debris stats
- Scholarship, competitions and SGAC vacancies
- Upcoming events
- Recent activities of Space Safety and Sustainability (SSS) Project Group
- Few important definitions
- Member spotlights



BOEING'S STARLINER RETURNS BACK UNCREWED!

Starliner was on a historic first test mission with astronauts and reached the ISS on June 6 after experiencing trouble with its propulsion system and thrusters. Following two months of tests and safety discussions, NASA eventually said the **risk was unacceptable** to return Wilmore and Williams home on Starliner due to uncertainties about how well the thrusters would work. Starliner undocked from the ISS and landed back this morning, to free up its docking port on the U.S. Harmony module for Crew-9.



SPACE X'S FALCON 9 CLEARED TO RETURN TO FLIGHT AFTER FAILED LANDING ATTEMPT

The Federal Aviation Administration (FAA) cleared SpaceX's reusable Falcon 9 rocket for flight after temporarily grounding it following a failed **landing earlier this week**. The company has already pulled off multiple launches since the FAA's decision.



SPACE X's FALCON 9



BLUE ORIGIN CREW

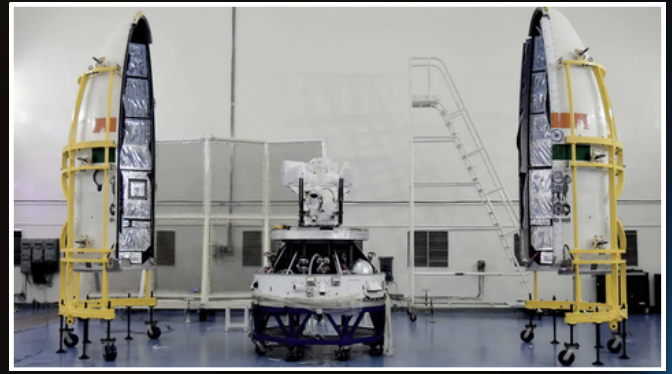
BLUE ORIGIN COMPLETES LATEST SPACE TOURISM FLIGHT

Blue Origin flew its latest group of six thrill-seekers to the edge of space and back **crossing the Karman line**, including the youngest-ever woman to complete the feat. Mission NS-26 marked the eighth human spaceflight for the company, founded by Jeff Bezos, as it presses ahead in the emerging suborbital tourism market.



INDIA LAUNCHES EARTH OBSERVING SATELLITE ON SSLV ROCKET

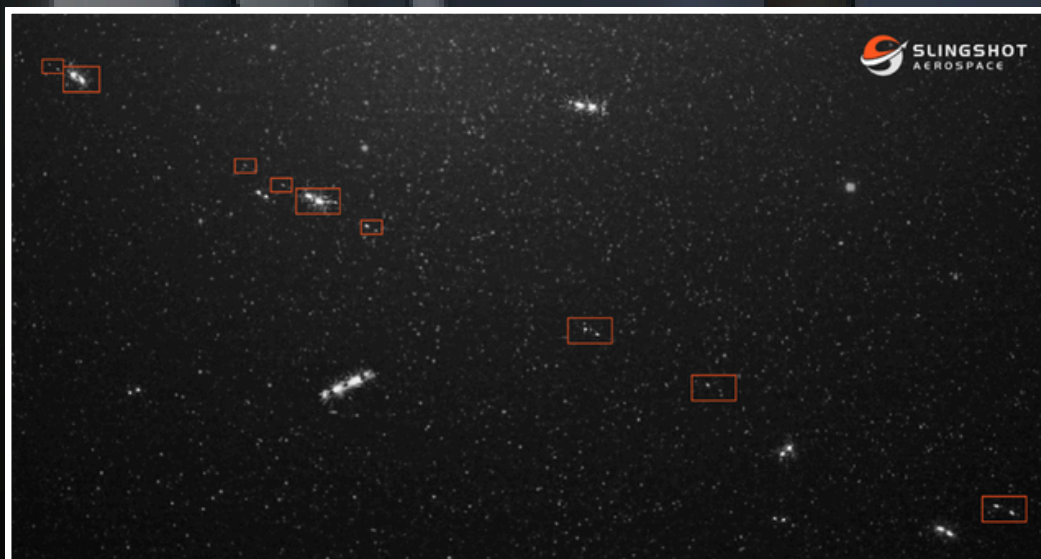
India launched an advanced Earth-observing satellite on Aug. 15, third-ever mission of its new SSLV rocket. On this third flight, the rocket deployed EOS-08 into a circular orbit with an altitude of 295 miles, **according to ISRO**. The 387-pound satellite will study Earth with two instruments, the Electro Optical Infrared Payload (EOIR) and the Global Navigation Satellite System-Reflectometry payload (GNSS-R).



SSLV EOS-08 AND LAUNCH

CHINESE LONG MARCH 6A REPORTEDLY CREATES CLOUD OF SPACE DEBRIS AFTER DEPLOYING FIRST SATELLITES OF MEGA CONSTELLATION

The first launch for a coming Chinese internet mega-constellation turned out to be contributing to space debris. The rocket successfully delivered the satellites to low Earth orbit (LEO), at an altitude of about 800 kilometers. But its upper stage broke apart shortly thereafter, **generating a cloud of debris** that's now racing around our planet, according to United States Space Command (USSPACECOM).



Slingshot Aerospace spotted the “bright unexpected objects” moving along the same trajectory as the rocket body.



★ IMPORTANT LAUNCHES

1. Name: SpaceX Falcon Heavy Europa Clipper

Launch site: Launch Complex 39A - Kennedy Space Center

Launch Date: 10 October 2024

Description: Europa Clipper will conduct a study to determine if Europa, the icy moon of Jupiter, has conditions suitable for life.

2. Name: Blue Origin New Glenn-NASA ESCAPE

Launch site: Cape Canaveral Space Force Station, Florida

Launch Date: 13 October 2024

Description: NASA and Blue Origin are preparing for the agency's ESCAPE (Escape and Plasma Acceleration and Dynamics Explorers) mission, which begins on the inaugural launch of the company's New Glenn rocket. The mission will study the solar wind's interaction with the magnetosphere on Mars.

3. Name: NASA's SpaceX Crew-9 mission

Launch site: Kennedy Space Center, Florida

Launch Date: 24 September 2024

Description: SpaceX Falcon 9 rocket and Dragon spacecraft will now carry two astronauts instead of four astronauts to the International Space Station. This mission is part of NASA's Commercial Crew Program and this will be ninth operational Space-X Dragon spacecraft flight to carry the astronauts to ISS. This Dragon spacecraft will also bring back the two stranded NASA astronauts from ISS.



4. Name: Private human spaceflight - Polaris Dawn

Launch site: Kennedy Space Center, Florida

Launch Date: September 2024

Description: SpaceX is now preparing for launch of Polaris Dawn, a mission funded by billionaire entrepreneur Jared Isaacman. The upcoming flight, which will employ SpaceX's Crew Dragon spacecraft and Falcon 9 rocket. First ever private space walk will be witnessed in this flight!

5. Name: Soyuz MS-26

Launch site: Baikonur Cosmodrome, Republic of Kazakhstan

Launch Date: 11 September 2024

Description: A Russian Soyuz 2.1a rocket will launch a three-man crew to the International Space Station. Crew commander Alexey Ovchinin will be joined by fellow cosmonaut Ivan Vagner and NASA astronaut Don Pettit.

★ FINANCIAL STATS RELATED TO SPACE INDUSTRY

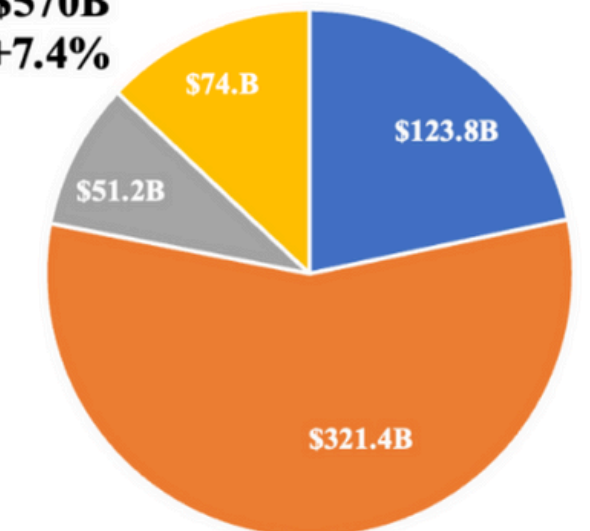
- The global space economy totaled **\$570 billion in 2023**, 7.4% higher than 2022's revised sum of \$531 billion. This growth is consistent with the industry's five-year compound annual growth rate (CAGR) of 7.3% and is nearly double the size of the space economy a decade ago.
- The commercial sector (combining commercial space products, services, and infrastructure) dominates the global space activity with a combined total of \$445.2 billion, representing about **78% of the total space activity**. This reflects the increasing privatization and commercialization of space activities, with private companies playing a significant role in advancing space technology and exploration.



- The Space Debris Management market was valued at approximately **\$800 million in 2023**. The market is expected to grow at a CAGR of 12-15%, potentially reaching around \$2 billion by 2030. This segment supports the overall debris management ecosystem and is closely tied to the success of ADR efforts.
- Space Traffic Management (STM) market was valued **at \$600 million**, driven by the rapid increase in satellite deployments. STM solutions are expected to see a 20% annual growth rate, driven by the increasing number of satellites in Low Earth Orbit (LEO).
- The active debris removal (ADR) market is projected to reach \$1.5 billion by 2030. With over 34,000 objects larger than 10 cm currently tracked in orbit, the need for debris removal solutions is critical.

Global space activity by category, 2023

\$570B
+7.4%



- Commercial Infrastructure and Support Industries
- Commercial Space Products and Services
- Non-U.S. Government Space Budgets
- U.S. Government Space Budgets

Source: Space Foundation database

Different market segments of the global space economy: Space Foundation Database



★ SCHOLARSHIPS, COMPETITIONS AND SGAC VACANCIES

SGAC Vacancies are announced [here](#)

Name: [The Human Lander Challenge](#)

Activity: The 2025 Human Lander Challenge asks teams of students and their faculty advisors to design innovative solutions and technology developments addressing in-space cryogenic liquid storage and transfer systems for long duration NASA missions to the Moon. A prize of substantial amount will be granted to three winning teams.

Deadline: 16.10.2024

Name: [SGC 2025 Logo Competition](#)

Award: Scholarship to attend the 23rd Space Generation Congress and the 76th International Astronautical Congress in October 2025 in Sydney, Australia.

Deadline: 15.09.2024

★ MARK YOUR CALENDARS: UPCOMING EVENTS

[SPACE GENERATION CONGRESS](#)

📅 Oct 10-12
📍 Milan, Italy

[GLOBAL AEROSPACE SUMMIT](#)

📅 Sep 10-11
📍 Washington, USA

[OUTER SPACE SECURITY CONFERENCE](#)

📅 Sep 10-11
📍 Geneva, Switzerland

[WORLD SPACE BUSINESS WEEK](#)

📅 Sep 16-20
📍 The Westin Paris - Vendôme

[DEFENCE IN SPACE CONFERENCE](#)

📅 Sep 10-11
📍 London, UK





INTRODUCTION AND UPDATE OF PROJECT 'EARTH'S ORBITS AS A UNESCO WORLD HERITAGE SITE' OF THE SPACE SAFETY AND SUSTAINABILITY PG

The Earth's orbits are a natural and overused resource, crowded with thousands of satellites that aid our daily lives. Despite their benefits, the increasing congestion poses a severe threat from space debris, with significant financial, operational, and political costs. This project sheds light on the threat posed by space debris by framing Earth's orbits as a vital environment in need of protection, acknowledging it as both an intangible natural and cultural heritage. The aim is to understand and provide a definition for orbit sustainability, elaborating policies and frameworks that could help in protecting Earth's orbits, preventing them from becoming inaccessible. To achieve this goal, we are using an archaeological approach and analyzing the UNESCO World Heritage criteria and policies to understand the possibility of defining Earth's orbits as a UNESCO World Heritage Site.

Project Lead: Selene Cannelli



★ SOME IMPORTANT DEFINITIONS

Orbital Decay: The gradual decrease in altitude of a satellite's orbit due to atmospheric drag, gravitational perturbations, or other forces. Orbital decay eventually leads to re-entry into the Earth's atmosphere, where most objects burn up. Managing orbital decay is important for reducing space debris and maintaining safe orbits

Gravitational Perturbations: Variations in a satellite's orbit caused by the gravitational influence of other celestial bodies (like the Moon or Sun) or irregularities in the Earth's gravitational field. Understanding these perturbations is vital for precise orbital calculations, maintaining satellite positions, and ensuring long-term stability in orbit.

Conjunction Data Messages (CDMs): Notifications issued by space surveillance networks or satellite operators that provide detailed information about potential close approaches (conjunctions) between space objects. It is important to recognize that CDMs are not collision warnings—no actual assessment of collision risk has been performed in generating them. Rather, they are proximity alerts, pointing out situations in which a serious close approach is possible.

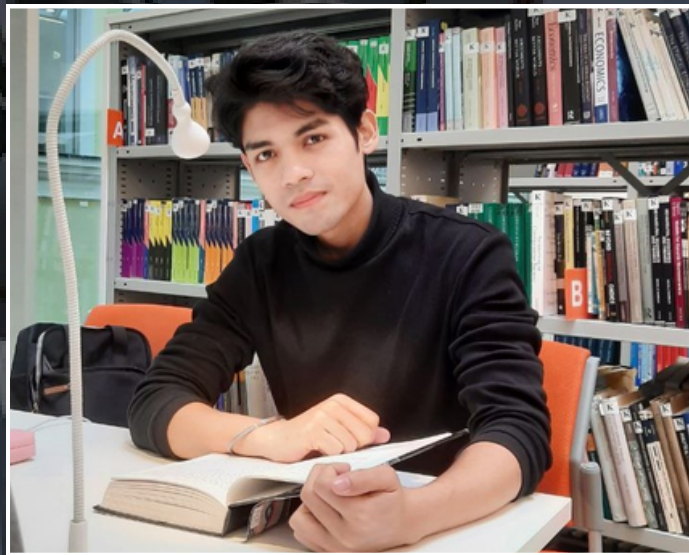
Solar Radiation Pressure (SRP): The force exerted on spacecraft by the momentum of photons from sunlight. This force, although small, can cause gradual changes in the trajectory and orientation of spacecraft. Understanding SRP is important for precise orbit determination and control, particularly for small satellites.

Drag Sail: A deployable device attached to a satellite or spacecraft designed to increase atmospheric drag, accelerating its orbital decay and facilitating a faster re-entry into Earth's atmosphere. Drag sails are a method for passively deorbiting space objects to reduce their contribution to space debris.



★ MEMBERS SPOTLIGHTS

Subhrajit Barua is a 3rd-year PhD candidate in Food Technology, specializing in sustainable agricultural techniques for space-based food production. He has more than 2 years of active involvement in the Space Safety and Sustainability (SSS) Project Group at SGAC, where he has contributed serving as the PR and Communications Coordinator for SSS Project Group along with other activities. He has been awarded the Space Generation Leader Award 2024 for his relentless participation in SGAC. Congratulations to Subhrajit! we are looking forward to see him at Milan for upcoming SGC.



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