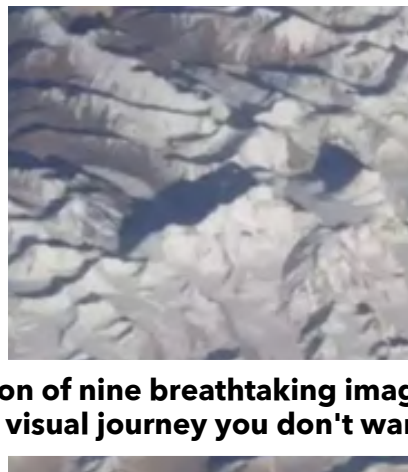
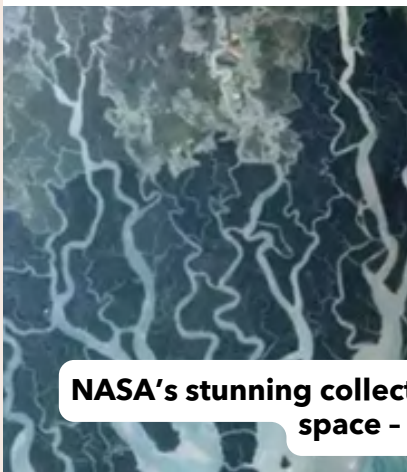
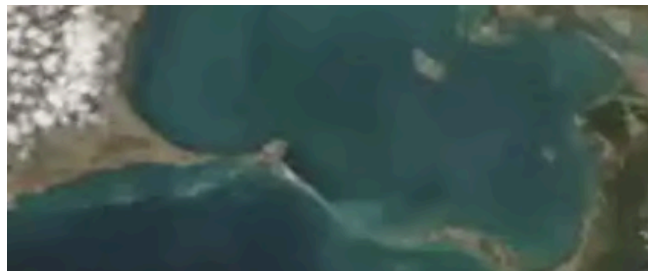
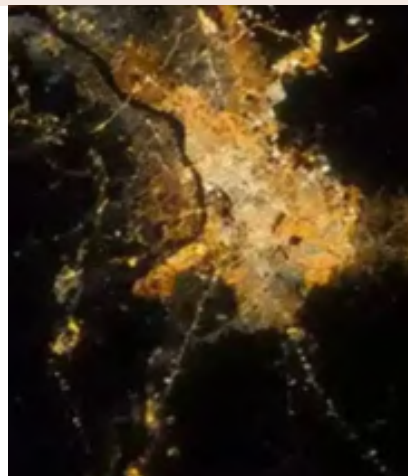


Space Beacon



NASA's stunning collection of nine breathtaking images of India captured from space - a visual journey you don't want to miss!

Stay up-to-date with the latest in spacetechnology

Orbital



Lead with the most significant celestial events and discoveries

Did you Know

Mars hosts the tallest volcano, Olympus Mons on Mars is the largest volcano in the solar system, standing about three times the height of Mount Everest!

ExoMars Rosalind Franklin Rover: European Platform

The European Space Agency (ESA) has selected Airbus to design the landing platform for the ExoMars Rosalind Franklin rover. Scheduled for launch in 2028, the rover aims to search for signs of life on Mars. Airbus will develop key components like the propulsion system and stabilizing gear. The rover, set to land in 2030, will drill into the Martian surface to study underground samples, enhancing Europe's space exploration capabilities. This mission marks a significant international collaboration in planetary exploration.



astrobiology.com

Gaia Telescope Retires After Remarkable Discoveries

The Gaia space telescope, launched in 2013, has been powered down after a decade of groundbreaking work mapping the Milky Way. Gaia charted nearly two billion stars, uncovering insights about star movements, galaxies, and exoplanets. Its final mission phase will place it in a distant orbit around the Sun, ensuring it avoids interference with newer telescopes like James Webb. Despite its retirement, Gaia's data will continue to drive astronomical discoveries for years, including insights into the Milky Way's formation and growth.



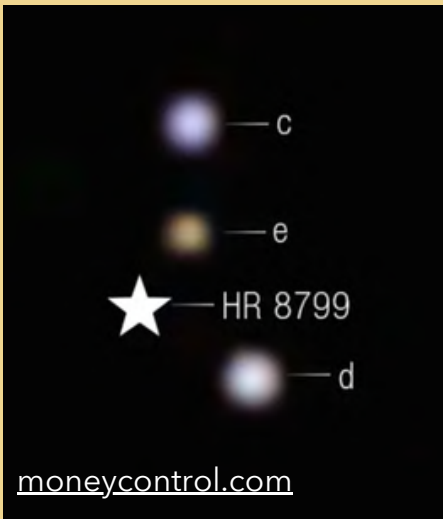
brecorder.com

Exoplanet Atmospheres May Hold Hydrogen-Water Mix

New research shows that exoplanets may have atmospheres with unexpected mixtures of hydrogen and water. Simulations reveal that planets ranging from Earth to Neptune may feature hydrogen-rich atmospheres that interact with molten interiors, leading to complex chemical reactions. Over time, as planets cool, water and hydrogen separate, potentially creating unique layers in the atmosphere. This helps explain the differences between planets like Uranus and Neptune and guide for potentially habitable exoplanets with water-rich environments.

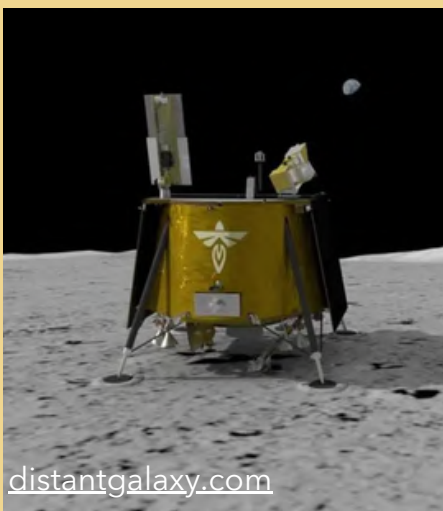


universemagazine.com



James Webb Finds Carbon Dioxide on Exoplanet

NASA's James Webb Space Telescope has identified carbon dioxide in the atmosphere of exoplanet HR 8799, located 130 light-years from Earth. This marks the first direct observation of CO₂ on an exoplanet, providing valuable insights into planetary formation and atmospheric composition. The detection was achieved using Webb's advanced imaging capabilities, which allowed researchers to infer atmospheric chemistry by capturing direct images of the planet. These findings enhance our understanding of exoplanetary systems and their potential for supporting life.



LuGRE Experiment Confirms GPS Functionality on Moon

LuGRE has successfully demonstrated the feasibility of using Global Navigation Satellite System (GNSS) signals, such as GPS and Galileo, for positioning, navigation, and timing on the Moon. This achievement marks a significant milestone in lunar exploration, as it allows spacecraft to determine their precise location and velocity using existing Earth-based GNSS signals. The experiment was conducted through a collaboration between NASA and the Italian Space Agency (ASI), with the LuGRE payload launched aboard Firefly Aerospace's Blue Ghost Mission 1 lander.



Giant Space Tornadoes Discovered in Milky Way's Core

Astronomers have discovered massive "space tornadoes" in the heart of the Milky Way. These long, narrow filaments of gas, identified in the Central Molecular Zone (CMZ) surrounding the galaxy's supermassive black hole, are unlike any previously observed structures. The filaments, dubbed "slim filaments," show signs of turbulent pressure and may function like tornadoes, dispersing gas and complex molecules across the region. Their discovery offers insights into the dynamic processes of the CMZ and the recycling of materials in this turbulent part of the galaxy.

Europa's icy ocean, hints at the possibility of subsurface life

Did you Know
The Age of the Universe, the universe is approximately 13.8 billion years old, originating from the Big Bang

New Dust Shield Shows Promising Results

Electrodynamic Dust Shield (EDS) has successfully reduced the buildup of lunar dust, a major challenge for long-term lunar exploration. Tested on Firefly Aerospace's Blue Ghost Mission 1, the EDS uses electrodynamic forces to prevent dust from sticking to surfaces, such as spacesuits, camera lenses, and solar panels. While it didn't eliminate dust entirely, the shield removed a significant portion, marking a critical step in addressing the hazardous effects of lunar dust. This breakthrough will improve astronaut safety and spacecraft functionality on the Moon.



GITAI Completes Robotic Arm Study for Lunar Rover

GITAI Japan Inc., a subsidiary of U.S.-based GITAI, has finalized a concept study for a robotic arm system intended for JAXA's pressurized crewed lunar rover. This rover, developed in collaboration with Toyota, aims to facilitate extended human exploration of the Moon's polar regions as part of Japan's contribution to NASA's Artemis program. The study encompassed the design, interface requirements, and operational scenarios for both remote and autonomous use of the robotic arm.



Biomass Satellite Propulsion System Ready for Fueling

Biomass satellite, which will study Earth's forests, is now ready for propellant fueling ahead of its 29 April launch. The satellite's propulsion system, including valves and thrusters, has undergone rigorous testing, ensuring no leaks and system functionality. The mission will use a P-band radar to measure forest biomass and contribute to understanding the carbon cycle. Biomass is set to provide valuable insights into global forest changes and carbon storage. This milestone marks significant progress toward the satellite's successful launch and operation.





First Orbital Rocket Launch from Europe Fails

Isar Aerospace's Spectrum rocket, attempting to make history as the first orbital launch from European soil, faced a failure shortly after lift-off on 30 March 2025. The rocket lifted off from Andøya Spaceport in Norway but began tumbling just 18 seconds into flight before crashing back to Earth and exploding. While no payload was aboard, this mission aimed to gather data for future flights. The cause of the anomaly remains unclear, but Isar Aerospace's timeline for future missions is unaffected.



Space Force to Test Satellite Refueling in Orbit

The U.S. Space Force will conduct in-orbit satellite refueling tests as part of the Tetra-5 and Tetra-6 missions. These experiments, launching in 2026 and 2027, will involve companies like Astroscale, Northrop Grumman, and Orbit Fab to demonstrate advanced refueling technologies. The tests aim to evaluate hardware such as Orbit Fab's Rapidly Attachable Fluid Transfer Interface (RAFTI) and Northrop Grumman's Passive Refueling Module (PRM), which could revolutionize satellite longevity, operational flexibility, and space logistics, enhancing commercial space operations.



SpaceX's Fram2 Mission Launches Historic Polar Flight

SpaceX's Fram2 mission, launching on 31 March 2025, is the first private astronaut flight to orbit Earth's poles. The mission, which launched from NASA's Kennedy Space Center, includes four crew members: cryptocurrency billionaire Chun Wang, vehicle commander Jannicke Mikkelsen, pilot Rabea Rogge, and medical officer Eric Phillips. Over the course of the 3-5 day mission, the crew will conduct 22 scientific experiments, including growing mushrooms in space and taking X-rays of the human body. The mission marks a key step for private space exploration.

Remembering the pioneers celebrating the achievements of space exploration

Satellogy

Focus on recent and upcoming satellites and launches

Did you Know
Explorer 1 (1958 - USA), the first U.S. satellite, it discovered the Van Allen radiation belts, unveiling crucial details about Earth's magnetic field and space environment.

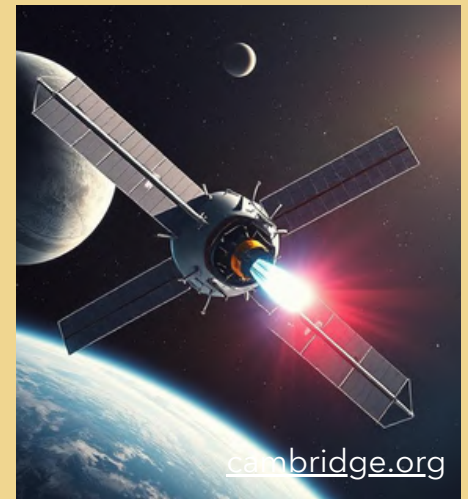
China Launches Tianlian II-04 Satellite in 15th Mission

China successfully launched the Tianlian II-04 data relay satellite into orbit on 30 March, 2025, marking its 15th space mission of the year. The Long March 3B rocket lifted off from the Xichang Satellite Launch Center in Sichuan. Tianlian II-04, developed by the China Academy of Space Technology, is designed to enhance satellite communications and support crewed missions, Earth-observation satellites, and operations at the Tiangong space station. The satellite is part of China's growing space-based relay infrastructure for global communication.



Self-Defence in Outer Space and ASAT Weapons

Chris O'Meara's paper explores the use of anti-satellite (ASAT) weapons in space, focusing on their role in self-defence under international law. As space becomes more militarized, ASAT weapons are increasingly seen as crucial for protecting space assets. However, the paper argues that the jus ad bellum principles of necessity and proportionality must govern their use to avoid unlawful force. A clear understanding of these legal frameworks is essential to ensure peaceful operations in space while maintaining national security interests.



Satellite Antenna Market Growth and Future Forecast

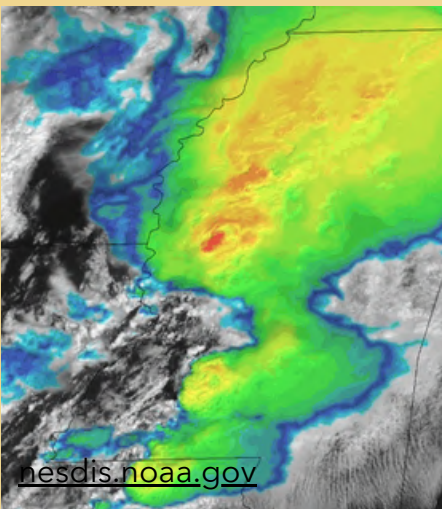
The global Satellite Antenna market is poised for significant growth, expanding from USD 6.2 billion in 2024 to USD 26.5 billion by 2033, at a CAGR of 17.50%. Key drivers include the rise of small satellites, government investments in satellite infrastructure, and the growing demand for IoT connectivity. Technologies like Satellite-On-The-Move (SOTM) and Satellite-On-The-Pause (SOTP) systems are leading the market. Despite high development costs, growing demand for advanced satellite antennas drives industry expansion.





Rocket Lab Launches 8 Satellites for Wildfire Detection

Rocket Lab successfully launched eight wildfire detection satellites for OroraTech aboard its Electron rocket. The satellites, part of the "Finding Hot Wildfires Near You" mission, aim to provide real-time data to firefighters by continuously monitoring fire behavior. This marks Phase 1 of OroraTech's plan to build a 100-satellite constellation by 2028. The mission's swift deployment showcases Rocket Lab's responsive launch capabilities, enhancing wildfire detection and response efforts globally. This helps improve situational awareness and support for firefighting teams.



NOAA Satellites Track Severe Weather Outbreaks

NOAA satellites monitored a powerful storm system impacting the central and eastern U.S., triggering severe thunderstorms, tornadoes, and wildfires. The storms caused extensive damage across Missouri, Arkansas, Mississippi, and Alabama. NOAA's geostationary and polar orbiting satellites provided real-time data, including high-resolution imagery and weather models, which enabled better forecasting and response. These provided vital insights into weather conditions, hazards like dust storms and wildfires, aiding in protecting lives and property.



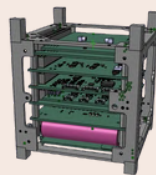
SpaceX Launches 28 Starlink Satellites into Orbit

SpaceX successfully launched 28 Starlink satellites from Florida on 31 March, 2025, using its Falcon 9 rocket. This mission marks SpaceX's 451st Falcon 9 flight and the 17th launch for the rocket's first-stage booster. The satellites will join the growing Starlink constellation, which now includes over 7,100 satellites, providing global internet coverage.

The booster also successfully landed on SpaceX's autonomous drone ship in the Atlantic Ocean. This launch continues SpaceX's mission to expand satellite internet services worldwide.

The future of connectivity, satellite constellations and global internet access

CubeTech

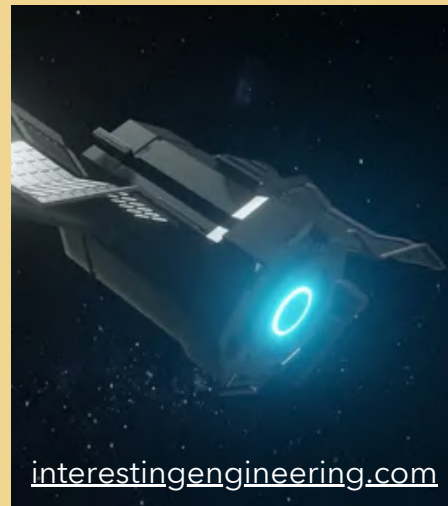


Showcase innovative CubeSat missions and unique payloads

Did you Know
The Mars Cube One (MarCO) mission consisted of two CubeSats that flew alongside NASA's InSight lander, demonstrating their potential for interplanetary communication.

Startup Tests Water-Fueled Plasma Thruster in Space

Miles Space has successfully tested its M1.5 plasma thruster, powered by water, in space. The thruster produced 37.5 millinewtons of thrust over five minutes with a specific impulse of 4,800 seconds, consuming just 1.5 watts of power. This efficiency marks a significant advancement in spacecraft propulsion technology, offering potential benefits for future missions. The technology could enable long-duration space exploration while reducing fuel costs and dependency on traditional rocket propellants. This breakthrough shows water's potential as eco-friendly fuel.



interestingengineering.com

Efficient Propulsion Innovations for Space Exploration

A recent IEEE paper presents innovative propulsion systems for spacecraft, focusing on enhancing efficiency and performance. The study explores novel designs and technologies aimed at improving thrust capabilities while minimizing fuel consumption. These advancements have the potential to revolutionize space travel, enabling longer missions and broader exploration. The research underscores the importance of developing sustainable and effective propulsion methods to meet the growing demands of future space endeavors.



ieeexplore.org

Guaranisat-2 Satellite Takes Major Step Forward

The Guaranisat-2 satellite project in Paraguay has made significant progress, with Italy celebrating its role in this groundbreaking initiative. The satellite, a collaboration between Paraguay and Italy, aims to enhance communication and scientific research capabilities. The project marks a critical milestone in Paraguay's space development, fostering international cooperation and technological advancement. This collaboration will improve the country's satellite infrastructure, contributing to global space exploration and communication efforts.



newsatlas.com



ani.com

BlueBlocks and TakeMe2Space Launch Student CubeSat

BlueBlocks Montessori School in Hyderabad, India, has partnered with aerospace education company TakeMe2Space to launch a CubeSat mission designed and developed by students aged 12 to 15. This initiative positions the students as researchers, designers, and scientists, providing hands-on experience in satellite technology. The CubeSat, with six sensors, facilitates studies on stabilization, radiation, climate, and aerospace biomimicry, marking a milestone in India's educational space projects for 2025.



techbriefs.com

MIT's Breakthrough in 3D-Printed Electro Spray Engines

MIT engineers have created the first fully 3D-printed electro spray engine, capable of emitting propellant droplets for space propulsion. This innovative engine is ideal for small satellites like CubeSats, providing precise in-orbit maneuvers with improved efficiency over traditional chemical rockets. The 3D-printed device reduces manufacturing costs and could even be made in space, using accessible materials and techniques. This advancement democratizes space research with cost-effective, high-performance satellite propulsion systems.



universetoday.com

Exploring Venus with Multiple Small Landers Concept

MIT's Valkyrie mission aims to explore Venus using multiple small landers. These landers, equipped with advanced instruments like gamma-ray spectrometers, will provide crucial data on Venus' geology. Unlike past missions, the Valkyrie landers will be designed to withstand Venus' extreme pressure and heat, with no need for orientation adjustments. The mission will study various sites, enabling scientists to explore Venus' rock compositions and understand its divergence from Earth. This promises to shed light on Venus' history and its differences from our planet.

**The growing CubeSat ecosystem,
a vibrant community of innovators**

The 75SSM

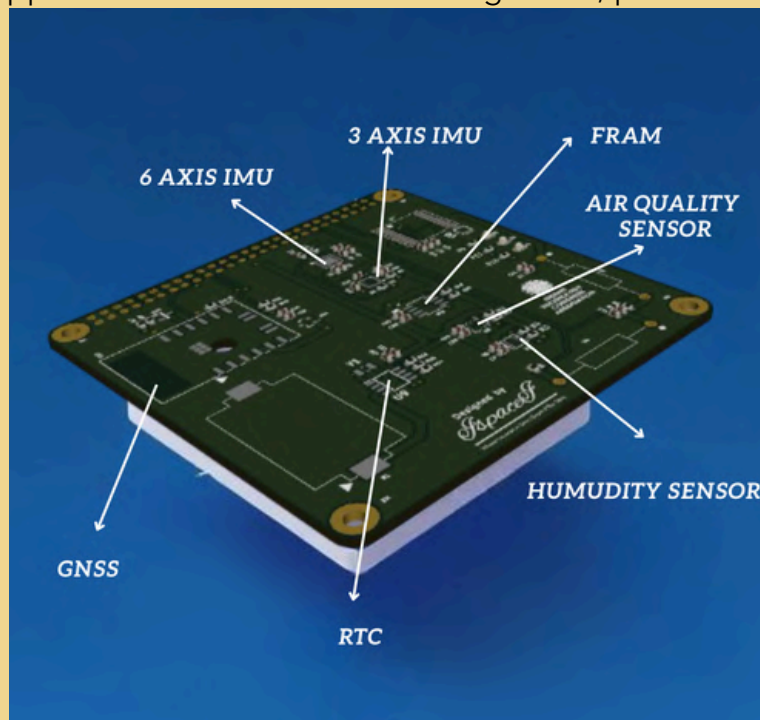
SSM: Students' Satellites Mission

Update readers on our ITCA internal space-based innovations

Did you Know
The VEML6030 Ambient Light Sensor and TMP117 Temperature Sensor provide precise light detection and temperature monitoring, boosting energy efficiency and stability in space and aerospace systems.

CRSat Payload Board: Advanced Data Acquisition, Storage, and Transmission

CRSat gives students hands-on experience with satellite tech, mirroring CubeSats. It integrates solar power, sensors, and real-time data collection, bridging theory and practice to build skills in power management, data analysis, and communication for real-world space challenges. The Payload Board is a crucial component designed to enable efficient data acquisition, storage, and transmission during CubeSat missions. Equipped with a range of advanced sensors, including a GNSS sensor for orbital tracking, an air quality sensor for environmental monitoring, and tilt, environmental, inertial measurement, and magnetometer sensors for precise attitude and motion data, the board ensures accurate and real-time data collection. This data is stored temporarily in onboard flash memory, and for high-frequency data, post-mission analysis is conducted. The onboard computer (OBC) processes the information, which is then transmitted to Earth via the LoRa module. To optimize power efficiency, the board adjusts sensor sampling rates based on power availability, while low-power modes are activated during CubeSat shadow periods. The CRSat Payload Board not only facilitates orbital tracking and environmental monitoring but also contributes to scientific research in space. It provides hands-on experience for students and researchers in space technology, bridging theory with real-world applications in satellite data management, power usage, and communication.



Building a community of space enthusiasts

Space@India

Glimpses into India's space chronicle, every week 

Did you Know
Aryabhata (1975), India's first satellite, Aryabhata, marked its entry into space exploration. It was used for scientific experiments, including X-ray astronomy and solar physics.

Sunita Williams Reflects on India's Beauty Seen from Space



[Read more at: moneycontrol.com](http://moneycontrol.com)



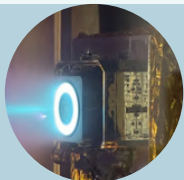
India's Role in Cosmic Understanding: Ex-ISRO Chief

[Read more at: businessstandard.com](http://businessstandard.com)

Semicryogenic Engine Test Successful



[Read more at: abp.com](http://abp.com)



ISRO Completes 1000-Hour Test of Plasma Thruster

[Read more at: brahmand.com](http://brahmand.com)

Reusable Space Tech with Winged ORV



[Read more at: defencenews.com](http://defencenews.com)



India Allocates Rs 548 Crore for ISS Astronaut Mission

[Read more at: timesofindia.com](http://timesofindia.com)

Images Reveal Myanmar Earthquake's Impact



[Read more at: ndtv.com](http://ndtv.com)



Private Sector's Role in Advancing Space Development

[Read more at: pib.gov.in](http://pib.gov.in)

Innovating India's tech for 22 years, we pioneered the '75 Students' Satellites Mission' and made a global impact in space tech, precision agriculture, and Industry 4.0.

Events

Space-Symposium

07-11 April 2025
The Broadmoor, USA
spacesymposium.org

Nuclear and Emerging Technologies for Space

04-08 May 2025
Huntsville, USA
nets2025.com

ISDC 2025

19-22 June 2025
Rosen Centre Hotel, Florida
isd2025.com

Launches

SpaceX | Falcon 9 Block 5 | Starlink Group 11-11

06 Apr 2025 04:00 IST
SLC-4E, Vandenberg SFB, California, USA

Roscosmos | Soyuz 2.1a | Soyuz MS-27

08 Apr 2025 11:17 IST
Site 31/6, Baikonur Cosmodrome, Kazakhstan

Blue Origin | New Shepard | NS-31

14 Apr 2025 19:00 IST
Launch Site One, West Texas, Texas, USA

Upcoming...



Compiled by

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Er. Moses Denny Veliath

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