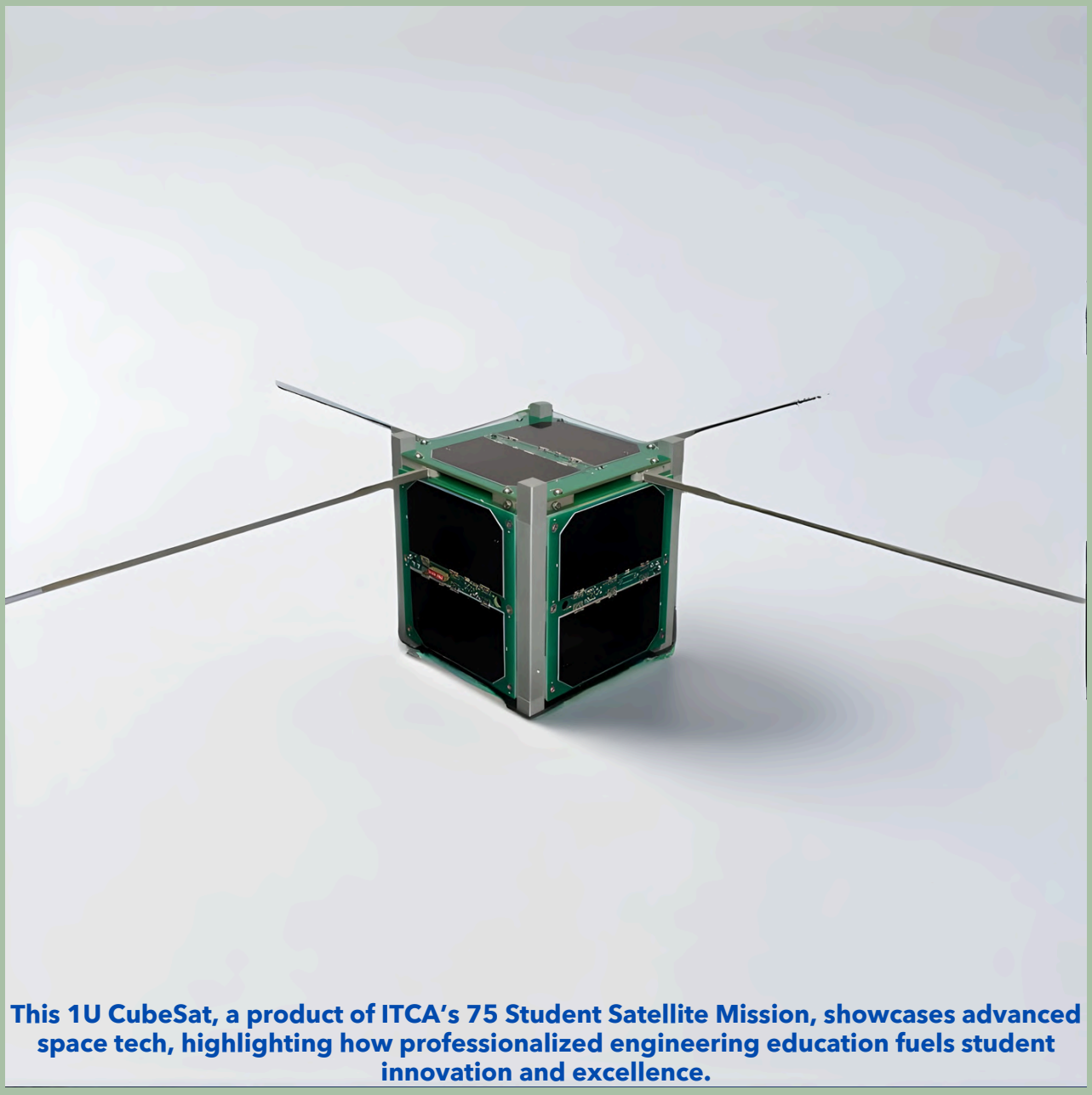
ISSUE 36 | 13 MARCH 2025

Space Beacon



This 1U CubeSat, a product of ITCA's 75 Student Satellite Mission, showcases advanced space tech, highlighting how professionalized engineering education fuels student innovation and excellence.

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
The James Webb Space Telescope can detect the heat signature of a bumblebee at the distance of the Moon, demonstrating the incredible sensitivity of modern space observatories

Scientists Discover Mysterious 3-Body System in Space

Hubble Space Telescope has identified a rare three-body system in the Kuiper Belt, named the Altjira system. This discovery could provide insights into the formation of our solar system and the dynamics of small celestial bodies. Understanding such systems may also help astronomers identify other similar structures in distant parts of the universe. This research could contribute to our knowledge of the gravitational interactions between celestial bodies in multi-body systems. Such studies deepen our knowledge of solar system dynamics.

River Bends Aid Advancements in Planetary Research

Researchers at the University of Texas at Austin have found that river bends differ from those formed by lava or ice, aiding the study of planetary channels on other worlds. This research might help us understand similar formations on Mars and other planets. It could also lead to new insights into the history of water and climate on Earth-like planets. Such studies can enhance our ability to identify past and present signs of water on other planets. This knowledge may prove crucial in the search for extraterrestrial life.

Supercomputer Discovers Spiral in Oort Cloud

NASA's Pleiades supercomputer has uncovered a mysterious spiral structure within the Oort Cloud, challenging existing theories about the solar system's outer boundaries. This finding may lead to new models of how our solar system evolved. Further study of this spiral could provide clues to the origins of comets and other celestial objects. This discovery may also reveal the presence of unknown forces shaping the outer regions of our solar system. Understanding these forces could help us grasp the formation and evolution of other star systems.


gadget360.com

Primordial Helium-3 Detected Leaking from Earth's Core

A study suggests that primordial helium-3, a rare isotope from the early solar system, may be trapped in Earth's core, providing new insights into the planet's formation. This discovery could have implications for our understanding of Earth's geological history. It may also contribute to research on potential energy sources for the future. The presence of helium-3 could help scientists trace the planet’s ancient atmospheric processes. This isotope's study could provide clues to the early solar system's conditions.


manilatimes.com

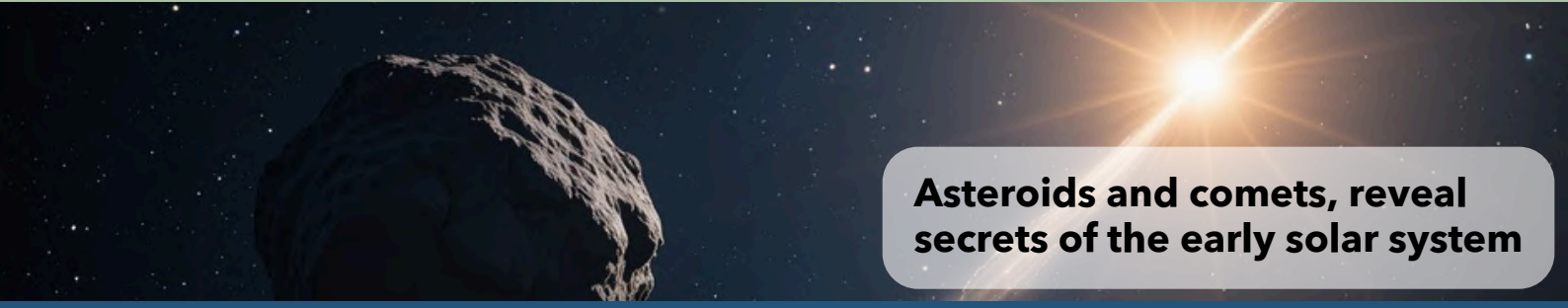
Intuitive Machines Aims for Moon with Robotic Drone

Intuitive Machines aims for its second lunar landing with a drill, rovers, and a hopping drone named Grace, designed to explore permanently shadowed craters. This mission seeks to uncover resources that could support future lunar habitats. Success in these missions could pave the way for sustained human presence on the Moon. The findings may play a critical role in future space exploration and resource utilization. Discoveries made during this mission could revolutionize our approach to lunar exploration.


spacedaily.com

Advanced Mars Spacecraft Concept for Exploration

Redwire Corporation has been selected by the European Space Agency to design a small satellite platform for future Mars missions, leveraging its Hammerhead platform. This concept aims to advance our capabilities for interplanetary exploration. The new design could enhance our ability to study Mars’ atmosphere, surface, and potential signs of life. This initiative marks a significant step toward more efficient and versatile space exploration technologies. The spacecraft may also assist in future crewed missions to Mars.



Genspace

Cover broader space news not fitting into other categories

Did you Know
Today's rockets use artificial intelligence to autonomously adjust their trajectory thousands of times per second during flight, making split-second decisions that human pilots couldn't match

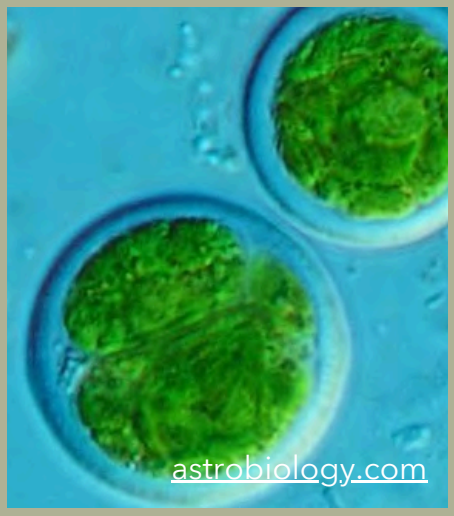
Empowering Women in Advancing Space Exploration

Europe's human spaceflight ambitions are soaring, with ESA's Astronaut Reserve leading the charge. Selected in 2022, these talented individuals are undergoing Astronaut Reserve Training (ART) to prepare for future missions. Their dedication and expertise are crucial to advancing space exploration and ensuring readiness for upcoming challenges. This initiative is a testament to the significant contributions women are making in the field. As they continue to break barriers, we can anticipate even greater achievements in space.


Spacelaunchschedule.com

Growing Algae: Mars Sustainability and Space Farming

A recent ESA Discovery project led by the Universitat de València explored the potential of microalgae from lichens to survive on Mars. These resilient microalgae can produce oxygen, food, and other essential resources, making them ideal for supporting human missions. The study found that these algae can withstand Martian conditions, including UV radiation, freezing temperatures, and high iron oxide levels. This research opens up possibilities for sustainable space farming and long-term human presence on Mars.


astrobiology.com

Revolutionizing Space Surveillance in Indo-Pacific

LeoLabs has won a $60 million public-private agreement to deploy a next-generation radar site in the Indo-Pacific region. The Strategic Funding Increase (STRATFI) was awarded by the U.S. Space Force SpaceWERX organization. The new Ultra High Frequency (UHF) radar installation, set to be operational by late 2026, will track satellites and other objects in low Earth orbit. This radar will enhance space domain awareness and support both government and commercial customers.

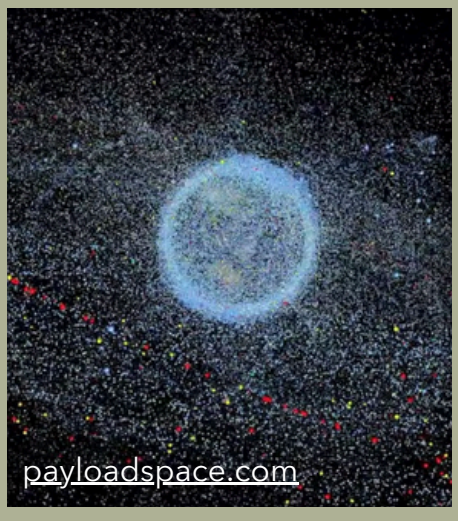

spacenews.com

AI Enhances Geospatial Satellite Imagery Analysis

Planet Labs and Anthropic have partnered to leverage Claude's advanced AI capabilities for analyzing geospatial satellite imagery. This collaboration aims to transform how we understand and utilize Earth observation data. Claude's sophisticated reasoning and pattern recognition abilities will enable near real-time pattern recognition and anomaly detection on a global scale. This partnership promises to improve environmental monitoring, infrastructure assessment, and disaster response, benefiting both government and commercial users.

SeaLand: A Floating Platform for Space Recovery

Rocket Lab has unveiled "Return On Investment," a 400-foot modified barge designed to recover its reusable Neutron rocket at sea. This platform will feature autonomous support equipment, blast shielding, and station-keeping thrusters for precise landings. The Neutron rocket, capable of carrying up to 33,000 pounds, is set to debut in the second half of 2025. This development aims to enhance space access and support various missions, including satellite deployments and national security operations.



Ephemeris Sharing: Reducing Satellite Collision Risks

As the number of satellites in low Earth orbit (LEO) grows exponentially, the risk of collisions increases. Sharing precise location data, or ephemerides, among satellite operators is crucial to avoid these collisions. Currently, only 3-4% of global satellite operators share their ephemerides, leading to a high rate of conjunctions and unplanned maneuvers. Improved ephemeris sharing can enhance space traffic coordination, reduce collision risks, and ensure the sustainability of space operations.

Satellogy

Focus on recent and upcoming satellites and launches

Did you Know
The latest communication satellites can process more data in a second than all the internet traffic of the entire world in 1995

Rivada's 600-Satellite Network for U.S. Goverment

Rivada Space Networks plans to deploy a 600-satellite constellation, Outernet, to provide secure, laser-linked mesh networks for U.S. government communications. The network aims to minimize data interception risks and enhance security. Rivada's cutting-edge technology promises seamless global coverage and resilience. The ambitious project is expected to be completed by 2026, significantly boosting national security. This initiative strengthens infrastructure and emergency communications for crisis resilience.

The Rising Market for Satellite Software

The software for satellites market is experiencing significant growth due to increasing demand for satellite-based services, advancements in satellite technology, and the rise of commercial space exploration. This market is driven by the need for real-time data analysis and satellite management solutions. Major players in the industry are investing heavily in research and development. The market is projected to reach a multi-billion-dollar valuation by 2030. Additionally, strategic partnerships and collaborations are emerging to develop innovative satellite software solutions.

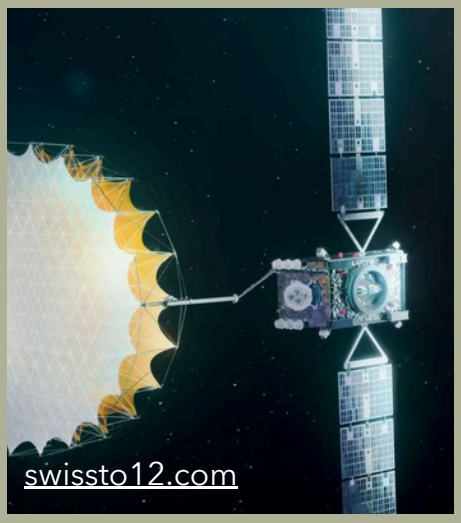
Digantara's Pioneering Space Sentinel Takes Flight

Bengaluru-based start-up Digantara has commissioned the world's first commercial space surveillance satellite, SCOT. Launched on January 14, 2025, aboard SpaceX's Transporter-12 mission, SCOT tracks objects as small as five centimeters in Low Earth Orbit. This satellite aims to enhance global space situational awareness. The data collected will help prevent collisions and ensure the safety of active satellites. Digantara's innovative approach is set to revolutionize space traffic management.


satnow.com

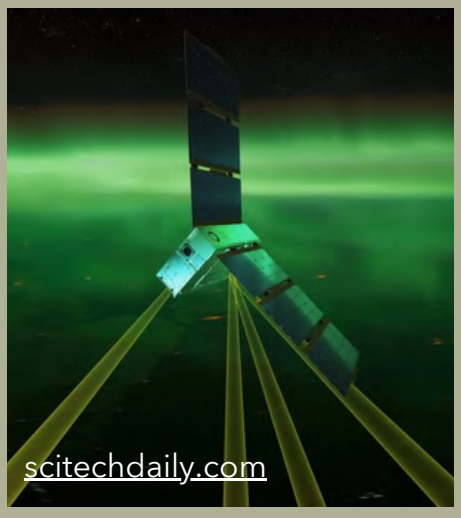
Aries Satellite's Stellar First Year in Orbit

Apex's Aries satellite has successfully completed one full year in orbit. Launched in March 2024, the satellite has surpassed its design life while continuing to perform its mission objectives efficiently. Aries' achievements include providing valuable data for climate monitoring, communications, and scientific research. This milestone marks a significant accomplishment for Apex and demonstrates the reliability and longevity of their satellite technology. The company looks forward to further contributions from Aries in the coming years.


swissto12.com

Asia’s Connectivity Transformed with New GEO Satellite

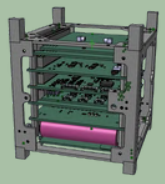
Swissto12 has been selected to manufacture the NEASTAR-1 geostationary satellite for Astrum Mobile. This satellite will provide direct-to-device 5G services across the Asia-Pacific region, ensuring reliable communication during severe weather conditions. NEASTAR-1's advanced technology will enhance connectivity for millions of users. The satellite is expected to be operational by 2027, ushering in a new era of telecommunication. The project represents a significant milestone in the development of resilient and advanced satellite communications infrastructure.


scitechdaily.com

Forecasting Space Storms: A Bold Mission Unveiled

EZIE mission will use three small satellites to study electrojets, powerful electrical currents in the upper atmosphere linked to auroras. By mapping these currents, EZIE aims to improve space weather predictions and safeguard modern technology. The mission will help protect satellites, power grids, and communication systems from space storms. EZIE's findings will contribute to a better understanding of Earth's magnetosphere. This knowledge will be vital for developing strategies to mitigate the effects of space weather on human activities.

CubeTech

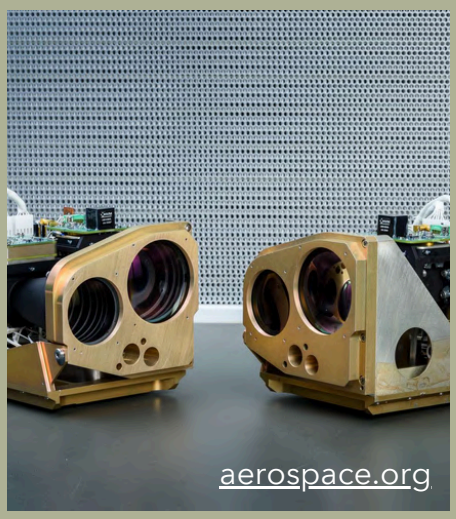


Showcase innovative CubeSat missions and unique payloads

Did you Know
Modern CubeSats can be as small as a coffee cup but carry sophisticated instruments that would have filled an entire room just 20 years ago

Ramses Expedition: Unveiling the Mysteries of Apophis

The European Space Agency (ESA) has selected the first CubeSat for its Ramses mission to asteroid Apophis. The CubeSat will analyze dust and radar data to study Apophis' surface and internal structure. This mission aims to enhance planetary defense techniques. Scheduled to launch in 2029, it will offer critical insights into the asteroid's composition. Understanding Apophis is vital for potential future asteroid deflection missions. The mission will also provide valuable data to refine our models of asteroid dynamics and evolution.

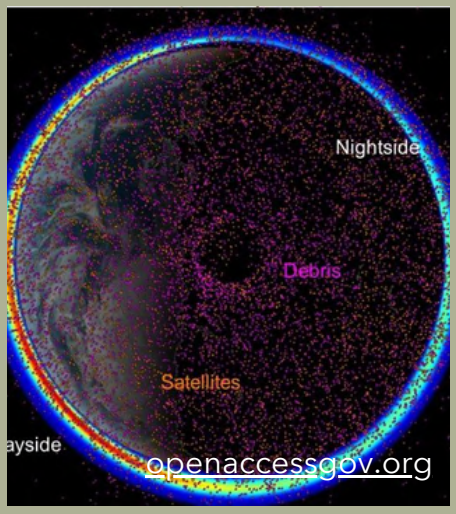


Revolutionizing Weather Forecasting with LEO Satellites

Low Earth Orbit (LEO) satellites provide critical data for weather forecasting. NOAA's National Weather Service uses LEO satellite data to improve forecast accuracy and protect lives and property. These satellites offer detailed atmospheric, oceanic, and terrestrial observations. They help monitor and predict extreme weather events. LEO satellites are pivotal in advancing climate science and resilience. This data is essential for early warning systems and disaster preparedness efforts.

Orbiting Eyes: Satellites Tracking Earth's Changes

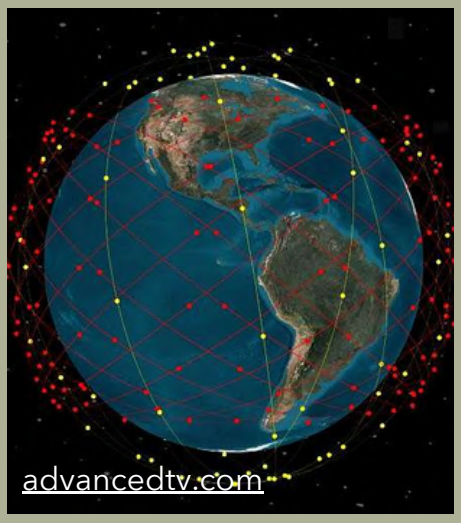
Researchers at Graz University of Technology are using communication satellite signals to observe Earth's changes. By analyzing these signals, scientists can track sea level, groundwater, and weather phenomena in real-time. This method enhances climate research and geodesy. The approach enables continuous monitoring without additional infrastructure. It opens new possibilities for global environmental studies. Researchers are also developing innovative techniques to improve signal processing and data accuracy.




rnz.co.nz

Unveiling Fresh Perspectives on Earth's Gravity

Scientists are utilizing communication satellites to study Earth's gravitational field. This approach allows for real-time observation of weather phenomena and short-term changes. The project aims to improve the accuracy of geodetic applications. By leveraging satellite data, researchers can refine our understanding of Earth's mass distribution. It is a leap forward in precision geosciences. These advancements will have wide-ranging applications in fields such as natural resource management and disaster response.


advancedtv.com

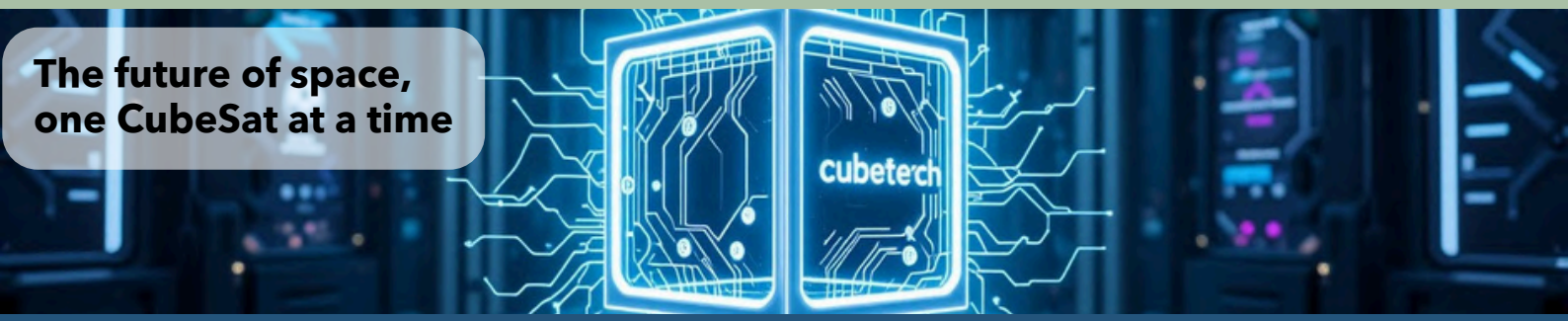
DTI Explores Sending First Pinoy to Space

The Philippine Department of Trade and Industry (DTI) is collaborating with SpaceX to send the first Filipino to space. This initiative aims to expand satellite broadband connectivity and explore transformative space projects. The collaboration highlights the Philippines' potential in the global space arena. It also aims to inspire the next generation of Filipino scientists and engineers. This mission marks a significant step in the nation's space exploration endeavors. The SpaceX partnership will boost tech innovation and economic growth in the Philippines.

kaust.edu

KAUST & NCVC Launch SaudiNet for Ecological Research

King Abdullah University of Science and Technology (KAUST) and the National Center for Vegetation Cover (NCVC) have launched SaudiNet, a cutting-edge environmental monitoring network. This initiative enhances terrestrial ecology research in Saudi Arabia, supporting biodiversity conservation and sustainable land management. SaudiNet integrates advanced sensor technologies to collect real-time ecological data, aiding policymakers and researchers. It fosters collaboration to tackle climate challenges and sustain ecosystems.



The 75SSM

SSM: Students' Satellites Mission

Update readers on our ITCA internal space-based innovations

Reliable Power Regulation: MT3608 & MIC29302

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. Efficient power management is vital for CRSat, with the MT3608 and MIC29302 regulators stabilizing voltage. The MT3608 boosts input voltage (2V–24V) to 5V with up to 93% efficiency, ideal for sensors and communication. Its compact design, internal MOSFET, and protections suit space use. The MIC29302, a 3V LDO regulator, supports microcontrollers with up to 3A output and low dropout (0.45V at 3A). With thermal shutdown and current limiting, these regulators form a reliable power chain: Solar panel → Battery → MT3608 (5V) → MIC29302 (3V) → Microcontroller → Subsystems, ensuring stable energy distribution and CubeSat efficiency.

Space@India

Glimpses into India's space chronicle, every week

Defence minister Shri Rajnath Singh urges aerospace medicine researchers to explore spin-offs

Read more at: timesofindia.com

India's space budget almost tripled in last 10 years: Minister Dr. Jitendra Singh

Read more at:idrw.org

Successfully Tested Semi-Cryogenic Engine: A Major Leap for Future Space Missions

Read more at: indiatvnews.com

IIT Patna Becomes a Part of the Prestigious NISAR Mission Program for Advanced Earth Observation

Read more at:hindupost.in

Chandrayaan-3 Provides Strong Indications of Ice Deposits and Potential Water Reserves on the Lunar Surface

Read more at:livemint.com

Assam Set to Launch Its Own Satellite for Enhanced Development and Connectivity

Read more at: thehindu.com

Construction Begins on SSLV Launch Facility in Tamil Nadu to Tap Global Small Satellite Market

Read more at: swarajyamag.com

ISRO's POEM-4 Achieves Milestone by Successfully Completing One Thousand Orbits in Space

Read more at: businessstandard.com

75 Students' Satellites Mission

ITCA's Engineering Prowess and Ingenuity

ITCA: Pioneering India's Tech Future

Innovating India's tech for 21 years, we pioneered the '75 Students' Satellites Mission' and made a global impact in space tech, precision agriculture, and Industry 4.0.

Events

Farnborough International Space Show

19-20 March 2025
FIECC, Farnborough, UK
farnboroughspaceshow.com

Space-Symposium

08-11 April 2025
The Broadmoor, USA
spacesymposium.org

CubeSat Developers Workshop 2025

22-24 April 2025
FIECC, Farnborough, UK
cubesatdw.org

Upcoming.....

Launches

Rocket Lab | Electron/Curie | The Lightning God Reigns

15 Mar 2025 05:30 IST
Rocket Lab LC-1B, Māhia Peninsula, New Zealand

CASC | Long March 2D | Unknown Payload

15 Mar 2025 09:40 IST
Site 9401 (SLS-2), Jiuquan Satellite Launch Center, China

VKS RF | Angara 1.2 | Cosmos (Unknown Payload)

15 Mar 2025 16:20 IST
Site 35/1, Plesetsk Cosmodrome, Russia

SPACE BEACON
cosmic cadences on our radar

Compiled by

Er. S. Shanmugam
Er. Srinivas Durvasula
Er. Anvitha Lokipalli
Er. Moses Denny Veliath

#3, First Main, BDA Layout, HAL 2nd Stage, Bangalore 560008

www.itca.org.in; contact@itca.org.in

Reader Advisory

This newsletter features curated content from a variety of reputable sources. We strive to bring you the most interesting and informative space news articles each week. The views expressed in the linked articles are those of the sources and do not necessarily reflect the views of this newsletter. We link to the original sources in some cases for further exploration.