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Galactica

Astronomy and Space Science Magazine

What's Inside?

www.space-global.com

Galactica is a monthly magazine about astronomy & space science published by SPACE India targeting amateur astronomers. Each monthly issue includes astronomy news, space launches, what's up in the sky every month, events and announcements done by the space team, Astrophotographs and articles on astronomy & astrophysics submitted by the readers for the general audience, and the article about historical missions & events of astronomy and more. All of this comes in an easy-to-understand user-friendly style that's perfect for astronomers at any level.

Team

Cover Photo: Canis Major captured by Mr. Saurabh Pandav at Sariska - SPACE Astroport site.

ABOUT SPACE

Legacy of 24 years | Pioneer Organization | 10000+ Activities Developed | 1000+ Schools Associated | 1.5M+ Students Engaged | 10K+ Outreach Events | 10+ Cities Presence

SPACE is the pioneer organization working towards the development of science and astronomy in India. It aims to create a scientifically aware society and contribute to the technological and social development of the country, SPACE organization belongs to an astronomical league. diligently working towards development in astronomy and space science through astronomical tutorials, modules, and curriculum for education requirements of schools & students in India. We constantly engage in offering introductory astronomy, science about space, astrophysics, telescopes, and internet astronomy to the masses.

Vision: To popularize hands-on space science & STEM Education through various fun-filled pioneering concepts, services, and programs.

Mission: To develop and popularize space science & STEM Education In India and establish a global association with national & international space science agencies, societies, amateur, and professional organizations, government agencies, and space observatories.

CMD's Message

Dr. Sachin Bahmba, CMD, SPACE

Space and Astronomy are the future for the young generation of our country. This is a great means to inculcate scientific temperament among the masses. Such astronomy sessions will provide a hands-on learning platform for students wherein they explore the real world of science, I wish for young students to let their ambitions soar and think big as they are the future of our country.

Co-founder's Message

Ms. Shalini Bahmba, Co-founder, SPACE

Astronomy education is important as it builds curiosity, critical thinking, and problem-solving skills, helping young minds prepare for the future. It encourages innovation, exploration, and a scientific mindset. Young learners build creativity and confidence through hands-on, experiential learning, preparing them for careers in space science and technology. We aim to cultivate future innovators who will lead progress, discovery, and global advancement.

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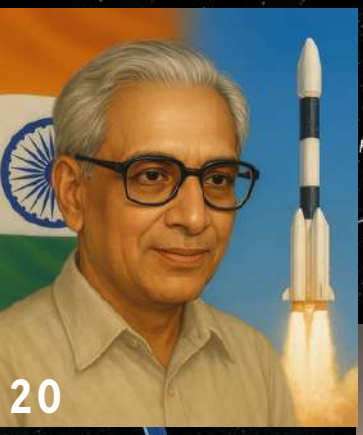
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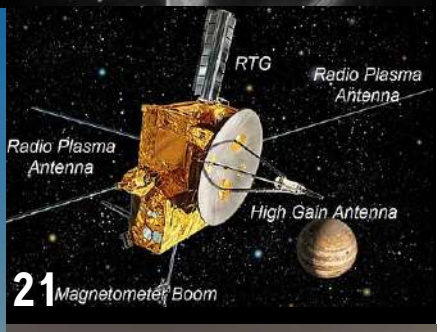

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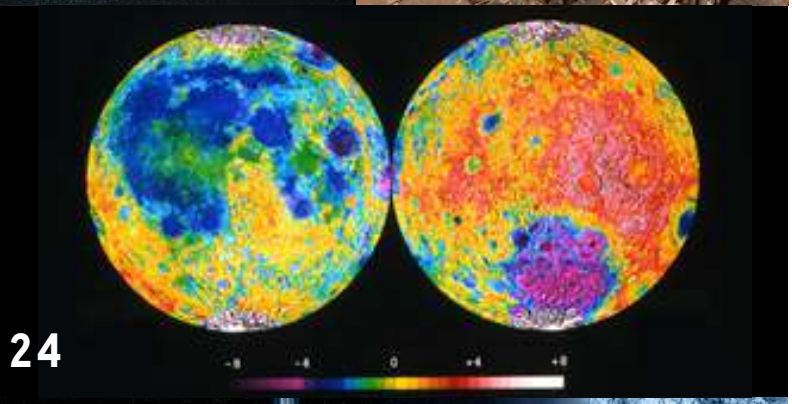
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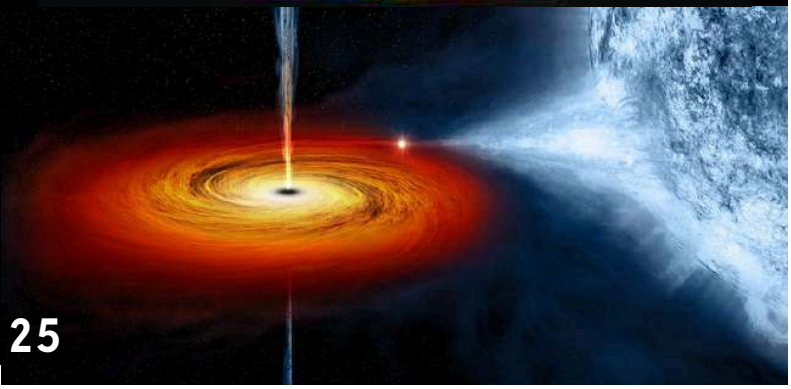
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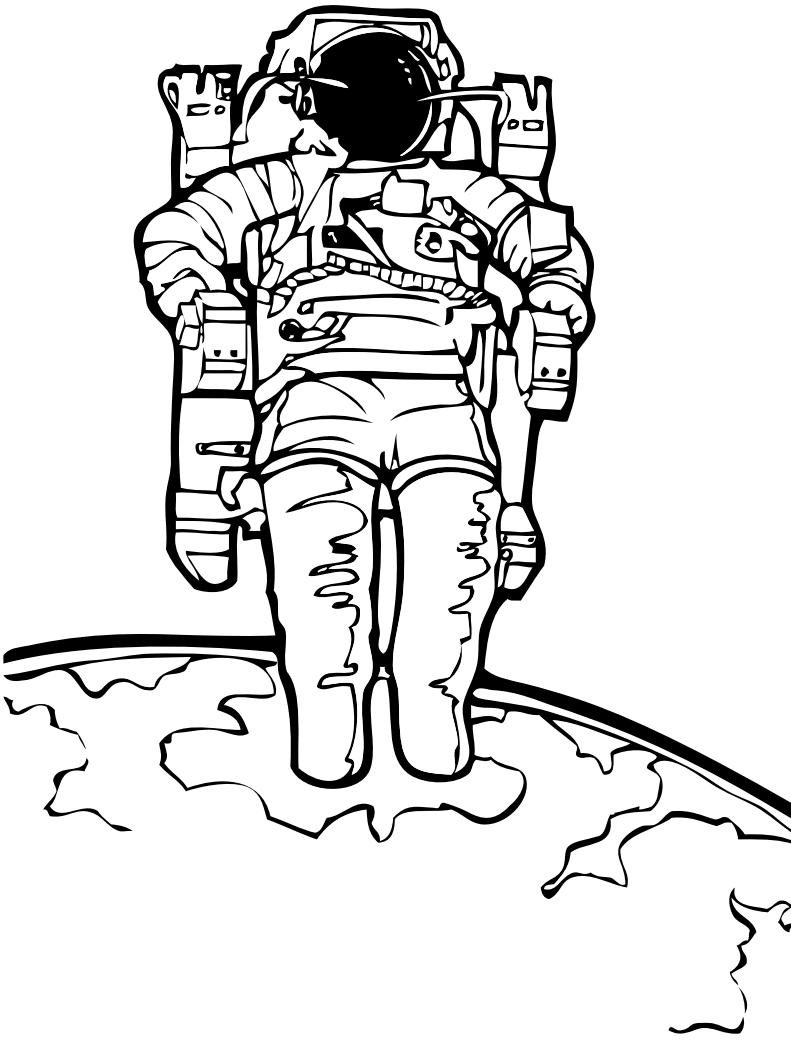


SPACE INSIGHTS

Cosmic Mind Forum: Inspiring Young Scientists

On 28th January 2026, SPACE India organised the "Cosmic Mind Forum Inspiring Young Scientists" at K. R. Mangalam World School, Vaishali, under the Universe in the School (UITS) Program, for students of Grade VII. The forum was held in the school auditorium from 10:15 am to 11:55 am, to ignite curiosity and promote scientific thinking among young learners.

The session featured an insightful talk by Dr. Parveen Saini, Senior Principal Scientist and Professor at CSIR – National Physical Laboratory (CSIR-NPL). He engaged students in meaningful discussions on Air Quality Index (AQI), waste management, solar energy through solar panels, and their real-world scientific applications, highlighting the importance of scientific awareness and responsible practices.

Students participated enthusiastically by asking thoughtful questions, which were patiently addressed, making the session interactive, inspiring, and memorable. The forum successfully encouraged students to think critically and reaffirmed the school's commitment to nurturing future scientists and explorers.

Blasting Off to Wonder: SD International School's Astronomy Carnival Lights Up Panipat

Imagine rockets soaring, sunspots dancing under telescopes, and kids floating in space, everything in one electrifying day. On January 31, 2026, SD International School in Panipat transformed its campus into a cosmic playground with its Astronomy Carnival. This space themed extravaganza became a portal to space and the stars, captivating students with hands on activities of art and astronomy.

The playground pulsed with rocket launches as students ignited mini thrust marvels, discussing the ways and strategies of launching different rockets. Hindered by daytime clouds at the start, but with time, the Telescope stations unveiled the sun's fiery sunspots, emanating from the shadows of the clouds. Moon rovers zipped over cratered mock terrains, seamlessly blending robotics with lunar soil.

The real showstopper, VR headsets whisking over the participants aboard the International Space Station, complete with zero gravity Earth visuals and orbiting thrills
through the experience of a space walk. Astronaut workshops about how to become an astronaut and the tests that they have to go through to reach the heights of space added to students' excitement.

The craft section soared with quizzes that led the participants to design their own planets. This edtech infused carnival promoted teamwork and curiosity, proving that experiential learning can launch the lifelong passions of students. Panipat's young stargazers are now ready to dive into the deeper part of the cosmos' journey.

HIGHLIGHTS OF JANUARY 2026

India's Highest Honour: Shubhanshu Shukla receives Ashoka Chakra

India's decision to award the Ashoka Chakra to Group Captain Shubhanshu Shukla during the 77th Republic Day celebrations has sparked widespread debate. Some critics argue that the nation's highest peacetime gallantry honour is traditionally reserved for acts of bravery on the battlefield. However, a closer look at Shukla's service reveals why the recognition is both appropriate and timely.

Shukla is not merely an astronaut; he is a decorated Indian Air Force officer and seasoned test pilot with over 2,000 flying hours on frontline fighter jets such as the Su-30 MKI, MiG-29, and Jaguar. His selection for ISRO's Gaganyaan mission and later participation in Axiom Mission 4 to the International Space Station came after years of rigorous training and operational excellence under high-risk conditions.

President Droupadi Murmu confers 'Ashoka Chakra' to Group Captain Shubhanshu Shukla

Human spaceflight remains one of the most hazardous peacetime missions. Serving as a pilot on a crewed ISS mission demands technical precision, split-second decision-making, and the courage to operate in an unforgiving environment where failure can be catastrophic. Beyond piloting, Shukla contributed to scientific research critical to India's long-term strategic goals in space.

The Ashoka Chakra recognises "Most conspicuous bravery or self-sacrifice otherwise than in the face of the enemy." In an era where national frontiers extend into space, honouring courage in orbit reflects the evolving nature of service and sacrifice.

Artemis II: NASA's Return to the Moon Humanity's Next Giant Leap

NASA is preparing to send humans back toward the Moon with the Artemis II mission, scheduled to launch as early as February 6, 2026, from Launch Complex 39B at the Kennedy Space Center in Florida. The mission marks a historic moment, as it will be the first crewed voyage beyond low-Earth orbit since Apollo 17 in 1972 and a crucial step toward future lunar landings–and eventually, missions to Mars.

Artemis II will carry four astronauts on a roughly 10-day journey around the Moon and back. The crew includes Commander Reid Wiseman, Pilot Victor Glover, Mission Specialist Christina Koch, and Mission Specialist Jeremy Hansen of the Canadian Space Agency. Their flight will follow a free-return trajectory, looping around the Moon's far side before returning safely to Earth for a Pacific Ocean splashdown, echoing the path of Apollo 8 more than five decades ago.

The mission will launch aboard NASA's powerful Space Launch System (SLS) rocket, carrying the Orion spacecraft. Final preparations are underway, including wet dress rehearsals that simulate fueling and launch procedures. On January 17, the fully stacked rocket completed its rollout to Launch Pad 39B, a visible sign that the countdown to launch has truly begun.

Although Artemis II will not land on the lunar surface, its importance is immense. The mission will test Orion's life-support systems, navigation, communications, and overall performance with astronauts onboard–capabilities that must be proven before landing crews on the Moon. The data gathered will directly inform Artemis III, which aims to land astronauts near the Moon's south pole and establish a sustained human presence.

Beyond the Moon, Artemis II represents a stepping stone toward deeper exploration. Lessons learned from operating in deep space will shape future long-duration missions, including those to Mars. As Artemis II prepares for launch, it signals not just a return to the Moon, but the renewal of humanity's ambition to explore farther than ever before.

A Stellar Career Concludes: Sunita Williams Retires After 27 Years at NASA

After an extraordinary 27-year career at NASA, astronaut Sunita Williams has announced her retirement, bringing to a close one of the most accomplished journeys in modern spaceflight. Selected as an astronaut in 1998, Williams became a symbol of quiet leadership, technical excellence, and resilience, inspiring generations of scientists and aspiring astronauts worldwide.

Born in Euclid, Ohio, and raised in Needham, Massachusetts, Williams built her foundations through education and discipline. She graduated from the U.S. Naval Academy in 1987 and later earned a master's degree in engineering management.

Her early career in the U.S. Navy saw her fly more than 30 aircraft types, log over 3,000 flight hours, and serve in operations across the Mediterranean, Persian Gulf, and during Hurricane Andrew relief efforts.

Williams made her first spaceflight in 2006 aboard Space Shuttle Discovery, joining Expeditions 14 and 15 on the International Space Station (ISS). Her four spacewalks during the mission set a then-record for female astronauts. She returned to orbit in 2012, serving as commander of the ISS during Expedition 33, becoming only the second woman to hold the role at the time

Her final missions defined a historic chapter. During extended ISS stays following Boeing's Starliner test flight and later SpaceX Crew-9, Williams surpassed Peggy Whitson's record to become the most experienced female spacewalker in history, completing 62 hours and 6 minutes of spacewalks. Across three missions, she spent 608 days in space.

As she retires, Williams leaves behind a legacy shaped by humility, courage, and groundbreaking achievement–one that will continue to inspire future explorers long after her final landing.

An Unplanned Descent: NASA's Crew-11 Departs ISS Following Medical Alert

NASA has made the rare decision to end SpaceX's Crew-11 mission ahead of schedule, bringing the four astronauts home early due to an undisclosed medical concern involving one crew member. The mission, originally planned as a six-month stay aboard the International Space Station (ISS), concluded sooner than expected as Crew-11's Crew Dragon capsule Endeavour undocked from the ISS at 5:20 p.m. EST (2220 GMT).

Following undocking, the crew began an approximately 11-hour deorbit journey back to Earth, with a planned splashdown in the Pacific Ocean off the coast of California at 3:41 a.m. EST (0841 GMT) on Thursday, Jan. 15. NASA confirmed that weather conditions were "excellent" for the parachute-assisted landing. Viewers around the world were able to follow the return live on NASA+, Amazon Prime, NASA's YouTube channel, and Space.com, along with a post-landing press conference later that morning.

SpaceX's Crew-11 Crew Dragon capsule, named Endeavour, is seen shortly after undocking from the ISS

Crew-11 launched to the ISS on Aug. 1, 2025, carrying NASA astronauts Zena Cardman and Mike Fincke, Japan Aerospace Exploration Agency (JAXA) astronaut Kimiya Yui, and Russian cosmonaut Oleg Platonov. Their return was initially planned for late February, after the arrival of SpaceX's Crew-12. However, medical concerns that surfaced ahead of a scheduled Jan. 8 spacewalk escalated quickly, prompting NASA to prioritize crew health and authorize an early return.

NASA Administrator Jared Isaacman formally announced the mission's conclusion during a press conference, the same day the spacewalk was canceled. Preparations aboard the ISS followed swiftly, including a change-of-command ceremony in which Fincke handed over leadership of the station to Roscosmos cosmonaut Sergey Kud-Sverchov.

With Crew-11's early departure, the ISS is temporarily staffed by a three-person "skeleton crew" until Crew-12 launches, currently targeted for no earlier than Feb. 15. The decision underscores NASA's commitment to astronaut safety—even when it means reshaping mission plans in orbit.

Orbital Insertion Missed: PSLV-C62 Suffers Critical Anomaly

India's first space mission of 2026 suffered a major setback on January 12 after ISRO's Polar Satellite Launch Vehicle, PSLV-C62, failed to place its payloads into orbit due to a critical third-stage anomaly. The mission, launched from the Satish Dhawan Space Centre in Sriharikota, was carrying 16 satellites, including DRDO's strategic surveillance satellite Anvesha.

The launch initially proceeded smoothly, lifting off at 10:18 am IST with all strap-on boosters separating as planned. However, around eight minutes into the flight, telemetry data indicated an unexpected drop in chamber pressure in the rocket's third stage (PS3). This caused the vehicle to deviate from its intended trajectory, ultimately preventing orbital insertion.

ISRO Chairman V. Narayanan confirmed the anomaly in a post-flight briefing, stating that while the first and second stages performed normally, the third stage failed to generate the required thrust. The deviation resulted in the presumed loss of the primary payload, Anvesha, along with 15 co-passenger satellites, which are expected to re-enter Earth's atmosphere and burn up.

Preliminary assessments suggest that the failure mirrors the PS3 issue encountered during the aborted PSLV-C61 mission in 2025, marking a second consecutive setback linked to the same stage. Experts note that at hypersonic speeds of nearly 8,000 km/h, even a minor instability can have catastrophic consequences.

The loss is particularly significant as the mission also included AayulSAT, India's first experimental orbital refuelling satellite, aimed at advancing in-space servicing capabilities. With two successive third-stage failures, ISRO has initiated a detailed investigation focusing on potential nozzle defects, propellant inconsistencies, or structural issues.

As ISRO works to identify and rectify the root cause, the PSLV–long regarded as India's most dependable launch vehicle–may remain grounded, casting uncertainty over the nation's near-term space launch schedule.

Beauty and Risk: Sun Unleashes Strongest Solar Storm in Two Decades

On 18-19 January 2026, Earth experienced its most powerful solar radiation storm in over two decades, reminding us that our planet lives under the constant influence of a restless star. Triggered by a massive eruption of charged particles from the Sun's atmosphere, the event reached an S4, or "severe," level on the space weather scale, a rarity last seen in 2003.

The most visible impact was breathtaking. As high-energy particles slammed into Earth's magnetosphere, they ignited aurorae far beyond their usual polar confines. Skies lit up with green and red curtains of light across parts of the United States, delighting skywatchers who rarely witness such displays. What is typically a polar phenomenon briefly became a mid-latitude spectacle.

Behind the beauty, however, lay serious scientific concern. Solar radiation storms can interfere with satellite electronics, degrade GPS accuracy, and disrupt high-frequency radio communications. Aviation routes near the poles faced increased radiation exposure, while space agencies kept a close watch on astronauts aboard the International Space Station. Power grids, though unaffected this time, are also known to be vulnerable during extreme events.

Such storms originate from the Sun's complex magnetic behavior. When stressed magnetic fields near sunspots suddenly release energy, they produce solar flares and coronal mass ejections – enormous clouds of charged particles racing through space at millions of kilometers per hour. If Earth lies in their path, the interaction can be dramatic.

This storm was both a cosmic light show and a sobering reminder: our modern, technology-dependent world is deeply connected to the Sun's volatile moods.

WHAT'S UP IN THE SKY - FEBRUARY 2026

LUNAR CALENDAR

IMPORTANCE OF MOON PHASES FOR STARGAZERS

One might wonder why it is important to refer to moon phases for star gazing. The reason is that the phases of the Moon reflect a great deal of illumination, and because the Moon is so close to us, it overrides the brightness of other celestial objects.

So, What Moon phase is best for stargazing? "The New Moon and the days immediately before and after the new moon (Crescent phases)" are among the best times for stargazing. Whereas the Remaining phases like Full Moon, waxing or waning gibbous, the first or third quarter Moon offers a time to zoom in and witness the features of the Moon.

PLANETS VISIBILITY

Mercury
Evening planet reaching greatest eastern elongation (18.1°) on 19 Feb.

Venus
Evening planet setting 30 minutes after sunset on 1 Feb, 70 minutes after by the end of the month.

Mars
Lost in the sun's glare and will remain hidden until early spring 2026.

Jupiter
Evening planet visible through out the month Waxing gibbous Moon nearby on 26 and 27 Feb.

Saturn
Evening planet fades into expanding twilight this February.

Uranus
Well-placed in the constellation Taurus near the South of Pleiades star cluster, and is visible for most of the night.

Neptune
Evening planet in Pisces constellation ,near by Planet Saturn on late February.

BRIGHT DEEP SKY OBJECTS

Large Magellanic Cloud (LMC), or Nubecula Major (PGC 17223) is a dwarf irregular galaxy and a satellite of our galaxy located in the constellation Dorado. It has an apparent magnitude of 0.9 and is best observed from southern hemisphere. It was first documented by Al - Sufi (Persian astronomer) in 964 CE.

Seven Sisters also known as M45 or Pleiades Star Cluster is located in Taurus constellation with apparent magnitude of 1.2. With naked eyes it looks like a small copy of Big Dipper with group of six stars. Binoculars can show more stars. This cluster is about 444 light years away from us.

Bode's Galaxy, M81 or NCG 3031 is a bright spiral one, located in Ursa Major constellation with an apparent magnitude of 6.9. It is one of the brightest galaxies which can even be seen under light polluted sky. It was discovered by Johann Elert Bode in 1774.

Hand Cluster also known as NGC 3114 or Cr 215, is best observed from the southern hemisphere. It has an apparent magnitude of 4.2 and can be observed through naked eye, while binocular or a small telescope can make it easier to observe in a dark and clear sky. It can be found in the Carina constellation.

Rocket launches in February 2026

USSF-87

Scheduled for launch in February 2026, United Launch Alliance's Vulcan Centaur VC4S rocket will deploy the USSF-87 mission for the U.S. Space Force's Space Systems Command from Space Launch Complex-41 at Cape Canaveral Space Force Station, Florida.

The mission will place two Geosynchronous Space Situational Awareness Program (GSSAP) satellites GSSAP-7 and GSSAP-8 into near geosynchronous orbit, where they will provide critical data on space traffic and orbital dynamics to enhance space domain awareness, including collision avoidance and monitoring of objects around high altitude orbits.


VC4S rocket (Credit: ULA)

CREW-12


Falcon 9 rocket (Credit:SpaceX)

Scheduled for launch in February 2026, SpaceX's Falcon 9 Block 5 will carry NASA's Crew-12 aboard a Crew Dragon spacecraft from Cape Canaveral Space Force Station, Florida to the International Space Station (ISS). The mission will fly four astronauts NASA's Jessica Meir and Jack Hathaway, ESA astronaut Sophie Adenot, and Roscosmos cosmonaut Andrey Fedyaev under NASA's Commercial Crew Program to support ongoing science, maintenance, and operations aboard the ISS.

Crew-12 will join Expedition 74/75 crew members already aboard the station, conducting experiments, technology demonstrations, and station upkeep during their long duration stay in low Earth orbit.

AMAZON LEO (LE-01)

Scheduled for launch in February 2026, Arianespace's Ariane 64 will deploy Amazon Leo (LE-01) satellites from Europe's Spaceport in Kourou, French Guiana. The mission will place 32 low Earth orbit broadband satellites into orbit as part of Amazon's Leo internet constellation to deliver fast, reliable internet connectivity to underserved and remote regions worldwide.

Designated VA267 (LE-01), this flight is the first of 18 Ariane 6 launches booked to support the Amazon Leo network and marks the first time a European launcher will launch satellites for the constellation, showcasing Ariane 6's full power capability in heavy satellite deployment.


Ariane 64 rocket (Credit:ESA)

ELEKTRO-L NO.5

Scheduled for launch in February 2026, Khrunichev's Proton-M/Block DM-03 will deploy Elektro-L No.5 from the Baikonur Cosmodrome in Kazakhstan. The satellite will provide continuous geostationary weather imaging with multispectral visible and infrared instruments, capturing full disk Earth views for meteorology, climate monitoring, and emergency response.

Proton-M/Block DM-03
(Credit: Gunter space page)

Elektro-L No.5 will join Russia's existing Elektro-L series to support real time forecasting, storm tracking, and space weather studies, and also relay signals for the international COSPAS-SARSAT search and rescue system.

FLIGHT 3

KAIROS rocket
(Credit: Kantaro Komiya

Scheduled for launch in February 2026, Space One's Flight 3 mission will lift off aboard the KAIROS launch vehicle from Spaceport Kii, Japan. It is the third flight of the KAIROS rocket, a four-stage solid-fuel small satellite launcher developed by Space One, a private Japanese space company.

The mission will carry four small satellites TATARA-1R, SC-Sat1a, HErO, and AETS-1 into Sun synchronous orbit, supporting a variety of technology demonstrations and Earth observation objectives. Flight 3 highlights Space One's continued efforts to establish affordable, frequent access to space for commercial and research payloads.

DEMO FLIGHT

Scheduled for launch in February 2026, Skyroot Aerospace's Demo Flight will be the first orbital launch of the Vikram-I rocket from the Satish Dhawan Space Centre First Launch Pad in India.

Vikram-I rocket
(Credit: Skyroot Aerospace)

The mission is a test flight to low Earth orbit, carrying several cubesats as secondary payloads to validate the new vehicle's performance and orbital insertion capabilities. Vikram-I is a four-stage launch vehicle developed by the Indian private company Skyroot Aerospace, designed to deliver up to 350 kg to LEO and support dedicated and rideshare missions.

****Note: Launch dates of the missions are scheduled to be launched in February 2026, but may be subject to change.**

Setbacks That Built Space Success

THE LAST FLIGHT OF COLUMBIA

A space shuttle was a reusable spacecraft developed by NASA to carry astronauts and cargo into low Earth orbit and back. Unlike earlier rockets that were used only once, the Space Shuttle system was designed to launch like a rocket, orbit like a spacecraft, and land like an airplane. Columbia was the first space shuttle ever built and flown. It launched for the first time on April 12, 1981, on the historic STS-1 mission. This marked the beginning of the Space Shuttle era.

By the time of its final flight, Columbia had completed 27 successful missions. Its last mission, STS-107, launched on January 16, 2003. On February 1, 2003, Columbia began its return to Earth. During re-entry, the shuttle was travelling at over 20,000 km/h. Tragically, it did not make it back to the runway. Instead, the orbiter broke apart over the southern United States, and all seven astronauts on board lost their lives.

David Brown, Rick Husband, Laurel Clark, Kalpana Chawla, Michael Anderson, William McCool and Ilan Ramon. (Credits: NASA)

Debris from the Space Shuttle Columbia seen stored in a hangar at NASA's Kennedy Space Center in Florida. (Credits: NASA)

Things that went wrong: The root cause of the Columbia disaster began during launch, when a large piece of foam insulation broke off from the external fuel tank and struck the left wing of the orbiter. The impact punched a hole in the wing's heat-shielding system. During re-entry, the shuttle's surface heated to over 1,500°C due to friction with the atmosphere. This weakened it from the inside until the wing failed. About sixteen minutes before the planned landing, sensors began showing unusual temperature and pressure readings, and soon after, communication with the shuttle was lost as the orbiter broke apart in the sky over Texas and nearby states.

How the debris were found: A massive recovery and investigation effort followed, involving NASA, the military, and thousands of volunteers who searched across hundreds of kilometres of land in Texas, Louisiana, and other parts of the southern United States. Debris ranging from tiny insulation fragments to large pieces of the wing and fuselage was collected and carefully catalogued. The wreckage was then brought to a hangar in Florida and reassembled like a puzzle, allowing investigators to trace the failure back to the foam strike on the left wing during launch.

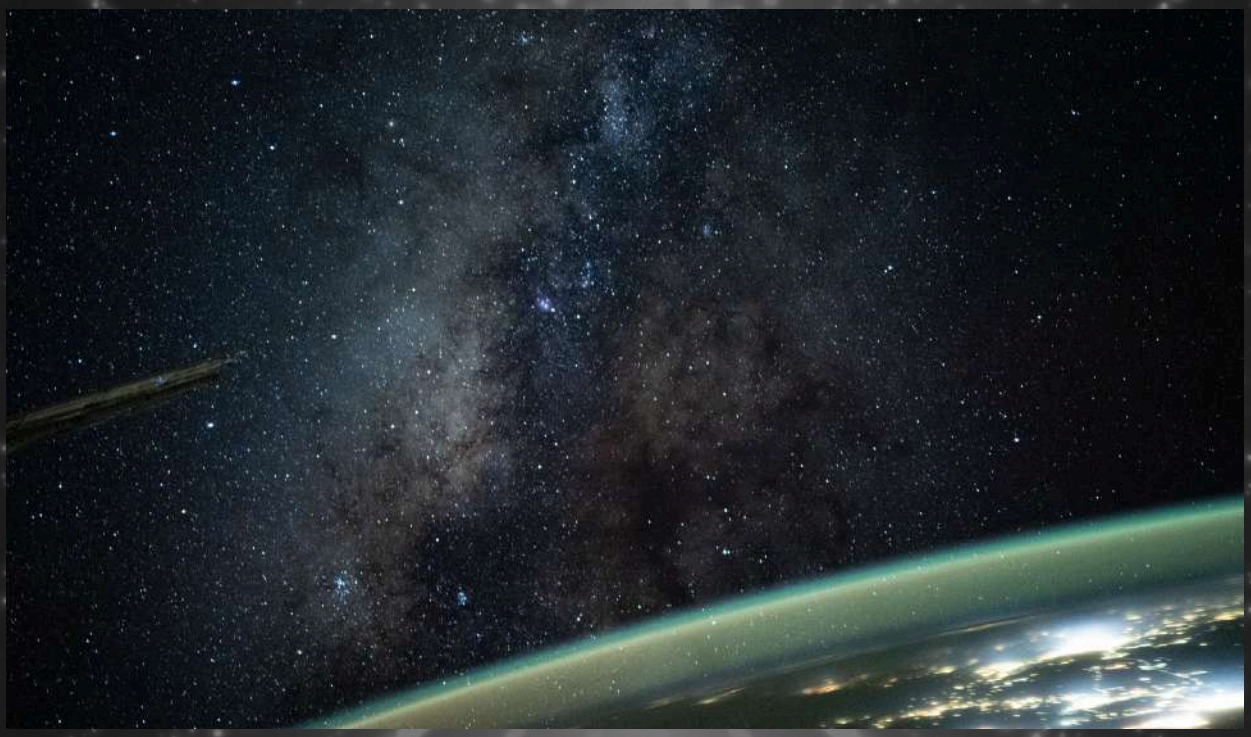
What NASA Learned: The Columbia Accident Investigation Board (CAIB) concluded that the disaster was caused not only by physical damage but also by organisational failures within NASA. Engineers had raised concerns about the foam strike, but these warnings were not fully addressed. After the tragedy, NASA improved in-orbit inspections of the heat shield, developed methods to repair damage in space, and strengthened communication between engineers and managers. Shuttle flights resumed in 2005 under stricter safety rules, but the system remained complex, expensive, and risky. In 2011, NASA retired the Space Shuttle program due to safety concerns and high costs.

Space Paradoxes: Glitches in the Cosmos

Olbers' Paradox: A Mystery Hidden in the Silent Night

When we look up at the sky at night, what do we see? Stars, the Moon and the black sky. But why is the sky dark at night? It feels like a trivial question. We say the night sky is dark because the Sun goes down, and we do not receive its light. But we also know that there are an infinite number of stars in the Universe. Even after the Sun goes down, the sky should glow with stars.

Our Milky Way galaxy alone has about 100 to 400 billion stars, and the observable Universe has around 100 to 200 billion galaxies. That means there are an enormous number of stars out there. If the Universe is endless, then no matter where you look in the sky, you should see stars in every direction. As a result, the night sky should be glowing with light. But in real life, it is not.



Milky Way above Earth: 23 August 2025, from the International Space Station. (Credits: NASA)

In the 19th century, an astronomer named Heinrich Olbers asked this same question, which gave birth to what we now call Olbers' Paradox. It took centuries to solve this puzzle. The answer reveals one of the deepest and most important insights we have ever gained about the Universe.

The Universe had a beginning, and light travels at a finite speed. What does this say about our night sky and its darkness?

The night sky is dark even though the Universe is full of stars because the Universe is not infinitely old. It began with the Big Bang about 13.7 billion years ago, and light does not travel instantly. That means we can only see objects whose light has had enough time to reach us since the beginning of the Universe. Even if space goes on forever, we are surrounded by a visible Universe with a limited size. Beyond that cosmic horizon, galaxies do exist, but their light is still on its way, or will never reach us because space itself is expanding.

Therefore, Olbers' Paradox is solved by time, not distance. The sky is not bright everywhere because most of the Universe is simply too young, from our point of view, for its light to be seen. Only a tiny fraction of all stars and galaxies contribute to the light we receive, and that is why the night sky remains mostly dark.
The night sky is dark not because there is nothing there, but because most of the Universe lies beyond the limits of what light has had time to show us.

Happy Birthday

Clyde Tombaugh

Clyde Tombaugh was an American astronomer best known for discovering Pluto in 1930. He found it while carefully comparing photographic plates at the Lowell Observatory, a task that required extreme patience and precision. Tombaugh's discovery expanded our understanding of the Solar System and made him one of the most famous astronomers of the 20th century.

William Huggins

William Huggins was a British astronomer who pioneered the use of spectroscopy in astronomy. In the 19th century, he studied the light from stars and nebulae and showed that stars are made of the same elements as those found on Earth. His work helped transform astronomy from simply studying positions of objects to understanding their physical composition, laying the foundation for modern astrophysics.

Fritz Zwicky

Fritz Zwicky was a Swiss American astronomer best known for proposing the existence of dark matter in the 1930s. While studying galaxy clusters, he noticed that visible matter wasn't enough to explain their motion. He also made major contributions to supernova research and neutron stars. Zwicky's bold ideas were ahead of his time and later proved crucial to modern cosmology.

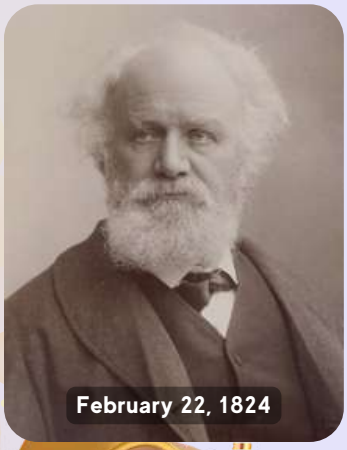
Happy Birthday

Galileo Galilei

Galileo Galilei was an Italian astronomer, physicist, and mathematician often called the Father of Modern Astronomy. Using a telescope, he discovered Jupiter's moons, observed the phases of Venus, and provided strong evidence for the heliocentric model. His work revolutionized science and changed how humanity understands the universe.

Nicolaus Copernicus

Nicolaus Copernicus was a Renaissance era astronomer who proposed the heliocentric model, placing the Sun at the center of the Solar System. His idea challenged the long accepted Earth-centered view and laid the foundation for modern astronomy. Copernicus's work sparked a scientific revolution that changed our understanding of the cosmos

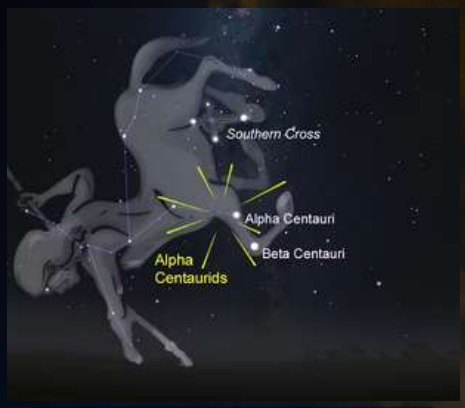


Pierre Janssen

Pierre Janssen was a French astronomer best known for discovering helium in the Sun's spectrum in 1868 during a solar eclipse. His work in solar spectroscopy helped scientists understand the composition of the Sun and stars. Janssen made important contributions to astrophysics and the study of solar phenomena.

Celestial Spectacles

Alpha Centaurids Meteor Shower



Position of the radiant in the constellation Centaurus. Credit: Theconversation.com

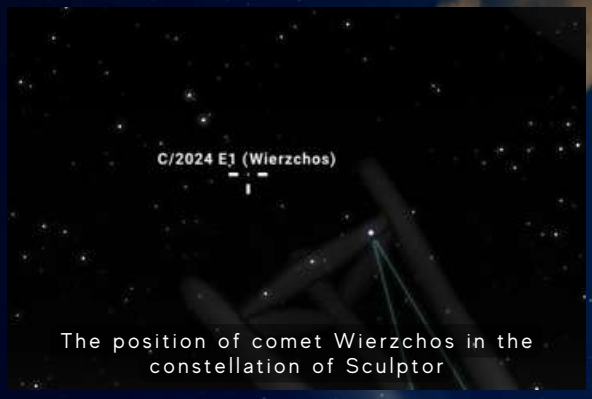
In 2026, the Alpha Centaurids will peak on February 8, just one day before the Last Quarter Moon. This makes the observing conditions fairly favourable. The event can be best seen from the Southern Hemisphere due to the position of the radiant. For South India, the best time to observe will be early morning, when the radiant climbs higher in the sky.

The Alpha Centaurids are a minor meteor stream radiating from the constellation Centaurus. It's the ninth-largest constellation in the sky, famous for containing Alpha Centauri, the closest star system to the Sun. The exact location of the radiant is about 2° northwest of the star Hadar (beta Centauri)

More meteors can be seen when the radiant climbs highest in your sky. Although the typical rate is modest, up to 6 shooting stars per hour, the shower occasionally produces brief outbursts of up to 20–30 meteors per hour.

Planet Parade and the Visitor

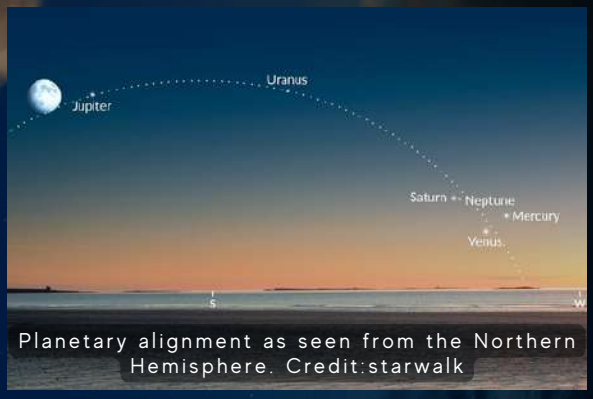
Icy visitor Comet Wierzchos journey through solar system



The position of comet Wierzchos in the constellation of Sculptor

On February 17, Comet C/2024 E1 (Wierzchos) will make its closest approach to Earth. The comet will become visible to observers in the Northern Hemisphere around this time. It will have a magnitude of about 8, becoming an interesting target for binoculars and small to medium telescopes. It will appear very low above the southwestern horizon, and the best viewing window is from about an hour after sunset. (approximately 07:00 PM to 8:30 PM IST).

Six worlds align in a breathtaking cosmic display



Planetary alignment as seen from the Northern Hemisphere. Credit:starwalk

On 28 February, a rare six-planet alignment will grace the evening sky about an hour after sunset. Mercury, Venus, Jupiter, Saturn, Uranus and Neptune will appear stretched in an arc from the western horizon upward, following the Sun's path across the sky. Four of these planets, Mercury, Venus, Jupiter and Saturn, will be bright enough to see with the naked eye, while Uranus and Neptune will likely require binoculars or a small telescope. The 90% illuminated moon will be nearby, making this a stunning sight for skywatchers under clear skies.

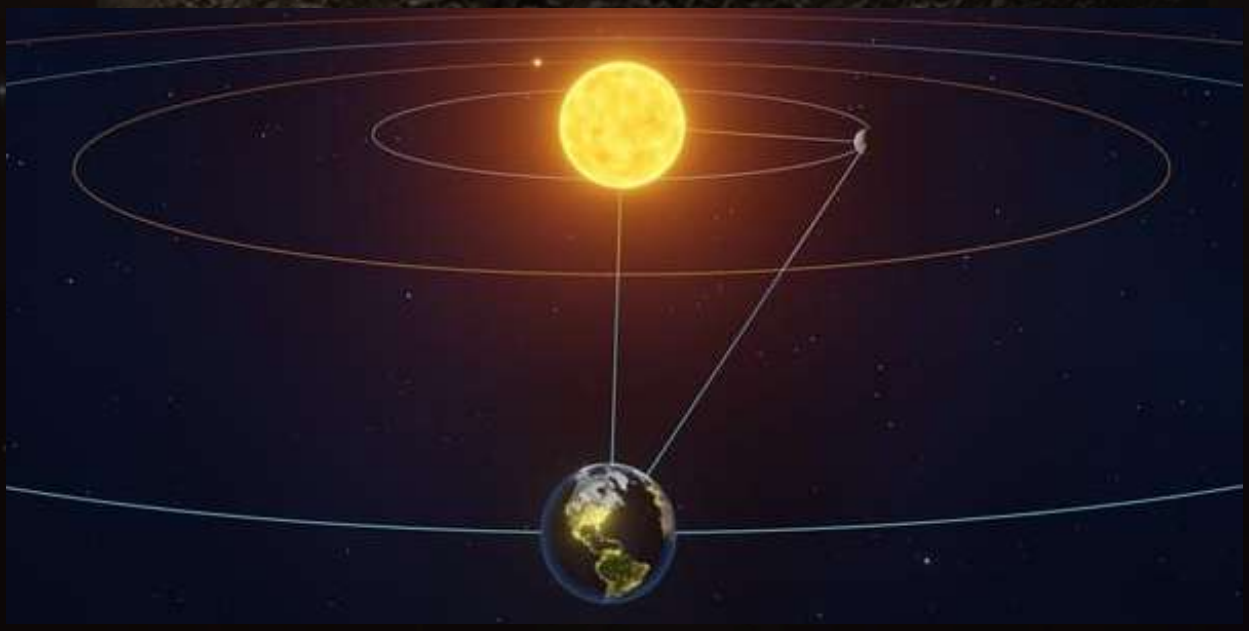
MERCURY AT GREATEST EASTERN ELONGATION

On February 19, Mercury will reach its maximum angular separation from the Sun (18°07'), making this the best time to observe the planet. Mercury will shine at a magnitude of -0.6 in the evening sky. You can see it with the naked eye in the constellation Aquarius.
The planet will be visible low on the western horizon shortly after sunset. Observers should look toward the horizon with a clear, unobstructed view and allow their eyes to adjust to the fading twilight. Although Mercury is often elusive due to its proximity to the Sun, elongation event makes it easier to locate with the naked eye. Binoculars can enhance the view, though care should be taken never to point them near the Sun.

What is Elongation?

In astronomy, an elongation is the angular distance between a planet and the Sun as seen from Earth. For inner planets like Mercury and Venus, elongation events are crucial because these planets usually stay close to the Sun, making them hard to spot. A greatest eastern elongation occurs when the planet appears farthest east of the Sun, visible after sunset, whereas a greatest western elongation occurs when the planet is farthest west, visible before sunrise. Elongation angles vary with the orbit. Mercury's can reach up to about 28°, and Venus's up to 47°, determining how long and how high the planet appears above the horizon.

The scientific importance of elongation lies in giving astronomers the best observational window for tracking the planet's motion, measuring its orbital characteristics, and studying its surface features. For casual skywatchers, it is a rare opportunity to see Mercury, often called the "elusive planet," shining against the backdrop of twilight.



On February 19, 2026, Mercury's evening visibility during its greatest eastern elongation offers both a spectacular visual and a chance to connect with the mechanics of our Solar System, reminding us how the alignment of planets and the Sun creates the celestial shows we can enjoy from Earth.

CONJUNCTIONS FOR THE MONTH

Conjunction of Moon and Mercury

Saturn and Neptune meet for their third and final conjunction on 16 February 2026, shortly after sunset. The planets continue drawing closer, reaching their minimum separation of 0°49′ on February 20. Though not a true conjunction, this will be the best visual pairing before they drift apart—and the last time they appear this close until 2132.

Place: New Delhi / Date: 16th February / Time: 07:00 p.m.

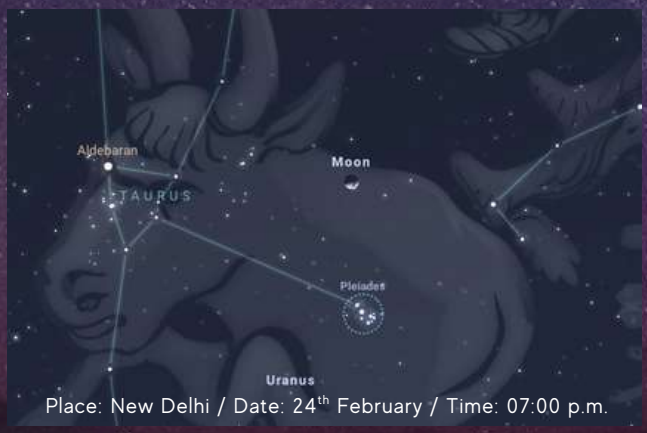
Conjunction of Mercury and Venus

Place: New Delhi / Date: 28th February / Time: 06:30 p.m.

On February 28, Mercury and Venus will appear closest to each other for the month in the evening sky. Mercury will shine at magnitude +1.9, while Venus will glow brilliantly at magnitude −3.8, outshining most celestial objects nearby. Look toward the western horizon shortly after sunset to catch this beautiful planetary pairing. A clear, unobstructed horizon and minimal light pollution will enhance your viewing experience.

Conjunction of Moon and Pleiades

On February 24, the 45% illuminated moon and the Pleiades star cluster reach conjunction at 8 AM IST. Though this happens in daylight, by evening the Moon will appear close to the sparkling "Seven Sisters" in the sky. After sunset, look towards the sky to see the half-moon glow shining beside the tiny blue-white stars of the Pleiades, creating a delicate and beautiful celestial pairing best viewed with binoculars or clear, dark skies.



Place: New Delhi / Date: 24th February / Time: 07:00 p.m.

Conjunction of Moon and Jupiter

Place: New Delhi / Date: 27th February / Time: 07.00 p.m.

On February 27, the 83% illuminated waxing moon will form a close conjunction with Jupiter, visible in the night sky until around 4 AM. The best viewing time is near 7 PM, when both celestial bodies shine brightly together in the constellation Gemini. This event offers a spectacular opportunity to witness the Moon and the gas giant appearing side by side, creating a breathtaking astronomical display.

ASK THE UNIVERSE

Why did the Roman Catholic Church actually believe that the Earth was at the centre of the solar system anyway? Didn't astronomers like Johannes Kepler and Nicklaus Copernicus, if not Aristarchus, already provide enough proof that the Sun was central in the Solar System?

SHASHVAT PATHAK,6 GRADE

The Roman Catholic Church did not initially condemn heliocentrism. When Copernicus proposed it in the 16th century, many Church scholars showed interest, and it was treated as a mathematical model.

In 1616, the Church rejected heliocentrism, judging it scientifically unproven and contradictory to certain scriptural interpretations, since geocentrism was then the accepted scientific consensus. The controversy intensified with Galileo, who promoted heliocentrism as established fact and clashed personally with Church authorities.
Books supporting heliocentrism were banned until 1835, and in 1992 Pope John Paul II formally acknowledged errors in the Church's handling of Galileo's case.

WHAT ARE DARK MATTER AND DARK ENERGY? **SIDDHANTH,6 GRADE.**

Dark matter and dark energy are two invisible components that together make up about 95% of the universe, yet they are very different.

Dark matter is a form of matter that does not emit, absorb, or reflect light, so it cannot be seen directly. Scientists know it exists because its gravitational effects influence the motion of stars in galaxies and the bending of light (gravitational lensing).

It acts like an unseen glue, helping galaxies stay together.
Dark energy is an unknown form of energy that fills space and causes the expansion of the universe to accelerate. It works opposite to gravity on cosmic scales, pushing galaxies farther apart.

In short: dark matter holds structures together, while dark energy drives the universe apart.

STORIES OF INDIA'S GREATEST MINDS

Dr. Satish Dhawan- Legend of India's Rockets

Who is Dr. Satish Dhawan?
Dr. Satish Dhawan was one of India's most respected aerospace scientists and a key architect of India's space success. He served as the Chairman of ISRO and guided the organisation during its most crucial growth years.

Why is he important to India's space journey?
Dr. Dhawan believed that science grows best with freedom, trust, and teamwork. He created a culture where young scientists were encouraged to experiment, learn from failure, and innovate. His leadership style helped ISRO become strong, confident, and globally respected.

What did he achieve?
Under his guidance, India successfully developed major launch vehicles like SLV and PSLV. These rockets became the backbone of India's space missions. He also strengthened research centres and ensured that space technology served national needs such as communication, weather forecasting, and remote sensing.

How did he shape ISRO's success?
Dr. Satish Dhawan stood firmly by his team even during failures. One of the most inspiring moments in ISRO's history was when he took responsibility for a failed launch and later gave full credit to young scientists when success followed. His leadership built confidence and unity within ISRO.

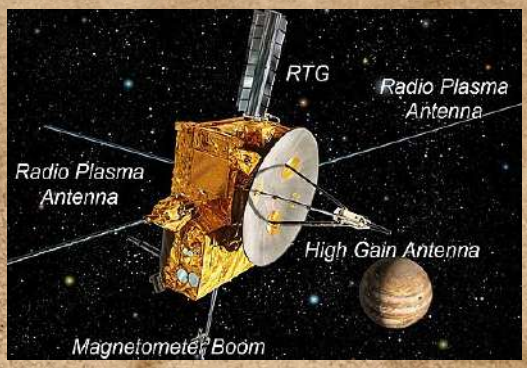
What is his lasting legacy?
Because of Dr. Dhawan's vision, ISRO grew into a reliable and world class space organisation. Today's achievements from Chandrayaan to Gaganyaan stand on the strong foundation he helped build.

Why do we remember him today?
As part of our Year of Indian Space Heroes, Dr. Satish Dhawan reminds us that true leadership is not about control, but about empowering minds. His journey teaches us that calm determination and belief in people can take a nation to the stars.

HISTORICAL EVENTS OF FEBRUARY

Columbia Shuttle Tragedy

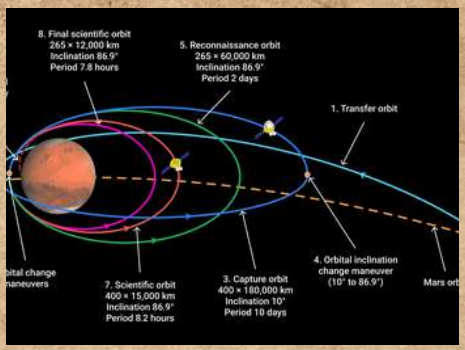
On February 1, 2003, Space Shuttle Columbia broke apart during re-entry due to damage to its thermal protection tiles caused by foam impact at liftoff. All seven astronauts were lost, making it one of NASA's greatest tragedies. The accident led to major investigations and major safety reforms across the Space Shuttle Program. Columbia's loss deeply shaped NASA's future decisions, emphasizing strict safety checks and eventually contributing to the program's retirement. (image credits: en. wikipedia.org).



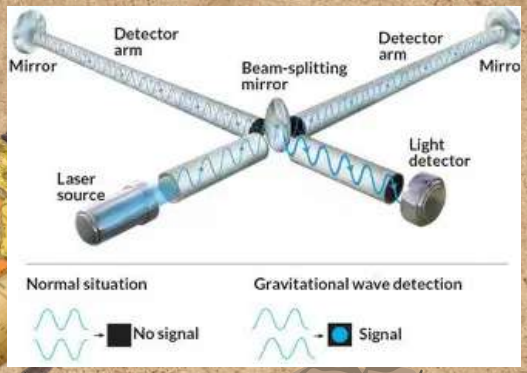
Ulysses Jupiter Flyby

On February 8, 1992, the Ulysses spacecraft completed a gravity-assist flyby of Jupiter that sent it out of the ecliptic plane, enabling the first exploration of the Sun's polar regions. Ulysses measured solar wind, the heliospheric magnetic field, and the structure of the outer heliosphere, revealing new insights into how the Sun influences space weather and expanding the field of heliophysics. (image credits: en. wikipedia.org).

Tianwen-1 Mars Orbit Insertion



On February 10, 2021, China's Tianwen-1 spacecraft successfully entered orbit around Mars in its first attempt. The mission combined an orbiter, lander, and rover, marking China's first independent Mars exploration. It collected data on Mars's atmospherical composition, surface features, and mineralogy and paved the way for the Zhurong rover's landing and exploration, making China one of the few nations to reach the Red Planet. (image credits: en.wikipedia.org).



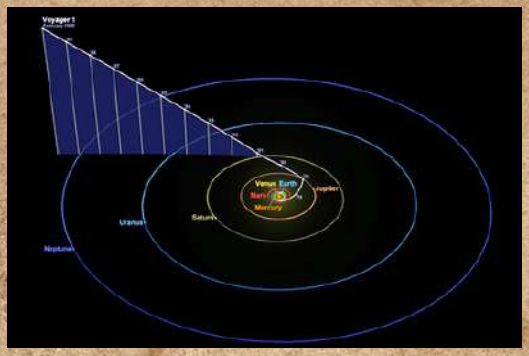
First Gravitational Wave Detection Published

On February 11, 2016, scientists announced that LIGO had directly detected gravitational waves from a pair of merging black holes more than a billion light-years away. This historic result confirmed a major prediction of Einstein's general relativity and inaugurated the era of gravitational-wave astronomy. This new observational method allows scientists to observe cosmic events that would otherwise be invisible through traditional telescopes. (image credits: www.snexplores.org).

HISTORICAL EVENTS OF FEBRUARY

NEAR Shoemaker Lands on Eros

On February 12, 2001, NEAR Shoemaker became the first spacecraft to land on an asteroid after completing its orbital mission around Eros. Despite not being designed for landing, it touched down safely and continued transmitting data for days. Close-up measurements revealed details about Eros's surface, composition, and geologic structure. This achievement demonstrated precise navigation in low gravity and advanced understanding of asteroid evolution and Solar System history. (image credits : science.nasa.gov).

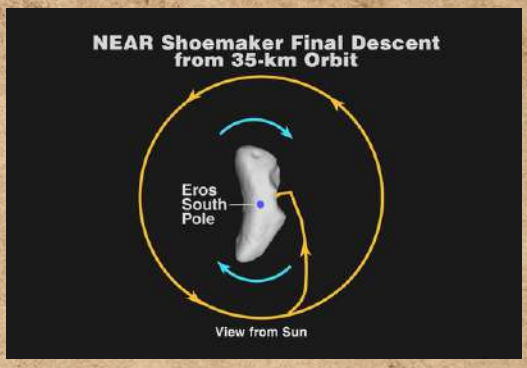


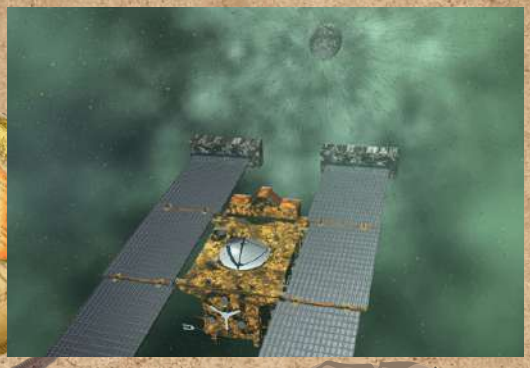
Voyager 1's "Family Portrait"

On February 14, 1990, Voyager 1 captured the Solar System's "Family Portrait," including the famous "Pale Blue Dot" image of Earth. Taken from nearly 6 billion kilometers away, the photograph showed Earth as a tiny speck suspended in darkness. The mosaic emphasized our planet's fragility and humanity's small place in the cosmos. The image became iconic after Carl Sagan's reflections, inspiring global appreciation for Earth and space exploration. (image credits: en.wikipedia.org).

NEAR Shoemaker Orbits Eros

On February 14, 2000, NEAR Shoemaker became the first spacecraft to orbit an asteroid when it entered orbit around Eros. It mapped the asteroid's surface in high detail, measured gravity, and analyzed its rocky composition. The mission revealed Eros's craters, regolith, and internal structure, deepening understanding of how asteroids formed. NEAR Shoemaker demonstrated new navigation techniques around small bodies and laid groundwork for later missions like Hayabusa and OSIRIS-REx. (image credits: www.jpl.nasa.gov).





Stardust-NExT Flyby of Tempel 1

On February 14, 2011, Stardust-NExT flew past Comet Tempel 1, revisiting a comet previously explored by Deep Impact. Its images showed how the comet's surface changed over time, revealing erosion, new deposits, and the crater created by Deep Impact's collision. The mission offered rare before-and-after comparisons, improving knowledge of comet activity, surface aging, and material loss due to solar heating. The extended mission showcased creative reuse of spacecraft. (image credits: NASA/JPL-Caltech/LMSS).

HISTORICAL EVENTS OF FEBRUARY

Discovery of Miranda

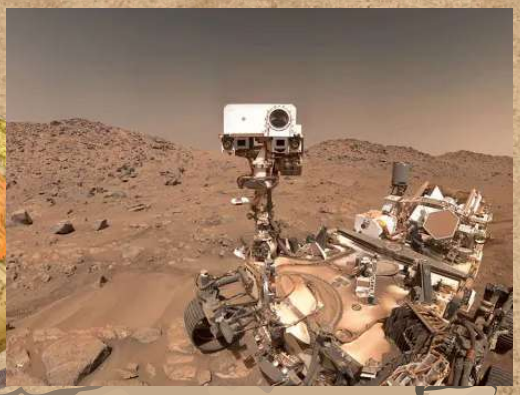
On February 16, 1948, Gerard Kuiper discovered Miranda, a small yet striking moon of Uranus. Later observations by Voyager 2 revealed Miranda's dramatic, patchwork surface, dominated by enormous cliffs, ridges, and strange oval regions called coronae. These features suggest a turbulent geological past involving tectonics or resurfacing. Despite its small size, Miranda remains one of the Solar System's most unusual moons and provides valuable clues to icy-moon evolution. (image credits: en.wikipedia.org).

Execution of Giordano Bruno

On February 17, 1600, philosopher Giordano Bruno was executed in Rome after being condemned by the Inquisition. Bruno proposed an infinite universe filled with countless stars and worlds, challenging rigid geocentric beliefs. His refusal to abandon his ideas led to years of imprisonment and his eventual execution. Today, Bruno is remembered as a symbol of intellectual courage, free thought, and the struggle against suppression during the early rise of scientific inquiry. (image credits: fineartamerica.com).

Discovery of Pluto

On February 18, 1930, Clyde Tombaugh discovered Pluto at Lowell Observatory by comparing photographic plates taken on different nights. The faint shifting dot confirmed the existence of a new Solar System object. Pluto was celebrated as the ninth planet for decades before being reclassified as a dwarf planet in 2006. Today, it remains a key world in the Kuiper Belt, and New Horizons revealed its surprisingly complex surface and atmosphere.(image credits: historianet.nl).



Perseverance Rover Lands on Mars

On February 18, 2021, NASA's Perseverance rover landed in Jezero Crater to search for ancient microbial life and collect samples for future return missions. Equipped with advanced cameras, spectrometers, and drilling tools, it began studying the crater's ancient river delta. Perseverance also carried Ingenuity, the first helicopter to fly on another planet, demonstrating powered flight in Mars's thin atmosphere. The mission greatly advanced exploration of Mars's habitability and geology. (image credits: science.nasa.gov)

HISTORICAL EVENTS OF FEBRUARY

Launch of Mir Space Station

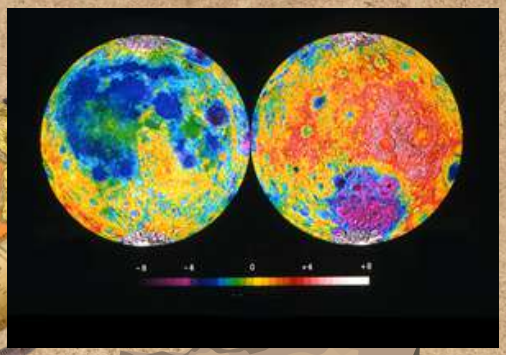
The Soviet Union launched the first module of the Mir space station on February 19, 1986. Over 15 years, Mir became a major hub for international space research and long-duration human missions. Astronauts conducted studies in astronomy, biology, medicine, and microgravity physics. Its modular design allowed continuous expansion and improvement. Mir's operations helped develop technologies and procedures later used on the International Space Station, shaping modern orbital exploration. (image credits: starwalk.space)

John Glenn Orbits Earth

On February 20, 1962, John Glenn became the first American to orbit Earth aboard Friendship 7 during the Mercury-Atlas 6 mission. Completing three orbits in just under five hours, Glenn's flight marked a major victory for NASA during the Space Race. The mission demonstrated reliable orbital flight, safe re-entry, and boosted American confidence in human space exploration. Glenn's achievement helped pave the way for future Gemini and Apollo missions. (image credits: www.gettyimages.co.uk).

Supernova 1987A

Supernova 1987A was first observed on February 23, 1987, becoming the closest visible supernova in nearly four centuries. Located in the Large Magellanic Cloud, it offered astronomers a rare chance to study a stellar explosion in real time. Detected neutrinos confirmed theories about core-collapse supernovae. Observations of its expanding shock wave and ring structure have continued for decades, providing insights into massive star deaths and the formation of neutron stars. (image credits: www.gettyimages.co.uk).



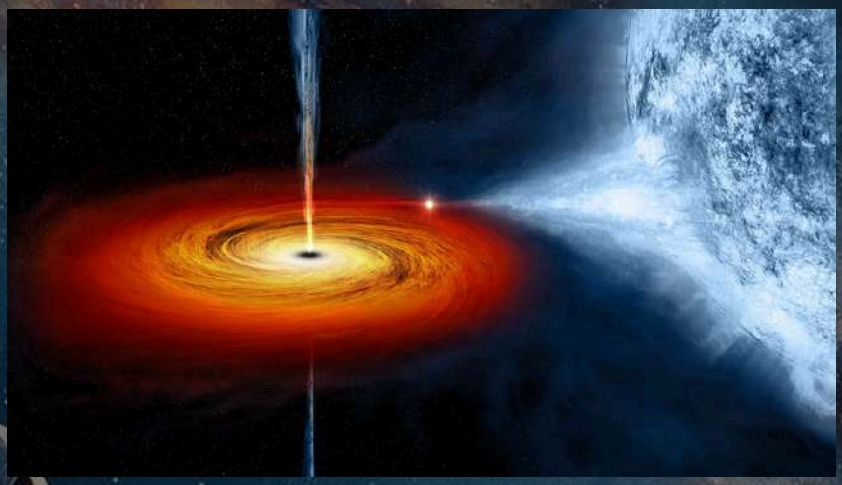
Clementine Lunar Mapping Begins

Clementine entered lunar orbit on February 26, 1994, beginning a mission that produced the most detailed Moon maps since Apollo. The spacecraft captured multispectral images, measured topography, and identified potential ice deposits in permanently shadowed craters. Clementine's global datasets greatly advanced lunar science and guided future exploration plans. The mission also tested lightweight spacecraft technologies, proving the effectiveness of small, cost-efficient planetary probes and influencing later lunar missions. (image credits: www.lpi.usra.edu)

ASTRONOMY & SPACE TERM

ACCRETION

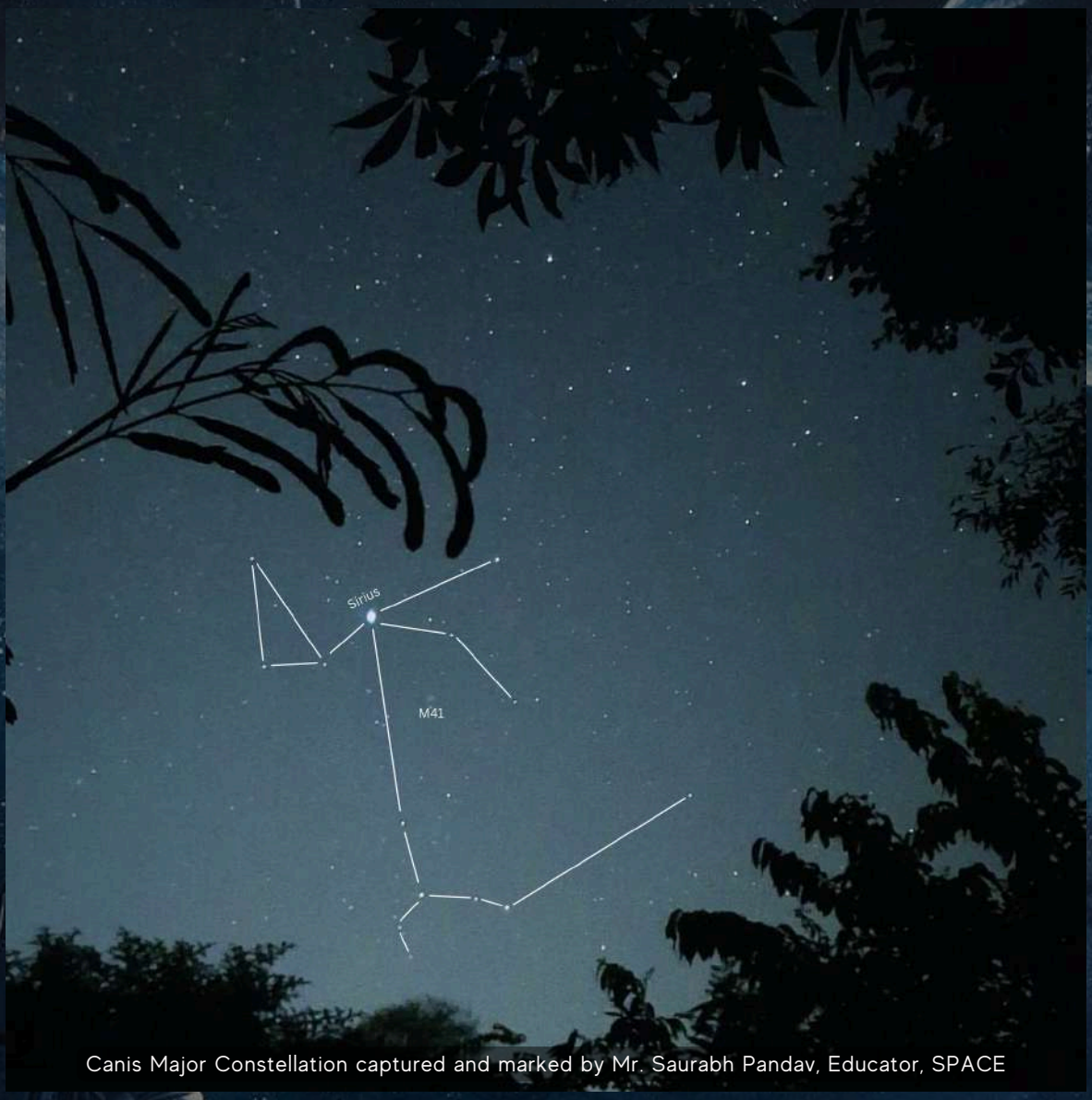
Accretion is the process by which objects in space grow by gravitationally attracting and collecting nearby matter such as gas, dust, and small particles. This material does not fall straight in but usually forms a spinning structure called an accretion disk around the central object. Inside the disk, particles collide and create friction, producing intense heat and light. Accretion is vital in the formation of stars and planets and also fuels powerful objects like black holes and quasars. Accretion disks help scientists study extreme environments, as the glowing material reveals how matter behaves under strong gravity and high-energy conditions in the universe.



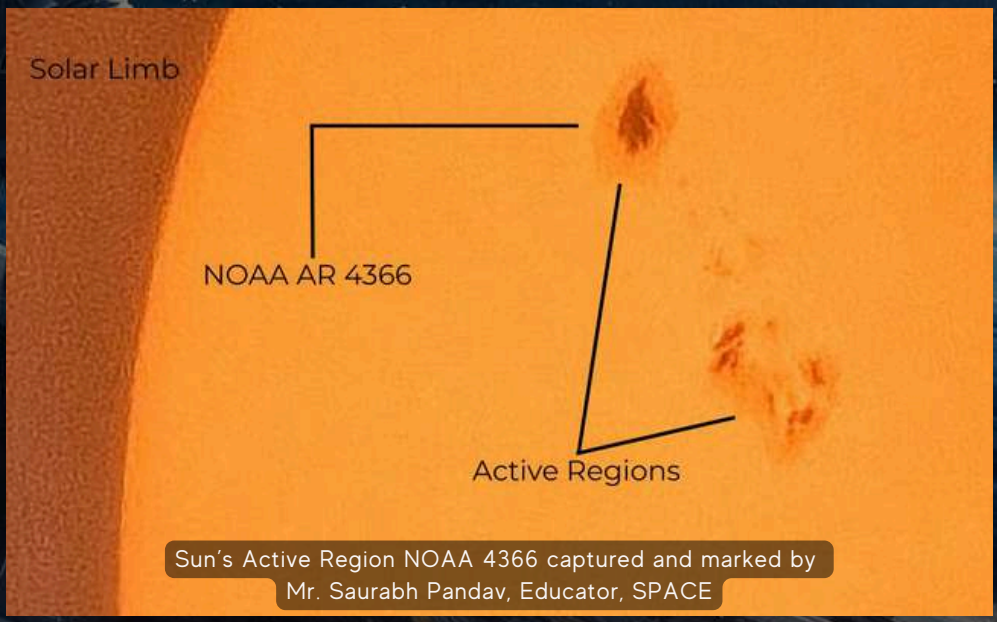
SINGULARITY

In astronomy, a singularity is a point in space where matter is squeezed into an extremely small area, causing gravity to become infinitely strong. It is found at the center of a black hole, where the known laws of physics no longer work. At a singularity, density and spacetime curvature become infinite, and our current understanding of time and space breaks down. Scientists cannot directly observe a singularity, but its effects are seen through the powerful gravity of black holes. Studying singularities helps scientists explore the limits of physics and may one day lead to a deeper theory that unites gravity with quantum mechanics.

ASTROPHOTOGRAPHY BY SPACE TEAM

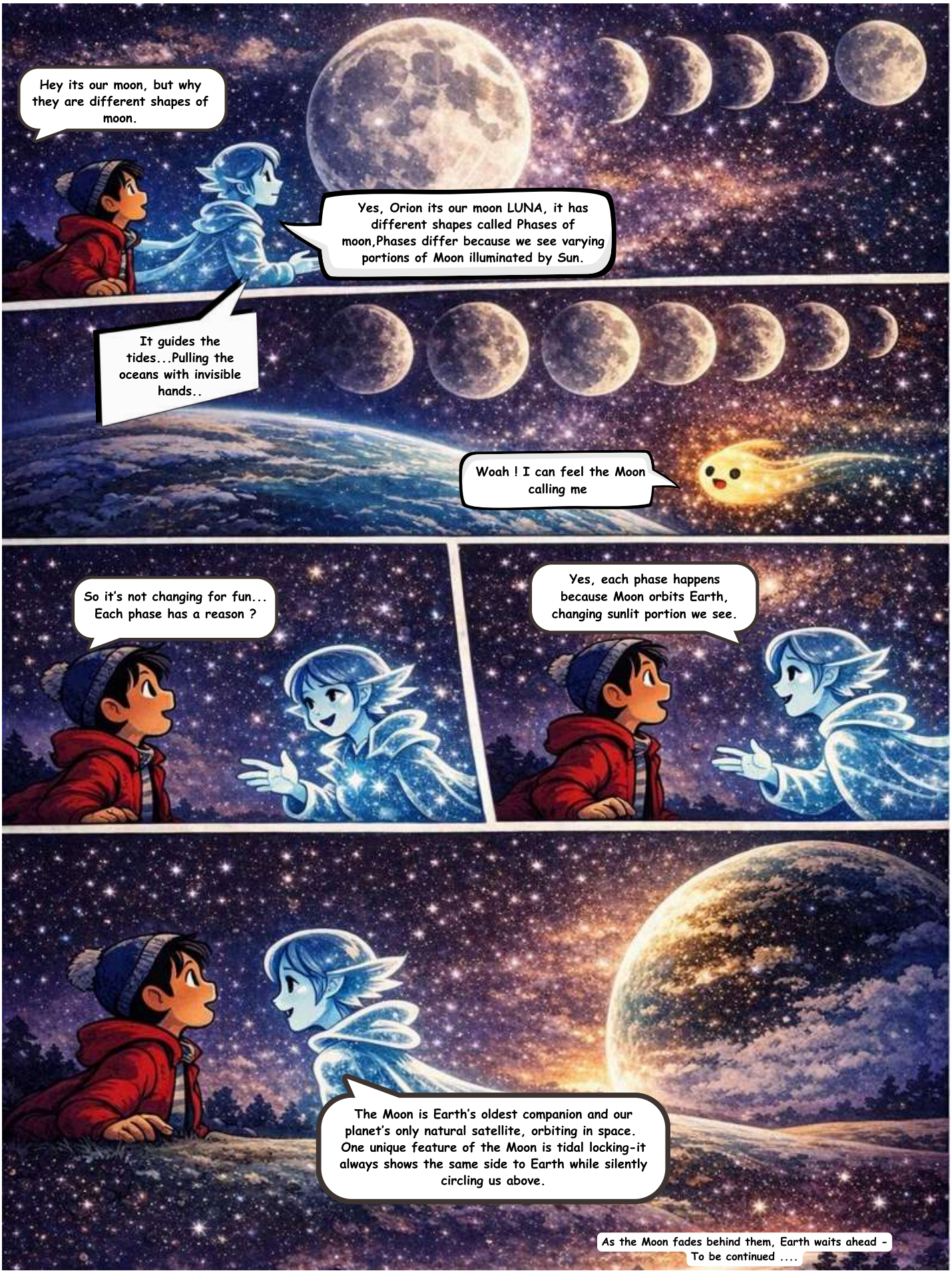


Canis Major Constellation captured and marked by Mr. Saurabh Pandav, Educator, SPACE

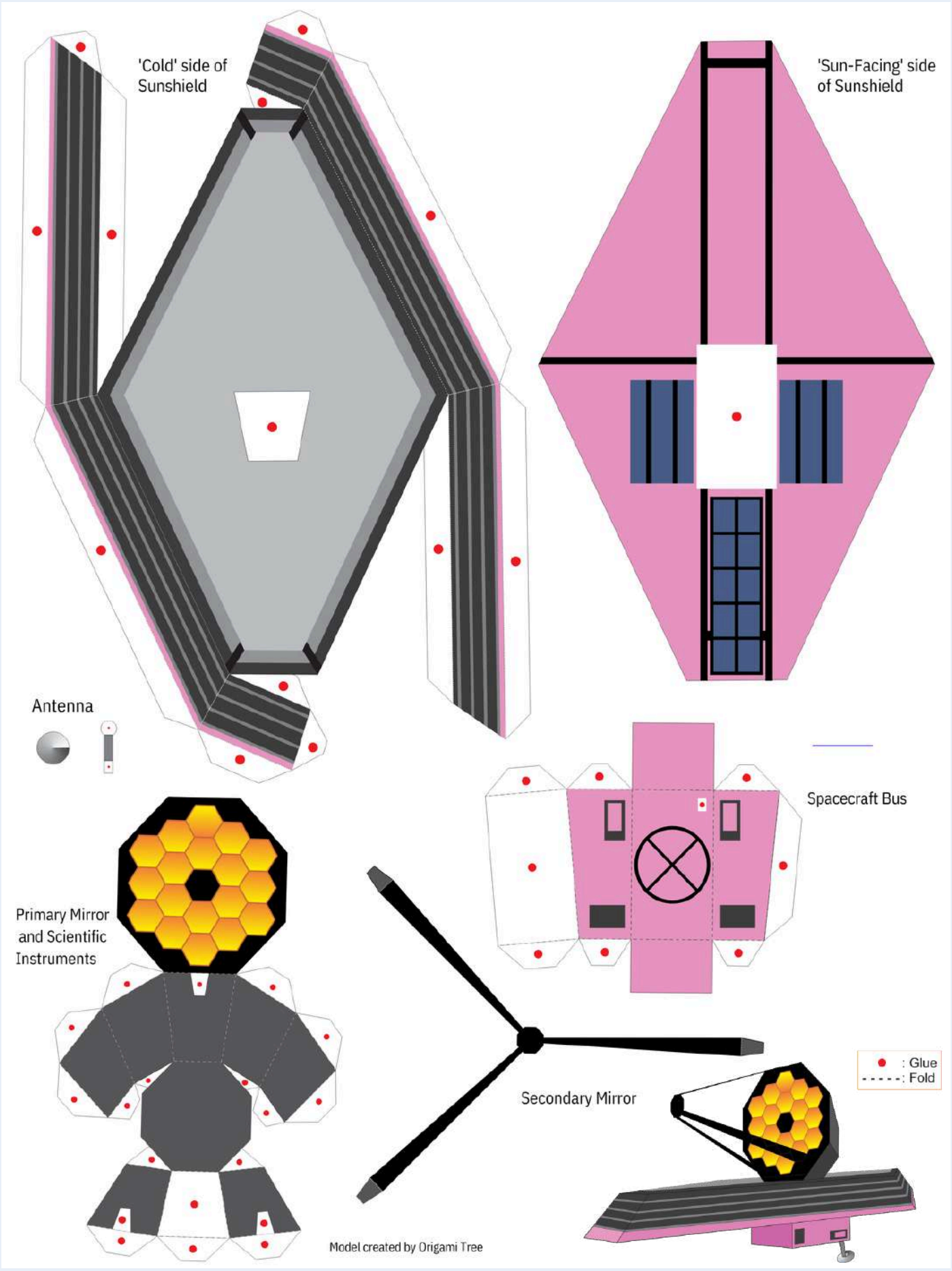


Sun's Active Region NOAA 4366 captured and marked by Mr. Saurabh Pandav, Educator, SPACE

COSMIC JOURNEY– THE MOON'S SECRET

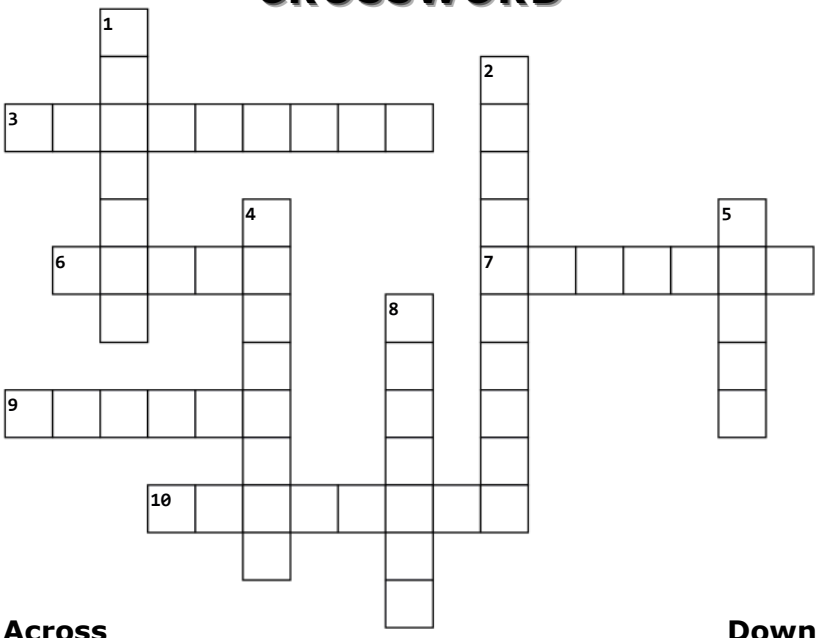


MISSION: DO IT YOURSELF



TRAIN YOUR BRAIN

CROSSWORD



Across

3. What structure feeds the black hole?

6. Which country launched the BlueBird-6 satellite?

7. What type of nucleosynthesis occurs inside stars?

9. What's the name of China's reusable rocket?

10. What force between dust particles causes Martian lightning?

Down

1. What maneuver is difficult with a rotating station?

2. What event makes the planet visible all night?

4. What force redirects material into jets of quasars?

5. What part of the spacecraft was redesigned to open outward after Apollo 1 tragedy?

8. Which physicist popularized the term spaghettification?

Astronomy Word Puzzle

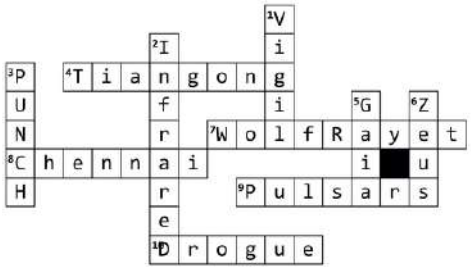
Women in Space

A	K	E	O	V	N	A	J	I	A	N	N	E	A
N	N	U	A	J	I	N	E	U	N	S	A	A	U
E	L	N	I	E	O	Y	M	N	T	C	N	T	O
E	N	N	C	S	S	E	I	M	J	H	A	I	E
L	L	A	T	S	A	N	S	T	U	R	P	N	A
I	S	I	S	I	M	V	O	N	D	I	L	U	Y
E	H	C	E	C	A	A	N	A	I	S	A	S	L
W	A	O	R	A	N	L	A	W	T	T	K	I	L
C	T	L	E	Y	T	E	R	S	H	I	A	S	A
A	R	S	N	E	H	N	I	E	T	N	P	L	S
T	L	C	A	A	A	T	I	A	M	A	T	E	S
A	J	E	E	A	S	I	E	S	I	I	J	I	N
K	A	T	H	Y	I	N	I	E	L	A	E	R	M
C	N	S	A	T	H	A	N	H	O	N	S	A	A

SAMANTHA
VALENTINA
SERENA
CHRISTINA
WHITSON
SALLY
JEMISON
SUNITA
KATHY
KALPANA
JESSICA
EILEEN
JUDITH

****Answers for this month puzzles will be shared in next magazine.**

Answers for last month puzzles.



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