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Space Beacon

PSLV C60/SPADEX, docking and power transfer

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INDIAN TECHNOLOGY CONGRESS ASSOCIATION

Orbital

Lead with the most significant celestial events and discoveries

Exoplanet Survival Depends on Space Weather

A new study using NASA's Chandra X-ray Observatory and ESA's XMM-Newton has found that exoplanets around red dwarf stars like Wolf 359 need strong greenhouse gases and a sufficient distance to support life. While the habitable zone allows liquid water, intense X-ray flares and constant high-energy radiation may strip away atmospheres. For planets to sustain life, they must have protective atmospheres, especially at the outer edge of the habitable zone, potentially shielding them from damaging space weather.

JWST and ALMA Unveil Young Star Formation

Astronomers using JWST and ALMA have uncovered new insights into star formation in the Large Magellanic Cloud (LMC). Their observations revealed a young super star cluster, H72.97-69.39, only 100,000 years old, offering a glimpse into early stellar birth. The data shows star mass segregation and identifies a massive protostar 500,000 times brighter than the Sun. This breakthrough helps scientists understand early star formation processes and the evolution of galaxies, providing a clearer picture of our universe's origins.

Study Explores Impact of Super-Earth on Solar System

Florida Tech graduate Emily Simpson’s research models the impact of a hypothetical super-Earth located between Mars and Jupiter, replacing the asteroid belt. Using a 3D simulation, she explores how varying planet masses influence orbital characteristics like obliquity and eccentricity. Her findings suggest that smaller super-Earths would have minimal effects on habitability, while larger ones could disrupt seasonal climates, potentially rendering Earth’s orbit unsuitable for life, offering valuable insights for astrobiology.


astrobio.com

Lower Sulfur Levels in Chicxulub Impact Revealed

A new study reveals the Chicxulub asteroid impact released 67 ± 39 billion tons of sulfur, five times less than previous estimates. This suggests a milder "impact winter," leading to less severe cooling and faster climate recovery. The research may explain why 25% of species survived, while dust clouds likely blocked photosynthesis, amplifying environmental impacts. This revised understanding could shape future studies on mass extinctions and provide new insights into climate resilience during catastrophic events.


webbtele.com

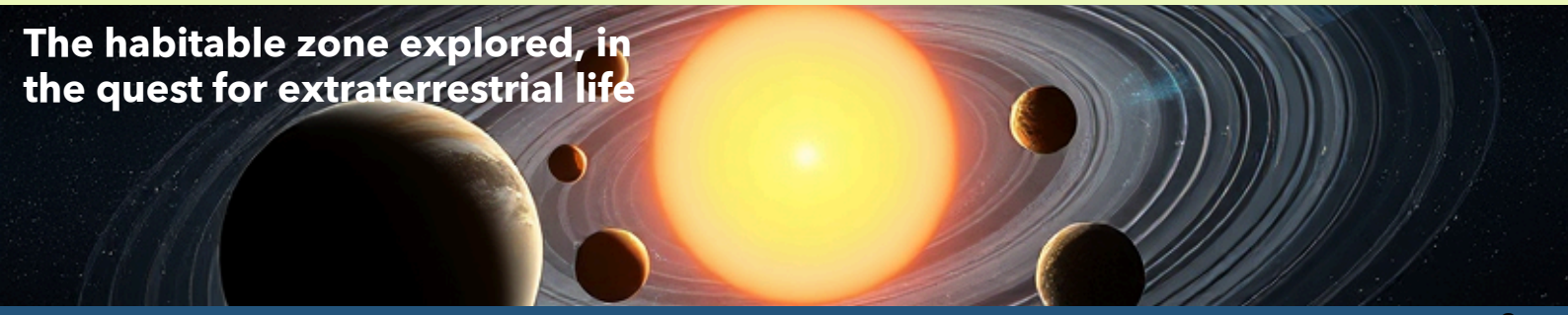
Webb Observes Carbon-Rich Dust Forming in Stars

The James Webb Space Telescope has observed carbon-rich dust shells forming in the Wolf-Rayet 140 star system, located 5,000 light-years away. As two massive stars collide, their winds create expanding dust shells that may eventually contribute to new stars and planets. Webb's mid-infrared observations show 17 shells moving at over 1,600 miles per second. These findings shed light on how carbon elements spread through space, crucial for understanding star and planet formation across the galaxy.


spacedaily.com

Hot Jupiters Found in Complex Multi-Planetary Systems

A study led by the University of Geneva has discovered the WASP-132 system, challenging previous models of Hot Jupiter formation. This system includes a Hot Jupiter, an inner Super-Earth, and an outer icy giant planet. Observations spanning 18 years revealed these planets coexist, suggesting a more stable migration within a proto-planetary disk, rather than destabilizing migration. This finding offers new insights into planet formation, migration, and the diversity of multi-planetary systems, questioning existing planetary evolution theories.



Genspace

Cover broader space news not fitting into other categories

Hubble Captures Unique Blue Lurker Multi-Star System

Hubble Space Telescope has captured images of the "Blue Lurker," a rare star in the M67 star cluster, located 2,800 light-years from Earth. This star is part of a triple-star system where two stars merged, leading to the Blue Lurker's unusual rapid spin. Its accelerated rotation, likely due to material accretion from a companion star, sets it apart. The Blue Lurker's evolutionary history, involving gravity, dust, and light, makes it a fascinating subject in the study of multi-star systems.

SpaceX Prepares for 7th Test of Starship Megarocket

SpaceX is gearing up for the seventh test flight of its Starship megarocket from its Starbase in Boca Chica, Texas. The company has upgraded the launch and catch tower to improve booster retrieval reliability after a previous failed attempt. The test flight will include 10 Starlink simulators as the payload. Starship's latest iteration features design refinements, including a more powerful propulsion system, and the rocket's eventual goal is to colonize Mars.

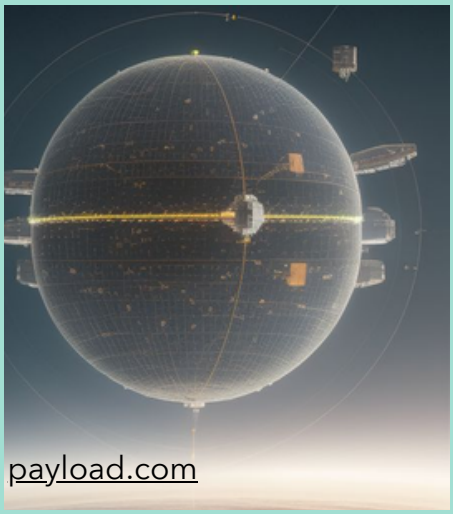
China's Tiangong Station Produces Oxygen, Rocket Fuel

China's Tiangong space station successfully produced oxygen and rocket fuel ingredients through artificial photosynthesis. The Shenzhou-19 crew conducted 12 experiments, converting carbon dioxide and water into oxygen and ethylene. This breakthrough reduces energy use compared to traditional methods and supports long-term space missions, including lunar exploration, positioning China as a leader in sustainable space technologies.


tracklive.com

NASA Astronauts Repair X-Ray Telescope on Spacewalk

NASA astronauts Nick Hague and Sunita Williams completed their first spacewalk of 2025 on 16 January, repairing the NICER X-ray telescope on the ISS. The spacewalk, lasting 6.5 hours, addressed light leaks in the telescope's thermal shields that disrupted observations of black holes and neutron stars. Additionally, they prepared the Alpha Magnetic Spectrometer for upgrades. This marked the first repair of a NASA space telescope since the 2009 Hubble servicing mission. Hague and Williams also performed maintenance on critical station components.


payload.com

Slingshot Wins Contract to Combat GPS Jamming

Slingshot Aerospace secured a $1.9M Phase 2 contract from the Space Force to enhance its GPS interference detection technology. The contract follows a 2021 Phase 1 award. The company's PNT-SENTINEL system will leverage a satellite mesh network, AI, and machine learning to identify GPS jamming and spoofing locations. The system will also improve its modeling capabilities, user interface, and interoperability with military systems. This technology aims to provide better insights into potential conflict zones and detect GPS interference with greater precision.


isstracker.com

Malargüe Station Upgraded with Cryogenic Technology

European Space Agency upgraded Malargüe's antenna with cryogenic technology, boosting data capacity by 80%. This reduces noise, enhancing signal clarity for missions like Juice and BepiColombo. The upgrade, developed with universities and commercialized through spin-offs, supports both space missions and quantum computing. Malargüe is the second ESA station to receive this upgrade, following Cerebros in 2023. This advancement ensures ESA can meet growing demands for deep-space data transmission.

Satellogy

Focus on recent and upcoming satellites and launches

Proba-3 Satellites Separate for Formation Flight

ESA's Proba-3 mission recently achieved a key milestone with the successful separation of its two spacecraft. After launching together, the satellites separated 60,000 km above Earth, starting the world's first precision formation-flying mission. Over the coming months, they will position themselves 150 meters apart, maintaining millimeter-level precision. This setup will enable the creation of artificial solar eclipses to study the solar corona. The operational phase of the mission is set to begin soon.

SpaceX Launches Italy's Pathfinder Satellite for IRIDE

SpaceX successfully launched Italy's Pathfinder Hawk satellite, the first in the €1.1 billion IRIDE Earth observation constellation. The IRIDE constellation will use advanced technologies, including SAR, optical imaging, and multiple spectral bands, to monitor climate change and support commercial applications. The 65-kilogram satellite will validate technology for the Hawk for Earth Observation (HEO) constellation, which focuses on maritime, land, and emergency monitoring. The mission marks a key milestone for IRIDE, with more satellites launching in 2026.

Xplore Launches XCUBE-1 Hyperspectral Satellite

Xplore successfully launched its first hyperspectral satellite, XCUBE-1, on the SpaceX Bandwagon-2 mission. Deployed into orbit from Vandenberg Space Force Base, the satellite will capture 4.2-meter resolution Earth observation data across multiple spectral bands. It is designed for applications in Earth observation, space domain awareness, and more. XCUBE-1 will deliver high-value hyperspectral data to commercial and government customers in sectors like agriculture, defense, and disaster prevention. Xplore's cloud software ensures seamless satellite control.

Sierra Space Satellite Passes Key R-GPS Milestone

Sierra Space's navigation satellite for the U.S. Space Force's Resilient Global Positioning System (R-GPS) program passed its early review. The program, aimed at enhancing GPS coverage with smaller, affordable satellites, includes Sierra Space, Astranis, Axient, and L3Harris. The Space Force plans to select up to two companies in 2026 to produce eight satellites by 2028. Sierra Space is also expanding its military satellite work with missile-tracking satellites and a new high-volume production facility.

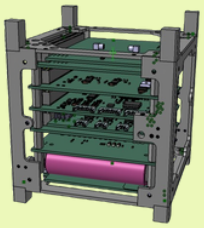
Lightweight Satellite Boom Poised to Transform Space

A lightweight satellite boom developed by UIUC, NASA, and Virginia Tech weighs just 20 grams, revolutionizing space exploration by optimizing small satellites like CubeSats. The technology integrates flexible electronics, motion and temperature sensors, and LED tracking support. This compact, durable boom improves satellite missions by reducing weight and cost. Set for its first mission in 2025, the boom could expand beyond CubeSats, paving the way for efficient, cost-effective space exploration and satellite operations.

Scientists Urge UN Action to Tackle Space Junk

Researchers from NASA, the University of Plymouth, and others are calling for space protection to be included in the U.N.'s Sustainable Development Goals (SDGs). The rise in satellite numbers, especially megaconstellations, has led to increased space debris, threatening future missions. With over 12,500 satellites in orbit and growing risks of collisions, experts stress urgent global cooperation to ensure space sustainability. Additionally, satellite reentries may harm Earth's atmosphere, exacerbating climate change.

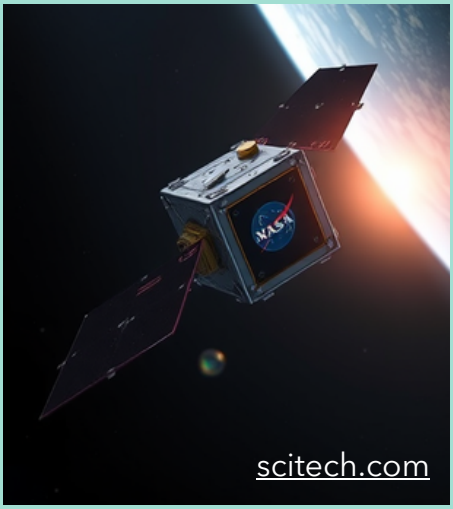
CubeTech



Showcase innovative CubeSat missions and unique payloads

TES-22 Tackles Space Debris and Atmosphere

TES-22 CubeSat, launched in January, carries cutting edge technology to combat space debris and study the thermosphere. Weighing less than four pounds, it features the Exo-Brake, a deployable drag sail to speed up deorbiting, and radiation detectors to monitor solar and cosmic radiation. TES-22's mission will provide insights into the thermosphere and solar activity's impact on satellites, improving space safety. Additionally, it offers educational opportunities through NASA's CubeSat Launch Initiative for U.S. institutions.



Taiwan's PARUS-T1 CubeSat Achieves Orbit

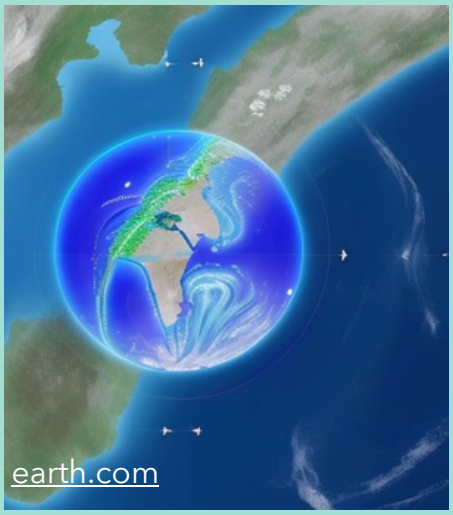
Taiwan's domestically developed PARUS-T1 CubeSat successfully launched aboard SpaceX's Transporter-12 rocket from Vandenberg Space Force Base on 23 January. The satellite will test Taiwanese satellite technology with a telecommunications payload for ship identification. The PARUS program aims to develop compact satellite systems for Taiwan. Meanwhile, Taiwan's Ministry of Environment unveiled plans for a satellite constellation to monitor air quality in Taiwan, China, and Southeast Asia, with the first satellite set to launch within three years.

EnduroSat's Balkan-1 Nanosatellite Launched

EnduroSat's Balkan-1 nanosatellite successfully launched on 15 January as part of SpaceX's Transporter-12 mission. Weighing 32 kg, it orbits 500 km above Earth and will provide high-resolution multispectral imaging for the European Commission's Copernicus program. The satellite will monitor agriculture, climate impacts, and biodiversity. EnduroSat, a leading Bulgarian nanosatellite manufacturer, plans to create a 120-satellite constellation to enhance Earth observation capabilities. Balkan-1 also focuses on security, disaster management, and environmental monitoring.

Kraków Students Launch Poland's Smallest Satellite

Students from AGH University of Science and Technology in Kraków launched "HYPE," Poland's smallest satellite, on SpaceX's Falcon 9 Transporter-12 mission. The 5x5x5 cm satellite will research environmental issues like light pollution and volcanic dust using a miniature spectrometer. Orbiting at 525 km, HYPE will also showcase Polish technology with a camera and display. Data from HYPE could assist in studies on deforestation and gas emissions. The team's next project involves a larger CubeSat with advanced communication systems.



HYPSO-2, Revolutionizes Ocean Monitoring from Space

The HYPSO-2 satellite, no larger than a water bottle, is transforming ocean research by monitoring algae blooms and water quality. Equipped with advanced hyperspectral cameras, it captures detailed images of up to 25,000 square kilometers. HYPSO-2's capabilities, 10 times more powerful than its predecessor, reduce the need for emissions-heavy vessels. Launched in August 2024, it provides vital data on sea ice, plankton, and organic materials, contributing to more sustainable and efficient marine environmental monitoring.

NorSat-4 Enhances Arctic Maritime Surveillance

Space Flight Laboratory (SFL) successfully launched NorSat-4, aboard SpaceX's Transporter-12 mission. The 35-kg satellite, based on SFL's DEFIANT microsatellite bus, features a low-light optical camera designed to detect and track vessels in Arctic waters, complementing its AIS receiver. Developed by Safran Reosc, the camera requires precise attitude control and thermal management. NorSat-4 continues Norway's commitment to space-based maritime monitoring, following successful missions like AISSat and NorSat-3.

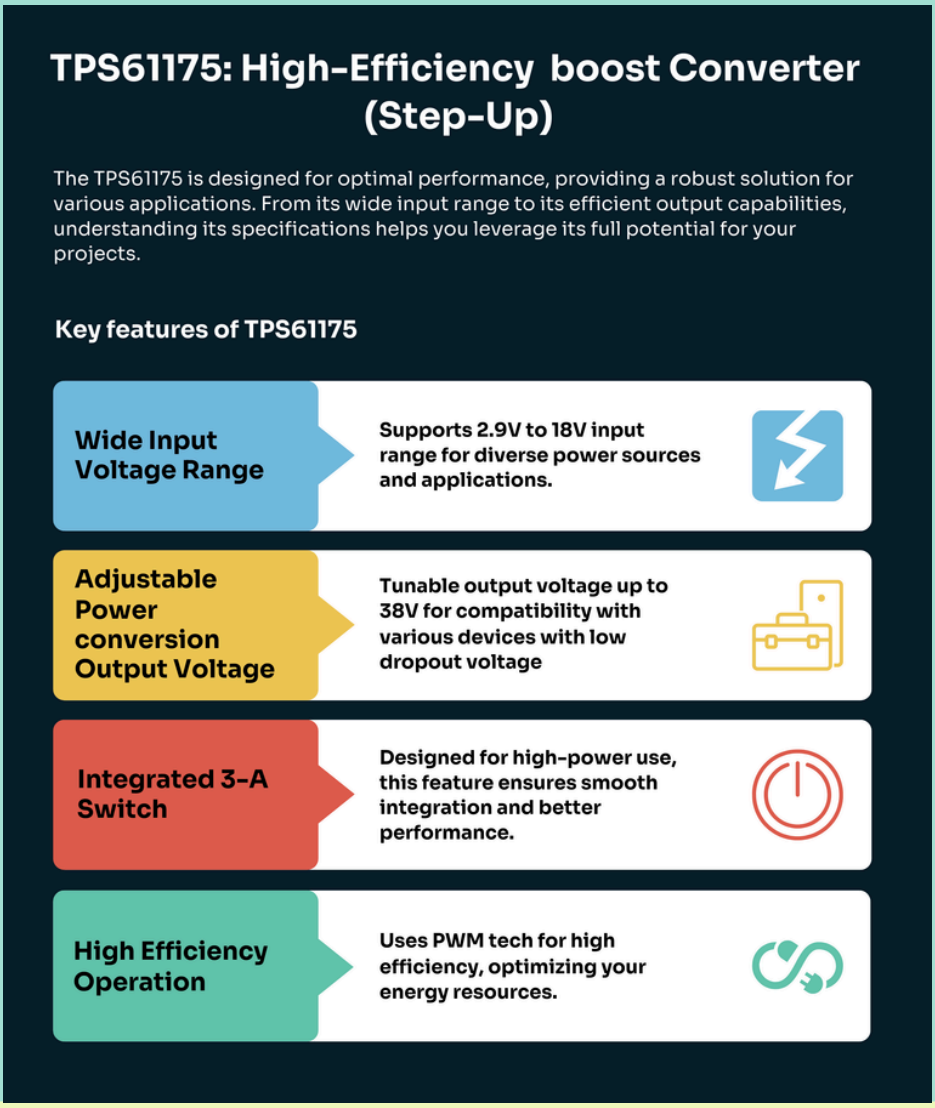
The 75SSM

SSM: Students' Satellites Mission

Update readers on our ITCA internal space-based innovations

TPS61175: Efficient and Reliable Power Management

The TPS61175 offers reliable performance with overcurrent protection, a compact design for space-saving integration, and excellent thermal performance for enhanced durability. Its high efficiency ensures optimal power delivery while minimizing heat generation, making it ideal for demanding applications. Additionally, the programmable switching frequency provides flexibility in system design, further enhancing its versatility in various projects. With its robust features, the TPS61175 ensures long-term reliability and performance, meeting the needs of modern electronic systems.



Space@India

Glimpses into India's space chronicle, every week

India's SpaDex mission successfully docked two satellites in orbit, making it the 4th nation to achieve this feat. The satellites, "Target" and "Chaser," weighed 219.8 kilograms each and demonstrated India's homegrown automated docking technology. This milestone is crucial for future lunar missions and space station construction, solidifying India's position in space exploration. With this achievement, India joins the US, Russia, and China in mastering in-space docking, paving the way for more complex space endeavors and cementing its growing reputation as a leader in space technology.

Read more at: stripes.com

PM Shri. Narendra Modi Praises for Successful Space Docking Operation and Efforts to Grow Plants in Space

Read more at: timesofindia.com

Cabinet approves third launch pad at Sriharikota, providing a significant boost to ISRO.

Read more at: businessstandard.com

ISRO dispatches crew module for Gaganyaan's first uncrewed mission, marking a key milestone.

Read more at: thehindu.com

Satellite images reveal the grandeur of the Maha Kumbh Mela from space, showcasing the event's immense scale.

Read more at: newsx.com

ISRO successfully demonstrates the restart capability of the Vikas liquid engine in testing.

Read more at: idrw.org

Pawan Goenka on India's Space Revolution: Reforms, Growth, and the $44 Billion Vision.

Read more at: fortuneindia.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

SpaceCom

29-30 January, 2025
Orlando, Florida
spacecomexpo.com

Business of Space Conference

23-25 February, 2025
UAH, Huntsville, Alabama
uah.edu

40th Space Symposium

7-10 April 2025
The Broadmoor, Colorado
spacesymposium.org

Upcoming.....

Launches

SpaceX | Falcon 9 Block 5 | Starlink Group 12-7

28 Jan, 2025 00:51 IST
SLC-40, Cape Canaveral SFS, Florida, USA

Blue Orgin | New Shepard | NS-29

28 Jan 2025 21:30 IST
Launch Site One, West Texas, Texas, USA

ISRO | GSLV Mk II | NVS-02 (IRNSS-1K)

29 Jan 2025 06:23 IST
Second Launch Pad, Satish Dhawan Space Centre, India

SPACE BEACON
cosmic cadences on our radar

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