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VIGYAN CONNECT

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Goa Science Centre

(A unit of National Council of Science Museums)

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OPENING NOTE

Dear Members and Science Enthusiasts,
Greetings to you all!

It gives me immense pleasure to present this edition of our quarterly newsletter, reflecting the vibrant scientific activities and educational initiatives being undertaken at Goa Science Centre. As we continue our journey of promoting scientific temper and innovation among students and the public, I extend my sincere gratitude to all our members, educators, volunteers, and partners for their unwavering support and enthusiastic participation.

The coming quarter promises an exciting array of programmes designed to inspire curiosity, celebrate scientific achievements, and encourage meaningful public engagement. Our **Science Demonstration Lecture Series** will continue to provide interactive learning experiences that make science enjoyable and accessible to learners of all ages.

During this quarter, we shall commemorate several important national and international occasions, including **World Population Day, Moon Landing Day, Independence Day, National Space Day, Engineers' Day and Hindi Pakhwada**. Each of these observances will feature engaging lectures, demonstrations, activities and competitions aimed at fostering curiosity, scientific awareness, and national pride.

This year is particularly special for us as we celebrate our **Silver Jubilee Year**, marking twenty-five years of dedicated service in science communication and science popularisation. Several commemorative activities and special events are planned throughout the year, and we warmly invite all our members and well-wishers to join us in making these celebrations memorable.

I encourage every member, teachers and parents to actively participate in our forthcoming programmes and help us spread the message of scientific inquiry, innovation, and lifelong learning within our communities. Together, let us continue to nurture young minds and strengthen the scientific spirit that drives progress and sustainable development.

I wish you all an enriching and inspiring quarter ahead.

Shri A.K. Bhelave
(Project Co-ordinator)

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EXHIBIT AT THE CENTRE

Magic Water Tap



Have you ever visited the Goa Science Centre and stopped in your tracks, wondering how a heavy metal tap appears to float in thin air while pouring out an endless stream of water? It looks like absolute magic, doesn't it? There are no visible pipes connected to the wall, yet water continuously overflows into the earthen pot below. Actually, there is no magic involved—just a clever optical illusion. The secret is hiding right in front of your eyes, camouflaged by the flowing water itself.

What is happening is that a rigid, transparent acrylic tube connects the bottom pot directly to the inside of the tap's nozzle. This clear pipe serves as the secret plumbing. Hidden inside the base pot is a small electric water pump that continuously pushes water upwards through the hollow center of this tube. When the water reaches the top, it overflows and falls back down over the outside of the pipe. Because the water is constantly rippling and splashing, it bends the light and masks the plastic tube, making it appear as if a solid column of water is suspended in mid-air.

FRESH FINDINGS

Nvidia's New AI Servers Aim to Reduce Water Consumption

Artificial intelligence has been expanding into nearly every sector of the society; concerns about its environmental impact have grown alongside its capabilities. While the enormous energy demands of AI have attracted widespread attention, researchers and policymakers are increasingly focusing on another critical resource: water. Large AI data centres require extensive cooling systems to prevent overheating, and many of these systems consume vast quantities of water through evaporation-based cooling processes.



AI Generated image

Training and operating large language models require thousands of high-performance processors working continuously, generating substantial amounts of heat. As companies race to build larger data centers to support increasingly powerful AI systems, demand for cooling has become a major environmental and economic challenge. Nvidia has recently announced a new generation of AI servers that it claims could dramatically reduce this water demand. The company's upcoming server architecture uses an advanced liquid-cooling system designed to operate at much higher temperatures (up to 45° C) than conventional data-centre equipment that requires air cooling fans that are dependent on water. By allowing coolant to circulate directly through server racks and carry heat away more efficiently, the system can rely on dry cooling methods instead of water-intensive cooling towers. This liquid coolant is made up of propylene glycol and water that is re-circulated in a closed loop which eliminates the need to draw in new water. According to Nvidia, this approach could reduce operational water consumption at AI facilities to nearly zero under suitable conditions.

Experts view Nvidia's development as a promising step toward more sustainable computing. However, they also note that reducing water use inside data centers addresses only part of AI's overall environmental footprint. Significant amounts of water are still required indirectly through electricity generation and the manufacturing of advanced semiconductor chips. As a result, lower water consumption during server operation does not eliminate the broader resource demands associated with AI technologies.

Nevertheless, the innovation highlights a growing shift in the technology industry. Future advances in artificial intelligence may increasingly be measured not only by improvements in speed and performance but also by their ability to minimize environmental impacts. If Nvidia's approach proves effective at scale, it could influence the design of next-generation data centers and help reduce one of the less visible costs of the AI revolution.

Resource: <https://blogs.nvidia.com/blog/liquid-cooling-ai-factories>



Balloon Horn

You will need

- Straw
- Balloon
- Rubber Band
- Scissors



What to do?

Step 1: Cut a small piece about 1 inch off the straw. Gently slide this small piece entirely inside the neck of the balloon.

Step 2: Take the larger straw and push one end into the balloon's mouth alongside the first piece. Make sure the small straw piece and the larger straw are sitting parallel (side-by-side) to each other.

Step 3: Tightly wrap a rubber band around the mouth of the balloon. This secures both straws in place and ensures an airtight seal around them.

Step 4: Blow firmly through the exposed end of the larger straw to inflate the balloon.

Step 4: Release the balloon such that air escapes making a squeaking sound.

Science behind it

As the air escapes through the narrow gap between the two parallel straws, it forces them to vibrate rapidly against each other. This creates a funny buzzing or squeaking sound.



Brain Teaser

1. I am a star, but I am not seen at night. I give you warmth, I give you light. Without me, the Earth would be cold and done. Look up in the day. Who am I?
2. I am not empty, though my name suggests I am a void. I am the remnant of a massive star, completely destroyed. My gravity is so fierce, an inescapable trap, Even light cannot escape off my map. Who am I?

Astronomy Quiz

1. Which is the largest planet in our solar system?
2. Which galaxy is home to our solar system?
3. Which famous comet is visible from Earth every 75 to 76 years?
4. What is the name of the first artificial satellite launched in 1957?
5. Which is the highest mountain in our solar system?

Send your answers to
vigyanconnectgsc@gmail.com

HISTORY OF SOLVING MYSTERY

Dr. Alexander Fleming

Returning from a holiday on September 3, 1928, Dr. Fleming found a messy lab bench, he began to sort through petri dishes containing colonies of *Staphylococcus*, bacteria that cause boils, sore throats and abscesses. He noticed something unusual on one dish. It was dotted with colonies, except for one area where a blob of mould was growing. The zone immediately around the mould was clear, as if the mould had secreted something that inhibited bacterial growth. Upon examining some colonies of *Staphylococcus aureus*, Dr. Fleming noted that a mould called *Penicillium notatum* had contaminated his Petri dishes. After carefully placing the dishes under his microscope, Dr. Fleming was amazed to find that the mould prevented the normal growth of the staphylococci, streptococcus, meningococcus and the diphtheria bacillus.

It took Dr. Fleming a few more weeks to grow enough of the Penicillin mould so that he was able to confirm his findings.



His conclusions turned out to be phenomenal: there was some factor in the *Penicillium* mould that not only inhibited the growth of the bacteria but more importantly, it might be harnessed to combat infectious diseases. Dr. Fleming famously wrote about that red-letter date:

"When I woke up just after dawn on September 28, 1928, I certainly didn't plan to revolutionize all medicine by discovering the world's first antibiotic or bacteria killer. But I guess that was exactly what I did."

HOW & WHY?

As the monsoon season rolls in with heavy downpours, frequent power cuts quickly become a frustrating daily reality. Thankfully, we have a silent hero in our homes: the inverter. This essential device seamlessly bridges the gap between stored backup energy and our household appliances, ensuring our lives keep running without a hitch.

What is an Inverter?

An inverter is a device that converts Direct Current (DC), like the electricity stored in the batteries into an Alternating Current (AC), the type required by most of the household appliances.

How do Inverter work?

Imagine if you could manually flip a battery's positive and negative terminals back and forth at lightning speed. By doing this, you would effectively convert DC into AC. This is exactly what an inverter does. Using advanced electronic switches, it flips the current's direction rapidly and efficiently at a standard frequency of 50 to 60 Hertz.

INVERTERS



Inverter continuously manage the flow of electricity. When the main Power is ON; it takes AC power from the grid, converts it to DC, and uses it to charge the backup batteries. When Power Cuts occurs; It instantly switches over, drawing the stored DC power from the batteries, converting it back to AC, and supplying it to your appliances.

Inverter thus play a pivotal role in our electrical systems bridging the gap between DC power source & AC powered appliances.

SCIENCE & TECHNOLOGY HERITAGE OF INDIA

The Virupaksha Temple



The Virupaksha Temple in Hampi is a 7th-century Hindu temple dedicated to Lord Shiva, worshipped here as Virupaksha. Situated 350 kms from Bengaluru, in District Bellary, on the South bank of the Tungabhadra, in Hampi, Karnataka State.

It is renowned as the only continuously functioning temple in Hampi since its inception. Located on the southern bank of the Tungabhadra River within the Vijayanagara district of Karnataka, it forms the spiritual heart of the group of Monuments at Hampi, a designated UNESCO World Heritage Site.

The temple was originally built during the 9th–10th centuries and later expanded under the Vijayanagara rulers. It survived the destruction of Hampi in 1565 CE and remained an important centre of worship. The temple is known for its impressive architecture, stone enclosure walls, sculptured pillars, and rich carvings reflecting Chalukya, Hoysala, and Vijayanagara influences.

Pinhole Camera at Virupaksha Temple

The pinhole camera phenomenon at the Virupaksha Temple is one of its most fascinating features and demonstrates a basic principle of optics.

How it works?

Behind the main sanctum is a small dark chamber called the Shalumandapa. A tiny opening (pinhole) in the wall allows sunlight to enter the dark room. Light travels in straight lines through this small hole and projects an inverted image of the temple's Eastern Gopuram (tower) onto the opposite wall. The image appears upside down because rays from the top of the tower reach the bottom of the projection, while rays from the bottom reach the top.

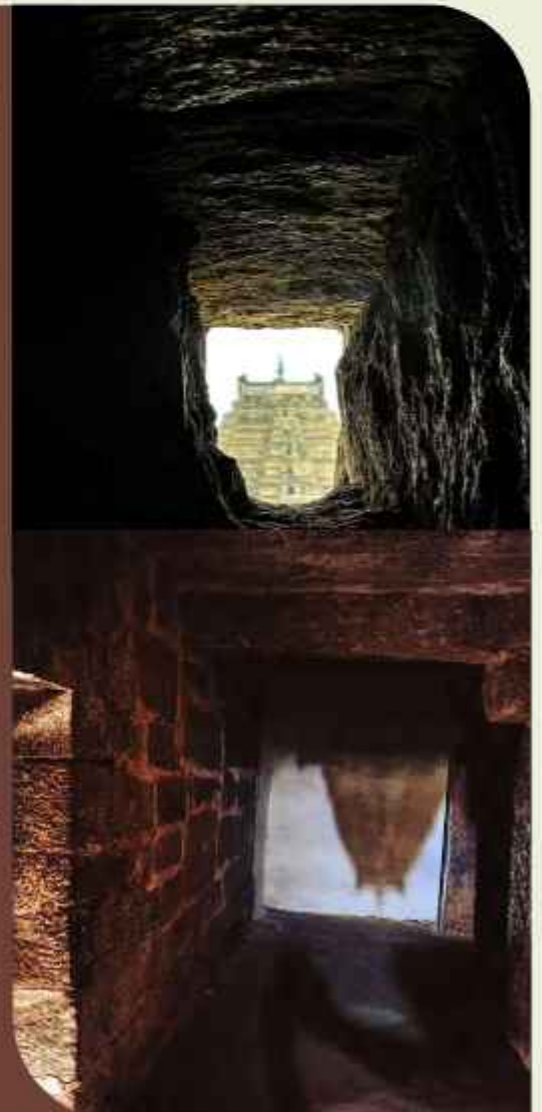
Scientific Principle

This is the same principle used in a pinhole camera, the simplest form of a camera: No lens is required. Small aperture forms an image on a surface. The image is real, inverted, and usually dim.

Significance

The phenomenon demonstrates the advanced understanding of architecture and natural light by the temple builders. It serves as a practical example of optical science centuries before modern photography. Visitors can still observe the inverted image of the Gopuram under suitable daylight conditions.

The projection changes with the intensity and angle of sunlight. During bright daylight, the image is clearer, while it becomes faint or disappears under poor lighting conditions. In simple terms, the Virupaksha Temple contains a working natural pinhole camera, where a tiny hole projects an upside-down image of the temple tower onto a dark wall—a remarkable blend of ancient architecture and optical science.



ASTRONOMY WONDERS

The Moon: Earth's Natural Satellite



The moon is our nearest neighbour in space, a natural satellite orbiting the Earth. It is the frontier of direct human exploration that is the great interest to astronomers.

The moon is about one fourth the diameter of the Earth, a barren ball of rock. The moon's orbit is elliptical, with an average distance from Earth of 380,000 kilometres (about 250,000 miles) and a period of 27.3 days. Through a small telescope or even a pair of binoculars you can see the dark areas of moon surface are smooth while bright areas are covered with numerous large circular pits called craters.

The Absence of Lunar Atmosphere

Unlike Earth, the Moon does not have a thick atmosphere surrounding it. The main reason for the absence of a lunar atmosphere is the Moon's weak gravitational force and the Moon lacks a strong magnetic field that could help protect and retain atmospheric gases. The absence of an atmosphere has several important effects. There is no weather on the Moon—no wind, rain, or clouds. As a result, footprints left by astronauts can remain unchanged for millions of years.

The Moon does not produce its own light. It shines because it reflects the light of the Sun. As it moves around the Earth, we see different portions of its illuminated surface, creating the phases of the Moon such as the new moon, crescent moon, half moon, and full moon.

The Moon plays an important role in life on Earth. Its gravitational pull causes ocean tides and helps stabilize Earth's rotation. Scientists believe that the Moon was formed billions of years ago after a large object collided with the young Earth.

Today, scientists continue to study the Moon to learn more about its history and the origins of our solar system. The Moon remains a symbol of wonder and exploration, inspiring future generations to look toward the stars.



*The footprint of an astronaut on the Moon.
(Courtesy NASA)*

*Reference book:
Explorations: An introduction to Astronomy
by Thomas T. Arny*



The phases of the moon are the different ways the moon appears from Earth, Caused by sun illuminating different parts of its surface as it orbits our planet.

Banyan Tree

Scientific Name: *Ficus benghalensis* **Hindi Name:** Vat Vriksh / Bargad **Konkani Name:** Vad

The banyan tree (*Ficus benghalensis*) is not just a tree; it is an entire ecosystem disguised as a single organism. As the National Tree of India, this colossal member of the fig family holds a legendary status for its ability to expand outward indefinitely, creating a massive canopy that can shelter entire villages.

The most striking feature of the banyan tree is its aerial prop roots. Roots drop down from horizontal branches into the soil. Once anchored, they thicken into sturdy, woody accessory trunks. These new trunks support further outward growth. Over centuries, a single banyan tree takes on the appearance of a dense, multi-tree forest.

The Strangler Habit despite its peaceful appearance, the banyan tree begins life as an aggressive survivor. It is a "strangler fig," meaning its life starts as an epiphyte when a bird drops a seed high up in the branches of another tree. The young banyan sends roots downward to anchor in the ground. It grows upward rapidly to steal the sunlight.

For thousands of years, the banyan has been revered across Asia, particularly in Hindu and Buddhist traditions. Because of its continuous regeneration, it represents immortality and eternal life. In Hindu mythology, it is called Kalpavriksha, the wish-fulfilling tree.

Some individual banyan trees have achieved global fame due to their staggering size. The Great Banyan Tree (Kolkata, India) is over 250 years old, its canopy covers nearly 5 acres, making it wider than most city blocks. Thimmamma Marrimanu (Andhra Pradesh, India) Holds the Guinness World Record for the world's largest tree canopy, spreading across more than 4.6 acres.



Its hollows provide home to various creatures. Mature banyan tree support bats, reptiles, and insects, while its year-round fig production offers a



Medicinal Uses:

1. Latex is used to treat toothache and skin diseases.
2. Bark is used to control diabetes and treat dysentery.
3. Leaves are used to treat wounds and ulcers due to their medicinal properties.

Economic Uses:

1. Provides shade in villages and public spaces.
2. Wood is used to make small tools and furniture.
3. Used in Ayurvedic medicine for its roots, leaves, bark, fruit, and flowers



critical food source for hundreds of species of birds and monkeys during times of scarcity.

In the Goa Science Centre there is Huge Banyan Tree.its aerial roots have cascaded down from the heavy branches, anchoring themselves firmly into the earth below to form a labyrinth of secondary trunks. Under its deep, welcoming shade, the air always feels a few degrees cooler. The gentle rustle of its broad leaves creates a steady, calming whisper, making it the undeniable heart and soul of the entire landscape.

Behind every successful space mission are dedicated scientists whose vision and hard work make these achievements possible. One such scientist is **Ritu Karidhal**, widely known as the "Rocket Woman of India."

Born in Lucknow, Uttar Pradesh, Ritu Karidhal developed an interest in space and astronomy at an early age. While many children simply admire the night sky, she wanted to understand its mysteries. She spent her childhood reading about planets, stars, and space exploration. Her fascination with science eventually guided her toward higher studies in physics and aerospace engineering, preparing her for a career that would contribute significantly to India's space programme. Ritu Karidhal joined the Indian Space Research Organisation (ISRO) in 1997.

One of her most celebrated contributions came during India's Mars Orbiter Mission, popularly known as Mangalyaan. The mission captured global attention because India became the first nation to successfully enter Mars orbit on its very first attempt. As a key member of the mission team, Ritu played an important role in planning and executing the complex operations required for this achievement. The success of Mangalyaan demonstrated India's scientific capability and earned admiration from around the world.



Her leadership skills became even more visible when she served as the Mission Director for Chandrayaan-2. Managing such a project required technical expertise, careful planning, and the ability to coordinate large teams of scientists and engineers. Although the mission faced challenges during the landing phase, it generated valuable scientific data and paved the way for future lunar exploration.

Ritu Karidhal's life is not just a story of personal success; it is a symbol of India's scientific progress and the growing role of women in shaping the nation's future.

Sci-Word Mix

How well do you know the Moons of Planets?

W	E	I	C	A	L	L	I	S	T	O	G
T	Y	A	M	K	E	P	S	M	K	P	A
A	R	P	A	N	B	U	R	M	H	J	N
R	H	E	A	O	O	N	R	O	K	P	Y
I	M	T	R	I	T	O	N	O	H	I	M
E	J	U	S	O	I	A	F	N	P	Q	E
L	L	S	S	O	T	K	P	T	W	A	D
U	R	M	I	R	A	N	D	A	L	O	E
P	N	M	O	O	N	O	P	W	I	P	A

TITAN
EUROPA
GANYMEDE
MIRANDA
ARIEL
RHEA
IO
PAN
IAPETUS
CALLISTO
MOON
TRITON

IN THE LAST QUARTER

April



Inauguration of Nuclear Power Plant model



PSL on Nuclear Power: Clean, Green and Safe



Visit of African Delegates



Swachhata Slogan by Students during Swachhata Pakhwada



Beach Cleaning by Staff during Swachhata Pakhwada



Swachhata Pledge Vowed by Staff during Swachhata Pakhwada



Poster Designing contest on the occasion of World Malaria Day



Valediction and Prize Distribution of World Malaria Day



Sci-Birthday Celebration



Clay Pottery Workshop organised on World Earth Day



Hydroponics Workshop organised on World Earth Day

IN THE LAST QUARTER

May



Zero Shadow Day observation



Sunday Fam-Lab workshop



Hands on Activity organised on National Technology Day



Science Buzz workshop



Creative Physics Lab workshop



Inauguration of Exhibition My Own collection organised on the occasion of International Museum Day



Visit of Honorable Chief Minister of Goa Dr. Pramod Sawant to the Exhibition My Own Collection



Valedictory Function of Exhibition My Own Collection



Visit of Honorable Governor of Goa Shri Pusapati Ashok Gajapathi Raju to Exhibition My Own Collection



Robotics Construction level 1 workshop



Exhibition unmasking the appeal: countering Nicotine & Tobacco Addiction

IN THE LAST QUARTER

June



QR codes created for the Trees



International Yoga Day Celebration



Tree plantation on the occasion of World Environment Day



Painting Competition organised on the occasion of World Environment Day



Poster Designing Competition organised on the occasion of World Environment Day



Workshop on plant propagation technique organised on the occasion of World Environment Day



Visit of Honorable Governor of Goa Shri Pusapati Ashok Gajapathi Raju



Poster Exhibition organised on the occasion of No Tobacco Day



Visit of Shri Mohd. Shabir, IAS, Director, Department of Science, Technology & Waste Management, Govt. of Goa



Sci- Birthday Celebration



Science Show

Science Wonderland

Goa Science Centre is a constituent unit of National Council of Science Museums functioning under Ministry of Culture, Government of India. It is a place of edu-tainment in Science & Technology. Its Main objective is to inculcate a scientific temper & bring the excitement of science to the common public. It provides a perfect environment for exploring science through sci-fi exhibit.

Galleries



- Fun Science
- Science of Ocean
- Magic Magic



Science Park



Pre-historic Animal Park



Digital Planetarium



3D Show



Science Show



Sky Observation Program



Upcoming Events

July 2026

- Science Demonstration Series
- World Population Day
- Moon Landing Day

August 2026

- Independence Day Celebration
- National Space Day Celebration

September 2026

- Engineers Day
- Hindi Pakhwada

General Information

Entry Fee Per Visitor to Science Centre

Particulars	Amount
Entry Ticket to Science Centre Only	
◇ General Visitors	Rs.50/-
◇ Group of Visitors (15 or more)	Rs.30/-
◇ Students in Organized Group with Authority Letter	Rs.10/-
◇ Students from Govt./Municipal School with Authority Letter	Rs.5/-
Planetarium/Taramandal Shows	
◇ General Visitors	Rs.50/-
◇ Group Visitors (15 or more)	Rs.40/-
◇ Students in Organized Group with Authority Letter	Rs.15/-
◇ Students from Govt./Municipal School with Authority Letter	Rs.10/-
3D Science Show	
◇ General Visitors	Rs.40/-
◇ Group Visitors (15 or more)	Rs.30/-
◇ Students in Organized Group with Authority Letter	Rs.10/-
◇ Students from Govt./Municipal School with Authority Letter	Rs.5/-
Science Film Show	Rs.20/-
Science show	Rs.20/-
Special Packages	
Package Ticket to Science Centre, Planetarium & 3D Show	
◇ General Visitors	Rs.120/-
◇ Group of Visitors (15 or more)	Rs.80/-
◇ Students in Organized Group with Authority Letter	Rs.30/-
◇ Students from Govt./Municipal School with Authority Letter	Rs.20/-
Package Ticket to Science Centre & Planetarium	
◇ General Visitors	Rs.90/-
◇ Group of Visitors (15 or more)	Rs.60/-
◇ Students in Organized Group with Authority Letter	Rs.25/-
◇ Students from Govt./Municipal School with Authority Letter	Rs.15/-
Package Ticket to Science Centre& 3D Show	
◇ General Visitors	Rs.80/-
◇ Group of Visitors (15 or more)	Rs.50/-
◇ Students in Organized Group with Authority Letter	Rs.20/-
◇ Students from Govt./Municipal School with Authority Letter	Rs.10/-
Family Packages	
Science Centre, Planetarium, 3DShow	
◇ Family of 4 Members	Rs.350/-
◇ Family of 6 Members	Rs.500/-

Membership Program

Innovation Hub Membership

- **Eligibility:** Students of class 5th & above
- **Benefits:** Access to the innovation hub for one year, can work on own innovative projects under the guidance of experts, free entry to the galleries, invitation to education programmes and activities.
- **Annual Membership Fee:** Rs.1000/-

Science Centre Membership

- **Eligibility:** Individuals above 3 years of age
- **Benefits:** Free entry to the galleries, invitation to education programmes and activities.
- **Annual Membership Fee:**
Rs.200/- for students
Rs.400/- for Teachers
Rs.500/- for other individuals

To avail membership please contact Education section GSCP.

Sci-Birthday

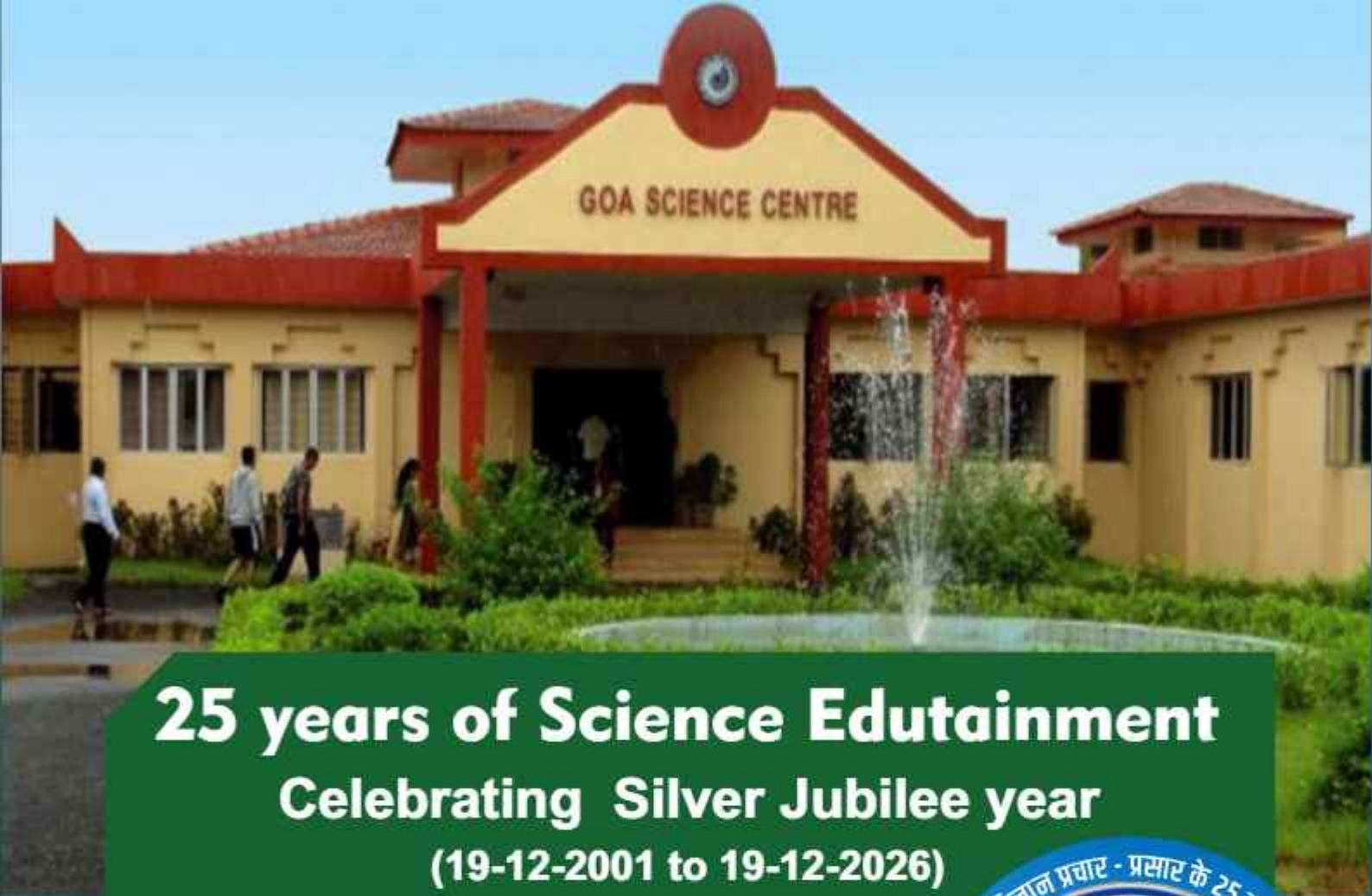
- Celebrate your birthday at Goa Science Centre in a sci-fun way!!
- Package includes guided gallery tour, 3D show, planetarium show and hand-on activities with full-on edutainment.
- The contents is designed as per the age group.
- Air-conditioned activity room.
- Prior booking necessary

Package Rates: (Children & adult included)
up to 25 people -Rs.5000/-
up-to 50 people- Rs.7500/-

To booking please contact Education section GSCP.

Goa Science Centre is open to public every day including Sundays & public Holidays throughout the year except on Holi & Diwali

Opening Hours
9.30am to 6.00pm
Ticket Counter Timing
9.30am to 5.30pm



25 years of Science Edutainment

Celebrating Silver Jubilee year

(19-12-2001 to 19-12-2026)

As we complete 25 years of wonders, we want to hear your stories. Whether it was your first school trip in 2001, a family afternoon in the Science Park, or the moment you first gazed at the stars in our Planetarium, your memories are our history. Please share your photos, stories, and messages with us at gscsilverjubilee@gmail.com



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