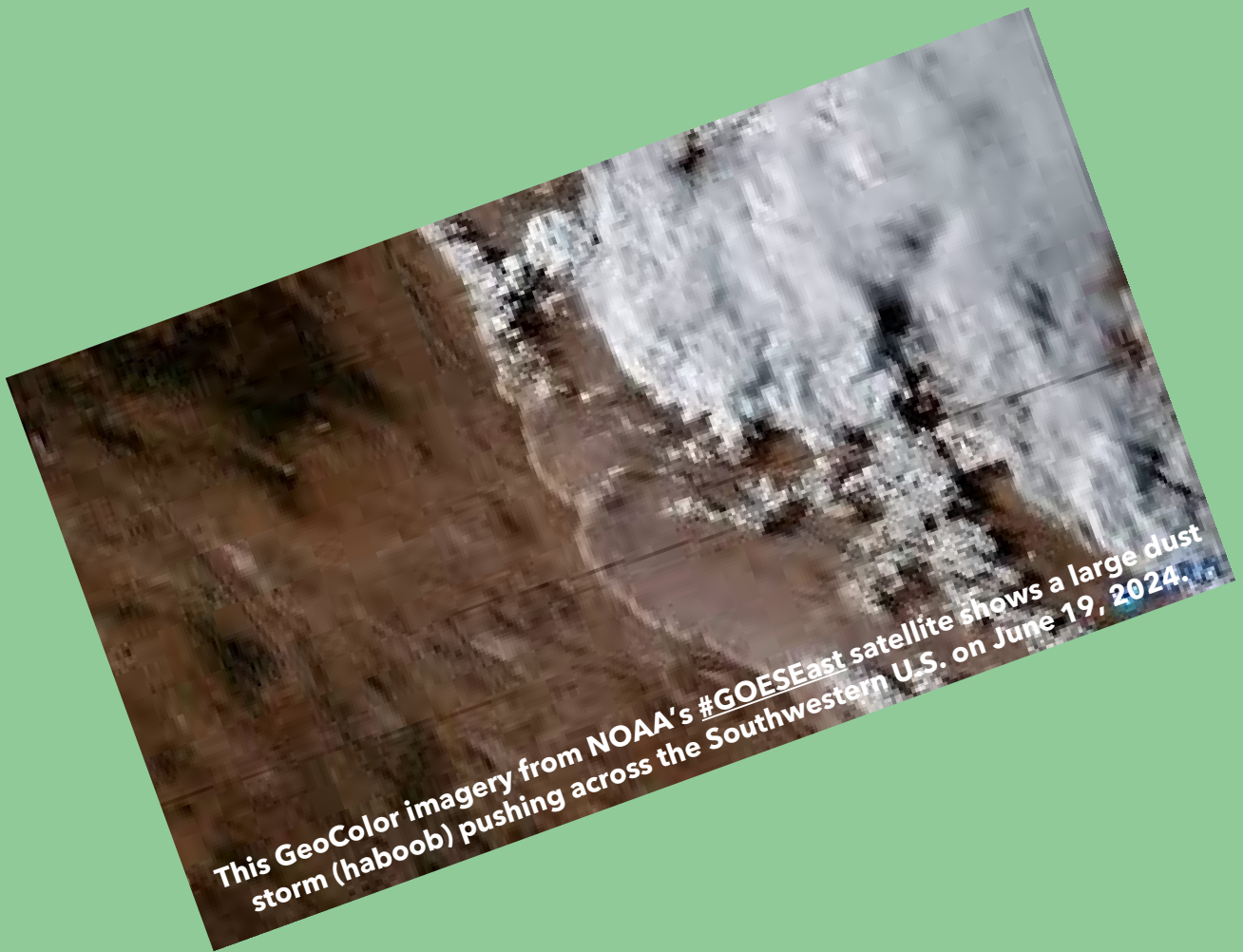




# Space Beacon

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*Stay up-to-date with the latest in spacetech*



This GeoColor imagery from NOAA's #GOESEast satellite shows a large dust storm (haboob) pushing across the Southwestern U.S. on June 19, 2024.

*The Celestial Odyssey*

# Orbital



*Lead with the most significant celestial events and discoveries*

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## Parker Solar Probe Nears Closest Sun Approach

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NASA's Parker Solar Probe will make its closest approach to the sun on Dec. 24, traveling at 191 km/s and reaching a record-breaking 6.1 million kilometers from the surface. Launched in 2018, the spacecraft used Venus flybys to achieve this proximity, with its thermal shield and solar panels performing beyond expectations. The mission is providing groundbreaking insights into the solar wind, corona, and coronal mass ejections, transforming our understanding of the sun as it reaches the peak of its 11-year activity cycle. Two more close approaches are planned for 2025, with potential for extended operations.



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## Event Horizon Telescope Boosts Black Hole Imaging

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The Event Horizon Telescope (EHT) has captured detailed images of the supermassive black hole in galaxy NGC 1052 and its twin jets, 60 million light-years away. Led by Anne-Kathrin Baczko of Chalmers University, the team used radio telescopes, including ALMA, to confirm strong magnetic fields (2.6 tesla) near the event horizon, which may help launch jets.

This breakthrough, detailed in *Astronomy and Astrophysics*, sets the stage for future studies with next-generation telescope networks.



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## Lunar Outpost Leads Australia's First Lunar Rover Mission

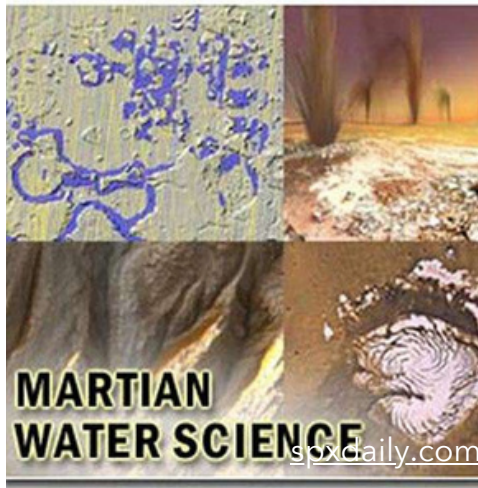
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Lunar Outpost Oceania will lead the construction of Australia's first lunar rover, "Roo-ver," as part of the ELO2 Consortium with EPE Oceania, funded by the Australian Space Agency. The team, based in Melbourne, has developed four rover prototypes, showcasing their technical expertise.

This mission strengthens Australia's space presence and further solidifies Lunar Outpost's leadership in planetary mobility, advancing its Lunar Terrain Vehicle initiative for NASA.







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## Study Questions Potential for Liquid Brines on Mars

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A new study challenges the idea of liquid water on Mars, suggesting it is less likely than previously thought. The research argues that recurring slope lineae (RSL) are caused by sand and dust flows, not liquid water, and debunks the persistence of liquid brines on Mars due to insufficient salt concentrations and other environmental factors.

The authors conclude that Mars remains cold, dry, and uninhabitable, though detecting brines in situ is important for planetary protection.



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## Webb's Best Glimpse Yet of Icy Planetesimals

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The James Webb Space Telescope has provided new insights into the early solar system by analyzing trans-Neptunian objects (TNOs) and centaurs. Researchers identified the specific molecules responsible for the diversity in their spectral features, including water ice, carbon dioxide, methanol, and complex organics. These findings suggest that TNOs, which never accreted into planets, serve as time capsules, offering crucial evidence about the solar system's formation. Additionally, the study sheds light on the evolution of these objects as they move inward toward the giant planets.



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## Space Gardens

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NASA's Plant Habitat-07 investigation focuses on how plants and their microorganisms respond to varying water levels, using lettuce as the crop.

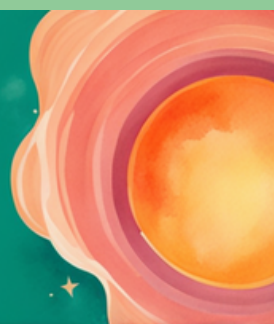
Previous studies on the International Space Station have tested multiple crops to improve space agriculture, with insights on light, genetics, hormones, and gravity's impact on plant growth.

These findings help design better plant growth systems for space missions and could inform crop cultivation on Earth.



WITNESSING THE WONDERS OF  
THE UNIVERSE, AS THEY  
UNFOLD.

Orbital



# Genspace



*Cover broader space news not fitting into other categories*

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## NASA launch of heliophysics missions

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NASA's Interstellar Mapping and Acceleration Probe (IMAP) mission, designed to study the heliosphere and solar wind, will be launched to the Earth-sun L1 point 1.5 million kilometers away. IMAP aims to explore the magnetic bubble created by the sun, shielding the solar system from interstellar particles. It will also monitor solar weather, safeguarding humanity by providing insights into space weather. IMAP will fly alongside other missions, including the Carruthers Geocorona Observatory and Space Weather Follow-On L-1, to enhance our understanding of solar activity and its impacts.



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## Vast signs SpaceX deal for ISS missions

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Vast has partnered with SpaceX for private astronaut missions to the International Space Station (ISS). The collaboration aims to provide private astronauts with access to the ISS, utilizing SpaceX's Crew Dragon spacecraft. This agreement marks a significant step in the commercialization of space travel, expanding opportunities for private sector participation in human spaceflight. It highlights the growing role of private companies in facilitating missions traditionally dominated by government space agencies.



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## Insights into NASA's Small Spacecraft Electric Propulsion

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NASA's Small Spacecraft Electric Propulsion (SSEP) program explores advanced propulsion technology designed to enhance spacecraft capabilities. This electric propulsion system, which is more efficient than conventional methods, could be key for future deep-space missions, providing better fuel efficiency and longer mission durations.

The program aims to develop and demonstrate the viability of these systems for small spacecraft, supporting exploration missions to the Moon, Mars, and beyond.







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## Plextek's mmWave Technology for Space

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Plextek has introduced a groundbreaking mmWave radar technology for in-orbit space operations, designed to enhance safety and reliability for space and satellite missions. This radar detects objects as small as a millimeter and operates effectively in challenging conditions, such as eclipses or dust-covered lunar surfaces. The technology is adaptable to various space missions, offering scalable, efficient solutions. Plextek aims to provide customized radar systems, ensuring rapid development and deployment for future space exploration.



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## Submarines for space exploration

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ESA, in collaboration with the Portuguese Space Agency and Navy, is using submarines for the SubSea project to simulate the isolation astronauts experience in space. The 60-day underwater mission monitored stress, immune health, and mood changes, providing insights into human adaptation in extreme environments. This research helps prepare for future space missions to the Moon and Mars. It also has broader implications for isolated communities and healthcare in extreme conditions. The project continues, with Portugal playing a key role in space exploration research.



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## NASA's Long-Term Goals for Human Presence in LEO

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NASA has unveiled its Low Earth Orbit (LEO) Microgravity Strategy to ensure continuous human presence in LEO, preparing for the transition from the ISS to commercial space stations by 2030. This strategy, developed with input from various stakeholders, aims to advance microgravity research, technology, and international cooperation. By focusing on commercial infrastructure, scientific research, and workforce development, NASA ensures ongoing innovation and supports future missions to the Moon, Mars, and beyond. The strategy aims to foster global partnerships and economic growth through space.



# Satellogy



*Focus on recent and upcoming satellites and launches*

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## Key Trends Shaping Satellite Industry in 2024

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The satellite industry in 2024 is being shaped by advancements in small satellite technology, cost reduction, and an increasing focus on sustainability.

The growth of commercial space operations, coupled with new regulatory frameworks, is driving innovation.

Satellite communication, Earth observation, and space-based internet are expected to expand, with significant investments in infrastructure and technology to enhance global connectivity and environmental monitoring.



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## Spacecoin XYZ Launches Blockchain Satellite

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Spacecoin XYZ has launched its first satellite aboard SpaceX's Falcon Heavy, a key step in building a blockchain-secured space network.

The project plans to deploy a constellation of satellites, with the goal of establishing a space data center offering unparalleled security.

Spacecoin's system will consist of a space-based "Celestial Chain" and an Earth-based "Uncelestial" network, aimed at creating a decentralized physical infrastructure.



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## Next-Gen OPIR Satellite for Testing

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Lockheed Martin has completed assembly and powered on the U.S. Space Force's Next-Gen OPIR GEO Block 0 satellite, which is now entering system-level testing.

This satellite, part of a multi-orbit missile warning system, will improve global coverage and enhance missile tracking, particularly against threats like ballistic and hypersonic missiles.

With its advanced sensor payload and resilient LM 2100 bus, the satellite is set for environmental testing before its expected 2025 launch.







[spxdaily.com](http://spxdaily.com)

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## China Launches Four Earth-Observation Satellites

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China successfully launched four Earth-observation radar satellites, PIESAT-2, aboard a Long March 2D rocket from the Taiyuan Satellite Launch Center. The satellites, developed by GalaxySpace, feature synthetic aperture radars for all-weather, day-and-night monitoring. This marks China's 65th launch of 2024 and demonstrates the efficiency of deploying multiple satellites with a single rocket. The PIESAT-2 satellites will enhance global Earth observation capabilities, with additional satellites planned for future launches to complete the network.



**UNIBAP**

[spxdaily.com](http://spxdaily.com)

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## Contec Space Optics Chooses iX10 for Satellite Network

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Unibap has secured a 1.1 MEUR order from South Korea's Contec Space Optics for its iX10 solution, which includes hardware, software licenses, and services for delivery throughout 2025. This agreement marks a significant step, as Contec directly placed a constellation order. Unibap's edge computing technology will integrate with Contec's space optics, enhancing high-resolution satellite payloads. This collaboration highlights the growing recognition of both companies' technical expertise and aligns with the rising demand for advanced satellite systems.



[gstatic.com](http://gstatic.com)

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## Over 480 Orbital Launches and 43,000 Satellites

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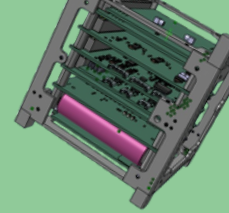
The space industry is rapidly evolving, with projections indicating over 480 orbital launches and approximately 43,000 active satellites expected by 2032. This surge is driven by advancements in reusable rocket technology and the proliferation of low Earth orbit (LEO) satellite constellations, which are set to revolutionize global communications, Earth observation, and data services. The anticipated increase in satellite deployments is expected to significantly enhance connectivity and data accessibility worldwide.

*Miniaturization, connectivity,  
and beyond: The evolution of  
satellites.*

SATELLOGY



# CubeTech



*Showcase innovative CubeSat missions and unique payloads*

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## Eutelsat to launch another 100 OneWeb satellites

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Eutelsat plans to expand its OneWeb low Earth orbit (LEO) constellation with new satellites, bringing enhanced capabilities such as 5G backhaul services and compatibility with the IRIS2 network. Built by Airbus and expected for delivery by late 2026, the new satellites will ensure continuity of service and introduce improved features.

This move aligns with Eutelsat's strategy for 2030, as the IRIS2 constellation becomes operational, with substantial capital investment projected to support the expansion.



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## Accelerating STEM and Space Ambitions

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The U.S. Embassy in Luxembourg invites proposals from organizations to strengthen bilateral ties through programs focused on STEM and space, including raising awareness of space technology, biotechnology, and emerging fields. Programs should involve U.S. expertise, such as educational initiatives in coding, robotics, and cybersecurity, and must engage Luxembourg audiences, with U.S. citizen speakers. These initiatives aim to promote understanding of U.S. policy and foster collaborative engagement between both countries.

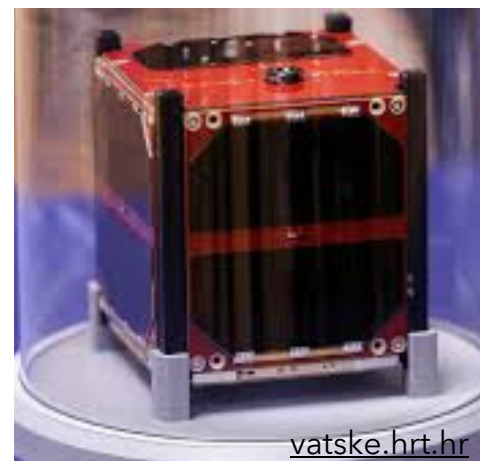


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## Croatia's first satellite, 'CroCube,' launched Saturday

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Croatia's first satellite, CroCube, was launched aboard SpaceX's Falcon 9 from California at 12:34 local time. It will photograph Earth and conduct scientific measurements at 510 km altitude for two years, equipped with a camera and a Croatian-developed experiment. CroCube's first message was received at 3:15 local time, and it carries a small meteor payload. Data, including photos and telemetry, will be freely available, and enthusiasts can track it via a mobile app. The satellite will be in range three times a day until it re-enters Earth's atmosphere and burns up.





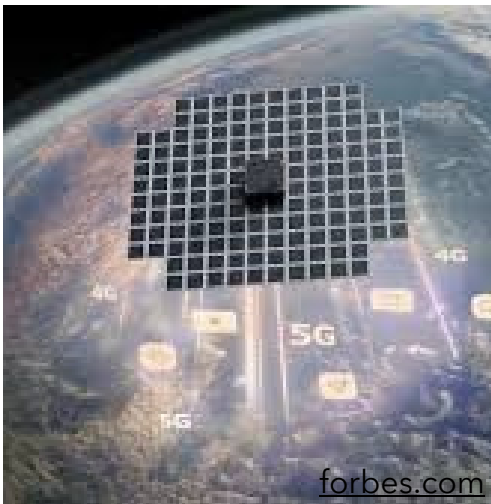


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## ION-X funding boosts small satellite ion thrusters

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ION-X, a Paris-based startup and spin-off from CNRS, plans to produce 200 ion thrusters per year by 2028 at its future Île-de-France facility. It raised funds in a Series-A round, with investors including the European Innovation Council (EIC) Fund and the Île-de-France Region. The company aims to revolutionize space mobility with electro spray propulsion technology, offering cost-effective solutions for small satellite maneuvers, with production and propellant sourced domestically. ION-X was selected for the EIC's CASSINI Business Accelerator to support its commercial growth.

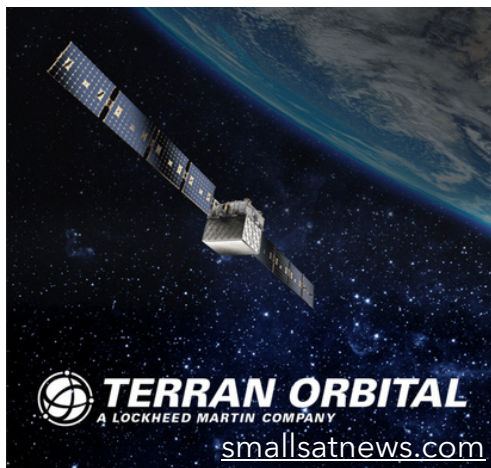


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## A Big Launch Year for Low Earth Orbit Satellites

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In 2024, Low Earth Orbit (LEO) satellites transitioned from experimental to expansive, rapidly becoming a key solution for broadband access in remote areas. Fueled by increasing commercial launches, government initiatives, and new regulatory frameworks, more than 5,500 operational LEO satellites now orbit Earth, contributing to a growing market. The rise of LEO satellite networks like SpaceX's Starlink has driven both innovation and competition in satellite broadband, revolutionizing connectivity, especially in underserved regions.



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## Peter Krauss Leads Terran Orbital's of Innovation

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Peter Krauss, now CEO of Terran Orbital, is advancing innovation, scaling manufacturing, and fostering collaboration to position the company as a leader in satellite manufacturing and aerospace solutions.

With expertise in managing complex organizations and a passion for competitive excellence, Krauss aims to drive strategic growth, strengthen customer-focused initiatives, and achieve new milestones in the aerospace and defense sectors.

## CUBETECH INNOVATIONS

Nanosatellites: Tiny packages, transformative potential.



# The 75SSM

SSM: Students' Satellites Mission

Update readers on our *ITCA* internal space-based innovations

## GP02(GPS)

The GP-02 is a versatile satellite navigation receiver module supporting GPS, BeiDou, and GLONASS systems for high-precision positioning, offering approximately 2-meter accuracy and a 5Hz update rate. It integrates an RF front-end, digital baseband processor, 32-bit RISC CPU, and power management features, making it ideal for applications requiring accurate navigation and timing. With 30-nanosecond timing precision and active antenna detection, the GP-02 is suitable for automotive, aerospace, and telecommunications projects. Its development board facilitates seamless integration, and comprehensive resources, including the [GP-02 Specification Sheet](#), are available for developers.

**INDIAN TECHNOLOGY CONGRESS ASSOCIATION**

**75 Students' Satellites Mission**  
*ITCA's Engineering Prowess and Ingenuity*  
www.itca.org.in; www.75satellites.org

### Exploring the Capabilities of the GP-02 Navigation Module

- Highlight the Key Features**  
Showcase the advanced functionalities and unique attributes of the GP-02 to effectively convey its value in satellite navigation technology.
- Gather Performance Data**  
Assess metrics like accuracy and timing from reliable sources to highlight the module's real-world effectiveness.
- Feature Viz**  
Use clear visual representations to highlight the GP-02's compatibility with BDS, GPS, and GLONASS, making its multi-system support easily understandable.
- Choose a Layout**  
Choose a layout that effectively showcases the technical specifications and applications of the GP-02 while maintaining a user-friendly design.
- Boost Appeal with Creative Elements**  
Incorporate diverse design elements like unique icons, vibrant color schemes, and modern typography to captivate your audience's interest. Use consistent branding while making the information accessible and engaging.

Deliver a compelling narrative on GP-02's innovative navigation solutions!

Uniting students through a shared passion for space.

75  
STUDENTS'  
SATELLITES  
MISSION





PARLIAMENT QUESTION: REGULATING GROUND STATION AS A SERVICE INDUSTRY

Read more at: <https://pib.gov.in/PressReleasePage>

What is the quantum satellite for India's National Quantum Mission?

Read more at : <https://www.thehindu.com//>



ISRO reveals first look of two Spadex satellites that will dock in space

Read more at: <https://www.indiatoday.in/>

ISRO rolls out PSLV rocket, to launch SpaDex mission on 26 Dec

Read more at: <https://www.news9live.com/>



Will transfer SSLV to industry: ISRO chairman

Read more at: <https://www.dinamalar.com/>

World's most expensive Indo-US NISAR satellite likely to be launched in March: Nasa

Read more at: <https://timesofindia.indiatimes>



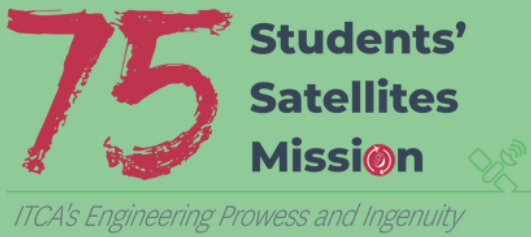
ISRO To Study How Crops Grow In Space On PSLV-C60 Mission

Read more at: <https://www.etvbharat.com/>

Skykraft to drive collaborative PNT Project with Indian partners

Read more at: <https://www.spacedaily.com/>





## ITCA: Pioneering India's Tech Future

Driving India's tech innovation for over 21 years, we've built strong academia-industry partnerships. Pioneer of the '75 Students' Satellites Mission,' we've made a global impact in space tech, precision agriculture, and Industry 4.0. We are shaping the future of India's technology landscape.

Upcoming.....

### SPACECOM 2025

CONFERENCE: 29-30  
JANUARY 2025  
EXPO: 28-30 JANUARY 2025  
ORLANDO, FL  
<https://www.spacecomexpo.com/>

### SmallSat Symposium 2025

4-6 February 2025  
Silicon Valley Mountain View,  
<https://smallsatshow.com/>


### Satellite 2025 Conference & Exhibition

Conference: 10-13 March 2025  
Exhibition: 11-13 March 2025  
Walter E. Washington  
Convention Center  
Washington, DC  
<https://www.satshow.com/>

Powered by Students

# A 75 Satellites Mission

A burst of coding creates the software; consistent testing ensures its reliability in orbit



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