



Ministry of Culture
Government of India



Vigyan Connect

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Goa Science Centre

(A unit of National Council of Science Museums)

Ministry of Culture, Government of India

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OPENING NOTE

Dear Members and Science Enthusiasts,

It gives us immense pleasure to announce the launch of our **first-ever Newsletter– Vigyaan Connect!** As we approach a remarkable milestone '**24 years of inspiring curiosity and fostering a love for science**', it is with great excitement that we present to you the inaugural edition of the newsletter. This newsletter not only marks the beginning of a new chapter but also sets the stage for a year of celebration as we step into our **25th year in December 2025!**

Over the past 24 years, the Science Centre has worked immensely in the field of edutainment and engagement in Science for all ages. We've created an environment where science isn't just something to learn about—it's something to experience. You may visit with family, friends, or as a part of a school group, there's always something to explore. Our hands-on exhibits Planetarium, 3D science film and thrilling science shows invite you to engage directly with the fascinating world of science. And as we look forward to our 25th year, we are more committed than ever to make science accessible, interactive, and exciting for everyone.

In this first issue, you'll find about the latest happenings at the Science Centre, including our new exhibits, upcoming events, workshops, live science demonstrations and the other facilities at the Centre. The various columns such as Fresh Findings, History of solving Mystery, How & Why, Astronomy Wonders, Rooted in the Campus, Science & Technology Heritage of India are not just interesting but knowledge enriching too.

As we celebrate our **24 years of dedicated service**, we are even more excited to continue our journey into the future. This milestone will be a year-long celebration filled with special activities, events, and initiatives designed to engage & inspire our visitors in new and innovative ways. Stay tuned for the many exciting activities we have planned throughout our **25th year**, including exclusive workshops, anniversary events, and more!

We look forward to welcome you to the Science Centre and invite you to explore, discover, and be inspired by the world of science.

With warm regards,

Mrs. Manjula U. Yadav
(Project Co-ordinator)

CONTENT

- Introduction
- Fresh Findings
- Sci-Craft
- Sci-Q
- History of Solving Mystery
- How& Why
- Science & Technology Heritage of India
- Astronomy Wonders
- Rooted in the Campus
- Indian Vaigyanic
- Sci-Word Mix
- In the last Quarter
- Science Wonderland
- Upcomig Events

EXHIBIT AT THE CENTRE



Supplemented Reality

Supplemented reality, more commonly known as Augmented Reality (AR), is a technology that adds digital information and virtual objects to the real world. Think of it as a layer of computer-generated content like images, videos, or sounds that is overlaid on top of what you're seeing in your actual environment.

Unlike Virtual Reality (VR), which replaces the real world with a completely simulated one, supplemented reality keeps you grounded in your own surroundings while enhancing them with digital elements. This is often done using a device like a smartphone, tablet, or smart glasses.

How it works?

The technology uses a device's camera and sensors to capture a live view of the real world.

Software then processes this information and, in real time, places virtual objects in a way that makes them appear to be part of your physical space.

For example, if you point your phone's camera at a street, the AR application might display information about nearby restaurants or show a virtual character standing on the sidewalk.

FRESH FINDINGS

Nano-Banana

The world has been going bananas over AI. It has made our already fast lives faster. It has the superpower to drape a saree in few seconds. Currently, AI-generated pictures of 3D miniature figurine models of people have been trending on Indian social media. This trend has been possible because of Nano-Banana, an AI image generation and editing tool from Google DeepMind. It's officially called 'Gemini 2.5 Flash Image'. This tool uses advanced AI to understand photos and prompts at the level of tiny details while preserving your identity. It allows you to combine multiple images to create a single image, transport yourself to different places and backgrounds with the outfits and hairstyles that you describe. It can also transfer the style, colour and texture of one object to another, edit or remove something from your photo and much more.



These edits can be achieved in seconds, compared to traditional photo editing which may take hours of screen time. Non-AI editing apps often struggle with challenges such as realism, cost, seamless blending of images, and the requirement for technical editing skills – problems that AI tools can solve more easily. AI-generated images also include a visible watermark and invisible SynthID to indicate they are AI-made. Nano-Banana is fun to use, but also reminds us to think carefully about what's real and what's fake.

To try it yourself, you can visit Google's Gemini app and use the "generate image" feature. Here you can upload a photo and describe the changes you want, or provide a text description to generate a completely new image. If the result is not to your liking, you can give further instructions to refine it.

Certain challenges faced by Nano-Banana include distortion of people's faces after multiple edits, the need for good quality starting images, and the importance clear prompts to avoid messy results. It also struggles with very fine details such as jewellery and text on clothes. Beyond technical issues, it raises questions about who will own the generated images, and concerns about the future of photo editing jobs, as well as the originality and creativity of artists and creators.

Such tools could shape the future of fashion, education, advertising and many more creative fields. It shows how AI is moving from playful experiments to powerful everyday uses but also raising new questions about ethical issues and digital safety.

Source: <https://blog.google/products/gemini/updated-image-editing-model/>



ROTOCOPTER

You will need



- Paper sheet
- Paper clip
- Scissors
- Ruler



What to do?

Step 1: Cut 3x15cm strip of paper.

Step 2: Fold and divide the paper into 3 parts.

Step 3: Cut a slit of around 12cm horizontally from either side

Step 4: Take the two cut ends of the strip and join them with a paper clip.

Step 5: Release it from a height and observe the rotocopter spin around its axis gradually as it falls down.



Science behind it

Gravity pulls the rotocopter down. Air resistance creates an upward force on its blades. The upward-pushing air strikes the blade & creates a small, horizontal thrust. Each end of the rotocopter experiences a sideways push in the opposite horizontal direction. These opposing forces cause the entire rotocopter to spin as it falls. The spinning allows the rotocopter to descent slowly.



Send your answers to
vigyanconnectgsc@gmail.com

Quiz

1. An optical illusion caused by the refraction of light through air layers of different temperatures is ____.
2. When a white light ray passes through a prism, it is separated into the colors of the ____.
3. Light changes direction as it passes from air into water, the phenomenon is called ____.
4. Sky is blue because ____.
5. The range of colors of light that the human eye can see is called ____ spectrum.

Riddles

1. You can't see me, but I can see you;
To be more specific, I see through.
Who am I?
2. Born in the ocean and white as snow. When I fall back to water I disappear without a trace.
Who am I?
3. I am a Roman god, a planet and I can measure heat.
Who am I?

HISTORY OF SOLVING MYSTERY

The EUREKA Moment-

Long ago in 3rd century BC, the king of Syracuse, in Sicily wanted a new crown of pure gold. So, he gave some gold to a goldsmith, who crafted a beautiful crown of the same weight. King liked the crown but had a suspicion that whether the crown is really made up of pure gold, or the artisan might have replaced some gold with other cheaper metal like copper or silver?

Archimedes was a brilliant scientist and inventor of Syracuse, so the king asked him to solve the mystery. Archimedes knew that determining density of the crown could be the only solution.

Density is the weight in grams of a small cube that occupies 1 cm x 1 cm x 1 cm space. Pure gold is one of the heaviest metals (Density of gold = 19.3 gm/cm^3 ; silver = 10.5 gm/cm^3 ; copper = 8.9 gm/cm^3)

Accurate measurements of weight and volume were needed to determine the density of the crown. Weight could be easily measured but how to measure the volume of a crown accurately as it had an intrinsic design and no regular shape with some specific length, breadth and height.

While taking a bath in a bathtub, he noticed water overflowing and realized that the amount of water displaced was equal to the volume of his body immersed. Thus, volume of a crown could be easily determined without any damage to its design.



Pure gold of same weight would occupy less volume hence displace less water due to high density. Impure gold with cheap metal adulteration would occupy more volume as lower density metals were added in it to match the weight and displace more water and he exclaimed.

EUREKA!! I found it.

Later he found that the king's suspicion was true.

Source: [Google.com](https://www.google.com)

HOW & WHY ? Differential Wheel Sizes in Tractors

A tractor is versatile machinery in the agricultural industry allowing farmers to perform variety of tasks like ploughing the field, tilling and harrowing the soil, for pulling heavily loaded trailers etc.

Tractors have two small wheels in the front and two huge rear wheels powered by the engine. These differential wheel sizes help tractors move on soft muddy ground without sinking in the soil.

The large rear wheels offer greater surface contact, providing a good grip on the soft & slippery muddy surface. This improves the traction in the tractor & ensures optimal power transfer from the engine to the ground. The weight of engine and the transmission components is concentrated towards the rear of the tractor. Larger rear wheels help to distribute the weight evenly & contribute to lower the centre of gravity. This enhances tractors stability and prevents tip-over of the tractor on uneven terrain.



The smaller front wheels exert less pressure on the soil, minimizing soil compaction. Smaller front wheels require less steering effort making it easier for drivers to maneuver the tractor in tight spaces when navigating through fields & around obstacles where precise control is required.

In conclusion, the differential wheel size allows tractors to perform efficiently in diverse conditions, thereby optimizing its performance in agricultural activities & contributing heavily to the success of farming operations.

Source: <https://www.apollotyres.com/>

Science & Technology Heritage of India

Equinox at Holy Spirit Church Margao

India has a long and proud history of achievements in science and technology. Thousands of years ago, Indian thinkers made important contributions in areas like mathematics, astronomy, medicine, engineering, and architecture. Their brilliant ideas and inventions are still used today. These ancient scientists were true pioneers, and their work continues to inspire the modern world.

Goa, the smallest state of India located on the western coast along the Arabian Sea. Goa's culture and heritage is a vibrant blend of Indian and Portuguese influences, stemming from its long colonial history. This fusion is evident in its architecture, with Portuguese-style churches, temples and mosques. Margao, the capital of South Goa, is home to the famous Holy Spirit Church. This existing church was destroyed four times earlier and was rebuilt fifth time in 1675. It is considered the largest and most beautiful church in Salcete.

The church has a near perfect East-West orientation, at roughly 70° East and 270° West. The structural positioning, of the oculus window along with the smaller rectangular windows of the choir loft, has an oculus at centre and 2 windows towards right and left of Oculus.



Every year at sunset on Equinox that is on March 21 and September 22 a natural spectacle occurs at the Holy Spirit Church, Margao. Around 6.20pm, for a few spellbinding minutes, the setting sun renders a spotlight directly on the emblem of the Holy Spirit on the main altar through the round oculus (circular window, just above the choir loft window) on the west-facing front facade of the church. Simultaneously, the two statues of the Sacred Heart of Jesus (L) and Sacred Heart of Mary (R) on the side altars are also lit by the sun rays shining through the smaller windows on the front facade. These are the days when the Sun crosses the equator. The equinoxes are the only time when both the Northern and Southern Hemisphere experience roughly equal amounts of daytime and night time.



The church is always packed beyond its capacity with people, including astronomy enthusiasts wanting to witness this 20-minute astronomical spectacle at sunset. The church is open on the days of the equinox to whoever who wishes to experience this celestial event



Courtesy: Shri Gaurav Dhumatkar

ASTRONOMY WONDERS

Black Holes: The Cosmic Monsters

Black Holes are the most fascinating and mind-bending objects in the cosmos. They are often called the "cosmic monsters" because of their immense power and mysterious nature. A black hole is a region in space with strong gravity where the mass is concentrated in a tiny region, surrounded by a boundary called the "event horizon". It is the region where gravity is so strong that nothing- not even light can escape from it

Birth of Black Holes

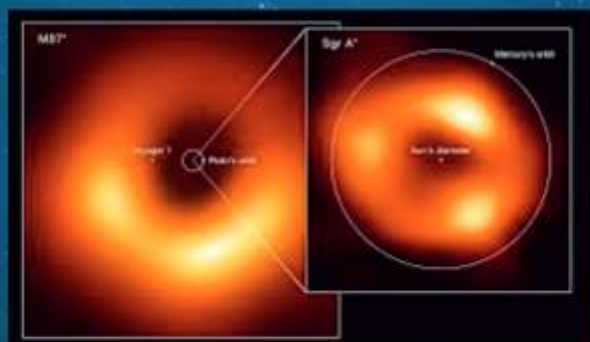
Black holes are formed when a massive star runs out of fuel. Usually stars balance themselves by burning fuel in their core, which produces energy to counteract the force of gravity. But when a massive star exhausts its fuel, gravity takes over, and the star collapses inwards. This collapse creates a black hole. Other methods include the collision of neutron stars and the direct collapse of vast gas clouds, which are believed to form supermassive black holes at the centers of galaxies.

Why are they important?

Black holes are not just destructive monsters; they also play a vital role in shaping galaxies. In fact, at the center of our own galaxy lies a supermassive black hole called Sagittarius A which holds our galaxy together. Scientists believe almost every large galaxy has one at its core.

Can we see Black Holes?

We cannot see black holes directly because they cannot emit light but astronomers can find their presence by deep observation how nearby stars and gas move under their gravitational pulls. Powerful radio telescopes, like the Event Horizon Telescope (EHT), have even managed to image the shadow or ring of light cast by the event horizon of the supermassive black holes at the centers of our galaxy and a distant galaxy.



Sagittarius A* (Sgr A) is the supermassive black hole at the galactic center of the Milky Way. Viewed from the Earth, it is located near the border of constellation Sagittarius and Scorpius, about 5.6° South of the Equator. Sagittarius A* is a bright and very compact astronomical radio source.

Sources:

<https://science.nasa.gov/universe/black-holes/>

<https://www.cfa.harvard.edu/research/topic/black-holes>

<https://www.britannica.com/editor/The-Editors-of-Encyclopaedia-Britannica/4419>

<https://www.space.com/15421-black-holes-facts-formation-discovery-sdcmp.html>



Rooted in the Campus

Cashew Tree

Botanical Name: *Anacardium occidentale*

The Cashew tree is a vital part of Goa's cultural and agricultural landscape, is more than just a source of delicious nuts and refreshing cashew feni (a traditional Goan liquor). The cashew tree, with its iconic nuts and vibrant cashew apples, is a trademark of Goa, symbolizing the state's rich agricultural heritage and cultural identity. In the Centre's campus, you can find around five thriving cashew trees, adding to the campus's natural beauty and serving as a living testament to the region's botanical diversity.

Originally from north-eastern Brazil, the cashew tree was brought to India during the Portuguese colonial period in the 16th century. Today, it is a common sight in Goa, especially in coastal and semi-coastal areas. The cashew tree grows well in Goa's warm, humid climate and well-drained sandy soils.

The tree thrives in areas that have both monsoon rains and dry seasons, thanks to its deep roots that help it survive droughts and heavy rainfall. It remains green throughout the year and typically grows to a height of 10 to 15 meters. The cashew tree has broad, leathery leaves and a gnarled trunk, which makes it stand out in the landscape.

In Goa, the cashew tree is economically and culturally important. Cashew nuts are one of the state's main exports, and harvesting and processing them provide jobs to many people, especially in rural areas.



Cashew trees also play a crucial role in the local ecosystem. Their deep roots help prevent soil erosion, which is important in Goa's hilly areas. The tree's flowers attract bees and butterflies, contributing to biodiversity. The fallen leaves and fruit remnants decompose, enriching the soil and supporting plant life.



From a sustainability perspective, the cashew tree offers several benefits. It needs little water compared to crops like rice or sugarcane. It's also resistant to pests and diseases, so it requires fewer chemicals, making it an eco-friendly crop. The cashew tree is a key part of sustainable farming practices in Goa.

Source: <https://en.wikipedia.org/wiki/Cashew>



Cashew apples, the juicy fruits of the tree, are eaten fresh, made into juices, or used in jams & jellies. Cashew feni, a local alcoholic drink, is made from the cashew apple through fermentation, adding to Goa's unique tradition & supporting tourism.

Indian Vaigyanic

Dr. Raghunath Mashelkar: A Journey of Struggles and Achievements

Dr. Raghunath Anant Mashelkar is one of India's most respected scientists, known for his pioneering work in polymer science. Born in 1943 in Goa, he lost his father at a young age and was raised by his mother in poverty. Despite financial hardships, his determination to study never wavered. Many times, he studied under street lamps because his home lacked electricity. His mother's encouragement played a vital role in shaping his career.

He completed his schooling in Pune and went on to earn a B.E. degree in Chemical Engineering from the University of Bombay (now ICT, Mumbai). Later, he pursued a Ph.D. in Chemical Engineering from the same institute.

Dr. Mashelkar made significant contributions to polymer science, chemical engineering, and innovation policy. He became the Director-General of the Council of Scientific and Industrial Research (CSIR), where he transformed the organization into a hub of innovation. His leadership encouraged research that balanced excellence with societal needs, promoting affordable technology for the poor.



He has been honored with several awards, including the Padma Shri (1991), Padma Bhushan (2000), and Padma Vibhushan (2014).

Internationally, he is recognized for advocating intellectual property rights in India and especially, fighting for revocation of the US Patent on wound healing properties of Turmeric claiming that this was India's traditional knowledge. He also fought for similar patents on Basmati Rice & Neem. This legal battle led to the creation of Traditional Knowledge Digital Library (TKDL)

Source: https://en.wikipedia.org/wiki/Raghunath_Anant_Mashelkar

Sci-Word Mix

Find the mixed Elements

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

Element List

ALUMINIUM
CARBON
MOSCOVIUM
OXYGEN
ZINC
SODIUM
COPPER
BORON
NEON
NITROGEN

IN THE LAST QUARTER

July



Launching of activity Everybody can do science ▲



World Population Day Celebration ▲



▲ Moon Landing Day Celebration ▲



Street Play by Education team at Miramar beach ▲



Goa State level competition in collaboration with ONGC and AERO ▲



Innovation Hub activity ▲



Robotics construction level 1 workshop in collaboration with Curious Minds ▲



Mobile Science Exhibition to Cancona Taluka ▲



Exposure visit to Innovation Hub ▲

IN THE LAST QUARTER

August



Eco Sculpt Workshop ▲



Empowering Physics Educators: Workshop with Padma Shri Prof. H. C Verma ▲



▲ National Space Day Celebration ▲



Innovation Hub members doing project work by ▲



Sci-Birthday Celebration ▲



▲ Har Ghar Tiranga Campaign ▲



▲ Science demonstration lecture ▲



IN THE LAST QUARTER

September



Engineer's Day Celebration ▲



Visit of Zimbabwe delegates ▲



Total Lunar Eclipse Awareness Program ▲



Essay writing competition during Hindi Pakhwada ▲



Innovation Hub activity ▲



Swachhata Hi Sewa Campaign ▲



Science Demonstration lecture at MSE Site ▲



Science Demonstration lecture ▲



Celebration of International Day of scientific Culture ▲



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 ▲
- Mirror Magic ►
- Science of Ocean ▼



Science Park



Pre-historik Animal Park



Digital Planetarium



3D Show



Science Show



Sky Observation Program



Upcoming Events

October 2025

- Special Swachhata Campaign 5.0
- Kaavi Art Workshop
- Creative Science Workshop

November 2025

- Sunday Science Workshops
- International Science Centre & Science Museum Day
- Children's Day Celebration
- National Standard Examination

December 2025

- National Energy Conservation Day Celebration
- 24th Anniversary Day Celebration of GSCP
- National Mathematics Day Celebration

General Information

Entry Fee Per Visitor to Science Centre

Particulars	Amount
Entry Ticket to Science Centre Only	
◇ General Visitors	Rs.30/-
◇ Group of Visitors (15 or more)	Rs.20/-
◇ 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.30/-
◇ Students in Organized Group with Authority Letter	Rs.20/-
◇ Students from Govt./Municipal School with Authority Letter	Rs.10/-
3D Science Show	
◇ General Visitors	Rs.30/-
◇ Group Visitors (15 or more)	Rs.20/-
◇ 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.10/-
Special Packages	
Package Ticket to Science Centre, Planetarium & 3D Show	
◇ General Visitors	Rs.100/-
◇ Group of Visitors (15 or more)	Rs.70/-
◇ 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.70/-
◇ Group of Visitors (15 or more)	Rs.45/-
◇ 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.50/-
◇ Group of Visitors (15 or more)	Rs.35/-
◇ Students in Organized Group with Authority Letter	Rs.20/-
◇ Students from Govt./Municipal School with Authority Letter	Rs.10/-
Family Packages	
Science Centre, Planetarium, 3D Show	
◇ Family of 4 Members	Rs.250/-
◇ Family of 6 Members	Rs.350/-

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



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Very good team of GSC. Everyone was very enthusiastic and passionate, the gallery exhibits are very informative. Learned many new concepts

Prof. H C Verma

Designed & Developed by
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