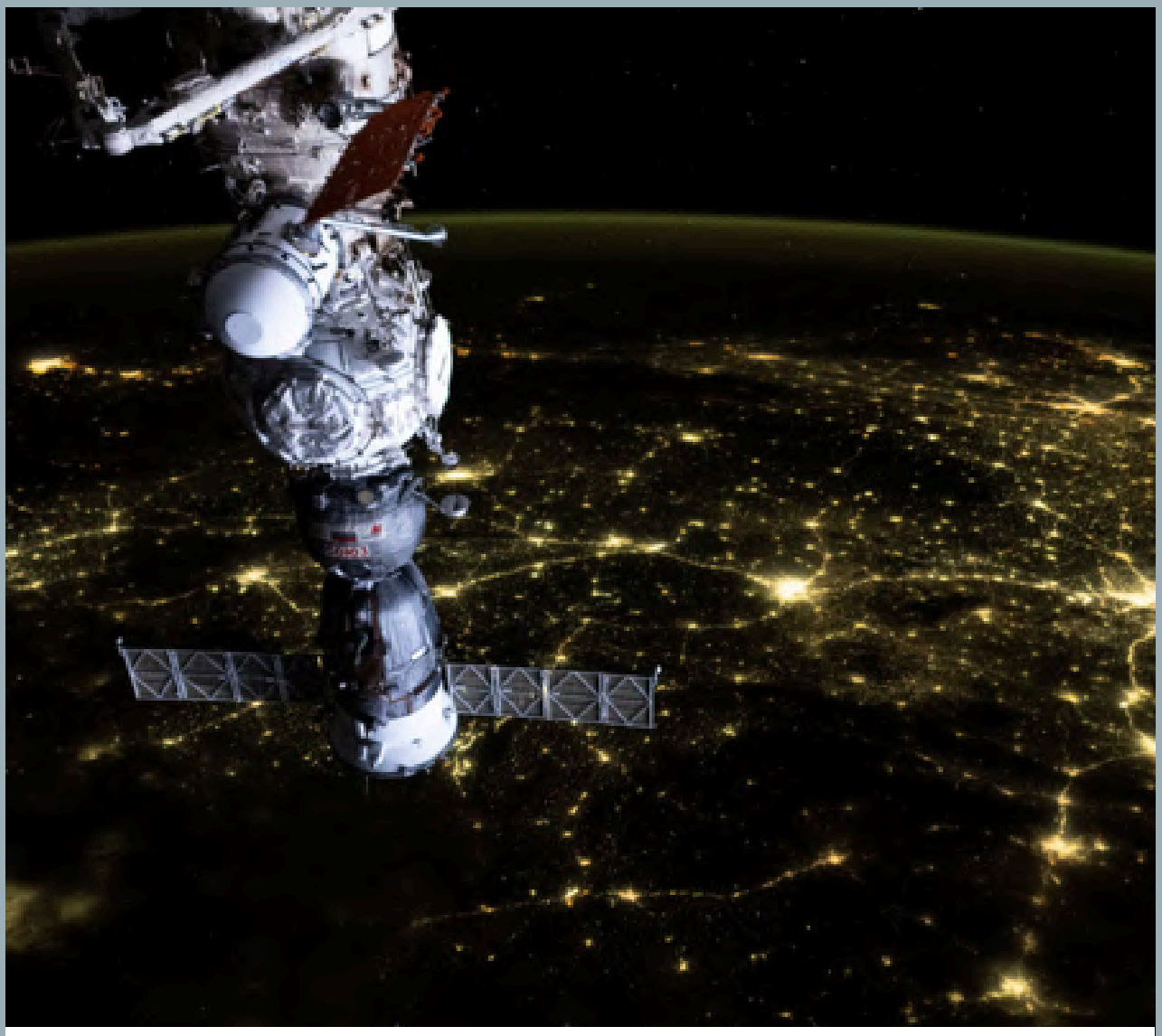
ISSUE 41 | 16 APRIL 2025

Space Beacon



City lights twinkle across India as seen from space, with stars shining above – a stunning nighttime view from ISS

Stay up-to-date with the latest in spacetech

INDIAN TECHNOLOGY CONGRESS ASSOCIATION

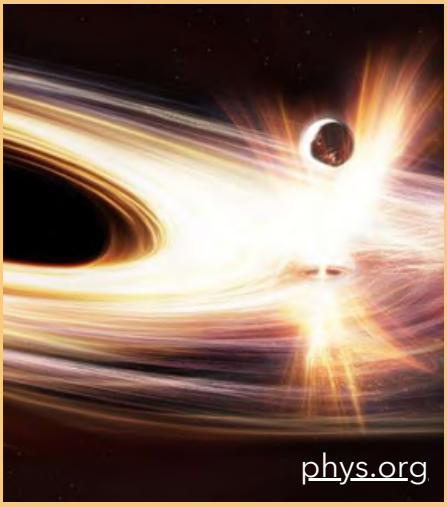
Orbital

Lead with the most significant celestial events and discoveries

Did you Know
Saturn's density is lower than water, if you could place Saturn in a giant bathtub (an enormous one!), it would float, as its density is less than that of water

Sleeping Giant: Black Hole Suddenly Awakens in Galaxy

Astronomers have observed an unprecedented awakening of a supermassive black hole in a distant galaxy. Located in SDSS1335+0728, this black hole, previously dormant, began emitting intense radiation, suggesting it's consuming surrounding material. This rare transformation is the first time scientists have witnessed such a change in real-time. The galaxy's brightness has drastically increased, confirming the black hole's dramatic activity. Researchers say this could shed new light on how supermassive black holes behave and evolve across the universe.

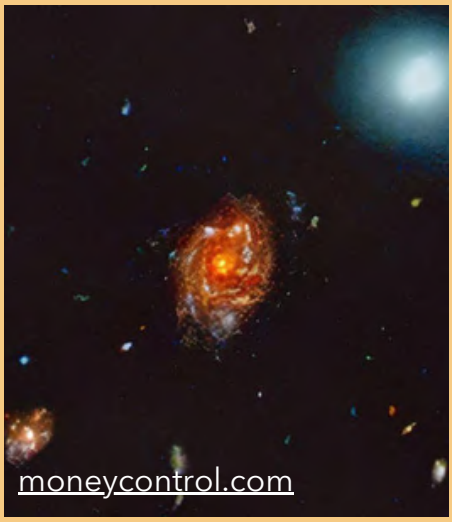


New Lunar Study Challenges Moon's Origin Timeline

A recent study has challenged established theories about the Moon's history. By analyzing lunar samples and modeling orbital dynamics, scientists now suggest the Moon may have formed much earlier than previously believed. The findings hint at a more complex and violent formation process, potentially involving a massive impact event with early Earth. These findings and refine space exploration goals. This could shed new light on one of astronomy's oldest mysteries: how the Moon truly formed.

Solar Wind Squashes Jupiter's Magnetic Field Shape

New data reveals how powerful solar winds dramatically compress Jupiter's magnetosphere, deforming it like a giant squash ball. Using observations from NASA's Juno spacecraft, scientists witnessed a fast-moving solar storm slam into the planet's magnetic field. The event triggered stunning auroras and offered insights into how Jupiter's magnetosphere protects its atmosphere. This highlights how dynamic and extreme space weather can be in the outer solar system—key for exoplanet research and future gas giant missions.


moneycontrol.com

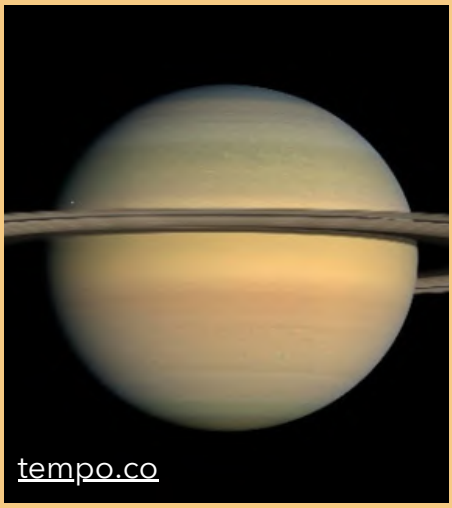
12-Billion-Year-Old 'Wheel' Galaxy Stuns Astronomers

Astronomers have discovered a massive wheel-shaped galaxy that's nearly 12 billion years old—formed just 1.5 billion years after the Big Bang. It's perfectly circular shape and surprisingly mature structure defy current models of galaxy evolution, which predict more chaotic early galaxies. This "too-early-to-exist" galaxy suggests that massive, structured galaxies formed much sooner than believed. The discovery could be a major revision in our understanding of early cosmic history, dark matter distribution, and galaxy formation processes in the infant universe.


dailygalaxy.com

Astronomers Find 'Super Venus' Unlike Any Planet

A scorching-hot exoplanet, described as a "Super Venus," has been discovered, challenging our understanding of planetary systems. Located around a star 40 light-years away, this planet has extreme surface temperatures and thick, toxic clouds. While similar in size to Venus, its proximity to its star makes it uninhabitable. The planet's unique features make it an ideal target for atmospheric studies with the James Webb Space Telescope. This discovery adds to the diversity of known exoplanets and could reveal the fate of rocky worlds in other star systems.


tempo.co

Saturn's Moon Count Rises With 128 New Discoveries

Saturn now officially has 145 moons, thanks to the recent discovery of 128 new ones. Researchers used advanced algorithms to sift through telescope data, tracking small, faint moons orbiting the gas giant. These tiny natural satellites were difficult to detect until now due to their size and distance. This record-breaking moon count surpasses Jupiter's, making Saturn the new moon king of the solar system. The findings provide valuable insights into the planet's formation, ring system, and gravitational influence.

Distant stars and orbiting planets, paint a picture of our cosmic neighborhood

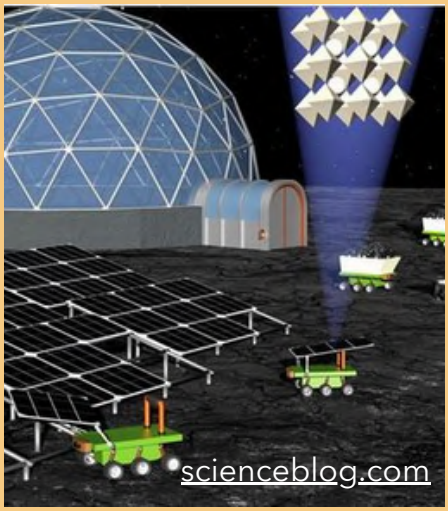
Genspace

Cover broader space news not fitting into other categories

Did you Know
Black Holes, regions of space with gravity so intense that even light can't escape. They continue to intrigue scientists and challenge our understanding of physics

Moon Dust Solar Cells May Power Space Future

Scientists are developing solar cells using lunar regolith—moon dust—to power future space missions. The concept could revolutionize energy infrastructure for long-term lunar bases, offering an efficient and sustainable solution without needing to transport materials from Earth. By leveraging in-site resources, these solar panels could reduce costs and improve the viability of deep space exploration. This development aligns with broader strategies to create self-sufficient extraterrestrial outposts.



Multi-Orbit Partnerships Shape Inflight Connectivity

The future of inflight connectivity is expanding with multi-orbit and multi-partnership strategies. Satellite operators are combining geostationary and low Earth orbit capabilities to deliver seamless, high-speed internet for aviation. These collaborations are redefining passenger experiences while enhancing airline operations. Key players are forming alliances to address bandwidth, latency, and coverage challenges through hybrid constellations and ground network integration. This shifts toward always-on connectivity, making the skies as connected as the ground.

New Space Telescope To Map Earth's Magnetosphere

A new space mission aims to launch a constellation of satellites to study Earth's magnetosphere in unprecedented detail. This mission will use coordinated satellite observations to track how solar wind and magnetic field interactions affect our planet. These insights could improve space weather forecasting and protect satellites and power grids. The mission leverages advanced technology and global collaboration to monitor geomagnetic phenomena, enabling key discoveries in Earth-space interactions.

esa.int

ESA’s ALEK Passes Harsh Test for Space Rider

ESA's Space Rider vehicle, a reusable uncrewed spacecraft, has completed critical testing for its onboard system ALEK (Advanced Landing Evaluation Kit). ALEK underwent extreme conditions including intense vibrations, shocks, and acoustic noise to simulate launch and re-entry stresses. This testing ensures system reliability for future missions, marking a major step toward ESA’s vision for sustainable, affordable access to low Earth orbit. Space Rider will support various science and tech payloads, providing a unique platform for orbital experiments and payload return.

solardaily.com

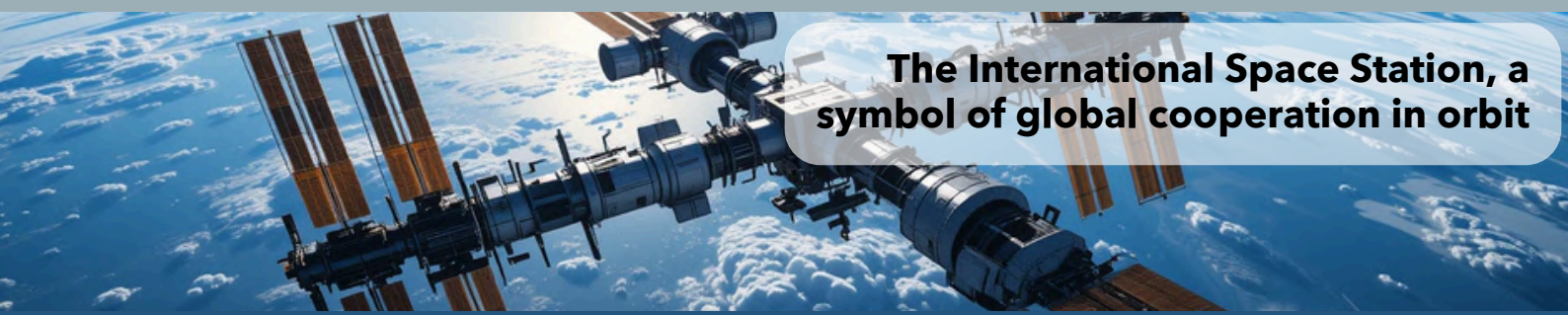
Rocket Lab Launches Custom Solar Arrays for Space

Rocket Lab has successfully launched tailored solar arrays designed for next-generation satellite missions. These high-efficiency, lightweight arrays meet the growing demand for power in small spacecraft and are part of Rocket Lab’s broader expansion into satellite hardware. By delivering power systems alongside launch services, Rocket Lab offers an end-to-end solution for mission operators. These innovations are crucial for missions requiring compact yet robust power sources, especially in low Earth orbit and deep space applications.

space.com

All-Female Blue Origin Crew in the latest spaceflight

Blue Origin's upcoming all-female spaceflight will feature custom flight suits designed by fashion brand Monse, merging style with function. Pop star Katy Perry headlines the mission alongside other influential women, celebrating diversity in private spaceflight. The bespoke suits balance safety and aesthetics, representing a cultural milestone in commercial space travel. This mission underscores the growing role of branding and personal identity in space exploration, appealing to a broader audience and inspiring the next generation of space enthusiasts.



The International Space Station, a symbol of global cooperation in orbit

Satellogy

Focus on recent and upcoming satellites and launches

Did you Know
Ariel 1 (1962 - UK), The first satellite launched by the UK, it conducted scientific experiments to study the Earth's upper atmosphere and its interactions with solar radiation

Foo Fighter Missile Tracking Satellites Move Forward

Foo Fighter missile tracking satellites have passed their Critical Design Review and are on track to enter production ahead of a 2027 launch. This advancement signifies a major step in enhancing missile defense capabilities with new space-based technologies. The satellites will play a crucial role in tracking potential threats, improving security. This breakthrough is pivotal in military and defense operations. The successful review sets the stage for continued development and eventual deployment into space.

NOAA Budget Cuts Impact Weather Satellites

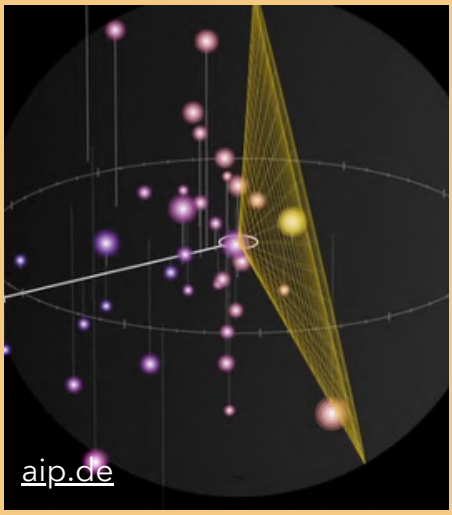
The NOAA's latest budget proposal includes significant adjustments that will affect weather satellite projects and other space programs. These changes aim to ensure better forecasting, satellite management, and space missions. However, proposed budget cuts could lead to delays or reductions in several satellite projects. The funding adjustments will influence key areas of environmental and atmospheric monitoring, potentially impacting climate research and weather predictions.

TruePoint FOCUS Delivers Real-Time Precision Solutions

Rx Networks has launched TruePoint FOCUS, a revolutionary system designed to provide real-time centimeter-level positioning precision. This breakthrough technology will enable precise navigation for applications requiring high accuracy, such as autonomous vehicles and geospatial services. By delivering pinpoint accuracy, the system aims to enhance industries like agriculture, transportation, and surveying. This advancement marks a significant step in location-based technologies, ensuring reliability and efficiency.

Weather Satellite Fleet Enhances Storm Forecasting

A new operational weather satellite has been added to the fleet, enhancing the capability to forecast severe storms on Earth. This satellite will improve weather prediction models, especially in monitoring and tracking intense weather patterns. The new addition completes the fleet, helping to provide better data for storm forecasting, disaster preparation, and mitigation strategies. With enhanced capabilities, the satellite will contribute to global safety and climate monitoring.



Andromeda's Satellites Challenge Cosmology

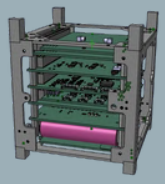
Recent observations show satellite alignment around the Andromeda galaxy that challenges existing cosmological models. This unexpected alignment could offer new insights into galactic structures and their behaviors. Scientists are revisiting their understanding of galaxy formation and gravitational interactions in light of these new findings. The results could reshape current theories on the universe's evolution and deep space observations. The alignment remains a focal point for researchers aiming to decode cosmic mysteries.

LEO Satellite Market to Reach 42,600 by 2032

The global low Earth orbit (LEO) satellite industry is set for massive growth, with projections indicating a rise to 42,600 active satellites by 2032, according to a new report. This growth will be fueled by defense, intelligence, and commercial applications, especially in communications and Earth observation. North America is expected to lead in LEO satellite deployments, while Asia-Pacific regions are also rapidly increasing investments. The increasing demand for broadband, real-time data, and global coverage is driving innovation and deployment.

The quest for knowledge, satellites driving scientific discovery

CubeTech

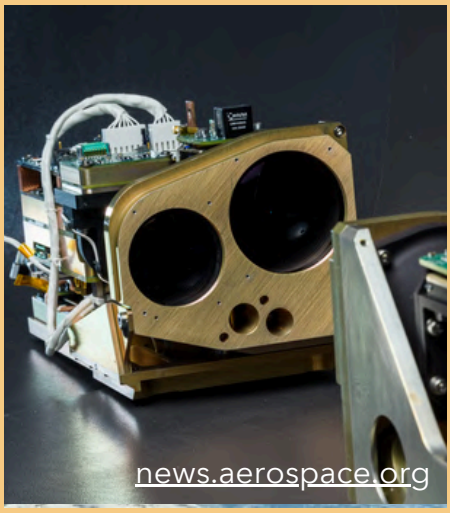


Showcase innovative CubeSat missions and unique payloads

Did you Know
Earth Observation - Dove Satellites, Planet Labs deploys Dove CubeSats, which provide high-resolution images of Earth daily for environmental and agricultural monitoring

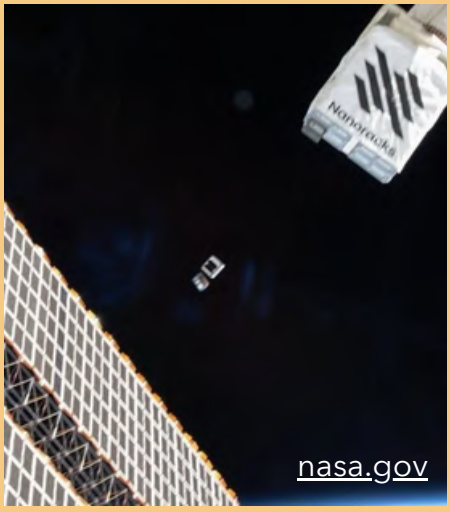
CubeSats and Optical Tech Enhance Data Sharing

Cubesats are advancing space communication by incorporating optical data transmission. Recent experiments have shown how this technology could enhance bandwidth capabilities and allow for more efficient data sharing between space systems. By leveraging the capabilities of small, cost-effective satellites, the industry can look forward to enhanced global communications and more efficient mission operations. This innovation could pave the way for faster, more reliable communication networks for future space missions.



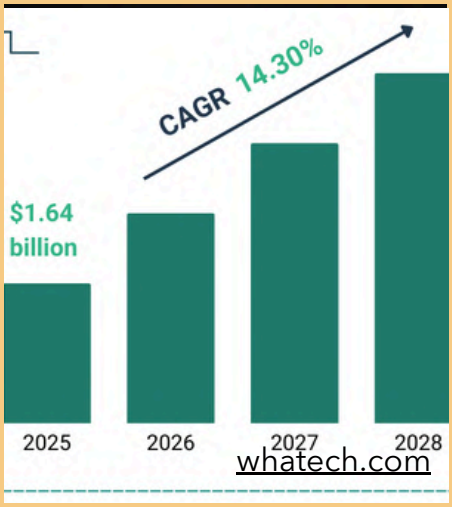
NASA Unveils 4th CubeSat Mission Candidates

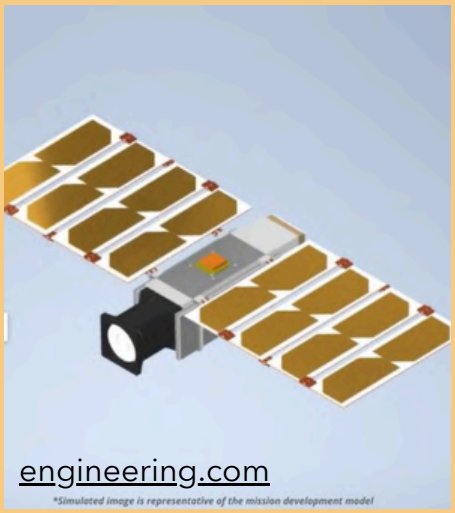
NASA has selected four CubeSat mission candidates as part of its efforts to enhance space exploration. These small satellite projects will focus on diverse goals, from monitoring space weather to studying lunar regolith. The new missions are expected to contribute valuable scientific data and further NASA's space research goals, providing a cost-effective method for tackling space exploration challenges. This initiative highlights NASA's commitment to innovative, scalable technology for deepening our understanding of space.



Space Onboard Computing Platforms Poised for Growth

The space onboard computing platform industry is poised for significant growth in 2025 and beyond. These advanced systems are integral to improving satellite and spacecraft functionality, from enhancing artificial intelligence capabilities to enabling autonomous operations. Experts predict that space-based computing will become essential for a wide range of space missions, from commercial satellite deployments to government-led exploration efforts. This surge is driven by the growing demand for real-time data processing and reduced reliance on ground control.





Aitech's IQSat uses AI to optimize satellite networks

Aitech's innovative IQSat platform integrates AI technology to improve the performance of picosatellite constellations. This cutting-edge system promises to increase efficiency in satellite communications by providing autonomous decision-making capabilities. The IQSat's AI-powered constellation could streamline operations, optimize resource allocation, and provide cost-effective solutions for a variety of space applications, from Earth observation to deep space exploration.

Flocking CubeSats Boost Farming Efficiency from Space

A new study shows how CubeSat constellations could transform agricultural practices. Using advanced flocking technology, groups of CubeSats could work in sync to collect real-time environmental data, enabling farmers to optimize their operations. By offering cost-effective, high-resolution data collection, CubeSats could revolutionize precision farming, improving crop yields and reducing waste. This breakthrough paves the way for smarter, more sustainable agriculture worldwide.

LEO Satellites Pave the Way for Global Connectivity

Low Earth Orbit (LEO) satellites are at the forefront of creating the "Internet of Everything" by providing widespread connectivity for IoT devices. These satellites are designed to create a global, seamless communication network that supports everything from connected homes to autonomous vehicles. As LEO satellite constellations continue to expand, they promise to bring reliable and fast internet access to remote and underserved areas worldwide.

Interplanetary CubeSats, exploring the solar system on a small scale

The 75SSM

SSM: Students' Satellites Mission

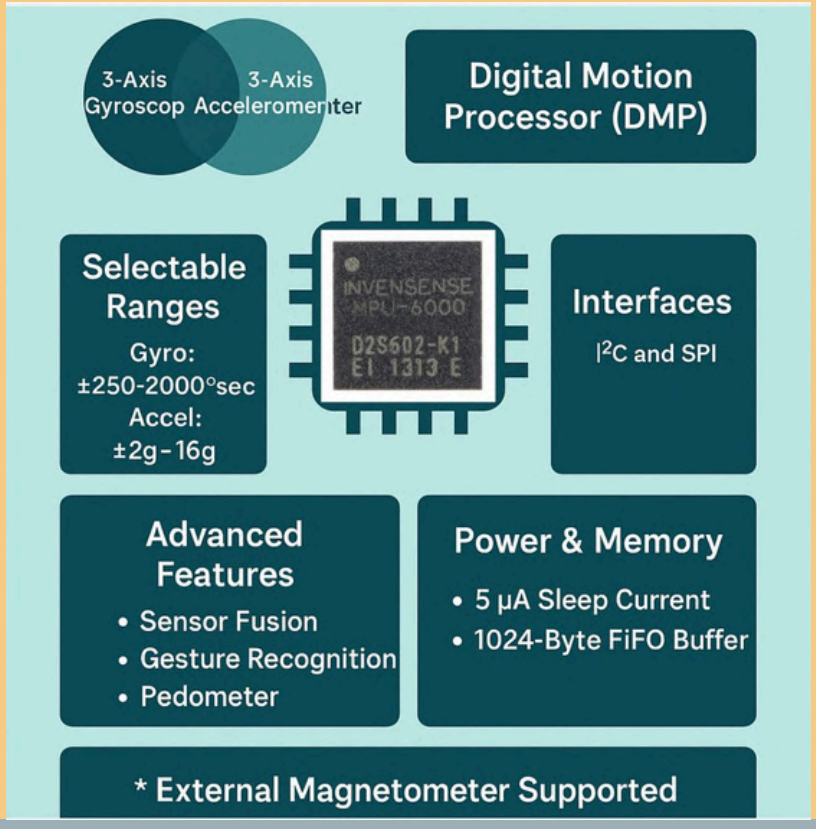
Update readers on our ITCA internal space-based innovations

Did you Know

CRSat's smart EPS boosts, regulates, and monitors power in real time—ensuring peak efficiency with MT3608, MIC29302, MPPT, and INA226 working in sync

MPU-6000/MPU-6050: Compact 6-Axis Motion Sensor for Embedded Systems

CRSat gives students hands-on experience with satellite tech, mirroring CubeSats. It integrates solar power, sensors, and real-time data collection, bridging theory and practice to build skills in power management, data analysis, and communication for real-world space challenges. The MPU-6000/MPU-6050 is a high-precision 6-axis motion sensor combining a 3-axis gyroscope, 3-axis accelerometer, and a Digital Motion Processor (DMP) in a compact 4x4x0.9mm package. The MPU-6000 supports both I²C and SPI, while the MPU-6050 uses I²C only.Key features include selectable gyroscope (±250–2000°/sec) and accelerometer (±2g–16g) ranges, 16-bit ADCs, digital filters, and built-in self-test. The DMP enables onboard sensor fusion, gesture recognition, and pedometer tracking, offloading processing from the host. A 1024-byte FIFO buffer, motion interrupts, and low-power modes (as low as 5µA) optimize performance and efficiency. With support for external magnetometers and 9-axis fusion, the MPU-6000/6050 is ideal for wearables, robotics, and satellite payloads requiring accurate, low-power motion tracking.



Innovation in miniature, the power of student-designed CubeSats

Space@India

Glimpses into India's space chronicle, every week

Did you Know
INSAT Series, the INSAT (Indian National Satellite System) series revolutionized telecommunications, broadcasting, and meteorology in India, offering vital services to millions

India's Bellatrix Aerospace is making global moves by expanding to the United States

Read more at: indiatoday.in

India is advancing celestial defense through a partnership between the Indian Army and ISRO.

Read more at: republicworld.com

India's space-based defense strategy is evolving rapidly, with Low Earth Orbit (LEO) assets playing a critical role.

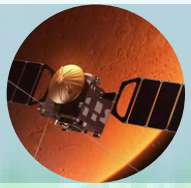
Read more at: deccanherald.com

India has set an ambitious roadmap to establish its own space station by 2035 and send astronauts to the Moon by 2040.

Read more at: firstpost.com

India marks the 50th anniversary of its first satellite, Aryabhata, which was launched on April 19, 1975.

Read more at: thehindu.com



Mangalyaan-2: ISRO Unveils Ambitious Mars Landing Plan

Read more at: timesofindia.com

ISRO Develops Advanced Landing Gear for Spacecraft

Read more at: indiandefensenews.in

Razor Crest MK-1: Reusable Medium-Lift Rocket Revolution

Read more at: thedefensenews.com

75 Students' Satellites Mission

ITCA's Engineering Prowess and Ingenuity

ITCA: Pioneering India's Tech Future

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

Events

ENC 2025

21 – 23 May 2025
ul. Wystawowa 1, Poland
enc2025.org

ISD Conference

05-07 June 2025
Rosen Centre Hotel, Florida
isdc2025.org

UK Space Conference

10-12 June 2025
Manchester, UK
uksc.co

Upcoming...

Launches

SpaceX | Falcon 9 Block 5 | CRS SpX-32

21 Apr 2025 13:45 IST
LC-39A, Kennedy
Space Center, Florida, USA

SpaceX | Falcon 9 Block 5 | Starlink Group 6-74

25 Apr 2025 07:02 IST
SLC-40, Cape Canaveral SFS,
Florida, USA

Arianespace | Vega C | BIOMASS

29 Apr 2025 14:45 IST
ELV, Guiana Space Centre,
French Guiana, France

SPACE BEACON
cosmic cadences on our radar

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