SPACE BEACON

INDIAN TECHNOLOGY CONGRESS

Beyond every week

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Issue 82



Researchers spot surprisingly mature galaxies in early universe

Astronomers found that galaxies in the young universe formed stars much more rapidly than models predicted.

ORBITAL

YOUR WEEKLY ORBIT THROUGH THE COSMOS' BOLDEST UPDATES

Space trivia alert

Galaxy clusters hold thousands of galaxies together with gravity.



sciencealert.com

Black Martian rock reveals ancient water on Mars

Scientists analyzed the Martian meteorite NWA 7034, known as Black Beauty, using advanced X-ray and neutron CT scanning techniques. They identified hydrogen-rich mineral fragments that store significant amounts of water, offering strong evidence that Mars once had widespread liquid water billions of years ago. Some microscopic clasts may hold up to around 11% of the meteorite's total water content. This supports the idea that early Mars had environments potentially suitable for life. The non-destructive imaging approach also opens new possibilities for studying precious future Mars samples without damaging them.



science.nasa.gov

NASA study hints Mars organics may have biological origins

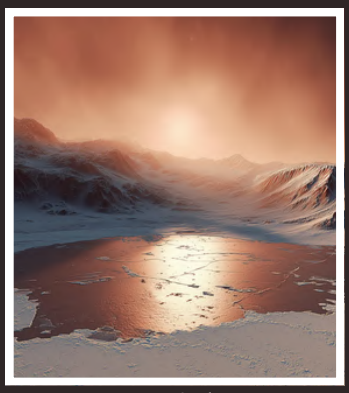
NASA scientists found that known non-biological processes cannot fully explain the abundance of organic molecules detected in Martian rocks by the Curiosity rover. The study examined possible sources such as meteorite delivery and geological reactions, but models and lab experiments suggested these mechanisms produce far less organic material than observed. This leaves open the possibility that ancient life could have contributed to these molecules, though no direct evidence of life exists yet. Researchers emphasize that more data and experiments are needed before drawing conclusions.



countercurrents.org

Warfare erodes the pillars of human civilization

The article argues that modern warfare does more than destroy cities and lives—it systematically erodes the core pillars of civilization, including ethics, social cohesion, institutions, and human values. Using "Mars" metaphorically, it highlights how conflict reshapes societies, normalizes violence, and weakens democratic structures and cultural identity. The piece warns that technological warfare and propaganda deepen division, making recovery harder even after battles end. Ultimately, it frames war as a civilizational disease that leaves long-lasting psychological, political, and cultural scars, not just physical devastation.



sciencedaily.com

Thin ice could explain how ancient Mars kept lakes

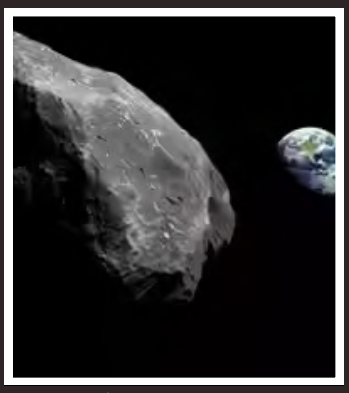
Scientists used a Mars-adapted climate model to show that ancient Martian lakes could have stayed liquid for decades despite freezing air temperatures. A thin, seasonal ice layer acted like insulation, trapping heat, reducing evaporation, and allowing sunlight to warm the water beneath. This mechanism explains why Mars shows strong evidence of lakes and sediments even though early climate models suggested the planet was too cold. The findings suggest long-lasting surface water was possible without a warm climate, reshaping ideas about Mars's habitability and ancient environments.



orbitaltoday.com

Venus could experience a rare meteor shower this summer

Astronomers predict Venus may encounter a cloud of debris from an ancient asteroid breakup, triggering a potential meteor shower around 5 July 2026. Simulations suggest two related asteroids, formed when a parent body split thousands of years ago, left dust trails that Venus could pass through. If the models are correct, the planet's thick atmosphere would burn most particles before they reach the surface, creating bright fireballs high in the sky. However, observing the event will be difficult due to the lack of active Venus missions.



indiatimes.com

Scientists say asteroids can be deflected before hitting Earth

Scientists tested real asteroid material under extreme conditions and found that deflection strategies could work before an asteroid reaches Earth. Using a powerful particle accelerator and an iron meteorite, researchers simulated the stress of impact-based deflection to see whether an asteroid would shatter or shift course. The results suggest earlier strength estimates were incomplete, improving planetary defense models and helping predict whether controlled deflection or fragmentation would occur. This research marks a key step toward realistic asteroid-deflection planning and future global defense strategies.



skyatnightmagazine.com

Sugars found on asteroid Bennu reveal cosmic life ingredients

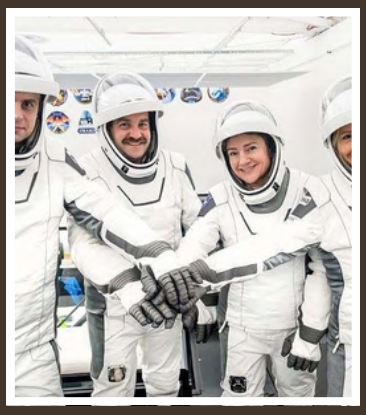
Scientists analyzing samples returned by NASA's OSIRIS-REx mission detected ribose and glucose—key sugars essential for life—in dust from asteroid Bennu. Ribose forms the backbone of RNA, while glucose fuels living cells, making this discovery a major milestone in understanding life's origins. Researchers say the findings suggest the building blocks of biology were widespread in the early Solar System and may have helped seed life on Earth. This strengthens theories that cosmic materials played a role in shaping early biochemistry.

GENSPACE

EXPLORING HUMANITY'S REACH BEYOND EARTH'S PAST, PRESENT, AND POTENTIAL

Space trivia alert

Pluto has a giant heart-shaped region made of nitrogen ice that drives glaciers and atmosphere cycles.



spacedaily.com

NASA confirms first ISS launch post-evacuation

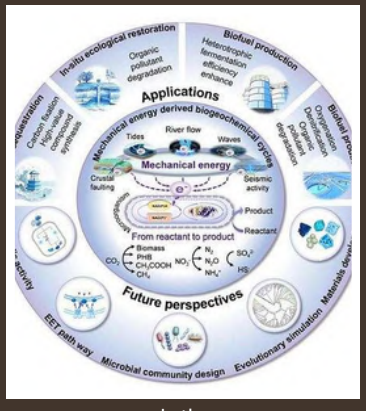
NASA confirmed the first astronaut launch to the International Space Station since a historic medical evacuation earlier this year. The Crew-12 mission will launch aboard a SpaceX Falcon 9 rocket to restore full staffing after the previous crew returned early due to an undisclosed health issue. The flight faced delays from rocket technical checks and scheduling conflicts but is now cleared for liftoff. The new crew will resume research and operations aboard the ageing ISS, which has been continuously occupied for over 25 years.



spacedaily.com

Data centers in space proposed to power future AI

Tech companies are exploring building data centers in space to meet rising energy and computing demands driven by artificial intelligence. The idea is to use constant solar power, avoid land constraints, and reduce environmental impact compared to Earth-based facilities. Firms like SpaceX, Google, and startups are testing orbital computing satellites and planning larger constellations. However, high launch costs, radiation damage, space debris risks, and maintenance challenges remain major hurdles. Experts say the concept could reshape global computing—but only if technical and economic barriers are solved.



spacedaily.com

Hidden mechanical energy may help sustain life on Earth

Scientists propose a third overlooked energy source that could sustain life on Earth: mechanical motion converted into electrical energy. Forces from waves, rivers, sediment movement, and earthquakes can deform piezoelectric minerals like quartz, generating electrons that microbes can use for metabolism. This process, called "mechano-biogeochemistry," may help explain how life survives in deep, dark environments without sunlight or chemical fuels. Researchers suggest this hidden energy pathway could influence global biogeochemical cycles and even guide the search for life on other planets.



spacenews.com

SpaceX IPO could boost investor interest in space firms

A potential SpaceX initial public offering could trigger renewed investor interest across the commercial space sector. Analysts say a successful listing would validate space as a mainstream investment category, attracting capital to launch providers, satellite companies, and space startups. Experts also expect increased consolidation and more public listings as firms seek funding to scale capital-intensive projects. With SpaceX seen as a market leader in launches and satellite services, its IPO could reshape valuations and accelerate growth across the broader space economy.



spacedaily.com

Moon becomes next strategic high ground in space race

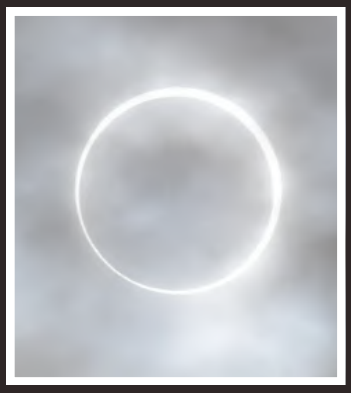
The space race isn't just about landing on the Moon again – it's about defining influence in cislunar space. NASA's Artemis II will orbit the Moon, signaling U.S. human deep-space capability, while China continues building its lunar architecture targeting a crewed landing by 2030. Elon Musk and SpaceX are shifting focus toward a potential lunar "self-growing city," blending public-private interests into the contest. Today's lunar competition mixes geopolitics, reputation, and long-term economic narratives, not just first bootprints.



discovermagazine.com

Satellite megaconstellations could ruin space telescope data

A new study warns that rapid growth in low-Earth-orbit satellite constellations could contaminate a huge majority of space telescope images. As satellite numbers rise toward projected totals of hundreds of thousands, reflections and light streaks from these objects threaten scientific observations by missions like SPHEREx, ARRAKIHS, and China's Xuntian – with more than 96% of their exposures potentially affected. Even NASA's Hubble Space Telescope could see a significant fraction of disrupted images. This emerging form of space light pollution challenges astronomy and calls for mitigation strategies.



space.com

Rare annular solar eclipse lights up Antarctica sky

An annular solar eclipse will occur on Feb. 17, 2026, when the Moon aligns between Earth and the Sun but doesn't fully cover it. This creates a "ring of fire" effect–where a bright solar rim remains visible around the Moon's silhouette–as seen only from a remote part of Antarctica for about two minutes. Partial views will be seen over parts of southern Africa, South America, and nearby oceans. Skywatchers outside these regions can follow live feeds and enjoy the rare astronomical event from afar.

SATELLOGY

TRACKING THE PULSE OF SATELLITE INNOVATION AND ASCENT

Space trivia alert

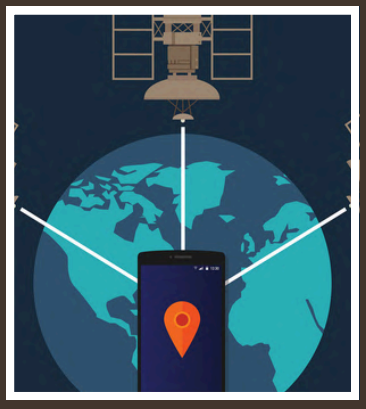
South Korea's first satellite KITSAT-1 launched in 1992 and kickstarted its space industry.



indiatimes.com

China develops microwave weapon to disrupt satellites

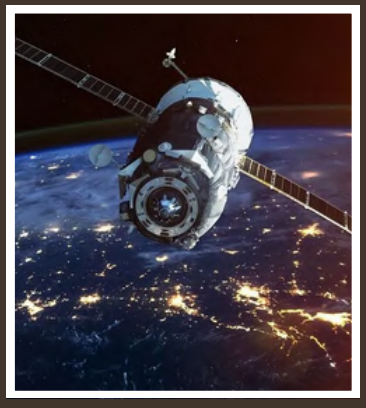
China has developed a compact high-power microwave system that could disrupt satellite constellations like Starlink. The device, called TPG1000Cs, can generate extremely intense electromagnetic pulses capable of damaging or disabling satellite electronics. Researchers say it is small enough to mount on trucks, ships, aircraft, or even in space, making it more flexible than earlier bulky systems. The breakthrough highlights growing interest in directed-energy anti-satellite technologies and raises concerns about future space security and electronic warfare capabilities.



news.cgtn.com

China launches BeiDou satellite messaging service

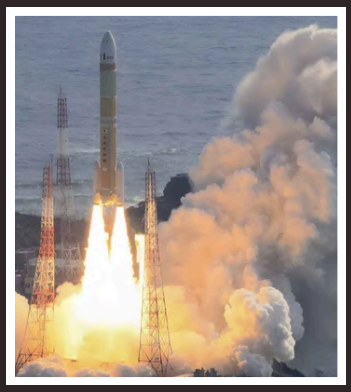
China has launched a new satellite-based short messaging service using the BeiDou navigation system, allowing users to send and receive texts even without mobile network coverage. The service, developed with major telecom operators, is designed for emergencies such as disasters, remote travel, maritime work, and rescue operations. Compatible smartphones can connect directly to BeiDou satellites without changing SIM cards or phone numbers. The rollout marks a major step toward integrating satellite communication into everyday devices and improving reliability in critical situations.



tvbrics.com

Iran unveils new satellite and space facility

Iran plans to unveil a new satellite along with a major space facility, highlighting progress in its growing space program. The country has been expanding its satellite development for remote sensing, communications, and scientific missions, aiming to strengthen technological independence and space-based services. Officials say the new facility will support satellite research, testing, and future launches, boosting domestic capabilities. The move reflects Iran's ambition to become a key space-faring nation and expand applications in environment monitoring, telecommunications, and national security.



ecoticias.com

JAXA admits H3 failure caused by satellite and fuel damage

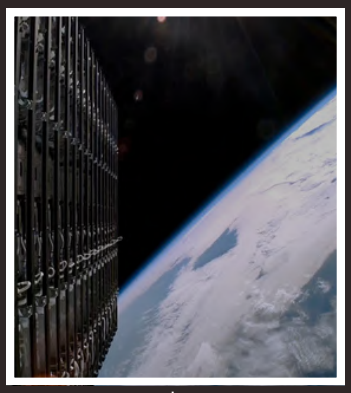
Japan's space agency JAXA confirmed that its H3 rocket failure was caused by damage to the satellite mounting section and fuel tubing in the second stage. The issues occurred after launch and during fairing separation, leading to premature engine shutdown and loss of the navigation satellite. The setback comes at a critical time for Japan's space program, which aims to expand its satellite navigation system and compete globally in launch services. Investigations are ongoing to prevent future failures and restore confidence in the H3 rocket.



earth.com

Satellite megaconstellations could blind space telescopes

A new study warns that plans to launch up to 500,000 satellites could severely disrupt space telescopes like Hubble. Simulations suggest bright satellite streaks may contaminate about one-third of Hubble images, permanently erasing cosmic data. With mega-constellations expanding rapidly for global internet coverage, scientists urge stricter regulations and mitigation strategies to protect astronomical research. Without global coordination, critical observations of galaxies, exoplanets, and cosmic events could be compromised for decades.



newatlas.com

Starlink satellites now act as space traffic controllers

SpaceX announced that its Starlink constellation is being used as a space "traffic cop" through a new system called Stargaze. Each satellite has star-tracker cameras, and with nearly 10,000 satellites scanning the sky, the network can detect and track other spacecraft and debris in low Earth orbit. The system can predict close approaches within minutes instead of hours, helping operators avoid collisions and manage crowded orbital corridors. SpaceX says this adds a new layer of space situational awareness, though transparency from all satellite operators remains essential.



openpr.com

Satellite Internet Market To Surge By 2030

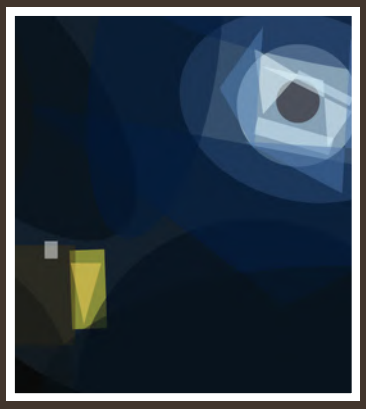
The global satellite internet market is projected to reach $18.59 billion by 2030, driven by rising demand for connectivity in remote regions, aviation, maritime, and defense. Growth is fueled by LEO constellations, falling launch costs, and increasing digital inclusion initiatives. Analysts estimate a strong compound annual growth rate as governments and private players push broadband access beyond terrestrial networks. However, competition, spectrum constraints, and space debris concerns could challenge long-term scalability.

CUBETECH

PIONEERING THE FUTURE WITH COMPACT COSMIC INNOVATION

Space trivia alert

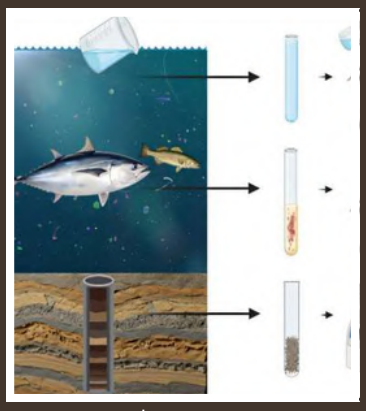
RemoveDEBRIS tested space debris removal tech using student-built CubeSats.



techbriefs.com

Top engineering innovations highlighted by Tech Briefs

Tech Briefs recently highlighted cutting-edge engineering innovations, featuring breakthrough ideas across robotics, electronics, manufacturing, and imaging technologies. These developments come from universities, research labs, and commercial innovators, showcasing rapid advances in sensors, automation, materials science, and computing systems. The platform regularly features emerging technologies that could shape aerospace, robotics, and next-generation engineering applications, helping engineers stay informed on industry trends and design breakthroughs.



phys.org

Ocean tides help push microplastics farther into seas

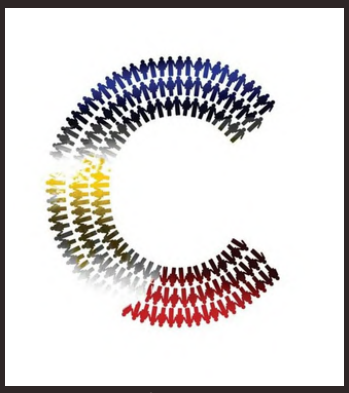
Scientists found that tidal forces and ocean dynamics can transport microplastics deeper and farther offshore than previously assumed. Their research shows tides can lift particles from coastal sediments and move them into open-ocean waters, spreading pollution beyond local sources. This means microplastic contamination may be underestimated and more widespread across marine ecosystems. The findings highlight the need for better monitoring and mitigation strategies to address hidden plastic transport pathways in the ocean.



news.satnews.com

Congress pushes GPS upgrade

The U.S. Space Force is reconsidering its role in the Regional GPS (R-GPS) modernization effort, questioning whether the program fits its priorities and budget constraints. However, Congress is pushing forward, arguing that R-GPS is critical for improving positioning, navigation, and timing capabilities for military and civilian users. Lawmakers see the upgrade as a strategic investment to enhance resilience and accuracy amid growing geopolitical and technological challenges. The debate highlights tensions between military planning and legislative priorities in shaping future GPS infrastructure.



mb.com

LEO satellites urged to bridge digital divide

A consumer advocacy group urged the Philippine government to invest in Low Earth Orbit (LEO) satellites to expand internet access and reduce the digital divide. The group said LEO constellations can deliver faster, more affordable connectivity to remote communities where fiber and cellular networks are impractical. They also highlighted benefits for disaster response, education, and economic development. Experts argue that government-backed investment could accelerate nationwide digital inclusion and strengthen national resilience against communication outages during emergencies.



sarawaktribune.com

Sarawak adopts CubeSats for land surveys

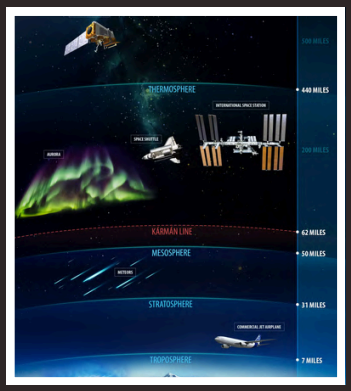
Sarawak is exploring low-cost CubeSat satellites to improve land surveys, environmental monitoring, and sustainable development planning. These nanosatellites can gather data on forests, water systems, mangroves, and land use to support flood mitigation and resource management. Officials highlight that CubeSats are far cheaper and faster to deploy than traditional satellites, making them a practical entry point into space technology. The initiative will be rolled out in phases, with a strong focus on building local expertise and developing a skilled aerospace workforce.



mexiconewsdaily.com

Students build nanosatellite to monitor Mexico's volcanoes

Students in Puebla developed a nanosatellite to improve monitoring of Mexico's active volcanoes and help protect nearby communities. The project focuses on tracking volcanic gases and activity patterns to improve eruption prediction and early warning systems. Built with support from universities and space agencies, the low-cost CubeSat demonstrates how student-led innovation can contribute to disaster risk reduction. Researchers hope the data will help authorities prepare evacuations and mitigate hazards in volcanic regions.



miragenews.com

Satellites reveal how methane disappears in stratosphere

Researchers at the University of Washington are using satellites to measure stratospheric temperatures and composition, improving understanding of how this layer influences climate and weather systems. By tracking changes in ozone, temperature, and atmospheric gases, the project aims to refine climate models and better predict extreme weather events. The data also helps scientists monitor long-term atmospheric trends linked to human activity and natural variability.

THE 75SSM

FROM LAB TO LAUNCH: INSIDE ITCA'S VANGUARD VISION

Space trivia alert

India's Gaganyaan will send its first astronauts into orbit, marking its first human spaceflight mission.

I²C addressing modes explained: 7-bit vs 10-bit basics



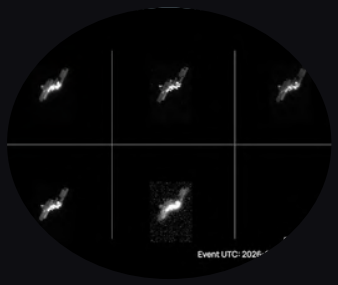
The 1U CubeSat, flagship of the 75SSM, marks a major leap in student-driven space innovation. It shows that when students are equipped with tools, mentorship, and ambition, they can redefine the frontiers of space technology. With its compact 10 cm^3 frame, the 1U CubeSat delivers capabilities rivaling larger satellites–making launches more accessible and affordable for educational institutions and emerging space nations. I²C uses two addressing modes to identify devices on the bus: 7-bit and 10-bit. The 7-bit mode is the industry standard, offering up to 128 addresses, though several are reserved for special functions like general call and start byte. It's simple, efficient, and supported by nearly all microcontrollers and peripherals. The 10-bit mode expands the address space to 1024 devices but adds protocol overhead, requiring two address bytes and more complex hardware support. Because of this complexity and limited compatibility, engineers rarely use 10-bit mode, instead preferring configurable addresses or multiple I²C buses in real-world designs.

SPACE@INDIA

TRACKING INDIA'S INDOMITABLE SPIRIT, RISING THROUGH SPACE

Space trivia alert

India's SRE-1 mission proved safe recovery of an orbiting space capsule in 2007.



India's private space firm Azista demonstrated the ability to image objects in orbit, boosting space surveillance and situational awareness capabilities.
Read more at: ndtv.com



A Bengaluru startup is developing robotic spacecraft to dock with ageing satellites in orbit, extending their lifespan and reducing space debris.
Read more at: indiatoday.in



Gujarat signed a letter of intent with Starlink to deliver high-speed satellite internet in remote and underserved regions, improving digital access.
Read more:timesofindia.com



ISRO chief says India's space programme prioritizes international cooperation over rivalry, strengthening partnerships for scientific progress and shared space exploration goals.
Read More: thehindu.com



ISRO is fast-tracking India's space station plans while developing 80 satellites to boost research, navigation, security, disaster management, and future human spaceflight missions.
Read more at: ndtv.com



ISRO chose a lunar south polar site for Chandrayaan-4, targeting water ice research and advanced landing technology tests.
Read more at:gktoday.in

75 Students' Satellites Mission

ITCA's Engineering Prowess and Ingenuity

ITCA: Pioneering India's Tech Future

Innovating India's tech for 23 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-Comm Europe
4 – 5 March 2026
London ExCeL, London, UK
space-comm.com

International Conference on Astronomy and Space Sciences ICASS
February 16-17, 2026 in Mumbai, India
conferenceindex.org

International Conference on Aeronautical and Aerospace Engineering ICAAAE
Feb 23-24, 2026 in New Delhi, India
conferenceindex.org

Slogan of the week

"Bold Ideas, Precise Engineering"
– The ITCA Way

Compiled by

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