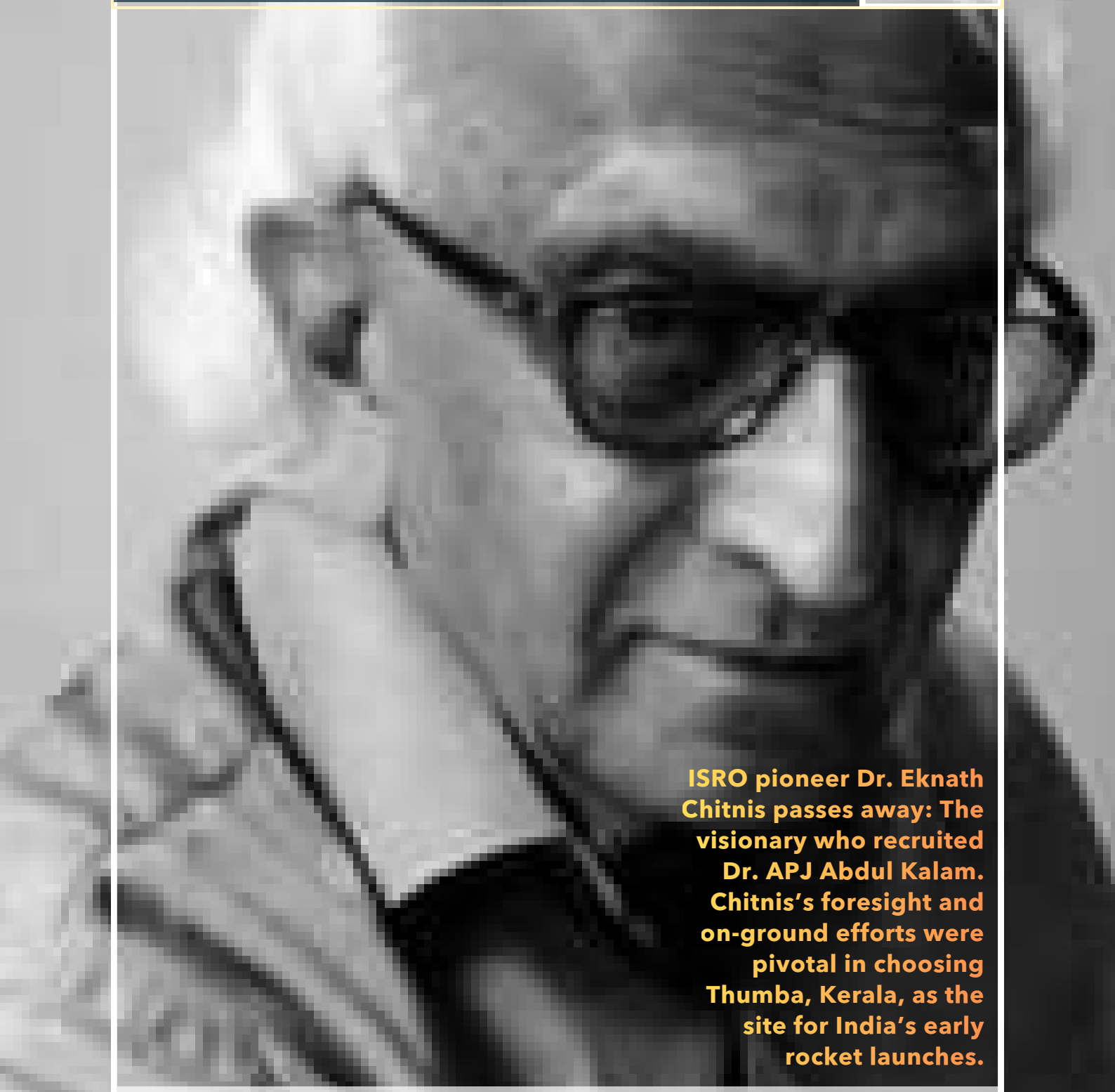
SPACE BEACON

INDIAN TECHNOLOGY CONGRESS ASSOCIATION

Beyond every week | 29 OCTOBER 2025 | Issue 67



ISRO pioneer Dr. Eknath Chitnis passes away: The visionary who recruited Dr. APJ Abdul Kalam. Chitnis's foresight and on-ground efforts were pivotal in choosing Thumba, Kerala, as the site for India's early rocket launches.

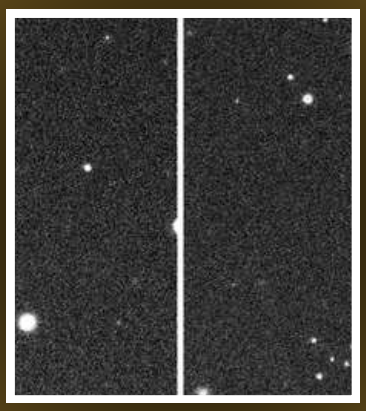
Weekly signals from the edge of innovation

ORBITAL

YOUR WEEKLY ORBIT THROUGH THE COSMOS' BOLDEST UPDATES

Space trivia alert

Stars orbit the centers of galaxies, often around a supermassive black hole



space.com

Blazing asteroid races through space near the sun

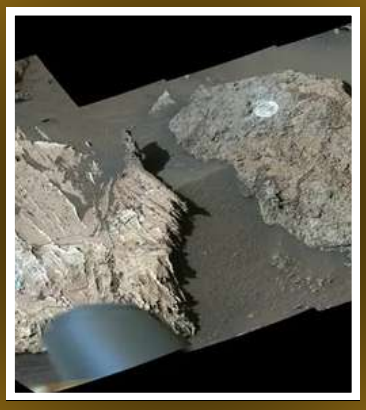
Astronomers have discovered 2025 SC79, the second-fastest asteroid in our solar system, racing around the Sun in just 128 days—a record only surpassed by 2021 PH27. Spotted by Carnegie astronomer Scott Sheppard using the Dark Energy Camera in Chile, the skyscraper-sized asteroid hides within Venus's orbit, eluding easy detection in the Sun's glare. Though it poses no immediate threat to Earth, finding such "twilight asteroids" is crucial for planetary defense. Future studies will explore its composition and origins.



earthsky.org

Why Mars brightens and dims across seasons

Mars doesn't shine with steady brilliance – its glow changes as Earth and Mars move in their separate orbits. The Red Planet appears brightest during opposition, when Earth passes between Mars and the Sun, placing the two planets at their closest approach. As they separate, Mars grows smaller and fainter in our sky. These cycles repeat roughly every two years, with some oppositions producing especially striking views depending on orbital distance and alignment.



mpg.de

Scientists refine methods for safe Mars samples

Researchers at the Max Planck Institute are advancing techniques to safely analyze future Mars samples on Earth. Their work focuses on preparing laboratory systems capable of handling extraterrestrial material while preventing contamination in both directions. Scientists are developing precise protocols for studying Mars rocks and dust, aiming to preserve chemical signatures that could reveal past environmental conditions—or even traces of ancient life. These preparations support international Mars Sample Return plans, ensuring that once the samples arrive, researchers can extract maximum scientific insight with rigorous safety and accuracy.



indianexpress.com

Jupiter's early arrival saved Earth from demise

New research from Rice University shows that the massive planet Jupiter played a pivotal role in molding our solar system. As Jupiter grew rapidly in its infancy, it effectively blocked inward flows of gas and dust toward the sun–material that might otherwise have pulled in the inner planets and even Earth. Its powerful gravity also carved gaps in the proto-planetary disk, separating inner and outer zones and giving rocky planets time to form and survive. Without Jupiter's influence, Earth as we know it may never have existed.



wionews.com

Jupiter shaped the origins of our entire solar system

A new study reveals that Jupiter acted as the solar system's architect, ensuring Earth's very existence. In the early years after the Sun formed, gas and dust spiraled inward and risked being consumed. As Jupiter grew, its massive gravity created ring-like zones that trapped material, preventing it from falling into the Sun. These "cosmic traffic jams" became the building blocks of Earth, Mars and Venus. Scientists say Jupiter's influence also stabilised inner planetary orbits and determined the structure of rocky worlds.



space.com

Young stargazer spots two surprising asteroid candidates

A 12-year-old from Ontario, Siddharth Patel, has identified two possible new asteroids – 2024 RX69 and 2024 RH39 – through a NASA-partnered citizen science program. His discoveries are now listed in the Minor Planet Center's database, though full orbital confirmation may take years. Inspired by a lifelong passion for space, Siddharth continues building his skills through the Royal Canadian Air Cadets as he dreams of becoming an astronaut. His astrophotography has already earned recognition, including a People's Choice Award for capturing Comet C/2023 A3.



space.com

Strange chemistry deepens mystery on Titan's surface

New research suggests Saturn's moon Titan hosts chemical reactions far more unusual than scientists expected, reshaping our understanding of this hazy, hydrocarbon-rich world. Using advanced modeling and data from past missions, researchers found that complex organic molecules may form through surprising pathways driven by Titan's dense atmosphere and frigid conditions. These discoveries strengthen the moon's reputation as one of the most intriguing places for studying prebiotic chemistry. As NASA's Dragonfly mission prepares for launch, Titan's mysteries only continue to grow.

GENSPACE

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

Space trivia alert

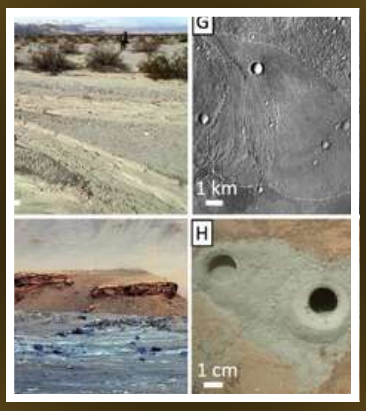
Venus is hotter than Mercury, with thick sulfuric acid clouds and crushing atmospheric pressure.



news.org

Space mission to test advanced nuclear microreactor

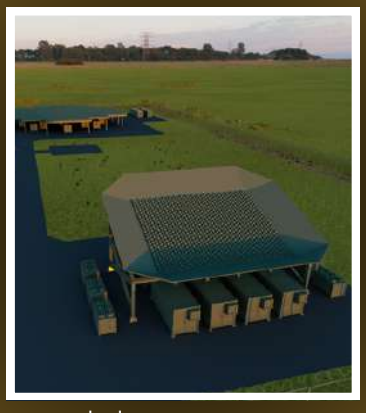
A new milestone in space power technology is approaching as a compact nuclear microreactor is set to be tested aboard the upcoming OCEAN satellite mission. Developed to deliver reliable, long-duration energy in orbit, the microreactor aims to support future spacecraft requiring higher power than solar arrays can offer. Engineers say the system's lightweight design, autonomous control and safety features make it ideal for deep-space missions. The test will evaluate performance, stability and power output, paving the way for next-generation propulsion and sustained off-planet operations.



nature.com

Microclimates shaped ancient sediment flows on Mars

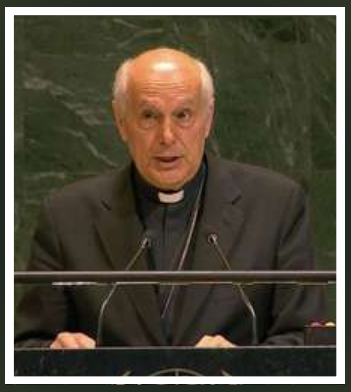
New research shows that Mars' microclimates strongly influenced how sediment-rich water once flowed across its surface. Experiments simulating pressures and temperatures from different Martian eras reveal that Noachian flows behaved much like those on Earth, while later Hesperian and Amazonian flows were dominated by boiling or freezing due to atmospheric loss. These changing conditions shaped distinct landforms, offering clues to Mars' paleo-atmospheric pressure. The study suggests that analyzing sediment flow morphologies could help reconstruct the planet's ancient climate.



thalesgroup.com

New Aurore radar enhances Europe's space security

Thales has introduced Aurore, a new space-surveillance radar designed to help Europe track satellites and detect orbital debris with greater precision. Built to operate day and night, the system identifies objects in low-Earth orbit and enhances awareness of congested space environments. Aurore supports defence, civil, and commercial users by providing real-time monitoring and improved collision-avoidance capabilities. Thales highlights that this radar will bolster Europe's strategic autonomy in space and contribute to safer orbital operations as traffic continues to grow worldwide.



vaticannews.va

Space weapons pose rising threats to global peace

The Holy See has warned that growing efforts to deploy or test weapons in outer space pose a serious risk to global peace and long-term human security. Archbishop Gabriele Caccia stressed at the UN that space must remain a cooperative domain, not one driven by rivalry or military escalation. He cautioned that actions harming satellites or generating debris could destabilise communication, navigation, and scientific systems worldwide. The Vatican urged nations to adopt binding agreements to preserve space as a peaceful environment for future generations.



unionrayo.com

Asteroid 2025 TF brushes past Earth closely today

A small asteroid named 2025 TF, measuring roughly 1–3 meters across, made an extremely close pass by Earth on October 1, flying just about 428 km above Antarctica—near the altitude of the International Space Station. Scientists detected it only hours after the flyby, highlighting the ongoing difficulty of spotting tiny, fast-moving space objects in advance. Although it posed no threat, the event serves as a strong reminder of how many small asteroids pass near our planet unnoticed.



spacenews.com

Satellite servicing demand rises as costs fall

The satellite-servicing market is expanding quickly as operators seek affordable ways to extend spacecraft life and reduce replacement costs. Lower mission expenses and advances in refueling, repair, and debris-removal technologies are making in-orbit support more practical than ever. Commercial players are testing reusable systems and new service models, while governments explore partnerships to boost orbital sustainability. Together, these trends are pushing routine satellite servicing closer to reality.



space.com

Japan launches advanced cargo spacecraft to ISS

Japan has launched its new-generation cargo spacecraft on its first mission to the International Space Station, marking a significant upgrade in the country's space logistics. The advanced vehicle is built to carry more supplies, scientific experiments, and essential equipment to support crews aboard the ISS. Its successful liftoff highlights Japan's expanding role in international space collaboration and its push for more efficient, reliable cargo transportation. This mission sets the stage for future improvements in resupply operations and demonstrates Japan's commitment to strengthening global space partnerships.

SATELLOGY

TRACKING THE PULSE OF SATELLITE INNOVATION AND ASCENT

Space trivia alert

Canada became the third nation to build its own satellite with Alouette 1 in 1962, studying the ionosphere?



indiatimes.com

LVM-3 rocket prepares for crucial naval satellite launch

ISRO's heavy-lift LVM-3 rocket has been positioned on the launchpad at Sriharikota ahead of its scheduled November 2 mission carrying a dedicated communications satellite for the Indian Navy. The 4,400-kilogram spacecraft will enhance secure maritime connectivity, support real-time operations, and strengthen surveillance across the Indian Ocean. Originally expected to fly earlier, the mission faced minor delays but is now fully set for liftoff following final checks. This launch marks another step in India's expanding defence space capabilities and long-term strategic communication infrastructure. It underscores India's commitment to advanced maritime security.



wmo.int

China unveils striking first images from FY-3H

China has released the first set of images from its newly launched FY-3H meteorological satellite, marking a major step in advancing global weather monitoring. The satellite's microwave imager captured detailed views of atmospheric temperature, humidity, sea-surface winds and cloud structures, offering improved data accuracy for forecasting and climate research. FY-3H's polar-orbiting design enhances coverage over oceans and polar regions, supporting disaster management and long-term environmental studies. These early images highlight the satellite's strong performance and its role in strengthening international collaboration on climate and weather observations.



financialexpress.com

DoT accelerates satellite spectrum plan

The Department of Telecommunications is pushing to finalise satellite-broadband spectrum allocation by December, aiming to enable commercial services in 2026. The decision awaits clarifications from TRAI on pricing, levies and subsidy structures reviewed by the Digital Communications Commission. Industry stakeholders expect quick pilot deployments once approvals are cleared, viewing satellite connectivity as a key enabler for bridging India's rural and remote-area coverage gaps. The faster timeline signals growing urgency to expand high-speed, nationwide digital access through next-generation satellite networks.



bbc.com

UK set for new satellite phone era

Virgin Media O2 will become the first UK network to offer automatic satellite connectivity in areas without mobile signal, launching O2 Satellite in early 2026 through a partnership with Starlink. Enabled smartphones will switch to satellite coverage for messaging, maps and location apps, though voice calls won't work initially. O2 may test WhatsApp calling before launch. The move follows Vodafone's successful satellite video call trial as competition grows in low-Earth-orbit services. Ofcom recently updated rules to support direct-to-device connections, despite astronomers warning satellites are cluttering the night sky.



adda247.com

Stellerus to launch world's first 3D wind satellites

Hong Kong startup Stellerus is set to deploy the Feilian Constellation, the first satellite network capturing three-dimensional wind data. This innovation promises transformative impacts on weather forecasting, renewable energy, aviation safety, disaster management, and insurance modeling. Leveraging cost-effective Chinese manufacturing, Stellerus plans six satellites to deliver hourly, kilometer-scale global wind maps. Led by NASA veteran Professor Hui Su, and in partnership with Chang Guang, the project bridges critical meteorological data gaps. The first two satellites are launching within 18 months.



space.com

Rocket Lab launches Japan's private Earth-imaging satellite

Rocket Lab successfully launched Owl, a Japanese private Earth-observation satellite operated by Synspective, into orbit. The satellite will provide high-resolution radar imagery to track urban development, disaster zones, and environmental changes, supporting faster and more precise monitoring from space. This mission highlights the growing role of private companies in Earth observation, offering cost-effective and timely data. Rocket Lab's Electron rocket ensured accurate orbital placement, demonstrating the increasing reliability of commercial launch services for global satellite operations.



eurekalert.org

AI space autopilot tackles Earth's growing satellite congestion

Space is increasingly crowded, with over 14,000 active satellites and 27,000 tracked objects, raising collision, debris, and light pollution risks. The ASIMOV project, led by AIKO and Politecnico di Milano, introduces an intelligent "space autopilot" to autonomously approach, map, and monitor inactive or non-cooperative satellites. Using AI-based navigation and reinforcement learning, it enhances orbital safety, inspection, and maintenance. Laboratory simulations at the ARGOS facility validate these systems, aiming to make space operations more sustainable and secure for future generations.

CUBETECH

PIONEERING THE FUTURE WITH COMPACT COSMIC INNOVATION

Space trivia alert

Aalborg University in Denmark launched AAUSAT-1 in 2003, a student-built CubeSat for remote sensing and education.



thehansindia.com

KLEF Students Make History With Triple Satellite Launch

KL Deemed to be University (KLEF) achieved a historic milestone by successfully launching three student-built satellites – KLSAT-2, CanSat, and KLJAC – from its Vaddeswaram campus. Designed by 34 students under expert guidance, the missions targeted environmental monitoring, tropospheric research, and CubeSat technology. KLSAT-2 boosted scientific data, CanSat reached national competitions, and KLJAC transmitted real-time atmospheric telemetry. Witnessed by dignitaries, this success highlights KLEF's dedication to innovation, indigenous space research, and inspiring India's next generation of space scientists.



abc13.com

Satellites offer weekly monitoring of aging bridges

Engineers worldwide, including University of Houston's Dr. Pietro Milillo, are using satellites to detect cracks as small as a credit card on bridges. This technology complements traditional inspections, offering weekly or bi-weekly monitoring to prevent damage and accidents. Focused on aging U.S. bridges like Houston's Sidney Sherman and Baytown's Fred Hartman, the approach aims to enhance safety as many structures reach their design life. Collaboration with transportation authorities is underway to integrate this advanced observation system.



mk.co

Nuri spacecraft fourth launch aims to boost private sector

NASA announced that Korea's Nuri spacecraft will launch its fourth mission on November 27, carrying 13 satellites including mid-size and cube satellites for research and technology verification. After three prior launches, this mission marks the first involvement of Hanwha Aerospace, transitioning production and assembly from state-led efforts to the private sector. The launch is expected to strengthen Korea's domestic space industry, enabling commercial satellite launches and advancing technological development. Public and institutional support remains key for ongoing success.



bloomberg.com

HK Startup to Revolutionize Wind Data Globally

Hong Kong startup Stellerus plans to launch a constellation of satellites to deliver the world's first 3D wind data, the SCMP reports. Founded in 2023 by HKUST academics, Stellerus will deploy two satellites within 18 months, followed by five more. The system aims to provide global coverage, serving aviation, shipping, insurance, and wind-farm sectors. Its 3D data captures wind speed, direction, and altitude, enhancing weather forecasts amid rising climate risks. AI will also analyze greenhouse gases to track atmospheric changes.



thebetterindia.com

Odisha innovators craft India's pioneering gamma-ray CubeSat

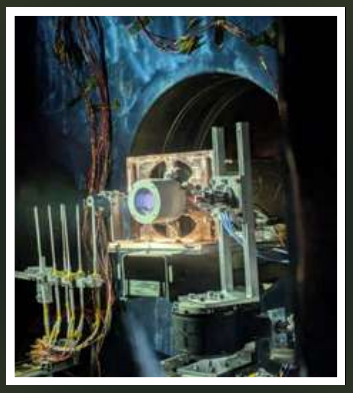
Two visionary students from Odisha's Nebula Space Organisation are building India's first gamma-ray detecting CubeSat to revolutionise affordable space research. Designed with locally sourced materials, the compact satellite will study cosmic gamma-ray bursts and solar flares from low Earth orbit. Their project merges innovation with education, showing how young minds can drive India's space future while inspiring students nationwide to explore astrophysics and satellite engineering.



voi.id

South Korea Prepares Historic Commercial Space Launch Soon

South Korea is set to make history with its first commercial space ride, the HANBIT-Nano, likely launching in November. Innospace, the private space startup, received approval from the Korean Space Agency for the SPACEWARD mission, completing all national safety, technical, and environmental requirements. The mission will deploy eight client satellites and experimental payloads to low Earth orbit. Brazil's Alcantara Space Center will host the launch, marking both countries' milestones in commercial space ventures. Exact timing depends on weather and inspections.



phys.org

ESA launches bold CubeSat mission to advance space-storm warnings

The European Space Agency's upcoming HENON mission marks the first time a CubeSat will operate independently in deep space, using its own ion engine and maintaining direct contact with Earth. Once placed in a distant retrograde orbit nearly 24 million km away, HENON will study solar emissions and aim to extend solar storm warnings from minutes to up to six hours. This innovative, autonomous spacecraft could revolutionize space-weather forecasting and pave the way for affordable, high-impact deep-space missions.

75 Students' Satellites Mission

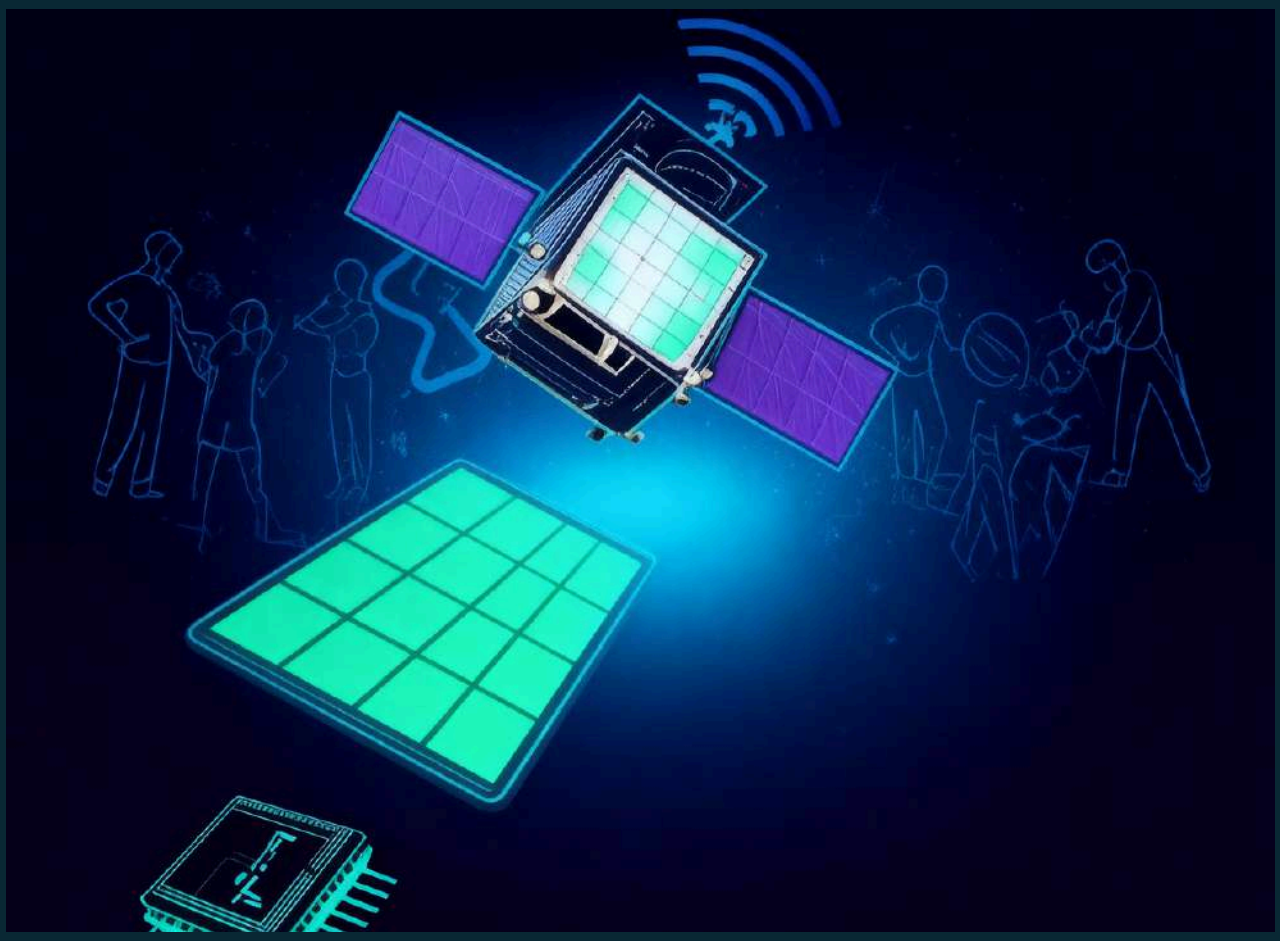
THE 75SSM

FROM LAB TO LAUNCH: INSIDE ITCA'S VANGUARD VISION

Space trivia alert

India's first satellite, Aryabhata (1975), conducted experiments in X-ray astronomy and solar physics.

High-efficiency power boost for reliable signal transmission



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 power amplifier boosts low-power signals to high-power levels for driving antennas, speakers, or other loads. Used in communication, audio, and embedded systems, it raises microcontroller RF outputs from about +10 dBm to around +30 dBm for reliable transmission. PA classes A, B, AB, C, and D balance efficiency and linearity. Key parameters include gain, efficiency, and linearity. Modern GaN and LDMOS designs enhance performance and integrate protective monitoring for improved reliability and safety.

SPACE@INDIA

TRACKING INDIA'S INDOMITABLE SPIRIT, RISING THROUGH SPACE

Space trivia alert

India's first radar imaging satellite, RISAT-1, launched in 2012, enables all-weather surveillance.



BlueBird-6, a 6.5-tonne LEO satellite from AST SpaceMobile, reached India for launch on ISRO's LVM3. The mission aims to provide direct mobile broadband and marks a major commercial milestone for ISRO.
Read more at: newindianexpress.com



ISRO has positioned the fully assembled LVM3 with CMS-03 at Sriharikota for a November 2 launch, delivering the 4,400-kg satellite to GTO to boost communication coverage across India's ocean regions.
Read more at: newsonair.gov.in



Gaganyaan is 90% complete, with three uncrewed missions planned before a 2027 crewed launch. NISAR is healthy, and NVS-02's valve issue has been identified.

Read more at: thgim.com

ISRO will launch the GSAT-7R satellite on November 2 to significantly strengthen the Indian Navy's secure sea-communication network across multiple frequency bands for improved maritime operations.
Read more at: google.com



ISRO hosted the ESTIC 2025 Curtain Raiser, highlighting space technology, innovation goals, collaboration, and a roadmap toward Viksit Bharat 2047, with emphasis on research, startups and future missions.
Read more at: pib.gov.in



Veteran space scientist and Padma Bhushan awardee Professor Dr. E.V. Chitnis, a key early architect of India's space programme and close associate of Vikram Sarabhai, has died at 100 after a remarkable career
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

"Spark Vision. Shape Innovation. Soar Beyond – The ITCA Way."

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