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The James Webb Space Telescope provides a glimpse into the distant past, capturing ancient galaxies and star formations.



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Lead with the most significant celestial events and discoveries

### Mars continues atmospheric loss via sputtering

A recent breakthrough from NASA's MAVEN mission confirms that Mars is still losing its atmosphere—not only through solar wind but also via a process called sputtering. In this process, high-energy particles dislodge atmospheric atoms, one by one. This is the first direct detection of this escape mechanism, shedding new light on Mars' climatic history and habitability. The findings are crucial for understanding how planets evolve over time in harsh space environments. Did you Know Pluto was discovered by Clyde Tombaugh, and it takes approximately 248 Earth years to complete one orbit around the Sun. This means Pluto is still making its way through its first orbit since its discovery!

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### The next Artemis II test phase rollout begins

NASA is kicking off the next major phase of Artemis II testing at the Kennedy Space Center. This crucial step includes evaluating integrated systems such as the Orion spacecraft and Space Launch System (SLS) ahead of the crewed lunar mission. Engineers will simulate launch operations and test interfaces to ensure mission safety and readiness. Artemis II aims to send astronauts around the Moon, serving as a precursor to a future lunar landing under Artemis III. The mission's success will mark a significant leap in deep space exploration.



### Beaming moonlight, powering lunar bases from orbit

To support human presence on the Moon, scientists are developing space-based solar power satellites that can wirelessly beam energy to lunar bases. These satellites would orbit the Moon and provide continuous power-even during the 14-day-long lunar night-ensuring habitats stay warm and systems remain operational. ESA and other space agencies are exploring these concepts as part of long-term plans for sustainable Moon settlements. With energy a top priority for survival, beamed power could be the key to unlocking permanent lunar habitation.





### Mystery object beams cosmic X-rays every 44 minutes

Astronomers have discovered a mysterious object 15,000 light-years away in our galaxy that pulses like clockwork every 44 minutes. Acting like a cosmic X-ray machine, this neutron star or magnetar emits high-energy radiation in a highly regular pattern, raising new guestions about stellar evolution and the nature of magnetic fields. The phenomenon is so rare that it challenges existing astrophysical theories. This discovery could unveil a whole new class of space objects.

### Newly found planet orbits twin suns perpendicularly

Astronomers have discovered a planet that orbits two stars at a 90-degree angle to their orbital plane-an unprecedented phenomenon that challenges current models of planetary formation. This Tatooine-like world, unlike anything previously observed, challenges long-held assumptions about how planetary systems form and behave. Its unique alignment around the binary stars could provide crucial insights into the dynamics of multi-star systems. Scientists are now rethinking orbital mechanics in light of this rare and baffling configuration.



### Japanese private lander targets Moon's Sea of Cold





Jupiter's storms rage on, captured in stunning detail



Cover broader space news not fitting into other categories

### Satellites silently scan earth's environmental health daily

From orbit, satellites provide scientists with a comprehensive, real-time view of Earth's environment. They monitor forests, oceans, air quality, ice sheets, and climate patterns–critical for tracking global changes like deforestation, rising sea levels, and pollution. With over 50 Earth-observing satellites in orbit, data is used to guide climate models, predict disasters, and influence environmental policy. The European Space Agency, NASA, and other space agencies rely on this technology to help mitigate environmental damage. Did you Know A floating laboratory orbiting Earth at 28,000 km/h, the ISS serves as a hub for cuttingedge scientific research in zero-gravity conditions!



### Langley tests flexible booms for space missions

Langley Research Center is pioneering the development of ultra-thin, meter-long flexible booms-essential structures for unfolding instruments and antennas in space. These extendable booms, as narrow as a pencil and lighter than ever, are being rigorously tested in a special facility simulating space-like conditions. This advancement could revolutionize satellite and spacecraft design, allowing more compact launches and broader operational capabilities once deployed.



### Nuclear rockets enable faster Moon and Mars travel

The European Space Agency (ESA) is exploring nuclear thermal propulsion to enable faster and more efficient travel to the Moon and Mars. Nuclear rocket engines use nuclear reactions to heat propellant, delivering much greater thrust and higher fuel efficiency than conventional chemical rockets. This technology could reduce Mars travel time by up to half, significantly lowering risks for astronauts and mission costs. ESA's research supports future crewed exploration, aiming to build reliable nuclear engines for deep space missions.





#### <u>spacenews.com</u>

### Golden Dome innovates satellite data management

The Golden Dome initiative is transforming how satellite data is collected, processed, and shared, emphasizing that "it's all about the data." By integrating advanced analytics, cloud computing, and AI, this technology enhances realtime insights from space assets. Its innovative approach ensures faster decision-making and improved accessibility for government and commercial users. As satellite data volumes continue to surge, Golden Dome offers a scalable solution to harness that information effectively.

### Concerns rise over growing starlink's satellite debris

Starlink satellite constellation continues to grow rapidly, raising concerns about increasing space debris and its impact on astronomy. While Starlink aims to provide global internet coverage, critics worry about the visual pollution caused by thousands of bright satellites crossing the night sky. Astronomers say this interferes with observations and scientific research, sparking debates on balancing innovation with preserving the dark skies. Space agencies and companies are exploring solutions to reduce satellite brightness and collision risks.



# **Robot-built solar satellites to power Earth endlessly**

A new study from the National Space Foundation highlights how commercial space stations could significantly reduce NASA's operational costs-saving billions over the next decade-while simultaneously unlocking new markets worth billions more. As the International Space Station nears retirement, private stations could offer a more cost-effective and revenue-generating alternative for government and industry alike. The findings show that a commercial ecosystem in LEO could support research, tourism, and manufacturing, while accelerating innovation.



Satellites connecting the world, the vital role of space-based infrastructure



Focus on recent and upcoming satellites and launches

### Smart satellites assist Japanese agriculture

Japan is using smart satellites to aid farmers in managing livestock, optimizing fertilizer use, and responding to disasters. At a Tochigi farm, satellite imagery and data– developed by JAXA and Keio University–monitor cattle movements and pasture conditions. The technology pinpoints grazing locations and improves livestock health, while helping farmers decide how much fertiliser to use. Post-disaster, it aids in assessing damage and coordinating response. Did you Know Bhaskara-I was India's first experimental Earth observation satellite? It carried TV and microwave sensors to collect data on hydrology, forestry, and oceanography!



### Sat megaconstellations pose risk to radio astronomy

The expansion of satellite megaconstellations is creating major interference for radio astronomy. With thousands of satellites beaming down radio signals, the once-clear skies for space-based observations are becoming increasingly polluted. Scientists warn this could severely impact studies of cosmic phenomena, including the search for alien life and the origins of the universe. Organizations like the Square Kilometre Array Observatory are sounding the alarm and urging for regulatory measures.



### Real-time satellite data captures river flood waves

A groundbreaking satellite technique is uncovering invisible river waves, known as "flood waves," which move across thousands of miles of waterways. These waves, triggered by storms or dam releases, travel faster than the actual floodwaters, acting as early indicators of downstream flooding. Researchers are using radar satellite data to monitor subtle changes in river height and flow, revolutionizing how we predict and manage floods globally. This new method can enhance climate resilience and save lives in vulnerable regions.



# eurasiareview.com

### **Compact satellite exposes secret oceanic movements**

Using a breadbox-sized satellite, scientists have discovered narrow electric currents in the ocean-small yet powerful forces that influence global circulation and climate. This marks a major leap in oceanography, made possible by the high-resolution magnetic field data collected by the ESA's "Hydronaut" satellite. These findings could revolutionize our understanding of ocean-atmosphere interactions, benefiting both climate models and maritime operations. It's a stunning example of how small satellites are quietly reshaping big science.

### Next-gen GPS Satellite's to boost Space NAV

A state-of-the-art GPS III satellite has been launched to upgrade the existing navigation constellation, offering improved accuracy, enhanced resistance to jamming, and stronger cybersecurity features. This new satellite will significantly improve the reliability of global positioning signals used by both military and civilian users worldwide. The enhanced GPS system supports critical defense operations and a wide range of commercial applications, marking a major advancement in space-based navigation infrastructure that will serve for many years ahead.



### Iridium and Syniverse enable global Sat connectivity





Navigating the world, the precision of satellite-based positioning systems



Showcase innovative CubeSat missions and unique payloads

### New Venus cubesat mission pioneers long-term study

Korea's Institute for Basic Science (IBS), in collaboration with NanoAvionics, is launching a groundbreaking cubesat mission to study Venus over an extended period. This marks the world's first long-term planetary cubesat study aimed at gathering valuable data on Venus' atmosphere and environment. The compact satellite leverages innovative technology to enable sustained observation, unlocking new possibilities for planetary science. This mission not only showcases advances in miniaturized space systems but also reinforces international collaboration in space exploration. Did you Know Longest CubeSat Journey -LightSail 2, utilized solar sailing to demonstrate propulsion, traveling hundreds of kilometers while showcasing innovative technology!

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### Partnership aims to reduce satellite reflectivity

Surrey Nanosystems and the University of Surrey have joined forces to address the growing issue of satellite reflectivity, which contributes to space light pollution affecting astronomical observations. Their collaboration focuses on developing advanced materials and coatings to minimize the glare and brightness of satellites in orbit. This innovation aims to help preserve clear night skies for astronomers and the scientific community worldwide, ensuring satellite operations can coexist with ground-based observations.



### Aerial technologies tackle climate change with precision

Drones and satellites provide real-time, high-resolution imagery that enables better responses to glacier retreat, forest degradation, and coastal erosion. High-resolution imagery captured from above is offering scientists real-time insights into everything from glacier retreat to forest degradation and coastal erosion. This evolving technology empowers governments, researchers, and conservationists to respond faster and more effectively to environmental threats. The integration of AI with geospatial data further sharpens decision-making and long-term climate modeling.



# Gene transfer in space, a microbial mystery

Can spaceflight influence how microbes evolve? Researchers at the University of Alabama in Huntsville (UAH) are finding out. Their latest project explores how microgravity affects horizontal gene transfer-a process where bacteria share genetic material. This groundbreaking study, led by the UAH Biology Department, could have major implications for astronaut health and long-duration missions. Using cutting-edge laboratory simulations of microgravity, the team is analyzing how microbial behavior changes in space-like environments.



### Small satellite market to hit \$7706.5M by 2030

According to Stratview Research, the small satellite market is expected to grow robustly, reaching USD 7706.5 million by 2030. This growth is fueled by rising demand for Earth observation, telecommunications, and scientific missions, particularly in low-Earth orbit. The report highlights a compound annual growth rate (CAGR) that reflects increasing investment by both governmental and commercial players. Enhanced affordability, miniaturization, and advancements in CubeSat technology are playing key roles.



### Silent quakes disrupt satellite communication links

A recent Japanese study has revealed that earthquakes may quietly interfere with satellite signals and communication networks without immediate surface-level damage. These disruptions occur through disturbances in the ionosphere–a layer of Earth's atmosphere affected by seismic waves– which can alter signal paths used by satellites. This finding deepens our understanding of geophysical impacts on space-based technologies and could help design more resilient satellite systems. The study emphasizes the need for integrated Earth-space monitoring systems.



Earth observation from a new perspective, small satellites monitoring our planet



Update on our ITCA internal space-based innovations

Did you Know The 75 Students Satellites Mission (75SSM) is first of its kind mission where students don't just study satellites-they build them!

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### **Pioneering Student Innovation: The 1U CubeSat Initiative**

The 1U CubeSat, a flagship of the 75 Students' Satellites Mission, marks a transformative leap in student-led 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<sup>3</sup> frame, the 1U CubeSat delivers capabilities rivaling larger satellites–making launches more accessible and affordable for educational institutions and emerging space nations. This multi-sensor platform tackles critical global issues–boosting agricultural productivity, enabling climate monitoring, and supporting sustainable policymaking.

Powered by GNSS, LoRa, beacons, and imaging systems, it bridges theoretical research with realworld impact. Its modular architecture supports constellation deployment, rapid prototyping, and scalable Earth observation networks—laying the groundwork for autonomous systems and deepspace missions. Students engage hands-on from design to launch, gaining not only technical skills but also leadership and systems thinking. The mission fosters global collaboration and contributes to smart cities, disaster response, and planetary science. By combining innovation, accessibility, and educational excellence, the 1U CubeSat initiative exemplifies how student-driven missions can meet present-day needs while preparing for a future among the stars.



A monumental undertaking, empowering students on a grand scale



Glimpses into India's space chronicle, every week



Did you Know Cartosat Series, these satellites provide high-resolution imagery for urban planning, infrastructure development, and disaster relief, supporting India's progress!

In a major milestone for propulsion development, ISRO successfully conducts the third hot test of its semi-cryogenic engine.

Read more at: business-standard.com





ISRO Chief on Group Captain Shubhanshu Shukla Axiom-4 mission as the dawn of a new era for Indian astronauts and space exploration

Read more at: ndtv.com

In 2024, India successfully saved satellites from potential collisions ten times, showcasing advanced space situational awareness

Read more at: indiatimes.com





Eyes beyond the skies, how IIIT Delhi and ISRO train AI to monitor space debris and rogue satellites for safer space operations

Read more at: economictimes.com

The Indian government is building three major facilities at Kulasekarapattinam spaceport



Read more at: news9live.com



India records its highest number of space launches in 2024, marking a historic national milestone since the dawn of the space age.

Read more at: deccanchronicle.com



# **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**

**ICSOS 2025** 

Launches

**SXM-10** 

Florida, USA

12-13 June 2025 Copenhagen, Denmark icsos2025.com

SpaceX | Falcon 9 Block 5 |

**Rocket Lab | Electron/Curie |** The Mountain God Guards

07 June 2025 08:49 IST SLC-40, Cape Canaveral SFS,

10 June 2025 21:15 IST Rocket Lab LC-1A, Māhia Peninsula, New Zealand

ULA | Atlas V 551 | Project

India Space Congress 2025

25-27 June 2025 New Delhi, India isc2025.com

International Satcoms conference 2025

17 - 18 July 2025 London, UK iscuk2025.com



EMPOWER EVERY STUDENT

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SLC-41, Cape Canaveral SFS, Florida, USA

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