



Space Beacon

Stay up-to-date with the latest in spacetech

The Year That Was: Global Spacetech Missions in 2024

ISRO's Groundbreaking Year in 2024 has been a remarkable year for India's space agency, ISRO, as it achieved significant milestones that placed India at the forefront of global space exploration.

Indian Missions

- Gaganyaan: ISRO launched its first uncrewed test flight, paving the way for crewed missions.
- Chandrayaan-4: Launched to explore the Moon's south pole.
- Aditya-L1: Launched India's first solar mission to study the Sun.
- OneWeb Launch: ISRO launched 36 OneWeb satellites.
- Skyroot's Vikram-1: A major milestone for India's private space sector.
- PSLV-C59 Launch: Launched Proba-3 for ESA and studied Sun's corona using artificial eclipse
- SpaDex Mission: Demonstrated autonomous space docking and successfully transferred power between two satellites

Global Missions

- NASA's Artemis: Progressed with the SLS rocket and Orion spacecraft, setting the stage for lunar missions.
- Mars Sample Return: NASA and ESA successfully launched Mars samples back to Earth.
- SpaceX Starship: Multiple successful launches demonstrated reusable tech for future lunar and Mars missions.
- China's Tiantan-1: Launched and docked with Tianzhou-6 cargo spacecraft.
- ESA's JUICE: Began its mission to explore Jupiter's moons.

India's space program is advancing, with ISRO and private players driving innovation.

Orbital



Lead with the most significant celestial events and discoveries

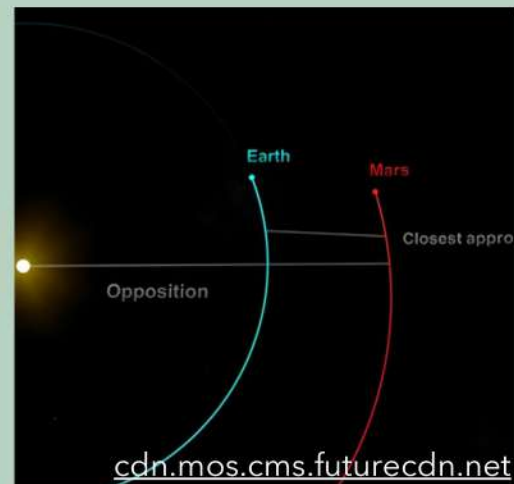
2025: A Year of Groundbreaking Space Exploration

2025 will bring a host of thrilling space missions. NASA's CLPS will deliver scientific payloads to the Moon, while Japan's M2/Resilience mission studies lunar soil and tests water extraction techniques. China's Tianwen-2 mission will gather asteroid samples. ESA's Space Rider will test new technologies in low Earth orbit, and SPHEREx will map the universe in near-infrared light. Additionally, spacecraft flybys, such as NASA's Europa Clipper and ESA's Hera, will explore asteroids and planets, expanding our knowledge of the solar system and beyond.



Mars Opposition 2025: A Spectacular Skywatching Event

On January 12, 2025, Mars will make its closest approach to Earth since 2022, marking its annual opposition. This event offers the best opportunity to observe the Red Planet at its biggest and brightest. Mars will be fully illuminated, showcasing features like Valles Marineris, Olympus Mons, and the polar ice cap. Peak viewing is from December 2024 to February 2025, with January 16 being the highlight. While not a "perihelic opposition," Mars will still shine brightly, making it an exciting time for stargazers and space missions alike.



NASA's Lunar Trailblazer: Exploring Water on the Moon

NASA's Lunar Trailblazer mission, launching in January 2025, will scout the Moon's south pole for water resources vital for future space exploration. As part of NASA's SIMPLEX program, this cost-effective mission uses small satellites to map the lunar surface. Equipped with the Lunar Thermal Mapper and High-resolution Volatiles and Minerals Moon Mapper, it will track temperature changes and study water in both solid and liquid forms. The data collected will provide insights into lunar water's origins and its potential for supporting future human missions to the Moon.



Parker Solar Probe Breaks Records with Historic Sun Pass



spxdaily.com

Parker Solar Probe breaks records with historic sun pass
NASA's Parker Solar Probe made history on Dec. 24, 2024, completing its closest-ever pass to the Sun, just 3.8 million miles above the solar surface. Traveling at 430,000 miles per hour, the spacecraft successfully entered the solar corona, collecting unprecedented data on the Sun's atmosphere. This close encounter provides vital insights into solar wind, energetic particles, and the Sun's mysteries. With its carbon foam shield protecting it from extreme heat, Parker Solar Probe is set to revolutionize solar science and deepen our understanding of space weather.

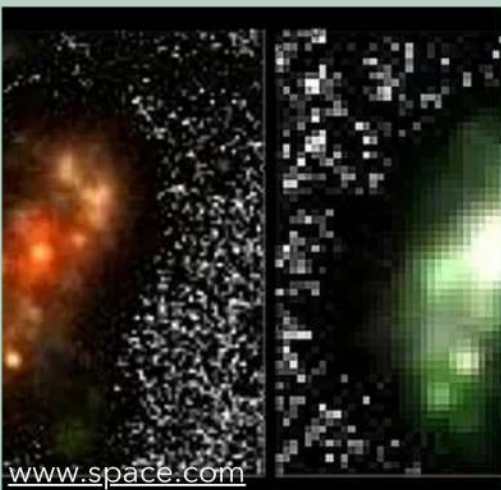
Trillions of Oceans Discovered Around Distant Quasar



msn.com

In a groundbreaking discovery, astronomers have detected a water reservoir around a quasar located over 12 billion light-years away, containing an astounding 140 trillion times the volume of Earth's oceans. This water, found near a supermassive black hole 20 billion times more massive than the Sun, provides a glimpse into the universe's early stages. The discovery of water vapour in such distant regions highlights the role of water in star and galaxy formation, offering valuable insights into the evolution of the early cosmos and the potential for life-building elements in the universe.

James Webb Tele Discovers Unusual Early Spiral Galaxy



www.space.com

A new discovery by the James Webb Space Telescope (JWST) has unveiled a grand-design spiral galaxy, A2744GDSpz4, located just 1.5 billion years after the Big Bang. This galaxy is much older than typical spiral galaxies, which are usually younger and clumpy. With a redshift of 4.03, its light has traveled for over 12 billion years. The galaxy's rapid formation, accumulating 10 billion solar masses in just a few hundred million years, challenges current theories of galaxy formation.

A photograph of the Earth as seen from space, showing the blue oceans and white clouds of the planet. The Earth is partially obscured by a dark, curved horizon.

**Expanding our cosmic understanding,
with each passing orbit**



Cover broader space news not fitting into other categories

SpaceX Launch Surge Sets Global Record in 2024

SpaceX's rapid launch cadence helped set a new global record for orbital launches in 2024, with 259 attempts, up 17% from 2023. SpaceX alone conducted 134 Falcon 9 and Falcon Heavy launches, surpassing all other countries combined. While other nations saw notable activity, SpaceX's dominance continues to grow. The company aims for 175-180 launches in 2025 and plans to ramp up Starship missions, with an ambitious goal of 1,000 launches annually in the future.



Spacecoin Launches Satellite for Decentralized Network

Spacecoin has successfully deployed its first satellite, CTC-0, to test a decentralized space-based network for global connectivity. The network uses blockchain (Creditcoin) to manage satellite operations and payments, without a central authority. Investors can participate by launching satellites and receiving a share of revenue. Initial services will offer text messaging and basic data rates, targeting regions with limited internet access. Spacecoin aims to lower internet costs in emerging markets, starting with Nigeria and India.



Themis Rocket Reaches Key Development Milestone

Europe's Themis reusable rocket has successfully completed a crucial 'full fit-check' at ArianeGroup's facility in France. This test confirmed that the rocket's components, including its engine bay and fuel tanks, integrate properly. Standing at 28 meters, Themis is powered by Prometheus, a next-generation engine running on liquid methane and oxygen. The milestone prepares Themis for its first flight at Sweden's Esrange Space Center next year, marking the beginning of its test phase under the European Commission's Salto program.



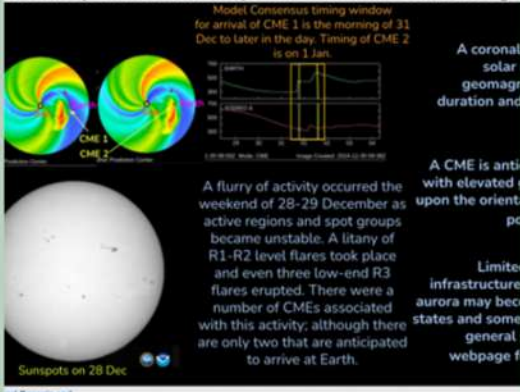


ISRO Launches SpaDeX Mission for Space Docking

ISRO's SpaDeX mission, launching on December 30 from Sriharikota, aims to demonstrate space docking technology. The mission will deploy two small satellites, SDX01 (Chaser) and SDX02 (Target), to test rendezvous and docking in low Earth orbit at 470 km. This experiment is crucial for future lunar missions, like Chandrayaan-4. SpaDeX mission, when successful will position India among a select group of nations with space docking capabilities, utilizing advanced positioning systems and VHF/UHF transceivers for precise satellite alignment.

Geomagnetic Storm WATCHES 31 Dec-1 Jan

WHAT: A pair of CMEs will likely reach Earth and lead to increased geomagnetic activity.



swpc.noaa.gov

Geomagnetic Storm Watch for New Year's Eve

A G3 (Strong) geomagnetic storm watch is in effect for December 31, with a G1 (Minor) watch for January 1, due to two Earth-directed coronal mass ejections (CMEs). The G1 watch may be upgraded to G2. Forecasters are confident about the general timing and components but uncertain about the storm's intensity. The true impact will be known once the CMEs reach 1 million miles from Earth. Neither CME is expected to be a direct hit, making intensity forecasts challenging.

York Space Systems Achieves Key Satellite Milestone

York Space Systems, a Denver-based aerospace company, has reached significant engineering and operational milestones in two major programs. The company completed the System Requirements Review for 10 satellites under the Space Development Agency's (SDA) Tranche 2 Transport Layer Gamma, and the Critical Design Review for 62 satellites under the Tranche 2 Transport Layer Alpha contract. These achievements highlight York's ability to scale production while ensuring quality, reinforcing its reputation as a reliable and innovative partner for both government and commercial clients.

YORK
SPACE SYSTEMS

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Working together to unlock the secrets of the universe



Satellogy



Focus on recent and upcoming satellites and launches

Key Satellite Launches to Shape Space Exploration

Exciting satellite launches are scheduled for 2024-2025, with NASA's Artemis II mission aiming to send astronauts around the Moon. The European Space Agency's JUICE mission will explore Jupiter's icy moons, while SpaceX expands its Starlink satellite network for global internet. The UAE will launch its Moon rover Rashid, and NASA's Earth Science satellites will monitor climate change. These missions promise technological advancements and groundbreaking discoveries, reshaping space exploration and enhancing Earth's services.



Roscosmos Plans 8 Earth Sensing Satellites for 2025

Roscosmos is preparing to launch eight remote Earth sensing satellites in 2025, including Elektro-L, Obzor-R, Grifon, and Aist spacecraft. The launches will also include Aist-2T1, Aist-2T2, Obzor-R1 radar satellite, and the hydrometeorological Elektro-L5. Additionally, four Grifon satellites will monitor Earth's surface, with plans to deploy 132 Sfera-Grifon satellites by 2026. Roscosmos will also launch foreign satellites, experimental Marafon satellites, and Ionosfera-M3 and M4 spacecraft as part of its expanding space projects.



SpaceX Sets Record with 21 Starlink Satellites

SpaceX successfully launched its final mission of 2024, deploying 21 Starlink satellites from Kennedy Space Center. The Falcon 9 rocket lifted off at 12:39 a.m. EST, marking the company's 134th orbital mission in the year, surpassing its previous record of 96 launches in 2023. The mission included 13 satellites with direct-to-cell capabilities, advancing global cellular connectivity. This milestone concludes a successful year, solidifying SpaceX's position as a leader in commercial spaceflight and telecommunications services.





Rocket Lab Ends Record Year with Synspecive Launch

Rocket Lab successfully deployed a StriX SAR satellite for Synspecive, marking its 16th mission of 2024. The launch took place on December 22 from New Zealand, capping a record-breaking year with a 60% increase in launches compared to 2023. This mission was part of an ongoing partnership with Synspecive, which exclusively relies on Rocket Lab for its satellite constellation. The company also achieved a perfect mission success rate, surpassing its previous record of 10 launches in 2023.



NOIRLab Launches Constellations Educational Resource

NSF NOIRLab has launched the 88 Constellations project, providing high-resolution images of all 88 IAU-recognized constellations. Created by astrophotographer Eckhard Slawik, the images feature stunning star colors and deep-sky objects. The project also includes educational materials such as flashcards, audiovisual resources, and detailed descriptions of each constellation's history and significance. A massive all-sky image, compiled from pristine locations worldwide, offers an unprecedented level of detail. The collection is freely available for educational use in classrooms and museums.

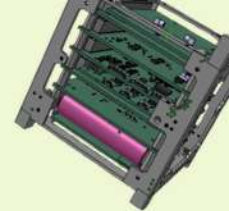


ULA Plans Vulcan Centaur as 'Space Interceptor'

United Launch Alliance (ULA) aims to upgrade its Vulcan Centaur rocket into a "space interceptor" to defend satellites. ULA CEO Tory Bruno envisions the Centaur as a rapid-response defender, able to neutralize potential threats in orbit. This concept addresses the increasing need for space defense, as satellites are vulnerable to hostile actions. ULA's proposed upgrades would allow the Centaur to act as a fast, lethal interceptor while avoiding space debris, enhancing U.S. military capabilities in contested space.



CubeTech



Showcase innovative CubeSat missions and unique payloads

UNH and Rogue Space Partner for Satellite Protection

The University of New Hampshire Space Tech Hub has teamed up with Rogue Space Systems to develop a 3D model predicting high-energy electron flux in space. This model will help protect satellites and spacecraft from potential damage caused by geomagnetic storms. The collaboration, funded by a Phase I SBIR award from SpaceWERX, aims to enhance space weather resilience, lower insurance costs, and ensure the continuity of space services, benefiting both commercial and defense assets.



Aerospace Student Wins Space Award

Sapphira Akins, a mechanical engineering graduate from the University of Hawai'i at Mānoa, has won the 2024 Universities Space Research Association (USRA) Distinguished Undergraduate Award. Akins, specializing in aerospace engineering, received the John R. Sevier Memorial Scholarship for her academic excellence and contributions to space science. She is also part of a team selected to launch a satellite into space through NASA's CubeSat Launch Initiative. Akins aspires to become a pilot and astronaut, continuing her studies through the BAM program.



NUS High School Builds Nanosatellite for Space Launch

Students from NUS High School of Mathematics and Science have created their first nanosatellite, set to launch on a SpaceX rocket in March. The 900g satellite will take Earth photos from orbit, showcasing students' hands-on experience in space engineering. The project began five years ago, with contributions from alumni and current students. This initiative not only paves the way for future technological advancements but also serves as an inspiration for aspiring young scientists and engineers worldwide, encouraging them to dream big and reach for the stars.



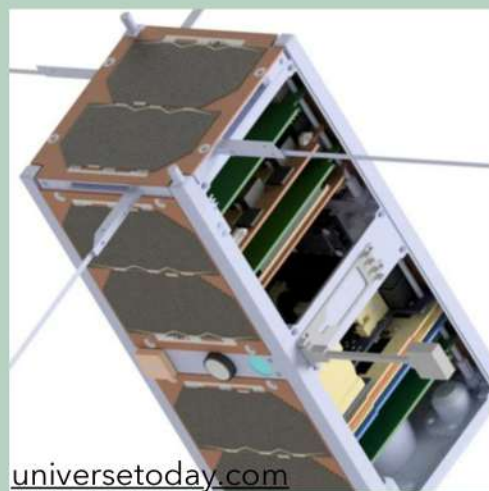
Top Careers with a Space Studies Degree

A degree in space studies opens doors to exciting careers such as space scientist, astrophysicist, aerospace engineer, mission controller, and space policy analyst. These roles involve studying the universe, designing spacecraft, analyzing space data, and shaping space policies. Professionals work with space agencies, research institutions, and private companies to contribute to space exploration. Specialized skills in STEM, problem-solving, and teamwork are crucial. The field offers diverse opportunities in research, engineering, and education for those passionate about space.



Padova Students Design Ambitious AlbaSat CubeSat

A team from the University of Padova is developing AlbaSat, a 2U CubeSat as part of ESA's Fly Your Satellite program. The satellite features four key payloads: an impact sensor for space debris, a tri-axial accelerometer for vibration detection, a laser rangefinder for orbit tracking, and a test rig for quantum communication systems. The project marks Padova's first CubeSat venture and aims to provide valuable scientific data before its orbit decays in under 12 years. AlbaSat is set to inspire future generations of engineers and scientists, encouraging them to reach for the stars.



Georgia Tech CubeSat Propellant Innovation

Georgia Tech engineers, led by Professor Álvaro Romero-Calvo, have developed a new propellant management device (PMD) that enhances CubeSat performance by using heat to reposition propellants, extending mission lifetimes by 30%. Their work, supported by NASA's TechFlights program, successfully demonstrated the technology in microgravity conditions during parabolic flights. This innovation simplifies CubeSat propulsion systems, offering greater reliability and efficiency, set to undergo further testing for space missions, with potential applications in satellite swarm configurations.



The 75SSM

SSM: Students' Satellites Mission

Update readers on our ITCA internal space-based innovations

Consonance CN3795 & CN3791: Advanced Battery Chargers with MPPT

CN3795: A versatile PWM charger for Lithium-ion, LiFePO₄, and Lithium Titanate batteries with MPPT functionality, ensuring efficient solar energy harvesting.

Features:

- Supports 6.6V-30V input
- Programmable charge current up to 4A
- Automatic trickle charge & overvoltage protection
- Compact 10-pin SSOP package Ideal for portable devices, backup systems, and solar-powered applications.

Innovative Solutions for Modern Battery Charging!

CN3795:
The All-in-One PWM Charger for Diverse Battery Types.

CN3791:
High-Efficiency Charger for Lithium-ion Batteries.

Versatility Meets Compact Design in Battery Charging.

Proactive Battery Management for Optimal Performance.

Ensure Safety and Reliability with Built-in Protections.

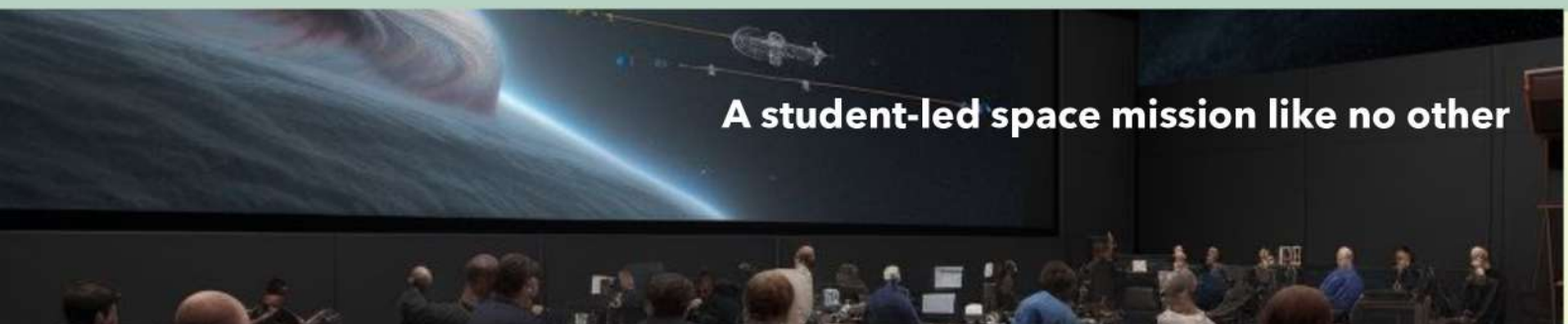
Engage with Next-Gen Technologies for Future-Ready Solutions.

Commit to Sustainable Energy Practices with Cutting-Edge Solutions

CN3791: A high-efficiency PWM charger for Lithium-ion batteries with integrated MPPT.

Features:

- 4.5V-28V input range
- Programmable charge current (up to 4A)
- Deep discharge recovery & overvoltage protection
- Compact 10-pin SSOP package Perfect for power banks, medical devices, and solar chargers.



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Space@India



Glimpses into India's space chronicle, every week



India launches space docking experiment with PSLV rocket, advancing major ambitions

[Read more at: spacenews.com](http://spacenews.com)

ISRO's biggest missions for 2025! from Gaganyaan spaceflight to Earth observation satellite, will India become Space leader in world?



[Read more at : msn.com](http://msn.com)



India's navigation satellite to be ISRO's 100th launch from Sriharikota

[Read more at: deccanherald.com](http://deccanherald.com)

India's XPoSat Mission: A Step Forward in Astrophysics

[Read more at: isro.gov.in](http://isro.gov.in)

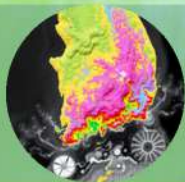


ISRO-ESA Agreement for Cooperation on Activities related to Astronaut Training, Mission Implementation and Research Experiments

[Read more at: isro.gov.in](http://isro.gov.in)

Pixxel Space Signs Deal To Supply Hyperspectral Data To Korean Firm

[Read more at : idr.org](http://idr.org)



India, Ghana ink MoU to boost collaboration in sat communication

[Read more at: indiatimes.com](http://indiatimes.com)

Space industry funding in India falls 55% in 2024, data shows

[Read more at : idr.org](http://idr.org)





ITCA: Pioneering India's Tech Future

Driving India's tech innovation for over 21 years, we've built strong academia-industry partnerships. Pioneer of the '75 Students' Satellites Mission,' we've made a global impact in space tech, precision agriculture, and Industry 4.0. We are shaping the future of India's technology landscape.

Upcoming.....

Spatial Perspectives

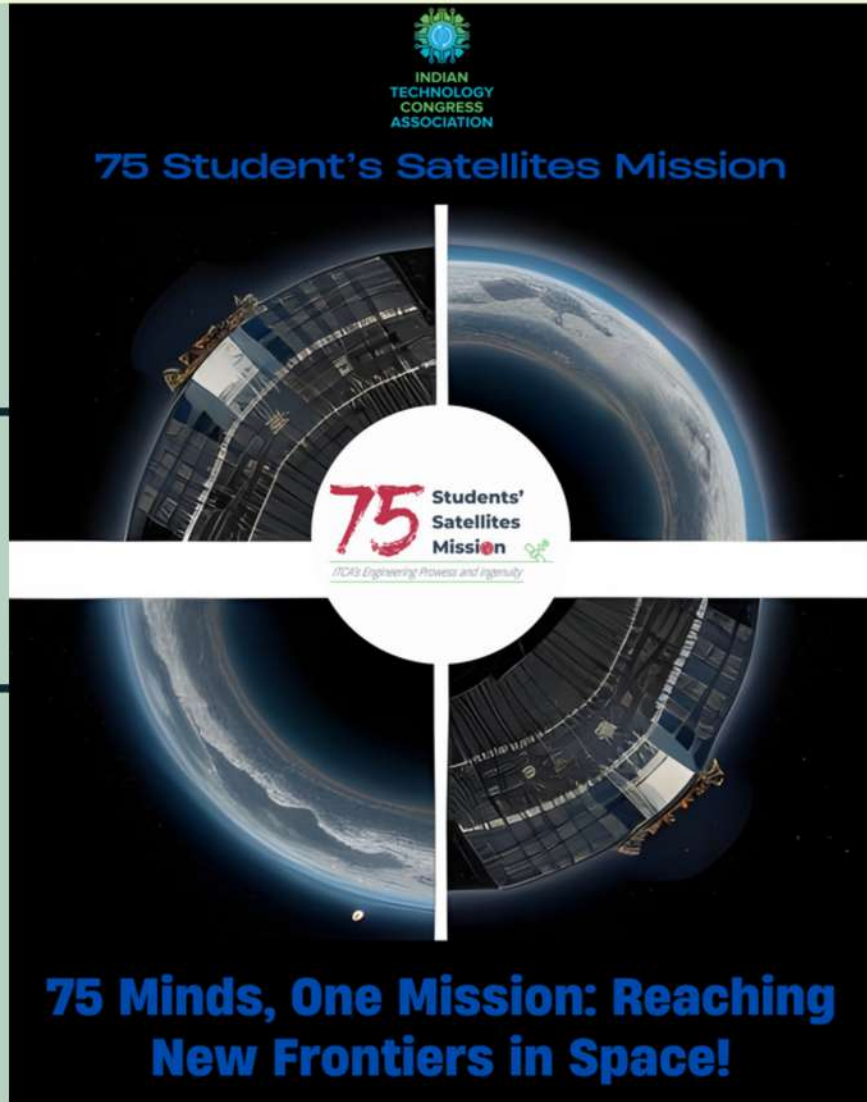
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Les Salons Hoche in Paris.
<https://perspectives-spatiales.com/>

Space-Comm Expo

11-12 March 2025
London ExCeL
Royal Victoria Dock, 1 Western Gateway, London, E16 1XL
<https://smallsatshow.com/>

Satellite 2025 Conference & Exhibition

Conference: 10-13 March 2025
Exhibition: 11-13 March 2025
Walter E. Washington Convention Center
Washington, DC
<https://www.satshow.com/>



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