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Touching lives while touching the Moon: India's Space Saga

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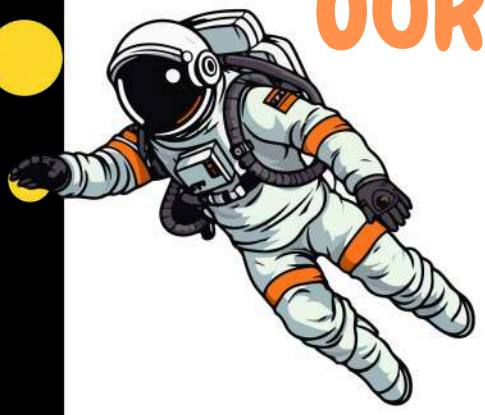
FROM THE EDITOR'S DESK

DR. MANPREET KAUR

MRS. PRABHJOT KAUR

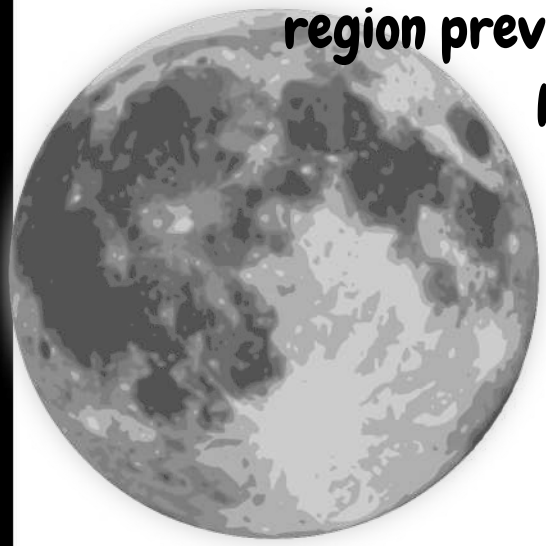
All the students of classes P4 - SS2 are encouraged to bring forth their scientific temperament in any representation of writing, videos, photography or art forms. Share your work at https://forms.office.com/Pages/ResponsePage.aspx?id=uWYNCSgIt0-C41wF7EuWrnlKIO74p5NAl8uEWvqNRwVUQTlYWEFZUEI2RklNUVVRMkg1OExJWk5PTi4u

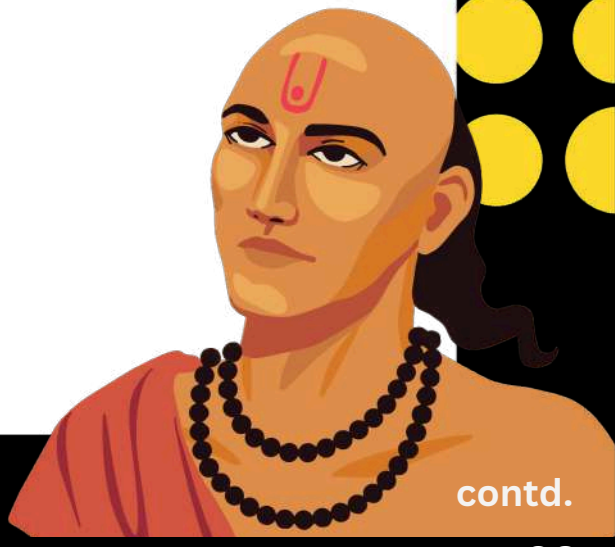


OUR ACHIEVMENTS IN SPACE

First Satellite: Aryabhata was India's first satellite which was launched on April 19th, 1975 using Russia's Kosmos-3M launch vehicle. Launch Vehicles: Satellite Launch Vehicle-3 was India's first experimental satellite launch vehicle, launched in 1980

On August 23, 2023, India reached a historic milestone by becoming the fourth nation to successfully land a spacecraft on the Moon's south pole-a region previously unexplored by humanity.





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Lauding the efforts of the Agnibaan Launch, Dr. Pawan Goenka, Chairman of IN-SPACe, said, "The successful launch of the Agnibaan SOrTeD is not just a milestone for Agnikul Cosmos but marks a significant moment for private players who are contributing to growing India's space sector

Barely 21 years later, India has successfully landed or deployed multiple rovers and orbiters on the Moon and Mars. The journey of the Indian Space Research Organisation (ISRO) has been spectacular

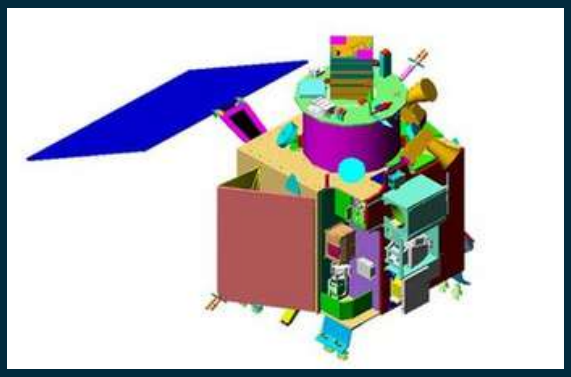
PRAVEER SINGH RAJPUT, M3A

India’s Achievements In Space

ARYABHATA

19 April 1975

It was launched by India on 19 April 1975 from and development site in Astrakhan Oblast using a Kosmos-Kapustin Yar, a Russian rocket launch 3M vehicle. It was built by the Indian Space Research Organisation (ISRO). The launch came from an agreement between India and the Soviet Union directed by UR Rao and signed in 1972. It allowed the USSR to use Indian ports for tracking ships and launching vessels in return for launching various different Indian satellites.



CHANDRAYAAN 1

Chandrayaan 1 was the first Indian lunar probe under the Chandrayaan programme. It was launched by the Indian Space Research Organisation (ISRO) in October 2008, and operated until August 2009. The mission included an orbiter and an impactor. India launched the spacecraft using a PSLV-XL rocket on 22 October 2008 at 00:52 UTC from Satish Dhawan Space Centre, at Sriharikota, Andhra Pradesh The mission was a major boost to India's space program, as India researched and developed indigenous technology to explore the Moon.[8] The vehicle was inserted into lunar orbit on 8 November 2008.

After almost a year, the orbiter started experiencing several technical issues including failure of the star tracker and poor thermal shielding; Chandrayaan-1 stopped communicating at about 20:00 UTC on 28 August 2009, shortly after which the ISRO officially declared that the mission was over. Chandrayaan-1 operated for 312 days as opposed to the intended two years; however, the mission achieved most of its scientific objectives, including detecting the presence of Lunar water.

CHANDRAYAN 2

Chandrayaan-2 iis the second lunar exploration mission developed by the Indian Space Research Organisation (ISRO) after Chandrayaan-1. It consists of a lunar orbiter, the Vikram lunar lander, and the Pragyan rover, all of which were developed in India. The main scientific objective is to map and study the variations in lunar surface composition, as well as the location and abundance of lunar water.

The spacecraft was launched from the second launch pad at the Satish Dhawan Space Centre in Andhra Pradesh on 22 July 2019 at 09:13:12 UTCby a LVM3-M1 rocket. The craft reached lunar orbit on 20 August 2019. The Vikram lander attempted a lunar landing on 6 September 2019; the lander crashed due to a software error.

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NEWSLETTER

MARS ORBIT MISSION

India's Mars Orbiter Mission, or MOM, was the country's first mission to the Red Planet. The mission tested key technologies for interplanetary exploration, and studied the Martian surface and atmosphere from orbit for eight years, far exceeding its projected lifespan. The ISRO (Indian Space Research Organization) lost contact in April 2022, and declared the mission's end.

Goals

India's Mars Orbiter Mission (MOM)—or Mangalyaan (Hindi for "Mars Craft")—was the country's first mission to the Red Planet. The mission goal was to test key technologies for interplanetary exploration and to use its five science instruments to study the Martian surface and atmosphere from orbit.

Accomplishments

The mission arrived safely in Mars orbit—completing the technology test. The spacecraft then spent eight years in orbit, returning science data and far exceeding its expected mission of six to 10 months.

Key Dates

Nov. 5, 2013 | 09:08 UT: Launch Sept. 23, 2014 | 1:47:32 UT: Mars Orbit Insertion April 2022 | : End of Mission Spacecraft Launch Vehicle: PSLV Spacecraft Mass: 1,075 pounds (488 kilogram)

contd.

ADITYA L1

Aditya-L1 is a coronagraphy spacecraft for studying the solar atmosphere, designed and developed by the Indian Space Research Organisation (ISRO) and various other Indian Space Research Institutes. It is orbiting at about 1.5 million km from Earth in a halo orbit around the Lagrange point 1 (L1) between the Earth and the Sun, where it will study the solar atmosphere, solar magnetic storms, and their impact on the environment around the Earth.

CHANDRAYAN 3

Chandrayaan-3 is the third mission in the Chandrayaan programme, a series of lunar-exploration missions developed by the Indian Space Research Organisation (ISRO).The mission consists of a Vikramlunar lander and a Pragyan lunar rover was launched from Satish Dhawan Space Centre on 14 July 2023. The spacecraft entered lunar orbit on 5 August, and India became the first country to touch down near the lunar south pole, at 69°S, the southernmost lunar landing on 23 August 2023 at 18:03 IST (12:33 UTC), made ISRO the fourth space agency to successfully land on the Moon, after Roscosmos, NASA, and the CNSA

Chandrayaan-3 was launched from Satish Dhawan Space Centre on 14 July 2023. The spacecraft entered lunar orbit on 5 August, and became the first lander to touch down near the lunar south pole on 23 August at 18:03 IST (12:33 UTC), making India the fourth country to successfully land on the Moon, and at 69°S, the southernmost lunar landing, until IM-1 landed further southwards in Malaperta a crater on 22 February 2024. The lander was not built to withstand the cold temperatures of the lunar night, and sunset over the landing site ended the surface mission twelve days after landing.The propulsion module, still operational, transited back to a high Earth orbit from lunar orbit on 22 November 2023 for continued scientific observations of EarthIt operated until 22 August 2024.

Milan M3A

India's Journey to a Science Powerhouse: A Student's Perspective

By Aayushi Satapathy, M3-A

When I first looked up at the night sky and saw the shimmering stars, I couldn't help but wonder about the vast universe beyond. My name is Aayushi, and I'm an 8th grader at Gyan Bharati School in Saket. Like many students, I dream of space missions and futuristic technology. Lately, I've started to think more deeply about how India could become a global leader in science. Through my school projects, discussions with teachers, and personal curiosity, I've realized that even as a student, I can contribute to this grand vision.

Fostering Curiosity and Innovation

I've found ways to ignite curiosity and innovation at home. Recently, inspired by simple science projects, I decided to build a rocket using plastic bottles and baking soda. The experiment was straightforward: I mixed baking soda and vinegar in one bottle, attached it to another with tape, and watched as the chemical reaction launched the bottle into the air. This hands-on experiment was thrilling and demonstrated that science is not limited to high-tech labs. It's about exploring ideas and conducting experiments, even with basic materials. This experience made me realize that science is about discovering how things work and finding answers through experimentation.

Building on Existing Strengths

India has a remarkable foundation in science, with impressive achievements in space exploration and pharmaceuticals. Institutions like the Indian Institutes of Technology (IITs) and Indian Institutes of Science Education and Research (IISERs) are prime examples of how strong research institutions can drive innovation. For students, it's not just about admiring these successes but being inspired by them and thinking about how we can contribute to this legacy. Schools play a crucial role by igniting a passion for science through engaging activities and projects.

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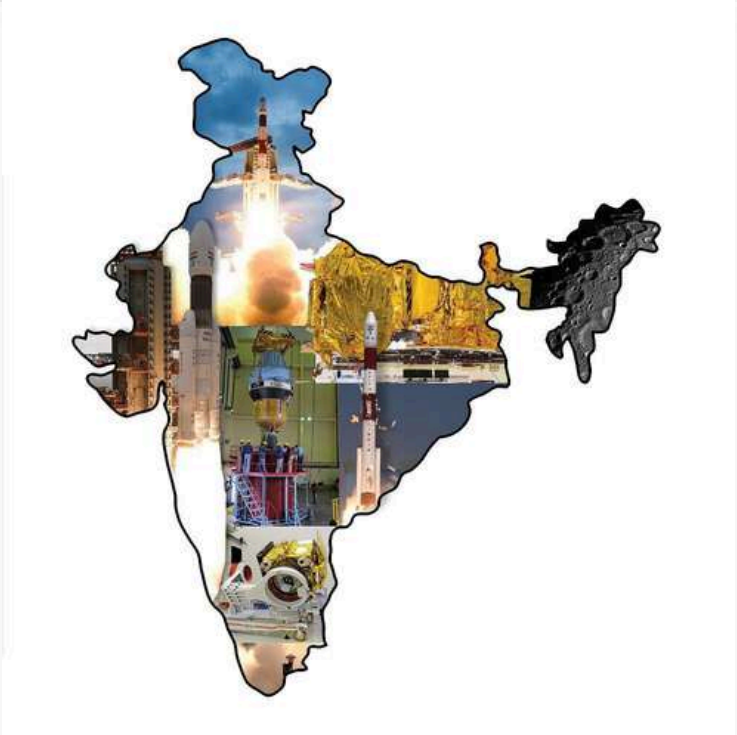
At Gyan Bharati School, we have science exhibition where students present their own research projects. Collaboration between schools and scientific communities is essential. Imagine if our school partnered with a local research institute to work on a project or internship! Such collaborations could provide students like us with hands-on experience and a clearer understanding of how our studies apply to real-world problems.

Conclusion

India's journey to becoming a global science powerhouse is not just a distant dream. It's something we, as students, can actively contribute to. By nurturing our curiosity, engaging in scientific exploration, and supporting one another, we can help drive India's success in science. As I look up at the stars, I am inspired by the potential for our efforts today to pave the way for tomorrow's discoveries.



COSMIC CONQUESTS: CHARTING OUR BREAKTHROUGHS IN SPACE SCIENCE

India has showcased its space exploration capabilities to the globe over the last two decades. India's journey in space science is nothing short of incredible. From launching its first satellite to exploring distant planets, India has made significant strides in understanding the mysteries of space.

Let's examine a few of the most outstanding accomplishments that have inspired pride in every Indian.

1. The Launch of Aryabhata: India's First Satellite

India's space journey began on April 19, 1975, with the launch of Aryabhata, our first satellite. Named after the ancient Indian mathematician and astronomer, Aryabhata was built entirely by Indian scientists. Even though there were some technical difficulties, the launch marked the beginning of India's ambitious space program. It was a huge step forward, showing that India had the potential to explore space.

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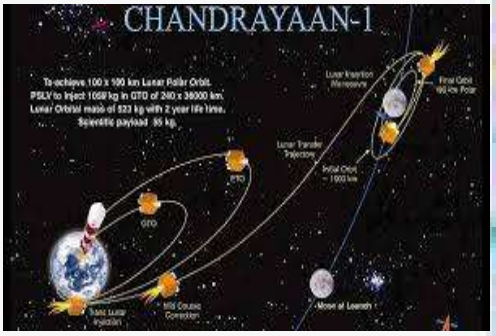
2. Chandrayaan-1: Discovering Water on the Moon



Fast forward to October 22, 2008, when India launched its first mission to the moon, Chandrayaan-1. This mission was a game-changer! Chandrayaan-1 made an amazing discovery: it found water molecules on the moon's surface. Since it created new avenues for future lunar exploration, this discovery was hailed globally. India was the first country to verify that the moon was more than simply a piece of dry rock floating in space.

3. Mangalyaan: India's Mars Orbiter Mission (MOM)

One of India's greatest achievements in space science came on November 5, 2013, when it launched the Mars Orbiter Mission, also known as Mangalyaan. What made this mission special? India became the first country to reach Mars in its very first attempt! What's even more amazing is that Mangalyaan was created on a far smaller budget than previous space missions. Scientists are learning more about Mars thanks to the orbiter's vital data returns about our neighboring planet.

4. Chandrayaan-2: Aiming for the Moon's South Pole

In 2019, India took another big leap with Chandrayaan-2, which aimed to explore the moon's south pole—a region that had never been explored before. Although the lander, Vikram, faced challenges during its landing, the orbiter continues to function and send important data about the moon. Chandrayaan-2 showcased India's determination to push the boundaries of space exploration.

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5. Gaganyaan: India’s First Human Spaceflight Program

Looking ahead, India is preparing for another historic moment with the Gaganyaan mission. Planned for launch soon, this mission will be India’s first crewed spaceflight, sending Indian astronauts (or ‘vyomanauts’) into space. This ambitious project is a significant step toward making India one of the leading nations in human space exploration.

6. Low-Cost Space Missions: Setting New Records

India’s space agency, ISRO (Indian Space Research Organization), is known worldwide for its cost-effective space missions. For example, the Mars Orbiter Mission was completed at a fraction of the cost of similar missions by other countries. India is a pioneer in space science thanks to its ability to accomplish more with less, demonstrating that ingenuity and willpower can overcome budgetary constraints.

7. International Collaboration: A Global Space Partner

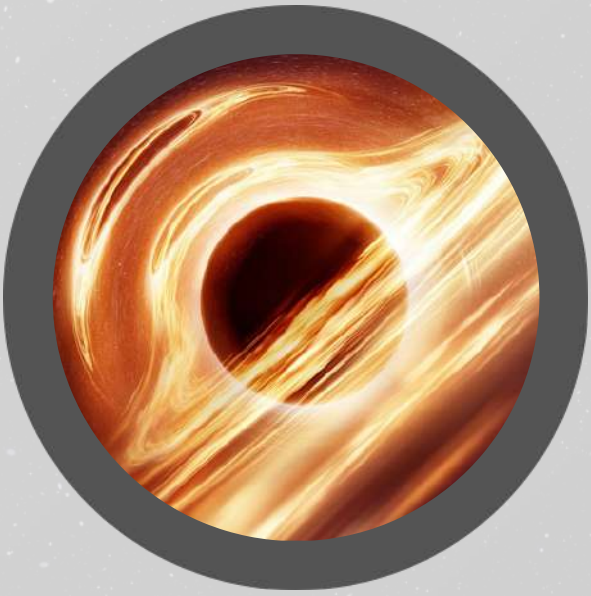
India's space program aims to promote both international cooperation and national pride. Many nations have benefited from ISRO's satellite launches as they have pursued their space ambitions. India is now seen as a key partner in international space exploration projects because of this.

Conclusion: Aiming for the Stars

India’s achievements in space science are a testament to the talent, hard work, and vision of its great scientists and talented engineers. From discovering water on the moon to reaching Mars on the first try, India has shown that it is a force to be reckoned with in the field of space exploration. And with future missions like Gaganyaan, the best is yet to come. Therefore, as we press on toward the stars, let's be proud of our progress and look forward to the thrilling journeys that lie ahead!

Ketan Shiv Saini
M3-A

BY: ARUNAV PRASHANT, M3B



WHAT IS A BLACK HOLE

A black hole is a region of spacetime where gravity is so strong that nothing, not even light and other electromagnetic waves, is capable of possessing enough energy to escape it. Einstein's theory of general relativity predicts that a sufficiently compact mass can deform spacetime to form a black hole.

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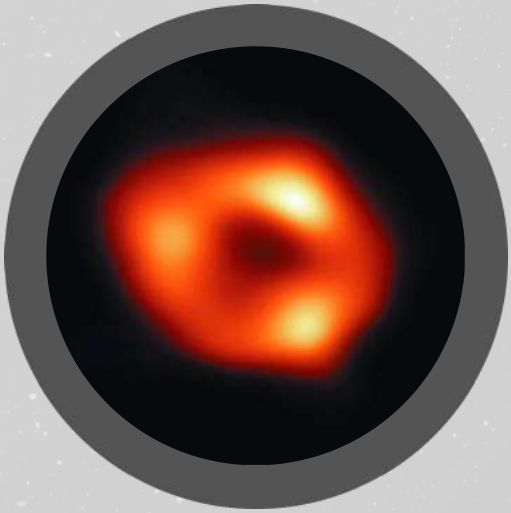
SAGITARIUS A

Sagitirius a is the supermassive black hole at the Galactic Center of the Milky Way. Viewed from Earth, it is located near the border of the constellations Sagittarius and Scorpius, about 5.6° south of the ecliptic visually close to the Butterfly Cluster (M6) and Lambda Scorpii.



REAL IMAGE OF BLACK HOLE

Astronomers have unveiled the first image of the supermassive black hole at the centre of our own Milky Way galaxy. This result provides overwhelming evidence that the object is indeed a black hole and yields valuable clues about the workings of such giants, which are thought to reside at the centre of most galaxies. The image was produced by a global research team called the Event Horizon Telescope (EHT) Collaboration, using observations from a worldwide network of radio telescopes.

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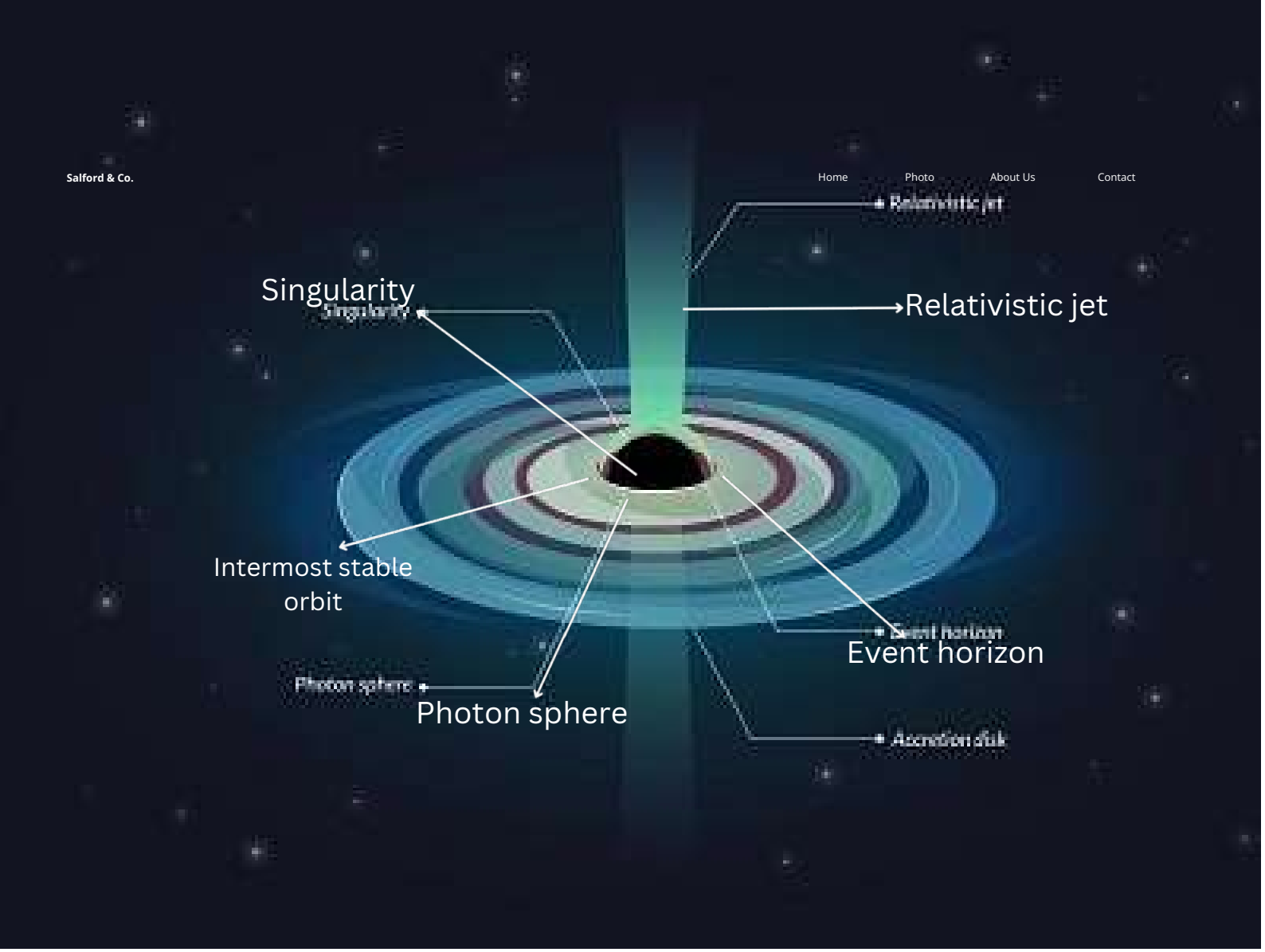
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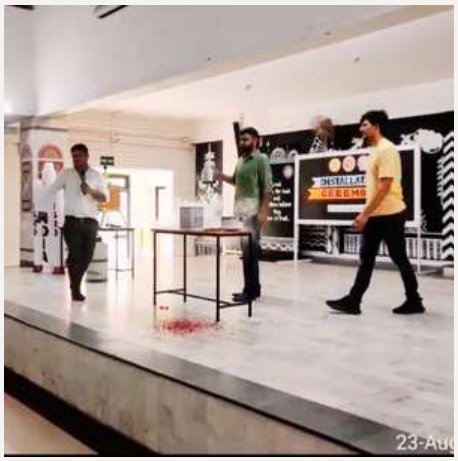
Relativistic jet
Intermost stable orbit
Event horizon
Photon sphere

NATIONAL SPACE DAY CELEBRATION

@GBS

An Astronomy workshop was organised by Dr. Manpreet Kaur for all sections of M1 and M2 and conducted by Mr. Sajid and his team of Starix Kids on 23.8.24 at 8:00 am in the inner auditorium. The workshop included display of video on ISRO's achievements and demonstration of activities simulating the environment on the surface of moon.
The link
https://bharatonthemoon.ncert.gov.in/
activities was shared across all M2 sections and around 110 children received a certificate by participating in the quiz.



Ms. Arvinder Kaur conducted crossword, Astronomy Word Puzzle and discussion on National Space Day and its importance for classes M3E, S1E and S1C. She also took the students of M2B to the Physics Lab and discussed the achievements of India-future plans BAS, Gaganyaan, Chandrayan-4, 5, 6.

Ms. Priyanka Rai conducted crossword on space science, quiz on Space Technology and discussion on National Space Day and Newspaper activity based on India's achievements in Space technology for classes M2E, M3D and S1B.

Mr. Satish Dixit conducted quiz on Space Technology for class S1A. Children enthusiastically participated in the quiz and this ignited their curiosity in space science.

Mr. Akshay Bhalla conducted crossword Puzzle on names of galaxies for classes M1B, M1C , M3E. He also gave a speech on National Space Day and why it is celebrated as well as a speech on how Sunita Williams is stranded in space. A few children also made posters. The link https://bharatonthemoon.ncert.gov.in/ activities was shared across all M1, M3 and S1 sections by him.

Ms. Renu Sukheja conducted a poster making session on 'space mission to moon' for the students of M1D and M1E.

Mr. Anil Batra conducted a discussion activity on gravity concepts related to the Chandrayaan-3 mission with SS1A students to enhance their understanding of gravitational forces in space exploration. The session began with an overview of Chandrayaan-3, focusing on its objectives and the importance of gravity in the mission. Students were divided into small groups, each assigned a specific aspect of gravity to discuss, such as the difference in gravitational pull between the Moon and Earth, the concept of escape velocity, and the effects of gravity on the lunar landing process. After group discussions, students presented their insights to the class, engaging in a reflective discussion on the role of gravity in Chandrayaan-3's success. The activity concluded with a summary of key points, reinforcing the significance of gravity in space missions. The activity effectively deepened their grasp of gravitational concepts by applying them to a real-world context.

He also conducted an online quiz focusing on India's achievements and contributions in space exploration. A total of 474 students participated in the online quiz, with 298 from middle school (6th to 8th grades) and 176 from high school (9th to 12th grades).

Our little Gallery Walk

JIYA SHARMA, M1E

NEHA BANO, M1B

MEHR KAUR, P4C


Space may seem distant, but is an integral part of our daily life. It drives our modern communication and connects even the remotest family to the ordinary. India's space programme is a perfect example of our vision of Scale, Speed and Skill.
Narendra Modi
quotefancy