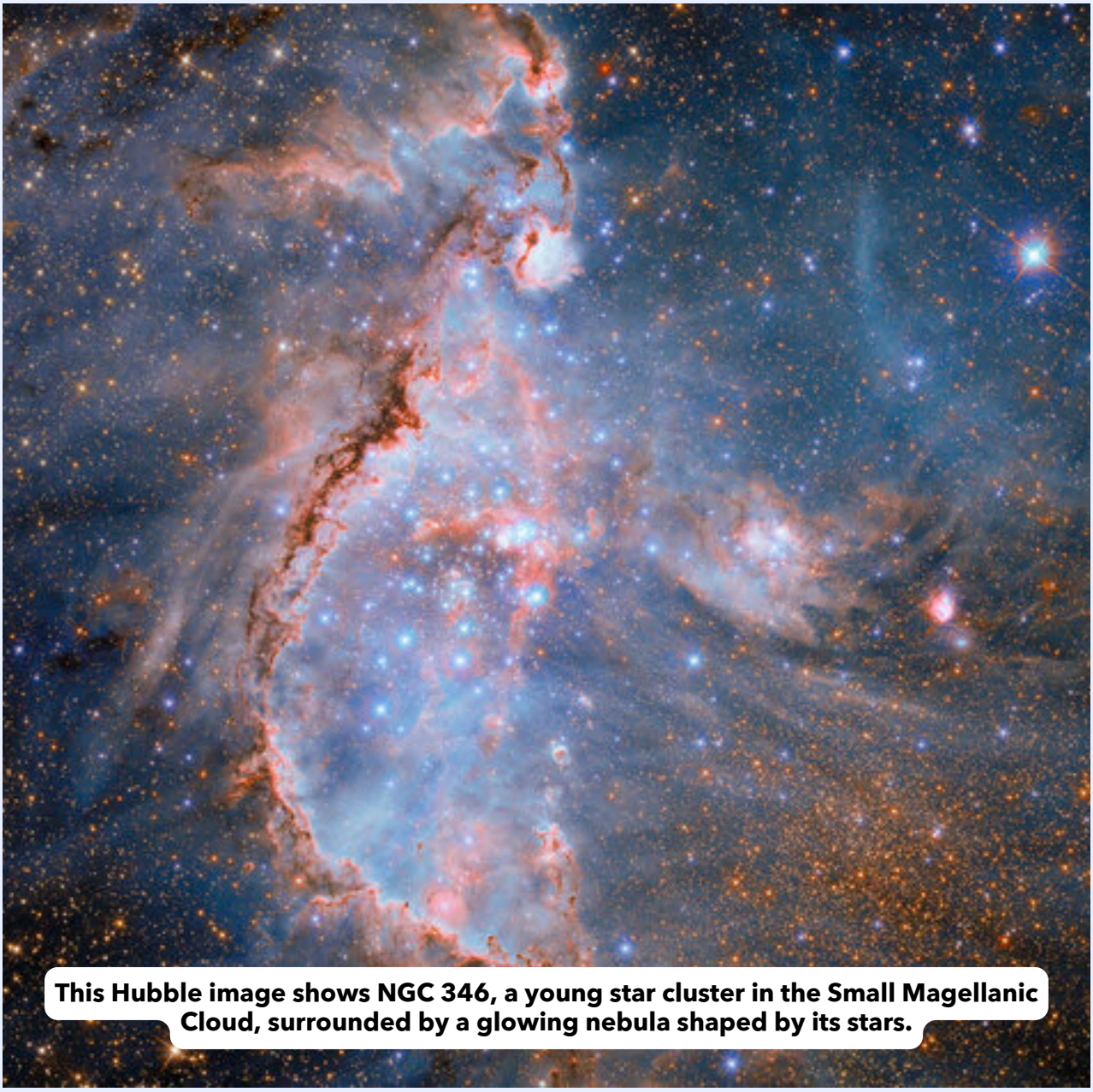
ISSUE 40 | 09 APRIL 2025

Space Beacon



This Hubble image shows NGC 346, a young star cluster in the Small Magellanic Cloud, surrounded by a glowing nebula shaped by its stars.

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INDIAN TECHNOLOGY CONGRESS ASSOCIATION

Orbital

Lead with the most significant celestial events and discoveries

Did you Know
Jupiter could fit all the other planets inside it. Being the largest planet, Jupiter's volume is so vast that you could fit all the other planets in the solar system into it with room to spare

JWST Unveils Sagittarius C's Magnetic Secrets

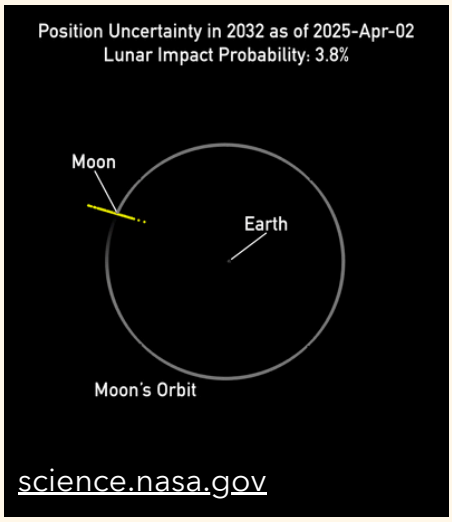
NASA's James Webb Space Telescope has provided unprecedented insights into Sagittarius C, a dense region near the Milky Way's central black hole. Researchers discovered powerful magnetic fields threading through this area, forming bright filaments of hot hydrogen gas. These magnetic structures may suppress star formation by preventing gas clouds from collapsing. The findings offer a deeper understanding of star birth processes in extreme galactic environments.

Honda's Hydrogen Tech Aims for Lunar Life Support

Honda plans to test a hydrogen-based energy system in space to support future lunar missions. The system will generate and store electricity and recycle water, critical for long-term survival on the Moon. In collaboration with JAXA, Honda aims to validate the system's performance in harsh lunar conditions. This compact, renewable energy solution could pave the way for sustainable human habitation on the Moon and other planets. Tests could begin later this decade, marking a major step for space-based green energy in remote environments.

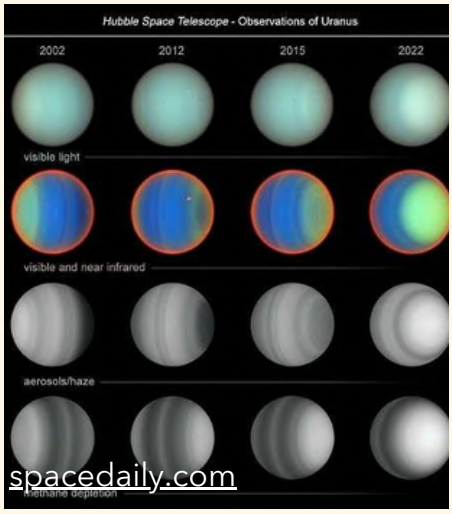
Lesser-Known Discoveries About Jupiter Explained

The exploration of Jupiter has unveiled surprising facts beyond its iconic Great Red Spot. Lesser-known details include its intense radiation belts, mysterious X-ray auroras, and the presence of "shallow lightning" in its atmosphere. The Juno spacecraft continues to send back vital data about the planet's magnetic field and core structure. These findings help scientists better understand Jupiter's formation and its influence on the solar system's evolution. The gas giant continues to fascinate, challenging old assumptions and opening new paths in planetary science.



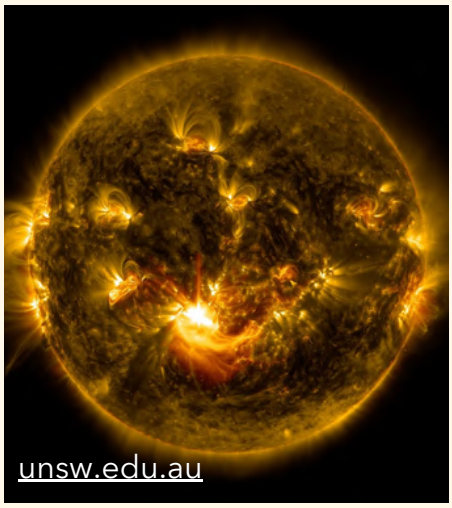
Asteroid 2024 YR4 Unlikely to Hit the Moon

Recently updated the trajectory data for asteroid 2024 YR4, ruling out a lunar impact. Initially flagged due to its close approach, improved measurements now show the asteroid will pass at a safe distance. The object is estimated to be 15 meters wide, roughly the size of a large bus. It is part of NASA's ongoing planetary defense monitoring. Events like this help refine tracking techniques and ensure preparedness for potential future threats. Although the risk from YR4 has decreased, NASA continues to monitor near-Earth objects (NEOs) with high precision.



Hubble Tracks Changing Weather on Distant Uranus

Using two decades of Hubble Space Telescope data, scientists have observed dynamic weather changes on Uranus. Seasonal variations, including shifting storms and cloud patterns, have been recorded as the planet slowly orbits the Sun. These observations provide insight into atmospheric behavior on an ice giant with extreme axial tilt. The findings help researchers better understand planetary climate systems far beyond Earth and support future missions to outer planets. This study shows the value of long-term space observation complexities.



Star Sound Waves Reveal Galaxy's Ancient Secrets

Astronomers are using sound wave data from stars to study galactic evolution and stellar lifecycles. This method, known as asteroseismology, detects vibrations within stars to determine their age, composition, and structure. Recent findings reveal patterns that trace the history of our Milky Way and show how star populations have changed over billions of years. These insights could refine models of galaxy formation. The approach mirrors how seismologists study Earth's interior, offering a cosmic version of "listening" to the stars for clues about the past.

Genspace

Cover broader space news not fitting into other categories

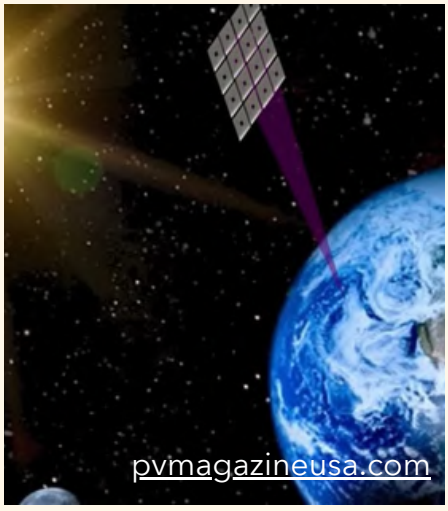
Did you Know
Cosmic Background Radiation. This faint radiation is the afterglow of the Big Bang, a direct remnant of the universe's origin

Advanced Remote Sensing with Digital Engineering

Raytheon is revolutionizing remote sensing payloads through digital engineering, enhancing speed, accuracy, and adaptability. Using model-based systems engineering, the company simulates complex systems before physical development, reducing cost and risk. This approach supports next-gen Earth observation and national security satellites. Raytheon's digital twin technology also allows continuous updates and faster integration of new capabilities, aiming to keep pace with emerging threats and tech innovation.

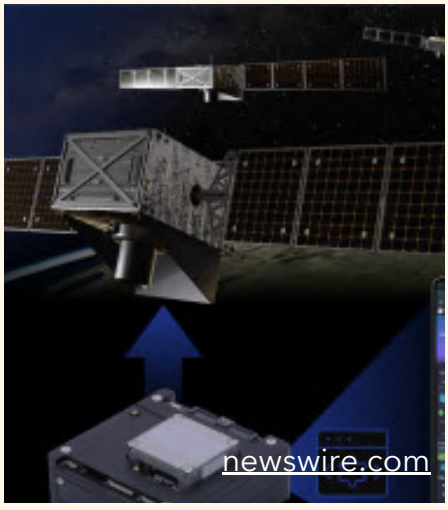
AetherFlux Raises $50M for Space-Based Solar Tech

Space-to-Earth energy startup AetherFlux secured $50 million to develop solar power transmission from orbit. Their wireless beaming technology aims to provide constant, clean energy, bypassing weather and daylight constraints. The funds will fuel prototype deployment and scaling. AetherFlux's innovation could revolutionize global energy infrastructure by delivering sustainable, uninterrupted power via space-based solar arrays, marking a key step in renewable energy evolution.



Sedaro Tests Self-Aware Satellite Autonomy in Orbit

Sedaro successfully tested its self-aware satellite autonomy technology in space. The software enables satellites to monitor and manage their own health and operations without human intervention. This breakthrough could drastically reduce reliance on ground control, increasing operational efficiency and longevity. Sedaro's digital twin-based system offers real-time simulation and predictive analytics, paving the way for smarter, more independent spacecraft.



marsdaily.com

Engineering Microbes to Support Human Life on Mars

Scientists are developing genetically engineered microbes to help humans survive on Mars by producing essential resources like oxygen, fuel, and food. These microorganisms could convert Martian materials into usable substances, reducing the need to transport supplies from Earth. Synthetic biology plays a key role in tailoring microbes for extreme Martian conditions. Research aims to create self-sustaining biomanufacturing systems, paving the way for long-term human presence on the Red Planet.

indiandefensenews.in

Russia Reveals Next-Gen Plasma Propulsion Engine

Russian scientists have introduced a new plasma engine designed for future interplanetary missions. This engine, utilizing ionized gas, significantly improves spacecraft efficiency and speed compared to conventional propulsion. The innovation is aimed at long-duration space exploration and supports Russia's ambitions in leading deep space travel. The prototype promises greater durability, cost-efficiency, and performance, marking a potential leap in next-gen aerospace technology.

issnationallab.org

ISS Lab Launches Accelerator for Space Startups

The ISS National Lab has launched a startup accelerator to support companies developing technologies for space. This initiative will fast-track innovations that can benefit Earth and future space missions. Selected startups will receive mentorship, funding opportunities, and access to the station's microgravity environment. The program encourages novel ideas in biotech, materials science, and space infrastructure, aiming to boost the commercial space economy and foster research breakthroughs in orbit.

Satellogy

Focus on recent and upcoming satellites and launches

Did you Know
Telstar 1 (1962 - USA), the first communication satellite capable of relaying television signals, telephone calls, and fax images across the Atlantic Ocean

Amazon to Launch First Project Kuiper Satellites Soon

Amazon is set to deploy the first full batch of satellites for its Project Kuiper broadband constellation, aiming to provide global internet coverage. These satellites will be launched via United Launch Alliance's Atlas V rocket. The initiative is part of Amazon's long-term plan to build a network of over 3,200 satellites. After successful prototype missions in 2023, this full-scale launch represents a key milestone in competing with SpaceX's Starlink. Amazon plans to launch commercial service in late 2025, focusing on underserved regions and global connectivity.

Space Force Missile Tracking Satellites Hit Design Phase

The U.S. Space Force's "Foo Fighter" satellites, part of a missile tracking constellation, have cleared a critical design review. This milestone indicates that the project is ready for hardware production and integration. The satellites will be capable of detecting hypersonic and ballistic missile threats using advanced infrared sensors. The development is a collaboration between industry partners like Millennium Space Systems and Raytheon. Deployment is expected to enhance national security by providing real-time tracking data across global hot zones.

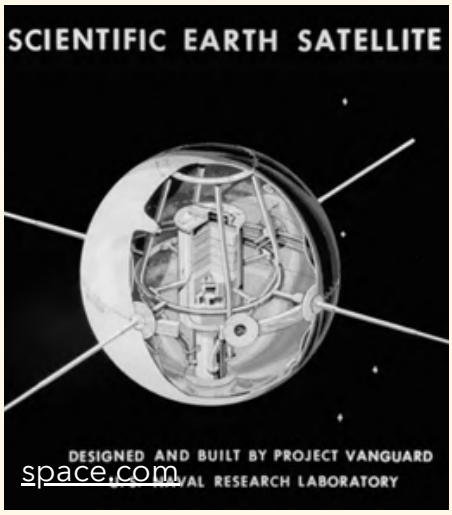
SpaceX Launches 28 Starlink Satellites into Orbit

SpaceX successfully launched 28 additional Starlink satellites into low-Earth orbit using its Falcon 9 rocket. The mission took place from Vandenberg Space Force Base and adds to the company's growing internet constellation. This launch supports SpaceX's goal of expanding high-speed internet coverage across remote and underserved regions worldwide. The reusable Falcon 9 booster was recovered, marking another win in SpaceX's sustainability efforts. Starlink now has thousands of satellites in orbit, with more launches planned throughout 2025.

satnews.com

Fraunhofer IIS Advances 5G Integration with Satellites

Fraunhofer IIS is pioneering the integration of satellite technology with 5G networks, promising seamless connectivity beyond traditional cell tower reach. This innovation enables faster, more reliable internet access in rural, remote, and mobile scenarios such as aviation and maritime. By combining terrestrial and non-terrestrial networks, Fraunhofer aims to overcome existing 5G coverage limitations. The technology includes software-defined radios and dynamic spectrum management for flexible deployment.



space.com

Mission to Recover 67-Year-Old Vanguard Satellite

Vanguard 1, launched in 1958 and now the oldest satellite still in orbit, may soon be brought back to Earth. Scientists and historians propose retrieving the spacecraft to preserve it as a space heritage artifact. Although it stopped transmitting in 1964, Vanguard 1 has remained in orbit as a silent witness to early space exploration. Retrieving it would be technically challenging but symbolically powerful, offering a unique opportunity to study early satellite engineering. Plans are still speculative, but the effort reflects growing interest in preserving space history.

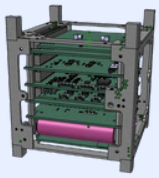
spacedaily.com

ESA's Mini Weather Satellite Surpasses all Expectations

The European Space Agency's mini weather satellite, known as the Arctic Weather Satellite, has outperformed expectations in its early mission phase. Designed to monitor atmospheric humidity and temperature, it's delivering data with remarkable accuracy. This success sets the stage for a planned constellation of similar satellites aimed at improving weather forecasts, particularly in the Arctic. Engineers and scientists are impressed by the satellite's stability and data quality, with its performance even exceeding initial benchmarks.

The next generation of satellites: smarter, smaller, more capable

CubeTech



Showcase innovative CubeSat missions and unique payloads

Did you Know
Educational Satellites, CubeSats are widely used in universities for hands-on student training in satellite design, testing, and operation

South Korea Greenlights Microsatellite Kill Chain Launch

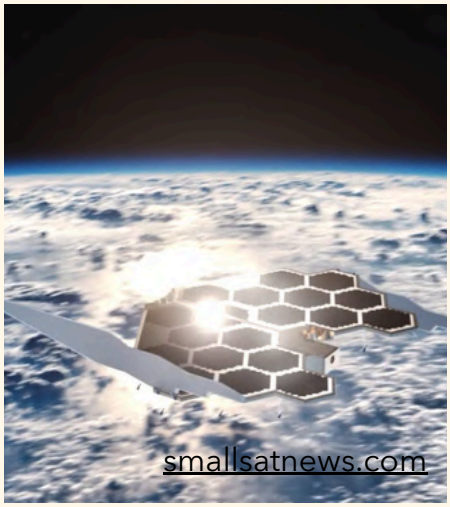
South Korea has approved the launch of a new microsatellite system designed to bolster its military "kill chain" — a preemptive strike strategy targeting North Korea's missile capabilities. This constellation of small satellites will enhance surveillance, tracking, and real-time data delivery, making it a crucial component of South Korea's defense modernization. The system was developed by Korea Aerospace Research Institute (KARI) and is expected to be operational in 2025. A shift to agile space-based tech for faster, integrated military response.

Taiwan Plans 50 Satellites Amid Security Concerns

Taiwan is launching an ambitious satellite initiative to strengthen its national security amid rising tensions with China. The government plans to build and deploy 50 satellites over the next ten years, focusing on communication, Earth observation, and reconnaissance. With the involvement of Taiwan Space Agency (TASA) and private firms, the constellation will serve both civilian and military uses. The project boosts Taiwan's space self-reliance and crisis connectivity, advancing strategic resilience.

Kongsberg to Supply 280 Satellites for SpinLaunch

Norway's Kongsberg NanoAvionics will provide 280 microsatellites to SpinLaunch for its upcoming low Earth orbit (LEO) communications constellation. This project is part of SpinLaunch's push to establish a cost-efficient, high-speed satellite network. The satellites will support a range of services including broadband internet, IoT, and data relay. Kongsberg will deliver in batches, using its expertise in scalable satellite bus manufacturing. The deal boosts public-private satellite ties, speeding next-gen comms.




businesswire.com

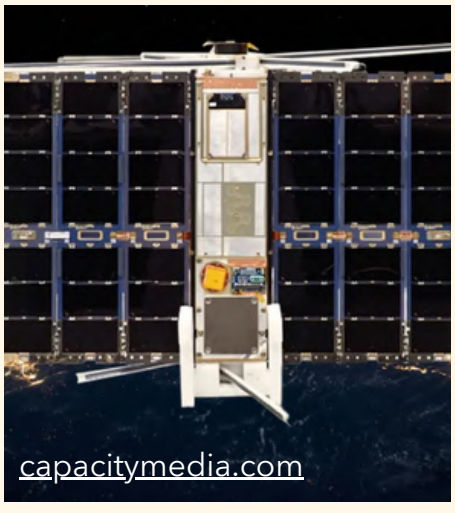
CesiumAstro to Power Taiwan's Satcom Network

CesiumAstro has been selected to deliver advanced space payloads and ground systems for Taiwan's first national communications satellite constellation. The project, led by Taiwan's National Space Organization (NSPO), aims to establish sovereign satellite infrastructure for secure communications and national resilience. CesiumAstro will provide software-defined radios and phased array antennas, improving the flexibility and performance of space-based communications.The satellite constellation will support government, disaster relief, and commercial sectors.


goodnet.org

Israeli Students Launch Dreams with Youth Satellite

A group of Israeli high school students successfully launched a nanosatellite as part of an educational initiative to promote STEM and space exploration. The "Tevel-3" satellite was designed, built, and tested by youth under professional supervision and was launched aboard a SpaceX rocket. It will be used to collect environmental data and transmit signals as part of a global amateur radio network. The project gave students real satellite engineering experience and showed Israel's commitment to future space scientists.


capacitymedia.com

Myriota Expands Global IoT Reach with Satellites

Australian IoT satellite company Myriota has launched four new LEO nanosatellites to broaden its global coverage for Internet of Things (IoT) applications. This expansion brings the company's constellation to 13 satellites, offering low-power, low-cost data connectivity in remote regions. Myriota's satellites serve industries such as agriculture, logistics, and environmental monitoring, enabling real-time data transfer without relying on terrestrial networks. The launch advances Myriota's plan to expand IoT connectivity via space-based infrastructure.

The 75SSM

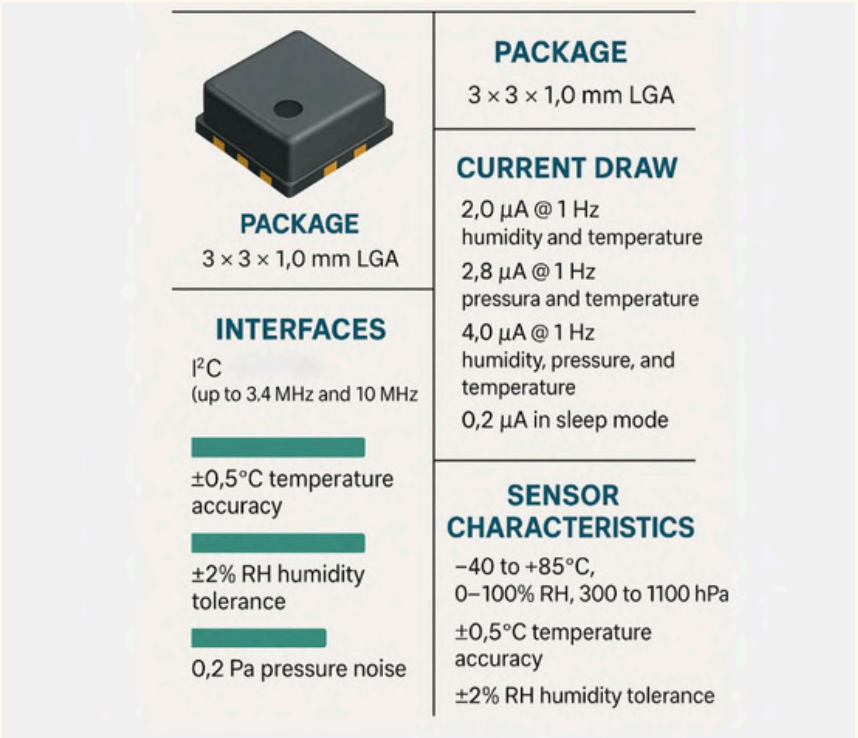
SSM: Students' Satellites Mission

Update readers on our ITCA internal space-based innovations

Did you Know
CRSat LoRa transmits up to 10 km using minimal power– perfect for keeping tiny CubeSats connected in space!

BME280 Sensor: Integrated Environmental Monitoring for Compact Electronics

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 BME280 is a compact, high-performance environmental sensor by Bosch Sensortec that integrates humidity, pressure, and temperature sensing in a 2.5 × 2.5 × 0.93 mm LGA package, making it ideal for space-constrained and battery-powered devices like smartphones, wearables, and IoT modules. It supports both I2C interfaces, with low power consumption and a wide operating range (-40 to +85 °C, 0–100% RH, 300–1100 hPa). With ±0.5 °C temp accuracy, ±3% RH humidity tolerance, and 0.2 Pa pressure noise, the BME280 sensor is ideal for CubeSats, satellite monitoring, spacecraft cabins, and space exploration. It offers configurable oversampling, IIR filtering, multiple modes (sleep, forced, normal), and outputs raw temperature, pressure, and humidity data for onboard compensation. Key guidelines include proper pin connections, mounting clearance, and post-solder reconditioning. RoHS and halogen-free compliant, it's a robust, energy-efficient choice for precise environmental sensing.



A collaborative effort, students working together to achieve a common goal

Space@India

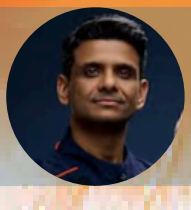
Glimpses into India's space chronicle, every week

Did you Know

Aryabhata (1975), India's first satellite, Aryabhata, marked its entry into space exploration. It was used for scientific experiments, including X-ray astronomy and solar physics.

From Bicycles to Rockets: ISRO Chief Reflects on India's Space Journey

Read more at: businessstandard.com



Group Captain Shubhanshu Shukla Set to Make History with Space Station Mission in May

Read more at: gadget30.com

POEM-4 Safely Re-Enters Earth's Atmosphere, Reinforces Space Debris-Free Commitment

Read more at: zeenews.com

Next Generation Launch Vehicle (NGLV) Development

Read more at: indiandefensenews.in

Third Launch Pad at Sriharikota; Rs 3984.86 Cr Project to be Completed in 4 Years: Union MoS Shri. Jitendra Singh in Rajya Sabha

Read more at: ani.com

India's semi-cryogenic engine reaches the launch pad in a stellar leap for its space ambitions

Read more at: economictimes.com

SDAL Develops Propulsion System for VIKRAM-1 Satellite Launch Vehicle

Read more at: asiannews.com

Bacteria-Based Technique for Repairing Lunar Bricks

Read more at: techexplorist.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.

Upcoming...

Events

Space-Tourism Conference

22 May 2025
Sheraton Gateway Hotel, USA
spacetourismconf.com

SpaceOps 2025

26-30 May 2025
Montreal, Canada
spaceops2025.org

Human to moon and mars summit 2025

28-29 May 2025
GW university, Washington DC
exploremars.org

Launches

SpaceX | Falcon 9 Block 5 | NROL-192

12 Apr 2025 17:47 IST
SLC-4E, Vandenberg SFB, California, USA

Blue Origin | New Shepard | NS-31

14 Apr 2025 19:00 IST
Launch Site One, West Texas, Texas, 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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