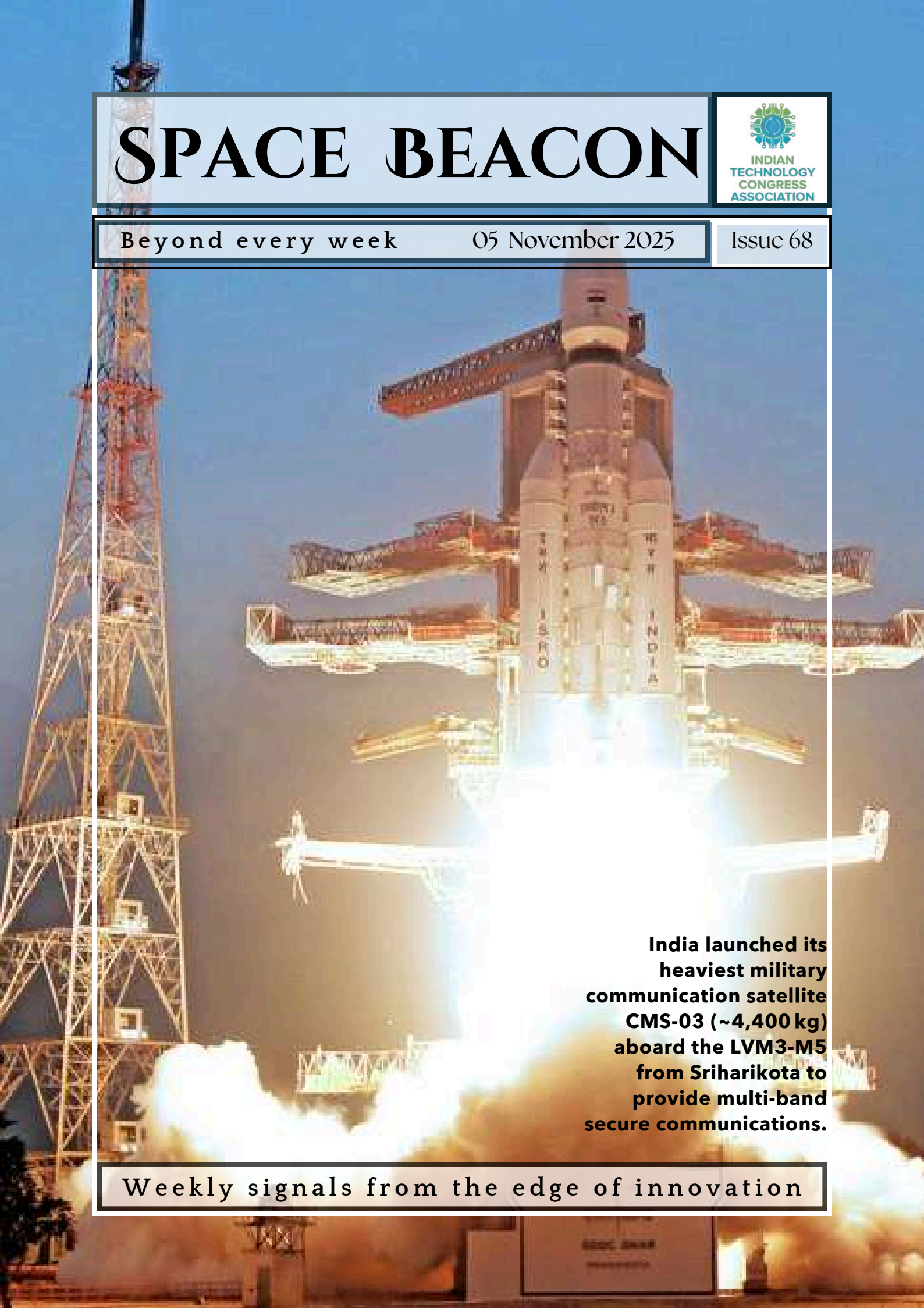
SPACE BEACON

INDIAN TECHNOLOGY CONGRESS ASSOCIATION

Beyond every week | 05 November 2025 | Issue 68



India launched its heaviest military communication satellite CMS-03 (~4,400 kg) aboard the LVM3-M5 from Sriharikota to provide multi-band secure communications.

Weekly signals from the edge of innovation

ORBITAL

YOUR WEEKLY ORBIT THROUGH THE COSMOS' BOLDEST UPDATES

Space trivia alert

Saturn's gravity gathers over 150 moons and moonlets, though only 53 have official names.



indiatimes.com

Earth's surprising new moon stuns NASA and astronomers

Earth has gained a surprising celestial companion – a small object named 2025 PN7, officially recognized by NASA as a quasi-satellite. Unlike our true Moon, it doesn't orbit Earth directly but follows an Earth-like path around the Sun, appearing to travel alongside our planet. Estimated to be 18–36 meters wide, 2025 PN7 will remain Earth's "second moon" until around 2083. Though faint and hard to spot, this discovery offers scientists fresh insight into orbital dynamics and near-Earth asteroids.



indiatimes.com

India tests large-scale Mars habitat tech in Gujarat

India has taken a bold step towards future Mars habitation with a two-week analogue mission in Gujarat. Local firms Aaka Space and MiCoB successfully 3D-printed Asia's first indigenous Martian-regolith radiation shield using Indian materials. This dome structure, built with Mars-simulant soil, acted as both a load-bearing shell and radiation barrier. Meanwhile, IIT Madras deployed its Martian rover to test astronaut-robot teamwork. The mission marks India's debut in habitat simulation and paves the way for autonomous space construction.



indiatoday.in

NASA launches twin ESCAPADE spacecraft to Mars

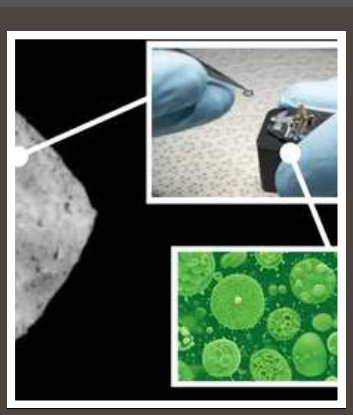
The NASA is set to launch its first dual-spacecraft science mission to Mars, the ESCAPADE mission, carrying two probes named Blue and Gold. They'll embark on a bold journey aboard the New Glenn rocket, spending a year near Earth's L2 point before a 10-month cruise to Mars, arriving around September 2027. Once at Mars, the twin orbiters will split paths, enabling simultaneous, three-dimensional measurements of the planet's magnetosphere and how its atmosphere is stripped by solar wind. This cost-effective mission aims to shed light on planetary habitability and atmospheric evolution.



indiatvnews.com

Giant Beaver Moon lights up the November sky

The Beaver Supermoon on November 5 delivered the biggest and brightest full Moon of 2025, appearing up to 14% larger and nearly 30% brighter than usual as it reached its closest point to Earth. This dazzling lunar event is part of a rare trio of supermoons occurring this year. Skywatchers enjoyed the most dramatic views near the horizon during early evening, where the Moon appeared especially large due to the Moon-illusion effect. Clear skies offered a perfect opportunity to witness this striking natural spectacle.



space.com

Asteroid impacts can rapidly trigger microbial growth

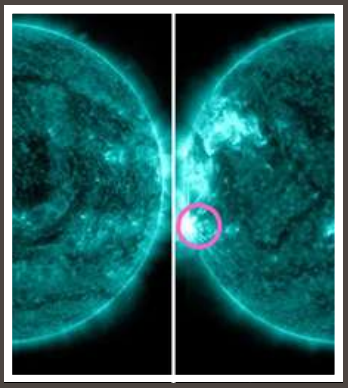
A new study shows that asteroid impacts may help life return far sooner than expected. At an ancient Finnish impact site, researchers found minerals signaling microbial activity just 4 million years after the event. Despite initial devastation, the post-impact environment acted as a natural incubator that supported microscopic life. Similar to organic-rich asteroid Ryugu, such impacts may have fueled early biochemical processes on Earth. The findings, published in Nature Communications, refine understanding of life's rapid recovery after planetary upheavals.



livescience.com

Water and oil unite on Titan's surface

New research suggests that on Titan, Saturn's largest moon, water and oil could mix rather than separate, creating conditions for unusual chemical interactions. Titan's frigid surface, rich in hydrocarbons and frozen water, allows these typically immiscible substances to blend into a unique slurry. Scientists believe this behavior could enable exotic prebiotic chemistry not seen elsewhere in the solar system. The findings deepen interest in Titan as a prime target for future exploration, especially for missions studying habitability and complex organic processes.



space.com

Sun unleashes twin flares disrupting global signals

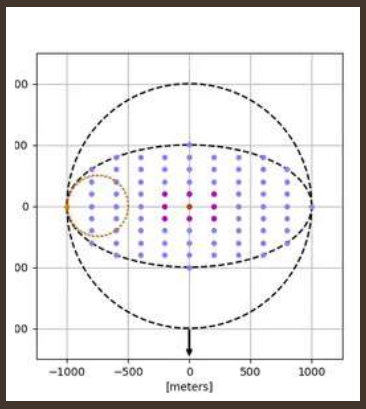
The Sun released two powerful X-class solar flares, triggering major radio blackouts across the Americas and Pacific. The eruptions, classified as X2.8 and X1.5, temporarily disrupted high-frequency communications used by aviation, maritime operators, and emergency services. Scientists report that both flares originated from an active region capable of further eruptions. While the blasts caused short-term signal loss, they did not pose a direct threat to satellites or power grids. Space weather teams are monitoring the region for additional activity.

GENSPACE

EXPLORING HUMANITY'S REACH BEYOND EARTH'S PAST, PRESENT, AND POTENTIAL

Space trivia alert

Many moons and some exoplanets are tidally locked, always showing the same face to their planet or star.



arstechnica.com

Orbital AI data centers rise

Tech giant Google has unveiled Project Suncatcher, a bold initiative to deploy solar-powered satellites in low Earth orbit hosting its Tensor Processing Units (TPUs). The goal: tap into near-continuous sunlight—solar panels in space can yield up to eight times the power of ground versions—and build next-gen AI infrastructure in space. Major hurdles remain, including ultra-high-bandwidth optical links, radiation-hardened hardware, and launch economics. Prototype launches are slated for 2027.



space.com

Inside NOVA's gripping tribute to 25 years aboard ISS

PBS's NOVA marks the 25th anniversary of the International Space Station with Operation Space Station, a two-part documentary airing Nov. 5 and Nov. 12. The film blends cinematic recreations, advanced CGI, and decades of NASA archival footage to trace the ISS's high-risk construction, daily challenges, and landmark scientific work. Astronauts recount near-disasters, from water-filled helmets to software glitches that triggered uncontrolled station rotation. The series also looks ahead to the ISS's planned 2030 de-orbit, reflecting on its legacy and lessons.



foxnews.com

Supercomputer chip launch transforms space computing

A new NVIDIA H100 supercomputer chip is set to launch into orbit aboard a Starcloud satellite, marking a major step toward building data centers in space. The vacuum environment offers natural cooling, potentially cutting energy use, carbon emissions, and water consumption compared to Earth-based facilities. The system will process satellite imagery, run AI models in real time, and speed up data delivery back to Earth. If successful, it could redefine how high-performance computing is deployed and scaled globally.



space.com

Rocket Lab lifts Japan's radar satellite to orbit

Rocket Lab successfully launched Japan's QPS-SAR-14 radar satellite, Yachihoko-I, on Nov. 5, sending it to a 575-kilometer circular orbit aboard an Electron rocket from New Zealand. The mission, called "The Nation God Navigates," marks Rocket Lab's sixth launch for Earth-imaging company iQPS. The satellite will join the expanding QPS-SAR constellation, designed to deliver high-resolution synthetic aperture radar images and near-real-time Earth monitoring every 10 minutes. This was Rocket Lab's 16th mission of 2025 and its 74th overall, further strengthening its role in small-satellite launches.



flightnow.com

SpaceX Bandwagon-4 launches innovative space tech

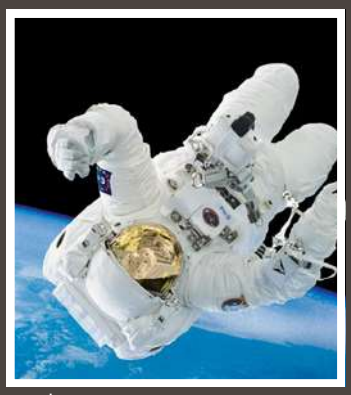
SpaceX's Bandwagon-4 mission successfully launched a mix of cutting-edge satellites into low Earth orbit. Highlights include Vast's Haven Demo, a precursor to its first commercial space station, and Starcloud-1, hosting Nvidia's H100 GPU for space-based AI data processing. The Falcon 9 booster B1091 landed safely at LZ-2 after liftoff from Cape Canaveral. Additional payloads included weather satellites and synthetic aperture radar satellites from Korea, ICEYE, and Türkiye. This mission showcases the growing role of commercial and AI-driven technology in orbit.



arianespace.com

Ariane 6 boosts Europe's Earth observation strength

Arianespace has successfully launched the Copernicus Sentinel-1D satellite on Ariane 6, boosting Europe's radar-based Earth observation network. Sentinel-1D enhances all-weather, day-night imaging for monitoring oceans, ice, land changes, and emergency situations. The mission ensures continuity for the Copernicus programme and supports climate, security, and disaster-response needs. This flight marks Ariane 6's third commercial launch, underscoring Europe's renewed access to space and commitment to reliable environmental monitoring.



theconversation.com

How Mars Missions Stretch Human Biology To Limits

NASA's Mars missions push human bodies to extremes—radiation, weightlessness, and isolation test bones, muscles, and organs. Spacesuits act as tiny biospheres, sensors track health, and countermeasures help astronauts stay functional. Research in space is also advancing Earth medicine, from osteoporosis to cancer treatments. Every mission reveals how resilient humans can be, showing biology's incredible ability to adapt, survive, and recover in the harshest environment.

SATELLOGY

TRACKING THE PULSE OF SATELLITE INNOVATION AND ASCENT

Space trivia alert

IRS-1A (1988) was its first homegrown Earth observation satellite for agriculture and water management?



space.com

India's major military communications satellite launch

India's space arm recently propelled its largest military communications satellite, CMS-03 (also called GSAT-7R), using the country's strongest launcher, LVM3. The 4,400-kg satellite was lofted aboard from the Satish Dhawan Space Centre and placed into geostationary transfer orbit in about 16 minutes. With advanced multi-band payloads, the satellite will bolster secure naval, air-defence and strategic links across vast oceanic and terrestrial zones—marking a significant leap for India's blue-water force capabilities.



newsonair.gov.in

Maharashtra first state to adopt Starlink internet

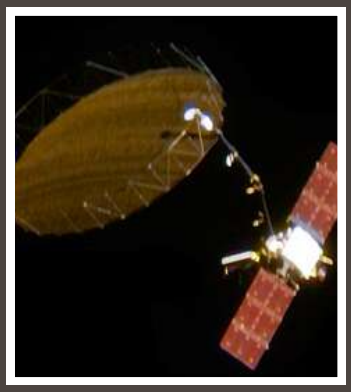
Maharashtra has become India's first state to partner with Starlink for satellite-based internet services. The initiative aims to provide high-speed connectivity to government offices, schools, healthcare centers, and remote villages, bridging the digital divide. Chief Minister Devendra Fadnavis highlighted that this collaboration will ensure seamless communication, promote education, and improve public services even in the most isolated areas. This move marks a major step toward digital inclusion and technological advancement across the state.



ndtv.com

SpaceX launches hub for first private station

SpaceX has successfully launched a satellite hub, marking a major step toward the world's first private space station. This milestone demonstrates the growing role of commercial players in space exploration, complementing government missions. The station aims to support research, manufacturing, and tourism in low Earth orbit. By providing a platform for private enterprises, it could revolutionize space access and innovation. This initiative signals the next era of orbital infrastructure driven by private companies, opening unprecedented opportunities for science and commerce.



indiatoday.in

Nisar satellite blooms: Stunning space antenna revealed

The NASA-ISRO Synthetic Aperture Radar (Nisar) satellite has been captured in a breathtaking "full bloom" image by Vantor, showcasing its massive 12-meter radar antenna fully deployed in orbit. Launched in August 2025, this dual-band radar satellite will provide high-resolution imaging of Earth's surface every 12 days, aiding disaster response, agricultural monitoring, and climate research. The image visually confirms antenna deployment and spacecraft health, marking a milestone in NASA-ISRO collaboration and symbolizing a new era of precise, reliable Earth observation.



airbus.com

Sentinel-1D takes Earth's watch to the next level

Launched by Airbus for the European Space Agency under the Copernicus programme, the new Sentinel-1D satellite carries an advanced synthetic-aperture radar that operates 24/7, rain or shine. Its 12-metre folded antenna unfurls in orbit to deliver precise imagery of land, ocean and ice, penetrating clouds and darkness alike. With four operational modes—wide swath for floods, extra wide for seas, wave mode for oceans and strip map for emergencies—it strengthens Europe's ability to monitor natural disasters, maritime spills and ground deformation for years to come.



iot-now.com

Satellite IoT revolution: refining market segments for growth

The satellite IoT space is undergoing a major shift, moving far beyond simply tracking assets in remote areas. A new white paper by Transforma Insights and Globalstar argues that market segmentation must be rethought – factoring in differences in technology (spectrum, architecture), deployment models and use-case requirements like latency, throughput and power. Industries including agriculture, maritime, energy and humanitarian aid now demand tailored satellite IoT solutions rather than one-size-fits-all.



space.com

Satellite traffic in low Earth orbit hits warning levels

A recent study shows that Low Earth Orbit (LEO) is becoming dangerously crowded, with around 24,000 satellites and debris tracked as of early 2025, a 76% increase since 2019. This congestion forces satellites to perform frequent maneuvers to avoid collisions, raising the risk of chain-reaction debris storms. Experts warn that without coordinated global management and smarter orbital planning, space operations could become increasingly hazardous, threatening both scientific missions and commercial satellites.

CUBETECH

PIONEERING THE FUTURE WITH COMPACT COSMIC INNOVATION

Space trivia alert

STRaND-1, developed by Surrey University students, was the first CubeSat to use a smartphone as its onboard computer.



montana.edu.com

Catch the cutting-edge doctoral defence in ECE!

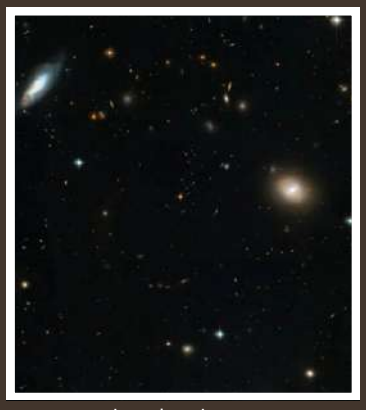
Join us on Thursday, 6 November, at the Montana State University Department of Electrical & Computer Engineering for the doctoral defense of Hezekia Ajax Austin. The presentation, titled "Dynamic Partially Reconfigurable Coprocessor for Low-Power, Radiation-Hardened Small Satellites", will showcase groundbreaking research in FPGA-based space systems. The event runs from 10:00 AM to 11:00 AM in Cobleigh Hall. Don't miss this opportunity to witness one of the latest innovations driving satellite technology at the frontier of aerospace engineering.



myscience.ch

New satellites map emissions down to each plant

Space takes monitoring to a new level. Soon, Europe will launch the CO2M satellites, enabling detailed emission maps that pinpoint greenhouse gases and air pollutants right down to individual power plants and industrial facilities. Developed by Empa in collaboration with international partners, this technology delivers an independent data basis for tracking decarbonisation progress and supporting climate policy. The satellites will furnish the first-level transparency in emission monitoring, helping ensure countries meet their climate targets with trustworthy evidence.



coorbitaltoday.com

Unlocking the early universe to reveal dark matter's secrets

A team at Tel Aviv University has pioneered a fresh way to probe the shadowy realm of Dark matter: ancient radio waves. These faint signals were emitted long ago during interactions between dark matter and hydrogen gas in the cosmos's "dark ages." Researchers propose placing antennas beyond Earth's atmospheric interference – perhaps on the Moon – to detect these elusive whispers. Simulations suggest dark matter formed dense clumps that tugged on hydrogen, producing radio waves we now seek. If successful, this could open a new chapter in physics.



uga.edu

Mini satellites, major impact for student space innovation

The University of Georgia's Small Satellite Research Lab (SSRL) has grown from a classroom project into a hub of hands-on space missions. Founded in 2016, the lab now engages over 90 undergraduates and launched its first CubeSat into orbit in 2020. SSRL partners with NASA, the U.S. Air Force, and industry sponsors to push the boundaries of space technology, exploring areas like AI, space health, and Earth imaging. Students gain real-world experience while contributing to meaningful space research.



startuphub

EnduroSat secures $104 M to boost small-satellite manufacture

EnduroSat has raised $104 million in a funding round backed by Riot Ventures, GV (formerly Google Ventures), Lux Capital, the European Innovation Council Fund and Shrug Capital. The spacetech firm will use the funds to expand its Sofia facility to 188,340 sq ft, aiming to build two ESPA-class satellites (200–500 kg) per day – accelerating deployment of satellite constellations and reducing time-to-orbit.



tales.com

Argentina launches microsatellite for NASA lunar mission

Argentina's National University of La Plata (UNLP) has made history with its Atenea microsatellite, selected to join NASA's Artemis II mission—the first crewed lunar orbit mission in over 50 years. Developed by students and professionals at UNLP's Aerospace Technology Center, Atenea will test new space technologies and gather critical data on radiation, GNSS, and long-range communications. Measuring just 30×20 cm, it exemplifies Argentina's innovation in space. The satellite is now in the U.S. for final integration ahead of its 2026 launch.



smallcaps.com

Kleos Space inks deal for new polar-orbit nanosatellites

Kleos Space SA (ASX: KSS) has signed a contract with Netherlands-based Innovative Solutions in Space BV (ISISPACE) to build a cluster of four nanosatellites for its "Polar Patrol Mission" (KSF2) set to launch by year-end. ISISPACE will provide a turnkey solution across design, manufacture, testing, and launch integration. The contract also offers an option to add three more clusters—totalling 12 extra satellites. These satellites monitor illegal activity via RF tracking, enhancing Kleos' data-as-a-service offering.

75 Students' Satellites Mission

THE 75SSM

FROM LAB TO LAUNCH: INSIDE ITCA'S VANGUARD VISION

Space trivia alert

The INSAT series transformed India's telecom, broadcasting, and weather services, reaching millions.



The 1U CubeSat, flagship of the 75SSM, marks a major leap in student-driven space innovation. It shows that when students are equipped with tools, mentorship, and ambition, they can redefine the frontiers of space technology. With its compact 10 cm^3 frame, the 1U CubeSat delivers capabilities rivaling larger satellites–making launches more accessible and affordable for educational institutions and emerging space nations. A Real-Time Clock (RTC) ensures accurate timekeeping across subsystems like OBC, EPS, Payload, and TTC. It provides precise timestamps for telemetry, sensor data, and images, crucial for correlating in-orbit events with ground logs. The RTC supports autonomous task scheduling during communication blackouts or reboots. Unlike microcontroller timers, it tracks time independently via a backup battery. Even when GNSS is unavailable, a high-precision, low-power RTC (e.g., DS3231, RV-3028) enhances CubeSat mission reliability and operational robustness.

SPACE@INDIA

TRACKING INDIA'S INDOMITABLE SPIRIT, RISING THROUGH SPACE

Space trivia alert

"Chandrayaan-3's soft landing on the Moon highlights India's advancing exploration expertise."



ISRO aims for 50 annual launches by 2029, with new launchpads and private sector collaboration. Progress includes Gaganyaan, Next Generation Launch Vehicle, and increased space ecosystem participation.

Read more at: indiatimes.com



ISRO's LVM3-M5 rocket successfully launched India's heaviest communication satellite, marking a major milestone in the nation's space and digital connectivity efforts.

Read more at: thehindu.com



ISRO Chief announced that the NISAR satellite, a joint mission with NASA for Earth observation, will be declared fully operational on November 7, marking a major milestone for space research.

Read more at: thehindu.com



Chandrayaan-2 observed a solar storm inflating the Moon's thin exosphere over tenfold, offering the first direct evidence of this effect.

Read more at: swarajyamag.com



The Prime Minister congratulated ISRO for the successful launch of India's heaviest communication satellite, CMS-03, praising the space sector's excellence and innovation.

Read more at: pmindia.gov.in



ISRO successfully conducted an in-orbit test of its indigenous C25 cryogenic stage after the LVM3-M5 launch, marking a major milestone for precise, efficient, and heavier satellite deployments.

Read more at: indiatoday.in

75 Students' Satellites Mission

ITCA's Engineering Prowess and Ingenuity

ITCA: Pioneering India's Tech Future

Innovating India's tech for 23 years, we pioneered the '75 Students' Satellites Mission' and made a global impact in space tech, precision agriculture, and Industry 4.0.



Upcoming events

International Conference on Astronomy and Space Sciences (ICASS)
26 Jan 2026- Bengaluru, India
conferenceindex.org

International Conference on Aeronautical and Aerospace Engineering (ICAAAE)
Dec 11 2025 - Goa, India
conferenceindex.org

International Conference on Astronomy and Space Sciences (ICASS)
Dec 11 2025- Goa, India
svsw.events

Slogan of the week

"Inspire Ideas. Craft Excellence. Conquer Challenges – The ITCA Way."

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