



# GAGAN

ORBITAL TRAILS

VOLUME 6



GAGAN is a monthly magazine about astronomy and space science published by PSIT VYOMNAUTS targeting amateur astronomers. Each issue includes astronomy news, spacelaunches, what's up in the sky every month, events and announcements done by the space team, astrophotographs and articles on astronomy and astrophysics submitted by readers for the general audience, and articles about historical missions and events of astronomy and more. This comes in an easy-to-understand, user-friendly style that's perfect for astronomers at any level.

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
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PLATE VII.

# MANIFESTO



Group Director

**Dr. Manmohan Shukla**

Our students are not only unraveling the mysteries of the universe but also setting new benchmarks in national and international competitions. Their relentless pursuit of excellence and innovation is a testament to the bright future of space science and technology. Keep pushing the boundaries of knowledge and achievement!



Director Academics

**Dr. Raghvendra Singh**

As space science and technology continue to emerge as a key area of growth in India, vast opportunities are unfolding. The dedication and efforts of students in this field are truly commendable. Their contributions will play a vital role in shaping the future of the sector.

# SpaceX Crew-10

## A Lifeline for Stranded Astronauts

The SpaceX Crew-10 mission, a joint effort by NASA and SpaceX, marked a critical milestone in space exploration this March. Launched on March 14, 2025, at 7:03 PM EDT from Kennedy Space Center, this mission was not only the tenth operational flight under NASA's Commercial Crew Program but also a rescue operation for astronauts who had been stranded aboard the International Space Station (ISS) for nearly a year.

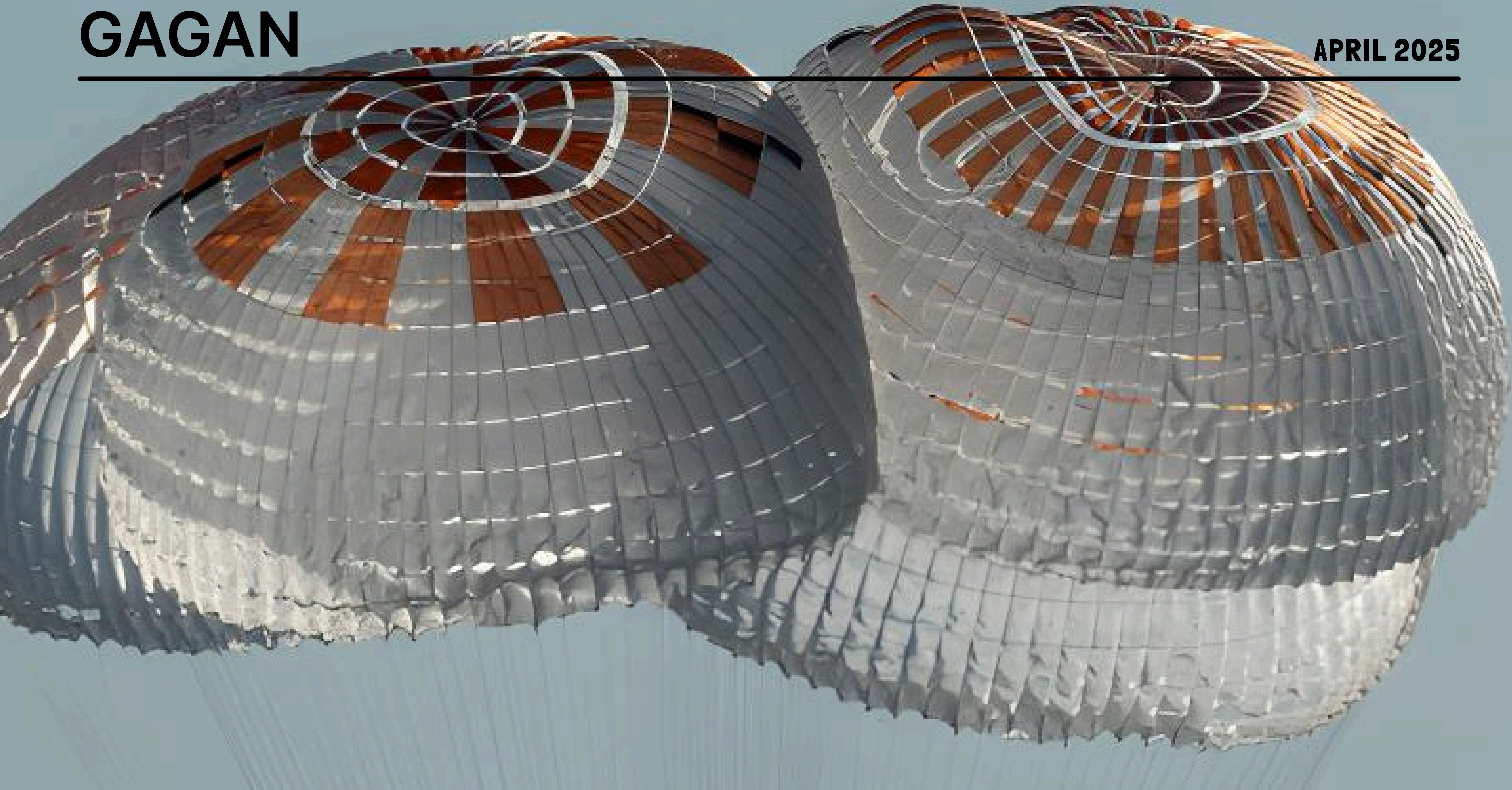




## THE MISSION DETAILS

The Crew-10 mission utilized the Crew Dragon spacecraft Endurance, mounted on a Falcon 9 rocket. The spacecraft carried four astronauts: NASA's Anne McClain (Commander) and Nichole Ayers (Pilot), JAXA astronaut Takuya Onishi, and Roscosmos cosmonaut Kirill Peskov. After a flawless launch, the spacecraft docked with the ISS on March 16, initiating a critical crew handover process.





## RESCUING THE STRANDED CREW

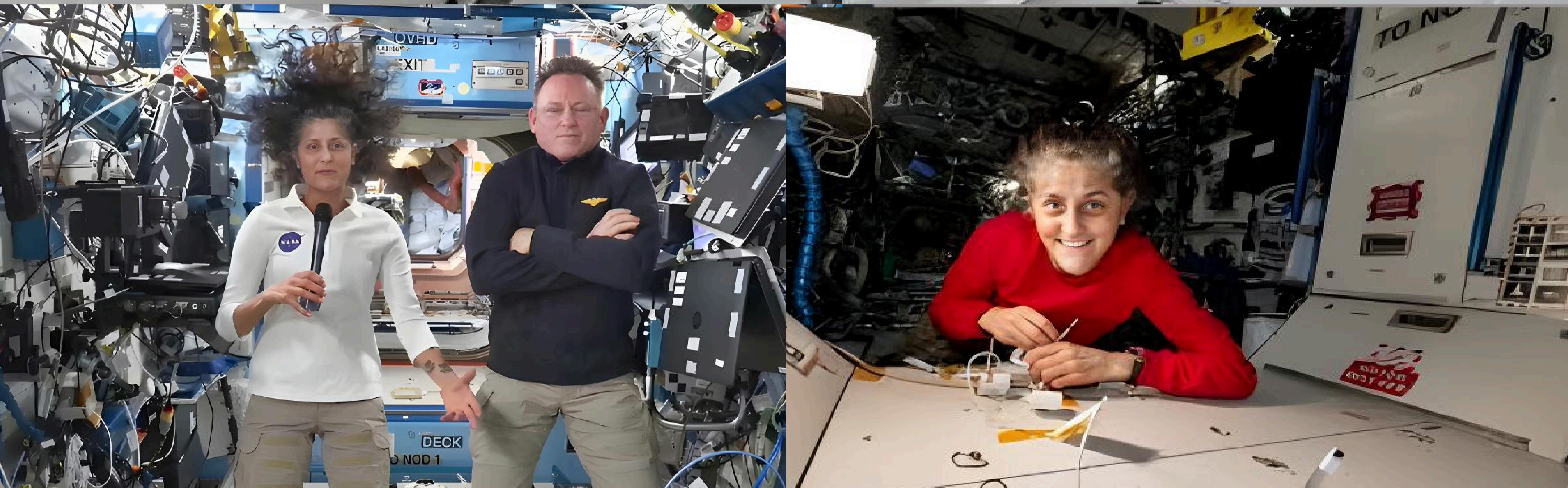
The mission's urgency stemmed from the prolonged stay of Crew-9 astronauts aboard the ISS. Initially scheduled for an eight-day mission in Boeing's Starliner spacecraft, technical issues with Starliner left NASA astronauts Nick Hague, Sunita Williams, Butch Wilmore, and Roscosmos cosmonaut Aleksandr Gorbunov stranded for nearly nine months. During this extended period, they conducted over 150 experiments, including groundbreaking research on plant growth and stem cell technology.

Crew-10's arrival allowed for a seamless transition of responsibilities and ensured the safe return of Crew-9 to Earth aboard SpaceX's Dragon capsule on March 18, 2025.



# GAGAN

APRIL 2025



## A TESTAMENT TO COLABORATION

This mission highlights the resilience and adaptability of international space programs. By leveraging SpaceX's proven technology and NASA's operational expertise, the mission ensured continuous scientific progress aboard the ISS while addressing unforeseen challenges.

As Crew-10 continues its six-month stay aboard the ISS, their work will pave the way for future advancements in space exploration. The successful execution of this mission underscores the importance of collaboration in overcoming obstacles in humanity's pursuit of the stars.

## MEET THE ASTRONOMER

**Albert Einstein (March 14, 1879 – April 18, 1955)** is celebrated as one of the most influential physicists in history. His groundbreaking theories reshaped humanity's understanding of the universe, laying the foundation for modern physics and space exploration. From his famous equation:  $E=mc^2$  to his revolutionary ideas about gravity and spacetime, Einstein's work continues to inspire scientists and astronomers worldwide.

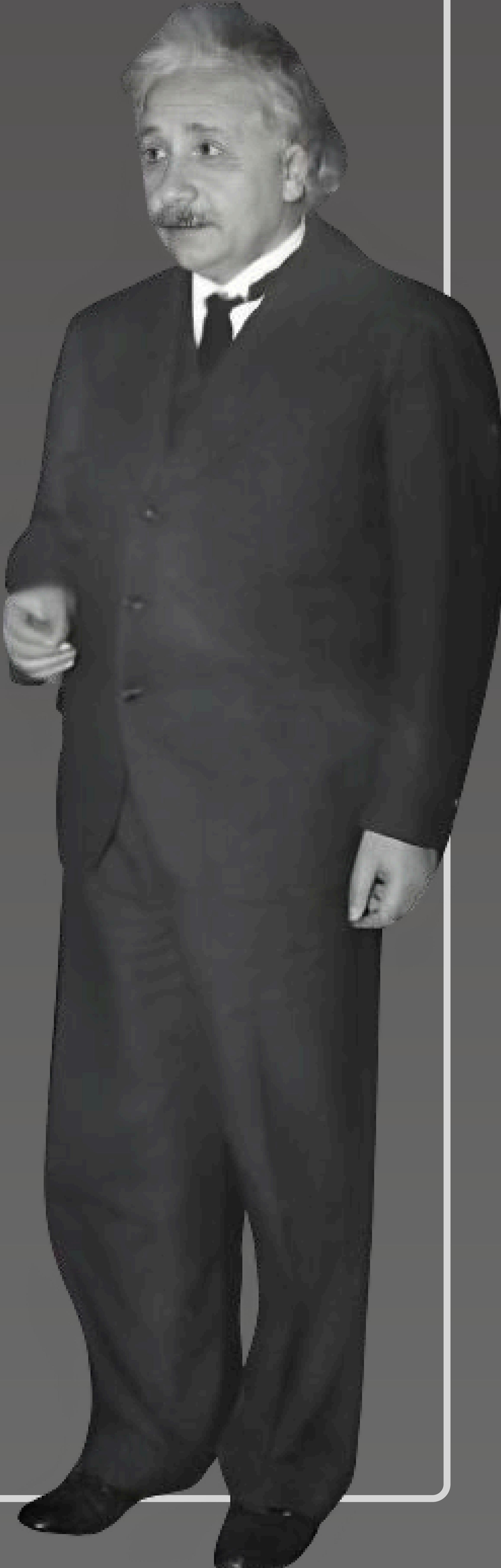
# A Visionary of Physicist

Einstein's journey into scientific greatness began in 1905, a year often referred to as his *Annus Mirabilis* (Miracle Year). During this period, he published four papers that revolutionized physics. Among them was his theory of special relativity, which introduced the idea that space and time are interconnected in a single continuum called spacetime. This theory also established the cosmic speed limit—the speed of light—and demonstrated that energy and mass are interchangeable through his iconic equation:  $E=mc^2$ .

Special relativity was groundbreaking but did not account for gravity. Einstein spent the next decade refining his ideas, culminating in the publication of his general theory of relativity in November 1915. This theory proposed that gravity is not a force between two masses, as Isaac Newton had described, but rather a warping of spacetime caused by massive objects like stars and planets. Einstein's elegant equations explained phenomena such as Mercury's orbital anomalies and predicted the bending of light near massive objects—a phenomenon later confirmed during a solar eclipse in 1919.

*"Life is like riding a bicycle. To keep your balance, you must keep moving."*

~ Albert Einstein



# Space Insights: March 2025

## Global Space Highlights



Firefly Aerospace's Blue Ghost Lands on the Moon: On March 2, Firefly's Blue Ghost became the first private spacecraft to land on the Moon, marking a milestone in commercial lunar exploration.



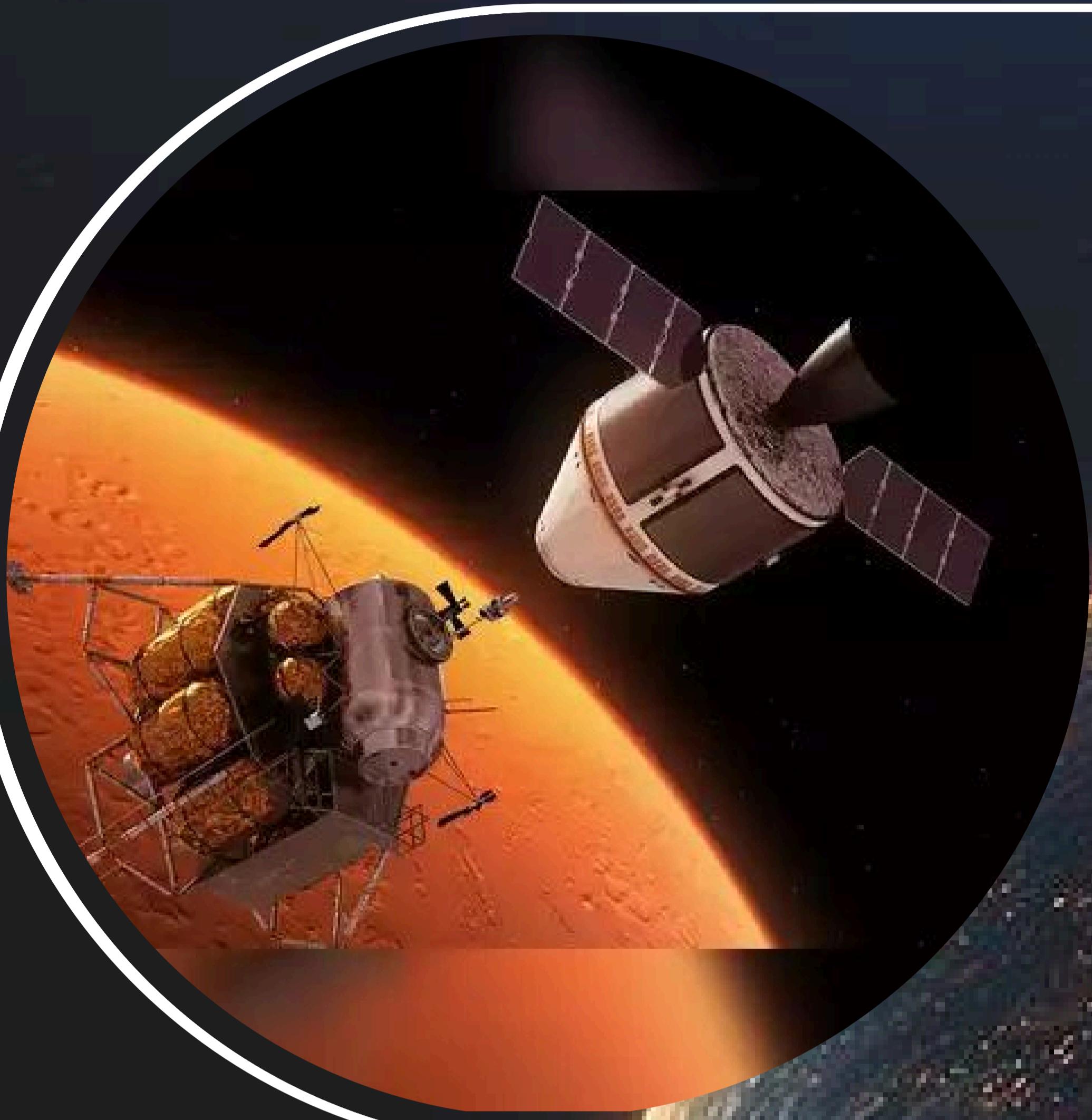
SPHEREx Telescope Launch: Launched on March 4, SPHEREx aims to map the universe in near-infrared light, studying stars and galaxies.



Total Lunar Eclipse: A spectacular "Blood Moon" captivated skywatchers worldwide on March 13-14.

# Space Insights: March 2025

## Indian Space Initiatives



ISRO is preparing for significant missions like Gaganyaan 2 (mid-2025) and the Venus Orbiter Mission (Shukrayaan) in 2025.



ISRO's Space Science and Technology Awareness Training (START) program will focus on the future of India's space exploration, offering online lectures for students.



ISRO continues to leverage space technology for rural development through initiatives like Village Resource Centers and telemedicine networks, enhancing digital inclusion and healthcare access.

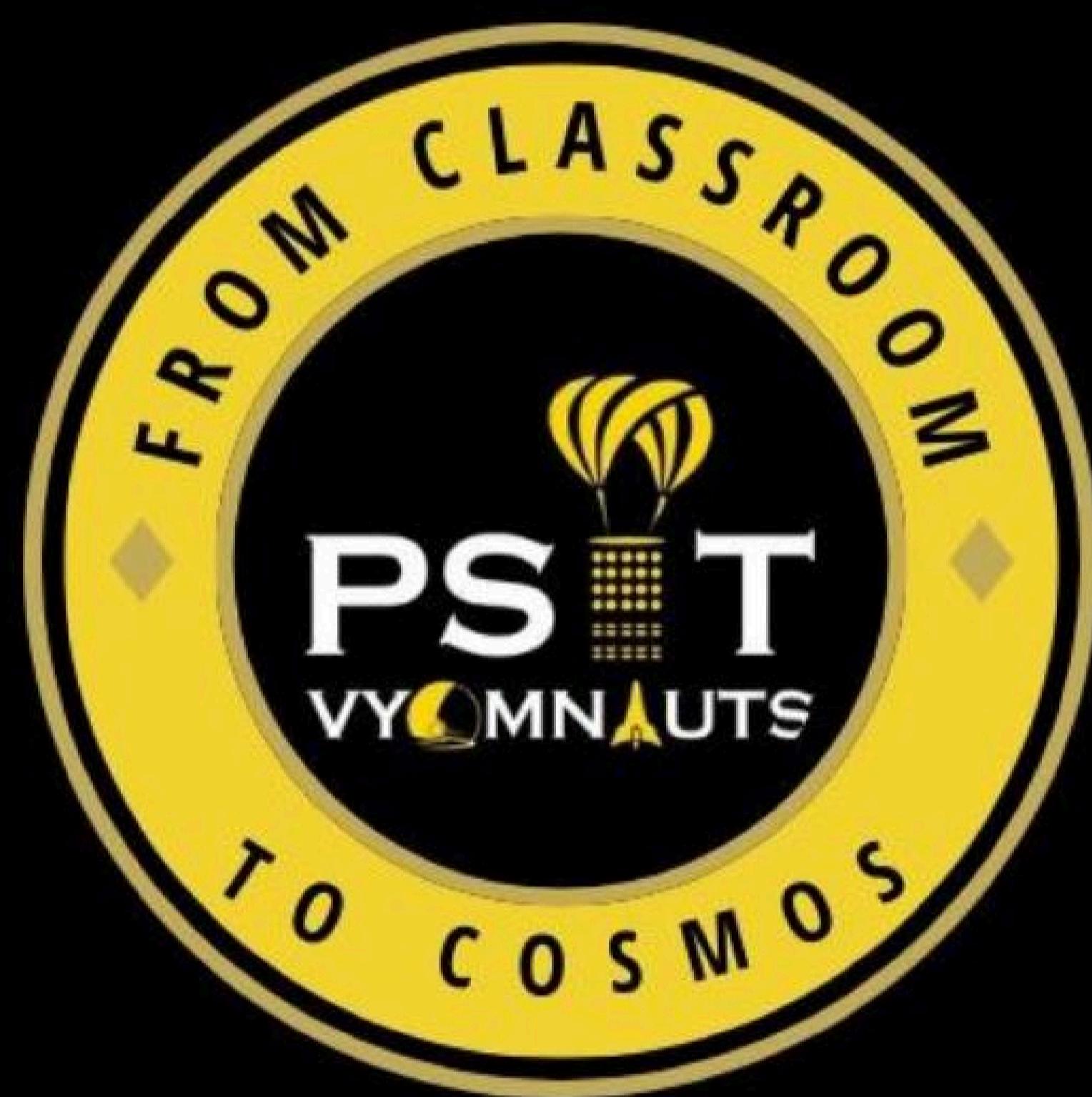
# Firefly Aerospace's Blue Ghost Mission 1 A Historic Lunar Landing

On March 2, 2025, Firefly Aerospace made history by successfully landing its Blue Ghost lunar lander on the Moon's Mare Crisium, marking the first fully successful commercial Moon landing. This groundbreaking achievement highlights the growing role of private companies in space exploration and showcases the potential for collaboration between NASA and commercial entities under the Commercial Lunar Payload Services (CLPS) program.





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## IGNITE PASSION FOR SPACE EXPLORATION

On the 28th and 29th of March 2025, PSIT Vyomnauts, hosted an inspiring series of events as part of Ignitia 2025. These activities celebrated innovation, learning, and teamwork in aerospace, showcasing India's growing prowess in space technology while fostering creativity and technical expertise among participants.



## SOLAR OBSERVATION

Attendees explored the Sun's mysteries through solar glasses, gaining insights into solar phenomena.



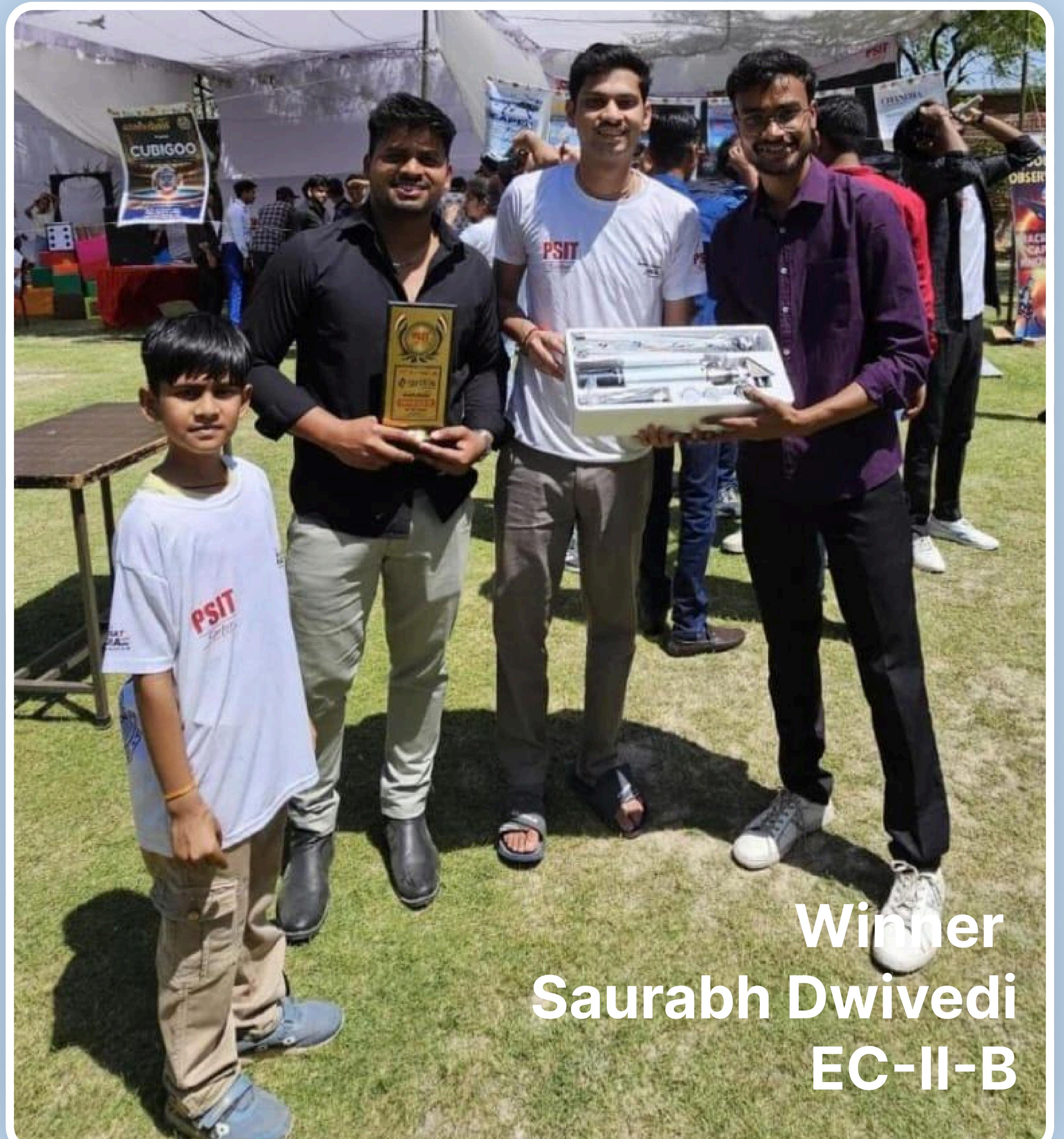
## SPACE EXHIBITION

Featured electronic and physical models of iconic Indian space missions, including Gaganyaan, Vikram Lander, Pragyan Rover, and Bharatiya Antariksh Station. These exhibits highlighted India's achievements in space exploration.

## HYDRO ROCKETRY COMPETITION



This year's Hydro Rocket Competition brings a burst of creativity, teamwork, and hands-on science. Students gather with custom-built water rockets, aiming for max height, precision, and flair. One shot shows teams prepping their rockets, fine-tuning fins and pressure. Another captures the dramatic liftoff — water spraying, rockets soaring. The final image freezes the moment of impact, surrounded by cheers and flying droplets. More than just a contest, the event celebrates curiosity in motion launching not just rockets, but the spirit of discovery.





## JOIN PSIT VYOMNAUTS

And embark on an extraordinary journey into the cosmos! This club offers unique opportunities for space enthusiasts to dive into hands-on projects, participate in prestigious competitions like NASA's Rover Challenge, and gain industry connections through networking and mentorship. Members can engage in satellite-building, astrophysics workshops, and access internships with organizations like ISRO.

Vyomnauts also encourages creative expression through contributions to the space magazine Gagan and participation in cultural events. By joining, you'll help pioneer sustainable and ethical space exploration, working on projects to reduce space debris and innovate eco-friendly aerospace technology.



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