SPACE BEACON

INDIAN TECHNOLOGY CONGRESS

Beyond every week

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Issue 81



Stellar flares near Milky Way's black hole reshape center models

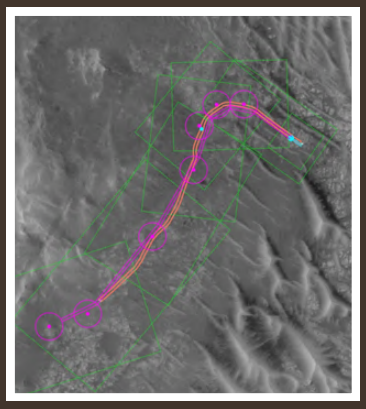
Astronomers detect intense stellar flares near our galaxy's supermassive black hole, offering new insights into extreme galactic environments.

ORBITAL

YOUR WEEKLY ORBIT THROUGH THE COSMOS' BOLDEST UPDATES

Space trivia alert

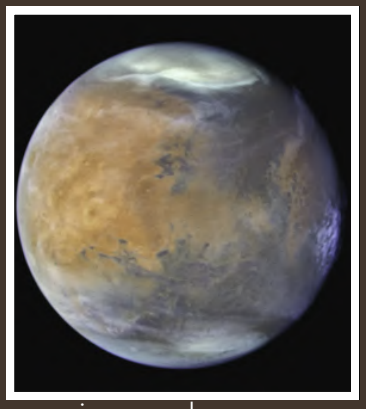
Pluto and Charon orbit a point between them, forming a rare binary system.



space.com

NASA rover completes first AI-planned drive on Mars

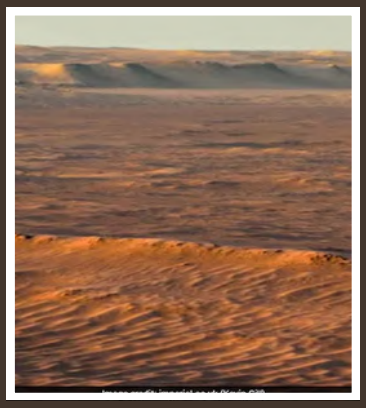
NASA's Perseverance rover has completed its first autonomous drive planned entirely by artificial intelligence, marking a milestone in planetary exploration. Using orbital imagery and terrain models, the AI identified hazards and generated safe navigation paths, allowing the rover to travel hundreds of meters without human route planning. The breakthrough could enable faster, longer, and more efficient Mars exploration by reducing reliance on Earth-based controllers and overcoming communication delays between planets.



asiaresearchnews.com

Unusual Mars dust storm reveals new clue to water loss

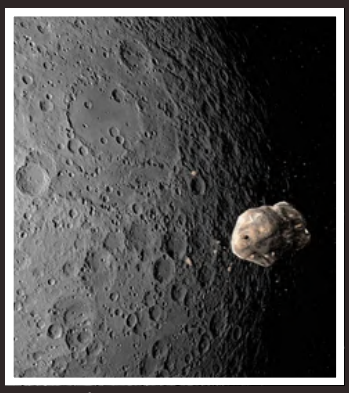
Scientists have discovered that a rare, localized dust storm on Mars pushed water vapor high into the planet's atmosphere, where it could break apart and escape into space. Observations from ESA's ExoMars Trace Gas Orbiter showed the storm triggered unexpected vertical transport of water and increased hydrogen loss, revealing a previously unknown pathway for Mars to lose water. The findings help explain how the once-wet Red Planet gradually became the dry, cold world seen today.



ndtv.com

Ancient Mars beach hints at past habitable environment

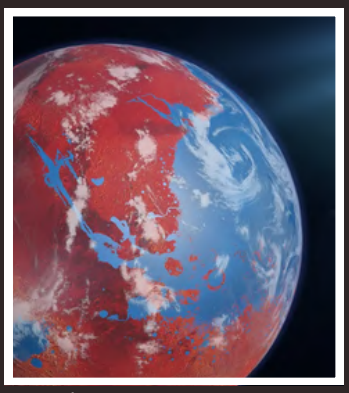
NASA's Perseverance rover has found evidence of a 3.5-billion-year-old beach in Jezero Crater, revealing Mars once had a vast lake with wave-shaped shorelines. Rounded mineral grains and eroded rocks suggest long-lasting water activity, similar to habitable coastal environments on Earth. Scientists say the discovery extends the timeline for Mars' potential habitability and strengthens theories that the Red Planet once had a warmer, wetter climate capable of supporting life.



livescience.com

Asteroid may hit Moon, causing flash visible from Earth

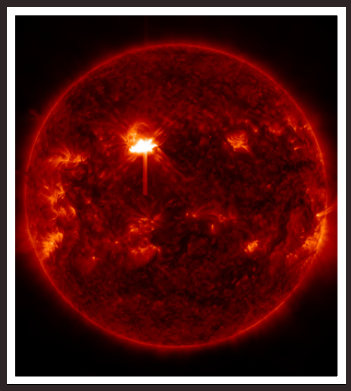
Asteroid 2024 YR4, a building-sized near-Earth object discovered in 2024, has a small chance of striking the Moon in 2032. Scientists say the impact could produce a bright flash lasting minutes—potentially visible from Earth—and eject huge amounts of lunar debris into space. Some fragments could fall toward Earth, triggering rare meteor storms, while others would create secondary flashes on the Moon. Although the collision probability is low, researchers view it as a unique real-time experiment to study asteroid impacts, planetary defense, and lunar geology.



livescience.com

Ancient Arctic-sized ocean once covered half of Mars

New high-resolution orbital images suggest Mars once hosted an ocean as large as Earth's Arctic Ocean, covering much of the planet's northern hemisphere around 3.37 billion years ago. Scientists identified ancient river deltas and shoreline features at consistent elevations, indicating a stable coastline and long-lasting body of water. The discovery strengthens evidence that Mars was once warm and wet, improving our understanding of its climate evolution and boosting prospects for past habitability on the Red Planet.



science.nasa.gov

Strong solar flare erupts, raising concerns for space weather

NASA reports a strong X1.5-class solar flare erupted on Feb 3, 2026, releasing intense bursts of energy from the Sun. Solar flares are powerful explosions that can disrupt radio communications, navigation signals, satellites, and power grids, while also posing risks to spacecraft and astronauts. The event was captured by NASA's Solar Dynamics Observatory, which continuously monitors solar activity during the current Solar Cycle 25. Scientists track such flares to predict space weather impacts and issue warnings through official monitoring agencies.



space.com

Blood Moon total lunar eclipse set to light skies

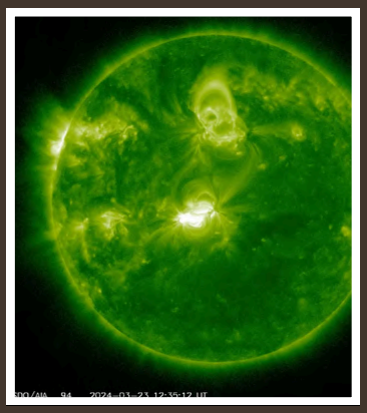
A spectacular total lunar eclipse, also known as a "blood moon," will occur on March 3, 2026, marking the only total lunar eclipse of the year and the last until 2028. During the event, Earth's shadow will cover the Moon, turning it red for about 58 minutes. The eclipse will be visible across North America, East Asia, Australia, and the Pacific, with billions able to witness it. The full eclipse, including partial phases, will last several hours, offering a rare and safe celestial show for skywatchers worldwide.

GENSPACE

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

Space trivia alert

Moonquakes: The Moon experiences quakes, some caused by tidal forces from Earth, which can last up to 10 minutes.



smh.com

SpaceX seeks approval for massive orbital AI data centres

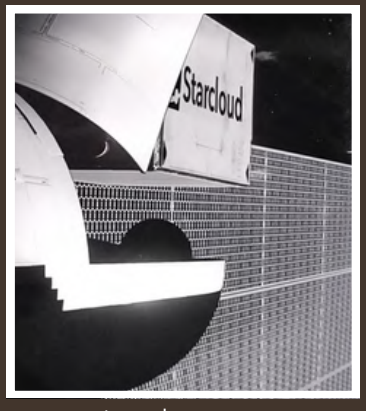
SpaceX has requested regulatory approval to launch up to one million solar-powered satellites designed to function as orbital data centres for artificial intelligence workloads. The proposed constellation would orbit between 500 and 2,000 km, using continuous solar energy and laser links to deliver massive computing power while reducing terrestrial energy costs. The plan is part of Elon Musk's broader vision for space-based AI infrastructure and a multi-planetary future, but it faces scrutiny over space debris and regulatory approval.



earthsky.org

Mission to create artificial solar eclipses from Moon

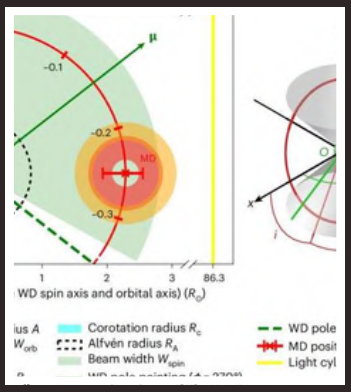
Scientists have proposed a Moon-Enabled Sun Occultation Mission (MESOM) that would use the Moon to block the Sun's glare, creating artificial solar eclipses in space. This would allow long, high-resolution observations of the Sun's corona to better understand solar storms and space weather. Unlike rare natural eclipses, the mission could provide extended observation windows monthly, improving forecasting of solar activity and protecting modern technology from disruptive solar events.



imeche.org

Solar-powered AI satellites could reshape future data centres

Engineers are exploring orbit as a new frontier for AI data centres, driven by rising energy demand, land constraints, and environmental concerns on Earth. Solar-powered satellites could provide near-constant energy, scalable computing capacity, and efficient cooling in space. However, experts warn of major challenges, including radiation damage, thermal management, communication latency, space debris, and high launch costs. While orbital computing could reshape AI infrastructure, its technical and economic feasibility remains uncertain and complex.



phys.org

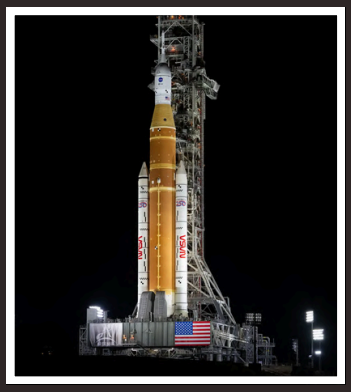
Slow radio pulses reveal surprising white dwarf cosmic systems

Astronomers have detected mysterious slow radio pulses from space, repeating every minutes or hours–far slower than known pulsars. A new study suggests these signals may come from white dwarf stars in binary systems, where magnetic interactions generate powerful radio beams. One source, GPM J1839-10, shows a stable repeating pattern that hints at orbiting stellar companions. The discovery challenges existing theories of stellar remnants and could bridge the gap between pulsars and newly discovered long-period cosmic radio transients.

bbc.com

SpaceX plans AI expansion with space-based data centres

Elon Musk says SpaceX could scale artificial intelligence by placing data centres in orbit, arguing space offers unmatched energy and cooling potential. The idea links satellite networks with AI computing, but critics warn about costs, feasibility, and orbital congestion risks. The proposal reflects Musk's broader vision of integrating AI, space infrastructure, and interplanetary ambitions, though experts question whether such projects are realistic in the near term.



nasa.gov.com

NASA starts Artemis II launch rehearsal countdown

NASA has started the countdown for the Artemis II wet dress rehearsal, a critical full-scale test simulating launch operations and rocket fueling before the first crewed Moon mission in over 50 years. Engineers run through detailed countdown procedures, fuel the Space Launch System rocket, and practice Orion spacecraft closeout operations to validate systems and identify potential issues. The rehearsal helps to finalize launch readiness and improve mission safety before setting an official launch date for the historic lunar flyby mission.



space.com

First imaged black hole fires massive cosmic jet

Astronomers have observed the first-ever imaged black hole, M87*, producing a massive 3,000-light-year-long jet emerging from its glowing accretion ring. Using Event Horizon Telescope data, scientists traced the jet's origin close to the black hole's shadow, revealing how matter and magnetic fields drive powerful cosmic outflows. This breakthrough links black hole feeding processes with jet formation, helping explain how supermassive black holes influence galaxy evolution and surrounding space environments.

SATELLOGY

TRACKING THE PULSE OF SATELLITE INNOVATION AND ASCENT

Space trivia alert

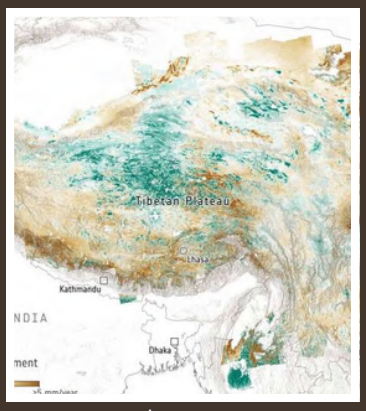
IRNSS-1A was India's first NavIC satellite for regional navigation.



indiatoday.in

Europe plans Draco satellite crash to study space debris

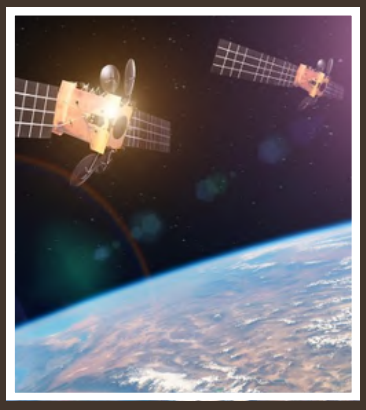
Europe is preparing a bold "suicide mission" called DRACO, where a washing machine-sized satellite will be deliberately destroyed during atmospheric reentry. The mission aims to study how spacecraft burn up, break apart, and release pollutants, helping scientists design safer satellites and reduce space debris. Packed with sensors and cameras, DRACO will capture real-time data during its fiery descent, supporting Europe's Zero Debris initiative and improving future space sustainability.



phys.org

Satellite data reveals Tibet's tectonic plates are weaker

Scientists have used satellite measurements to map how tectonic plates collide beneath the Tibetan Plateau, revealing that the crust is weaker and more complex than previously believed. High-resolution data from Copernicus Sentinel-1 and GNSS satellites show parts of the plateau stretching, compressing, and moving in different directions, offering new insights into how continents deform and mountains form. The findings could improve earthquake risk assessments and deepen understanding of continental collision processes shaping the Himalayas.



thefastmode.com

One NZ Brings WhatsApp Calling via Satellite

New Zealand telco One NZ has expanded its satellite-to-mobile service to include limited data access and WhatsApp voice calling, moving beyond its earlier text-only satellite messaging. Powered by SpaceX's Starlink Direct-to-Cell satellites, the service supports select apps and basic connectivity in remote areas without mobile coverage. Launched in 2024, the satellite service has already delivered millions of messages and aims to provide a reliable safety and communication lifeline across rural and hard-to-reach regions.



scientificamerican.com

SpaceX plans one million satellites to power orbital AI

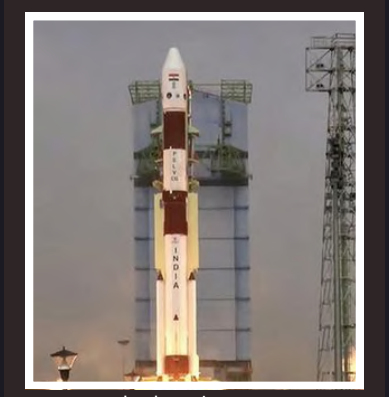
SpaceX has filed plans with U.S. regulators to launch up to one million satellites that would act as space-based data centers for artificial intelligence. The proposed constellation aims to process massive AI workloads using solar power in orbit, potentially reducing energy strain on Earth-based data centers. While the concept could revolutionize global computing infrastructure and cloud services, experts warn about orbital congestion, debris risks, and governance challenges from such an unprecedented megaconstellation.



varindia.com

SpaceX launches Stargaze to prevent satellite collisions

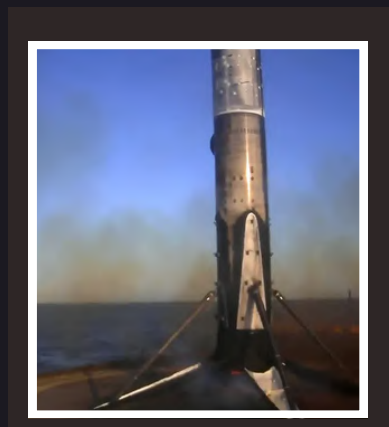
SpaceX has introduced Stargaze, a space situational awareness system designed to reduce collision risks in increasingly crowded low Earth orbit. The platform tracks satellites and debris, sharing real-time conjunction and orbital data freely with other operators to improve coordination. By enabling faster and more accurate collision alerts, Stargaze aims to shift space traffic management from reactive maneuvers to proactive prevention, supporting safer and more sustainable satellite operations worldwide.



thehindu.com

PSLV failures under probe as ISRO targets June comeback

India is investigating recent Polar Satellite Launch Vehicle (PSLV) mission failures, with technical teams analysing telemetry and appointing an independent review panel. The government confirmed no sabotage evidence and said the failures had different causes. Despite setbacks, ISRO plans to return the PSLV to flight by June, signalling confidence in fixes and continued demand from global partners. Officials stressed that India's broader space programme, including future missions, remains unaffected.



space.com

Falcon 9 launches Starlink satellites in latest California mission

SpaceX launched a Falcon 9 rocket carrying a new batch of Starlink internet satellites from Vandenberg Space Force Base in California, continuing its rapid expansion of the global broadband network. The reusable first-stage booster successfully landed on the drone ship Of Course I Still Love You in the Pacific Ocean, demonstrating SpaceX's routine recovery capability. The mission adds to the growing Starlink constellation, which aims to provide high-speed, low-latency internet worldwide, including remote and underserved regions.

CUBETECH

PIONEERING THE FUTURE WITH COMPACT COSMIC INNOVATION

Space trivia alert

RAX-2, a University of Michigan CubeSat, gave students real-time space weather data.



ntu.edu

NTU launches three space tech projects for testing

Nanyang Technological University (NTU) Singapore has announced three new space projects to validate emerging space technologies, including AI-powered satellites, advanced propulsion systems, and high-resolution imaging payloads. One nanosatellite will process data directly in orbit using edge-AI, while another will test electric propulsion and study material durability in harsh space environments. A third project will validate a new optical imaging system on the International Space Station. The initiatives aim to accelerate space innovation and commercialisation in Singapore's growing space ecosystem.



economist.com

South Korea advances new space rocket development plans

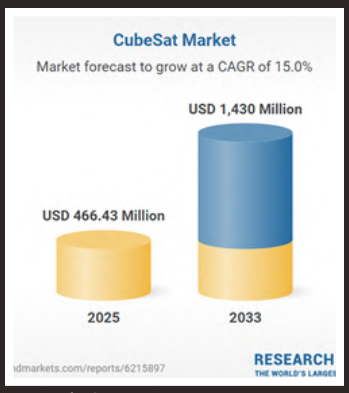
South Korea is accelerating its space program with plans to develop advanced launch vehicles and expand satellite and deep-space missions. The government aims to enhance independent launch capabilities, boost private-sector participation, and build a strong domestic space industry. Officials highlighted goals such as lunar exploration, deep-space communication technology, and next-generation rockets to support future missions. The initiatives are part of a long-term strategy to position South Korea as a major global space power and strengthen scientific, commercial, and security capabilities.



sarawaktribune.com

i-CATS CubeSats give students hands-on space research

i-CATS University College is using its own CubeSat projects as a hands-on research platform to train future space engineers and scientists. These small, low-cost satellites give students practical experience in designing, building, testing, and operating spacecraft systems. CubeSats are also used for environmental monitoring, telecommunications, disaster response, and technology demonstrations. The programme integrates industry partnerships and global collaborations, helping students understand real aerospace workflows, regulations, and mission operations while promoting innovation and applied research in Sarawak's growing space ecosystem.



globenewswire.com

Global CubeSat market set to triple by 2033

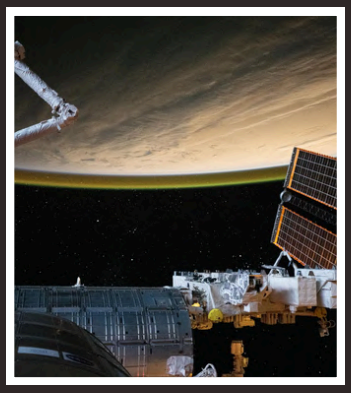
A new CubeSat research report predicts the global CubeSat market will grow from about $466 million in 2025 to $1.43 billion by 2033, driven by rising demand for low-cost satellites, space research, and commercial services. CubeSats are widely used for Earth observation, communications, education, and technology testing due to their low cost and flexibility. Growing investments in space exploration and private satellite networks are accelerating adoption, although challenges like limited power and space debris remain key concerns for the industry.



theborneopost.com

Sarawak plans CubeSat program for land monitoring

Sarawak is exploring CubeSat satellites to strengthen environmental and land monitoring, aiming to track deforestation, land use, and natural resource management more efficiently. The state government is studying collaborations with universities and space agencies to develop affordable small satellites and local expertise. Leaders see space technology as a strategic tool for sustainable development, disaster management, and data-driven policymaking, signaling Sarawak's intent to build a homegrown space capability.



nasa.gov

Biomedical research and CubeSat launches dominate ISS science schedule

NASA's Expedition 74 crew focused on biomedical studies and CubeSat deployments, highlighting ongoing research aboard the International Space Station. Astronauts collected health data to study how the human body adapts to microgravity, supporting future deep-space missions. Meanwhile, student-built CubeSats from multiple countries were deployed from the Kibo module for Earth observation and technology demonstrations. The crew also managed cargo operations and prepared for upcoming crew missions, keeping the station's scientific and operational agenda on track.



esa.int

Hera CubeSats will explore asteroid interior and surface details

ESA's Hera mission will deploy two CubeSats–Milani and Juventas–to study the Didymos asteroid system in unprecedented detail. Milani will analyze surface composition and dust, while Juventas will probe the asteroid's interior using low-frequency radar, providing the first subsurface scan of an asteroid. These briefcase-sized satellites will test advanced inter-satellite links and distributed mission architectures, supporting planetary defense research and future deep-space exploration strategies.

THE 75SSM

FROM LAB TO LAUNCH: INSIDE ITCA'S VANGUARD VISION

Space trivia alert

Chandrayaan-3 made a smooth landing on the Moon, showing India's growing skills in space exploration.

I²C Arbitration Enables Safe Multi-Master Bus Sharing Globally



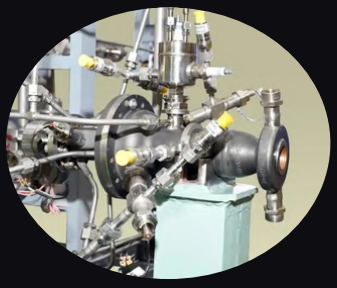
The 1U CubeSat, flagship of the 75SSM, marks a major leap in student-driven space innovation. It shows that when students are equipped with tools, mentorship, and ambition, they can redefine the frontiers of space technology. With its compact 10 cm^3 frame, the 1U CubeSat delivers capabilities rivaling larger satellites–making launches more accessible and affordable for educational institutions and emerging space nations. I^2C enables multiple masters on one bus using bit-level arbitration on the open-drain SDA line. During address and data transfer, each master monitors the bus and compares the actual level with its intended bit. If a master sends a high but reads a low, it immediately stops and yields control. The device transmitting the lowest binary value wins, ensuring non-destructive arbitration, preserved data integrity, and no extra bus-control hardware for reliable multi-controller embedded system communication.

SPACE@INDIA

TRACKING INDIA'S INDOMITABLE SPIRIT, RISING THROUGH SPACE

Space trivia alert

Cartosat satellites deliver high-resolution images for planning, resources, and defense.



ISRO successfully conducted a hot test of a sub-scale thrust chamber for its LOX-methane engine, advancing next-generation launch vehicle development and validating injector and combustion performance.
Read more at: thehindu.com



IISRO confirmed Chandrayaan-4 will collect and bring lunar samples back to Earth, marking a major leap in India's deep-space exploration capabilities.
Read more at: moneycontrol.com



Former ISRO chief A.S. Kiran Kumar said India focused on societal benefits like communication and weather services, unlike militarised global space programs.
Read more:aninews.in



Intense solar storms from active sunspots are prompting global alerts; ISRO tracks 50+ Indian satellites amid blackout and GPS disruption risks.
Read More: indiatvnews.com



ISRO launches IMEx-2026 to invite Indian researchers to propose diverse microgravity experiments for human spaceflight missions and future Bharatiya Antariksh Station.
Read more at: isro.gov.in



ISRO investigates back-to-back PSLV failures with internal and external reviews; sabotage dismissed and a June return-to-flight launch is targeted.
Read more at: thehindu.com

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

Space-Comm Europe
4 – 5 March 2026
London ExCeL, London, UK
space-comm.com

International Conference on Astronomy and Space Sciences ICASS
February 16-17, 2026 in Mumbai, India
conferenceindex.org

International Conference on Aeronautical and Aerospace Engineering ICAAAE
Feb 23-24, 2026 in New Delhi, India
conferenceindex.org

Slogan of the week

"Visionary Designs, Perfect Precision"
– The ITCA Way

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