

PRAJYA

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“Infrastructure is the backbone of economic growth. It improves access to basic services such as clean water and electricity, creates jobs and boosts business.”

- Alok Sharma



**Underwater Metro
in Kolkata**



**“A man paints with his
brains, not with his hands.”**

- Michaelangelo

**Art is the only serious thing in the world.
And the artist is the only person who is
never serious.”**

- Oscar Wilde



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Editorial Board:

Smt Mali Nandakumar
Educational Consultant

Shri Nandakumar V
Educational Consultant

Smt Nandhini S
Principal | D.A.V. Sec School, Mogappair

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Kum Sunita D Behera
Smt Uthra Dorairajan
Smt Vanaja Shankar

Technical Editor :

Shri Guhaprasath Subramanian

Creative Design & Printed by :

Shri Ram Manohar R
Sri Hari Digital Ventures P Ltd.
AVG Graphics

COMMENTS
&
SUGGESTIONS

prajya.magazine@davchennai.org

Every beginning is an assertion of hope; a departure from the mundane.

India's first **quantum computing based technology network** is functional in a limited way between Sanchar Bhawan and National Informatics Centre, New Delhi. With this, India is globally the sixth country to begin quantum technology mission. It is India's bold leap into the future; a proud moment too.

MF Hydra is the world's first ferry to run on liquid hydrogen. It is an important step towards reducing greenhouse gas emissions in the marine industry. It could mark the unfolding of many more eco-friendly ventures.

With the cloning of Ganga, the first female Gir calf, NDRI has initiated a project to clone hardy and high yielding desi breeds such as Gir, Red Sindhi and Sahiwal. The export of these can increase the popularity of desi breeds worldwide and strengthen India's position in the dairy industry.

Sooryamshu, India's first solar-powered tourist boat will preface cleaner and greener tourism.

Kolkata Metro has achieved a significant milestone with its first **under-river journey** beneath the Hooghly.

The first edition of **the Dogri version of the Indian constitution** is a firm move to promote linguistic diversity and preservation of our cultural heritage.

The first **joint conference of army chiefs of India and African countries** can pave way for Africa becoming a market for Indian defence products.

Read, reflect and revert with your thoughts and feelings.

We look forward to your support and suggestions.



- Editorial Team

Dear Readers,

There have been requests from quite a few readers for hard copies of Prajya. We understand that quite a high percentage of our young readers keep revisiting some articles, and a handy print version within reach induces one to read more often, highlight things and make notes. This also partly contributes to students spending less screen time. The Prajya team is happy to bring to you the issue in print.

However, there are few things that we want to be careful about:

- A. We don't want to print more than what is required and
 - B. Keep the cost of the print version (plus postage) within reasonable limits.
- Please note that the access to free online e-version will continue.**

So, it will greatly help us if you could fill in the details in the link provided.

<http://bit.ly/Prajya>

Happy Reading !

Watch out for the Monthly Prajya Quiz online

Visit <https://davchennai.org/publications/prajya-news-magazine/>

Content

International Current Affairs

- 6 Bhutan graduates from the UN list of least developed countries
- 7 RBI governor - Shaktikanta Das
- 8 India's first quantum computing-based telecom network link
- 10 Amit Kshatriya to head Moon to Mars programme
- 11 MF Hydra: First liquid hydrogen-powered ferry
- 12 Artemis 2 - The crew
- 14 Bhaskaracharya to CR Rao - The tradition continues
- 15 World Masters Championships - Sprinter Dadi dazzles
- 16 'Tulsi Ghat Restoration Project' launched in Uganda

National Current Affairs

- 17 Asia's largest liquid mirror telescope
- 18 Mission Lifestyle for Environment
- 20 Tamil Nadu's 18th wildlife sanctuary opens in Erode
- 21 'Sagar Manthan' and 'Sagar Setu'
- 23 Technique for creating strong bimetallic structures
- 24 ISRO's Reusable Launch Vehicle
- 25 Vedic heritage portal launched
- 26 Ganga - India's first cloned Gir female calf
- 28 Feline icons representing India's conservation success
- 30 Pocket-friendly device to detect adulteration in milk





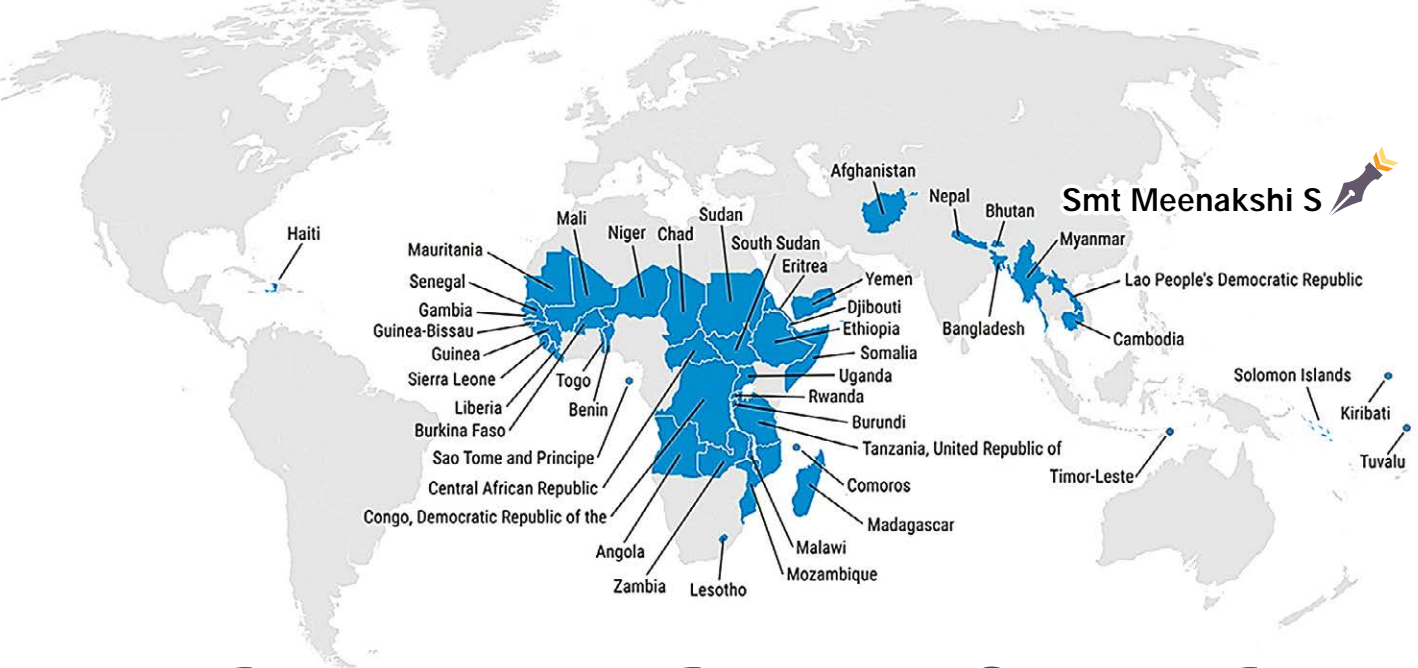
- 32 IPPB launches WhatsApp banking services
- 33 Eravikulam National Park gets a fernarium
- 34 Recent additions to GI Tag list -2023
- 35 India's first solar-powered boat
- 36 First edition of Dogri version of Indian Constitution
- 37 Himachal Pradesh launches Project Sanjeevani
- 38 India's first Underwater Metro
- 39 Arcturus - The strain behind recent spike in India's Covid cases

Defence Updates

- 40 India to upgrade Soviet era INS Sindhukirti submarine
- 42 First joint conference of Army Chiefs of India and African countries
- 44 Secure maritime communications using quantum technology

General Knowledge

- 46 Financial Literacy - Introduction to shares and mutual funds
- 49 Curiosity Corner - Explore the ocean-life
- 52 Law in Focus - Information Technology Law in India
- 54 Women Scientists of India - Anna Mani
- 57 Know Your Nation - GOA
- 58 Know your Padma Awardees - Pritikana Goswami
- 59 Bal Puraskar Awards - Innovation
- 60 Living Naturally - Sleep
- 62 Spotlight of the month - Ansar Shaikh
- 63 Geographical Wonder - Mahabaleshwar
- 65 NISAR - Satellite to map Himalaya's seismic zones



Bhutan graduates from the UN list of least developed countries

Bhutan's economy increased more than eight times in the last 20 years and the percentage of people living below the national poverty line decreased drastically.

The United Nations Organization was formed post the World War II for the maintenance of international peace and security and the promotion of the well-being of people around the world. Soon, UN began to recognise some of the most vulnerable and disadvantaged countries in the international community, considering factors such as development capacity, socio-economic parameters, lack of domestic financing and geographical location.

Recently, at the United Nations LDC Summit that concluded in Doha, Qatar, it was decided that Bhutan will no longer be on the list of LDCs and will become the seventh country to graduate from the list.

The elevation was possible since Bhutan successfully met the graduation criteria set by the UN. Bhutan's economy increased more than eight times in the last 20 years and the percentage of people living below the national poverty line decreased drastically.

In 1971, the UN officially established the category of Least Developed Countries (LDC) to attract particular support for them and the landlocked Himalayan kingdom of Bhutan was one among them.

Bhutan has mostly accomplished this by increasing exports of hydropower to India, which now accounts for 20% of its economy. The nation also established **Brand Bhutan** in an effort to diversify exports while acknowledging the modest size of its local market.





Shaktikanta Das named 'Governor of the year'



Shaktikanta Das pushed banks to raise more capital, restructured the RBI to create a stand-alone supervision department, and had put in place a scheme to train the next generation.

Shaktikanta Das, Governor, Reserve Bank of India, has been awarded the title 'Governor of the year' for 2023 by **Central Banking**, a Financial Publisher.

"The RBI governor has cemented critical reforms, overseen world-leading payments innovation and steered India through difficult times with a steady hand and well-crafted turn of phrase," the organisers said in a statement.

It comes as no surprise that given Shaktikanta Das's leadership during a time of crisis and his significant contributions to India's economic reforms, he was deemed a deserving recipient of the coveted award.

It is worth noting that he was not given much of credence and not spoken highly of when he took over the mantle of Governor of RBI since he was not an economist in the true sense of the term. He has since proved his detractors wrong.

It helped in no small measure that the timely creation of a 'bio bubble' in March 2020 to quarantine key staff helped continue the critical central bank operations

during the most intense phases of the pandemic. Staffing in the bubble on an average was around 200 over the 500 days of its operation, till it closed in August 2021.

He ensured the bankruptcy code back into legality after the Supreme Court had overturned the previous version. He pushed banks to raise more capital, restructured the RBI to create a stand-alone supervision department, and had put in place a scheme to train the next generation.

He launched the central bank's medium-term strategy framework titled '**Utkarsh 2.0**' to enhance the regulator's statutory and other functions and which would allow it to both react and act proactively to confront socio-economic challenges.

It may be noted that the fear that existed, of surge in bad loans, due to the pandemic did not materialise and India became one of the fastest recoveries of any country worldwide.

He not only had to deal with the economy in a positive bent during and post Covid but also with international press which constantly portrayed India in a negative light for reasons best known to them.





Shri Mrithyunjay GN

India's first quantum computing-based telecom network link

Difference between Quantum computers and classical computers

Instead of relying on transistors — which can only represent either the “1” or the “0” of binary information at a single time — quantum computers use qubits, which can represent both 0 and 1 simultaneously.

India's first quantum computing - based telecom network link is now operational between Sanchar Bhawan and National Informatics Centre office in Delhi.

This network will enable highly encrypted, instantaneous communication between the two places and will serve as a testing ground for further implementation of such systems across various sectors in India.

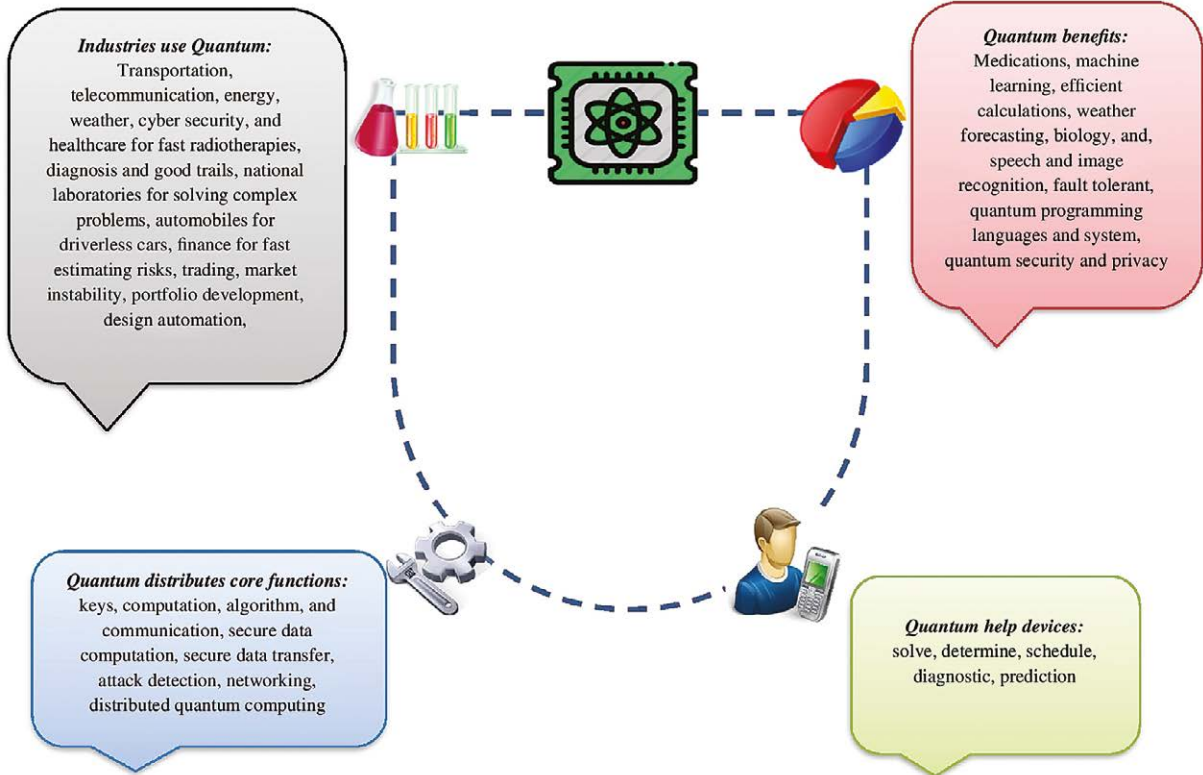
The future of technology and communication is quantum. This is not just because quantum computing

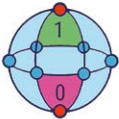



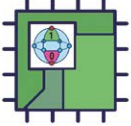
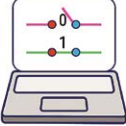


is that much more powerful than traditional methods or because of the variety of computations that it can perform, but rather because of the increased security potential of quantum computers.

While traditional modes of encryption available today can be cracked by supercomputers in the span of a few days to weeks, similar quantum-based encryption will take millions of years to break.

This leap in potential security is what makes quantum computers a breakthrough in the field of technology and communication.





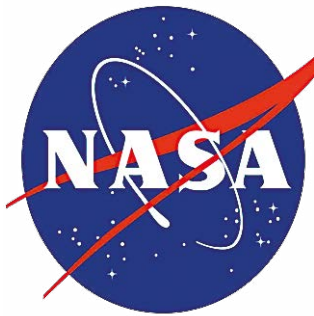
Quantum Computing	Vs.	Classical Computing
 <p>Calculates with qubits, which can represent 0 and 1 at the same time</p>		 <p>Calculates with transistors, which can represent either 0 or 1</p>
 <p>Power increases exponentially in proportion to the number of qubits</p>		 <p>Power increases in a 1:1 relationship with the number of transistors</p>
 <p>Quantum computers have high error rates and need to be kept ultracold</p>		 <p>Classical computers have low error rates and can operate at room temp</p>
 <p>Well suited for tasks like optimization problems, data analysis, and simulations</p>		 <p>Most everyday processing is best handled by classical computers</p>

The Telecom minister Vaishnaw announced a challenge to ethical hackers, with a prize money of ₹10 lakhs. He announced, "We are also launching a hackathon, a challenge round, for anybody who breaks this system and system developed by C-DoT, we will be giving ₹10 lakh per break."

This will serve as a way to test capabilities of the newly implemented system and strengthen any flaws it may have. He also invited quantum computing firms to test and run pilot programmes for pan-Indian communication networks and also the Indian Railways.

By adopting this platform India is positioning itself as a pioneer in the field and shows that we are willing to go through the trials and difficulties that come with implementation.





Amit Kshatriya

to head

Moon to Mars programme

As the head of the office, Kshatriya will be responsible for planning and executing human missions to these celestial bodies for the betterment of humanity.

Amit Kshatriya, an Indian-American engineer with expertise in software and robotics has been appointed as the inaugural head of NASA's newly-established Moon to Mars Programme. This programme has been created to establish a long-term presence on the moon, which is crucial for preparing for future missions to Mars.

Kshatriya will serve as NASA's first head of the office, with immediate effect and will oversee the agency's human exploration activities on Moon and Mars. As the head of the office, Kshatriya will be responsible for planning and

executing human missions to these celestial bodies for the betterment of humanity.

Kshatriya's career in the space programme began in 2003, where he worked as a software engineer, robotics engineer and spacecraft operator primarily focused on the robotic assembly of the International Space Station. Subsequently he served as the director of the Space Launch System, Orion, and Exploration Ground Systems programmes where he provided leadership and integration. He has also been involved in various Artemis Campaign Development Division initiatives that aim to support NASA's Moon to Mars objectives.





Smt. Sarada Devi Ravutu

MF HYDRA

World's first liquid hydrogen-powered ferry



The vessel MF Hydra is a hybrid that uses both batteries and liquid hydrogen fuel cells.

Greenhouse gases contribute to global warming and its consequences. Hydrogen is clean. The use of hydrogen as a maritime fuel is one of the several approaches for zero-emission in seagoing ships.

Norwegian company 'Norled' has successfully launched the world's first ferry that runs on liquid hydrogen. The vessel MF Hydra is a hybrid that uses both batteries and liquid hydrogen fuel cells and has been in operation since 31st March on the triangular route between Hjelmeland-Skipavik-Nesvik in Norway after receiving the final approval from the Norwegian Maritime Authority (NMA).

Features

Length of the ship: 82.4 meters

Capacity: 300 passengers and 80 cars

Speed: 9 knots (10mph)

The ship has two 200 kW fuel cells, a 1.36-1.5 MWh battery, and two 440 kW diesel generators. The 80 cubic meter hydrogen tanks and the fuel cell are located on top of the ferry. It is expected to reduce its annual carbon emissions by up to 95%.

On this journey, Norled collaborated with Linde Engineering of Germany and Danish Ballard Company. The ferry was completed by Westcon Company and SEAM, a world-leading provider of zero-emission solutions for the maritime industry.

This milestone achievement is a significant step towards reducing greenhouse gas emissions in the maritime industry, as hydrogen fuel cells produce only clean water as a by-product.





Artemis II

The crew

Artemis -II will serve as the next step in NASA's plan to return humans to the surface of the moon after 50 years.

Apollo 11 was the first crewed mission to land on the moon, on 20th July 1969. Totally, there were 6 manned missions to the moon from 1969 to 1972. After Apollo 17 in December 1972, no manned missions have been sent to the moon.

That is all expected to change with the Artemis generation.

Having successfully completed the first unmanned flight around the moon on 11th December 2022, NASA is gearing up for the second stage of the programme - manned flight. Expected to launch near the end of 2024, Artemis -II will serve as the next step in NASA's plan to return humans to the surface of the moon after 50 years.

The crew consists of four astronauts - three from USA and one from Canada.

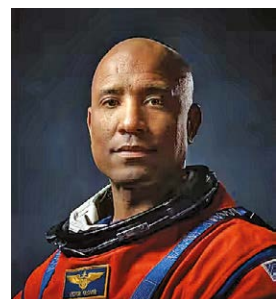
Commander - Reid Wiseman

His experience working in the armed forces and his previous space flight experience as part of the Soyuz mission made him the ideal candidate for Mission Commander. Has spent over 165 days in space as part of various missions and has been a part of NASA since 2009.



Pilot - Victor Glover

Victor Glover's distinguished experience as a US Air Force Test Pilot and pilot of the SpaceX Crew Dragon, justifies the choice as the pilot for Artemis 2. He will be the first African-American astronaut to serve on a mission to the moon. With over 160 days spent in space and



ARTEMIS II MISSION

Artemis 2 is the second scheduled mission of NASA's Artemis program and the first scheduled crewed mission of NASA's **Orion spacecraft**, currently planned to be launched by the Space Launch System in **November 2024**. The crewed Orion spacecraft will perform a **lunar flyby test and return to Earth**

THE CREW



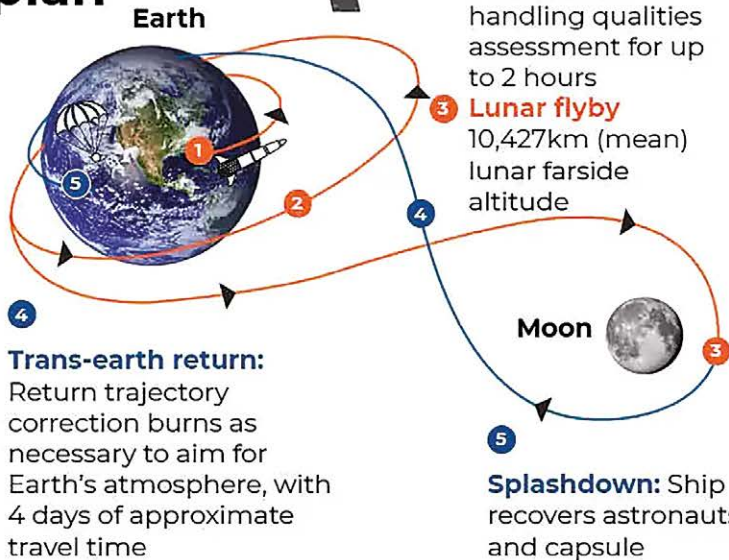
Victor Glover, 46

Reid Wiseman, 47

Jeremy Hansen, 47

Christina Koch, 44

The flight plan



multiple missions flown as pilot, he has served as a NASA astronaut since 2013.

Mission Specialist 1 - Christina Koch

With over 328 days spent in space as part of the International Space Station crew, Christina Koch



was part of the first all-female spacewalk alongside Astronaut Jessica Meir. She will be the first woman to travel beyond low-earth orbit.

Mission Specialist 2 - Jeremy Hansen

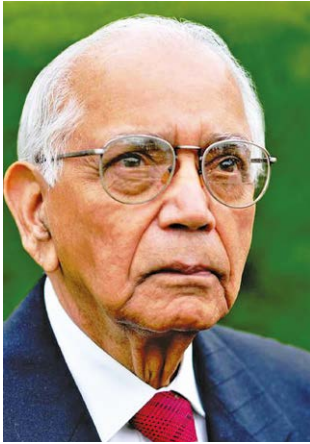
Jeremy Hansen is a Canadian Astronaut, fighter pilot and physicist. With extensive



experience serving as an Aquanaut, Jeremy Hansen will be the first non-American Astronaut to fly to the moon.

Artemis-II will be the first orbital flight around the moon in 5 decades and will be followed by Artemis-III which will put humans back on the lunar surface.





Bhaskaracharya to CR Rao

The tradition continues...

India received a great news in April 2023. One of her illustrious sons, **Prof. Calayampudi Radhakrishna Rao at the age of 102, was awarded the 2023 International Prize in Statistics, the equivalent to the Nobel Prize in the field, for his monumental work 75 years ago that revolutionised statistical thinking.** Rao's work continues to exert a profound influence on science.

Prof. Rao, is a **'living legend'** whose work has influenced, in the words of the American Statistical Association, **"not just statistics" but also "economics, genetics, anthropology, geology, national**

planning, demography, biometry and medicine".

Prof C. R. Rao was born in 1920 in Huvanna Hadagali, now in Karnataka State. He was the eighth child in a family of six brothers and four sisters and was named Radhakrishna following the tradition of naming the eighth child after God Krishna.

His father was a police inspector and the family moved frequently; however, he benefited a lot from his mother's discipline and his father's encouraging him to solve mathematical problems.

It would interest all of us to know that the genius in Prof C. R. Rao was kindled when his

father, C. Duraiswamy Naidu, presented him with Bhaskaracharya's ***Lilavati***, which is a part of his principal work called ***Siddhanta Shiromani***. ***Lilavati***, mainly discusses concepts in arithmetic.

In addition, there are elementary concepts taken from algebra and geometry also. The entire

book is written in poetic form (Shlokas). Everyday problems and illustrations are used as tools to teach mathematical concepts.

This prize to Prof C. R. Rao is a reminder to us about our glorious past and also a call to the concerned to integrate our age old learning into our educational curricula.

Prof. Rao's ground breaking paper, **'Information and accuracy attainable in the estimation of statistical parameters'**, was published in 1945 in the Bulletin of the Calcutta Mathematical Society. The paper was subsequently included in the book **Breakthroughs in Statistics, 1890-1990.**

This was an impressive achievement given Prof Rao was only 25 years of age at the time and had just completed his master's degree in statistics two years earlier.

I am certain that we have many, many young geniuses in the mould of Prof Rao in our country, waiting to be discovered. **But this can happen only if pedagogy used by Bhaskaracharya is integrated into our curricula and mathematics is made interesting for young minds.**





Shri Nagarajan R

World Masters Championships Sprinter Dadi dazzles

India's 95-year-old veteran Bhagwani Devi Dagar ran the 60-m sprint in 36.59 seconds and produced a throw of 2.93 m in shotput and 4.67 m in discus, bagging three gold medals in the process.

The 9th edition of World Masters Athletics (WMA) Indoor Championships took place in Poland, from 25th to 31st March 2023. The main venue was Arena Toruń, which has a banked six-lane indoor track where the turns are raised to neutralize the centrifugal force of athletes running the curves. Supplemental venues include Municipal Stadium for throws and Rudelka Park for Cross Country.

WMA is the global governing body of the sport of athletics for athletes 35 years of age or older, setting rules for masters athletics competition. A full range of indoor track and field events were held. In addition to indoor competition, non-stadia events included Half Marathon, 8K Cross Country, 10K Race Walk, Weight Throw, Hammer Throw, Discus Throw and Javelin Throw.

India's 95-year-old veteran **Bhagwani Devi Dagar** ran the 60-m sprint in 36.59 seconds and produced a throw of 2.93 m in shotput and 4.67 m in discus, bagging three gold medals in the process. Her achievement was celebrated across the country. **She is an inspiration to all Indian women for how age has no bar if you work hard and consistently for what you like.** Bhagwani Devi's achievements prove that age is just a number.

She told her family, "I have lived for many years. I do not fear death. If something happens to me, bring me back to my country. But let me go there, so that I can play and win for my country." Her undying spirit and exemplary skills helped her win the tournament. And soon people started calling her "**Sprinter Dadi**".





'Tulsi Ghat Restoration Project' launched in Uganda

The Tulsi Ghat Restoration Project is of greater significance because, living in the land of the Nile, the heritage of Varanasi is reflected in the culture of Uganda as well.

External Affairs Minister S. Jaishankar launched the 'Tulsi Ghat Restoration Project' of Varanasi on 10th April 2023, during his visit to Kampala, the capital of Uganda.

The Tulsi Ghat Restoration Project aims to restore and beautify the Tulsi Ghat in Varanasi, one of the many ghats on the banks of the river Ganga. Due to excessive pollution of the river, the ghats have suffered heavily.

The EAM opined that the Ugandan government's willingness to work together with India in a project across the globe is a sign of their shared goals and a confluence of the two cultures. It is of greater significance because living in the land of the Nile, the heritage of Varanasi is reflected in the culture of Uganda as well.

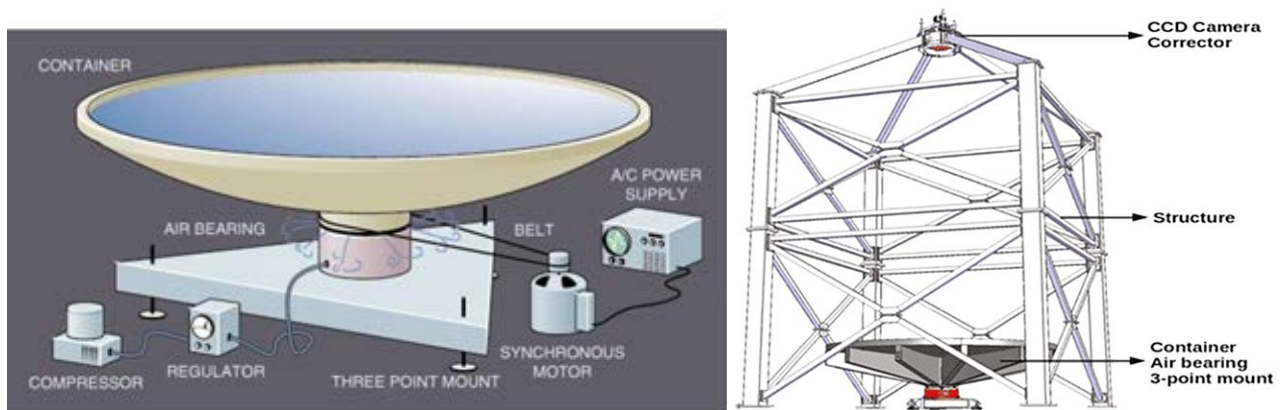
Jaishankar met the Ugandan President Yoweri K Museveni at his farm in Rwakitura and congratulated the country on assuming the chairship of the Non-Aligned Movement. Uganda has been selected to lead the Non-Aligned Movement on behalf of Africa from 2022 to 2025, as the



position of the movement's chair rotates every three years during summit conferences.

The Non-Aligned Movement (NAM) is an international organization dedicated to representing the interests and aspirations of developing countries. It was formed during the Cold War as an organization of States that did not seek to formally align themselves with either the United States or the Soviet Union, but sought to remain independent or neutral.

During his visit to Uganda, EAM engaged in delegation-level discussions with his Ugandan counterpart to strengthen the bilateral relations between the two nations. He also participated in talks with General Jeje Odongo, the senior Ugandan Military officer to strengthen India's ties with Uganda.



Asia's largest liquid mirror telescope

DO YOU KNOW ?

- ✔ **Supernova** is the result of an explosion that occurred by a dying massive star.
- ✔ The body causing the light to curve is called a **gravitational lens**.
- ✔ **Astrometry** is the art and science of the precise measurement of the positions of the heavenly bodies.

Dr. Jitendra Singh, Union Minister of State (Independent Charge) for Science & Technology, inaugurated Asia's largest 4-metre-diameter International Liquid Mirror Telescope to explore the deep celestial sky, at an altitude of 2450 metres at Devasthal Observatory campus of **Aryabhata Research Institute of Observational Sciences (ARIES)**, Uttarakhand on 22nd March. The telescope has a rotating mirror made up of a thin layer of liquid mercury and is designed to detect celestial objects such as supernovae, gravitational lenses, space debris and asteroids.

ILMT was built by researchers from ARIES in India, universities and observatories of Belgium, Poland, Uzbekistan, Columbia, Canada and several other countries.

The ILMT, the first optical survey telescope in India, while scanning the strip of the sky every night, will generate nearly 10-15 Gigabytes of data which will be used for classifying the objects observed and performing a deep astrometric survey.

FEATURES

- A bowl containing a reflecting liquid metal (essentially mercury).
- An air bearing (or motor) on which the liquid mirror sits.
- A drive system.

This landmark event certainly places India at a much higher level of capabilities to study the mysteries of the skies and astronomy, and to share the same with the rest of the world.



Assam launches Mission Lifestyle for Environment

The key feature of Mission LiFE is “mindful and deliberate utilization” to combat “mindless and wasteful consumption”.

The chief minister of Assam, Himanta Biswa Sarma inaugurated the Mission Lifestyle for Environment (LiFE) on 23rd March 2023 as part of a global mass movement led by Prime Minister Narendra Modi.

The mission encourages an environmentally conscious lifestyle, as part of a global initiative to aid in fighting and reversing climate change. This has been devised by the government to attain the Sustainable Development Goals (SDG) set by the United Nations.

Mission LiFE was introduced during the 26th United Nations Climate Change Conference of the Parties (COP26) in Glasgow, with the key feature being “mindful and deliberate utilization” to combat “mindless and wasteful consumption”.

The Stockholm Resilience Centre monitors seven planetary boundaries that represent the stability of earth’s ecosystems. Recently they published a report stating that five of the seven boundaries have been crossed due to human activity.





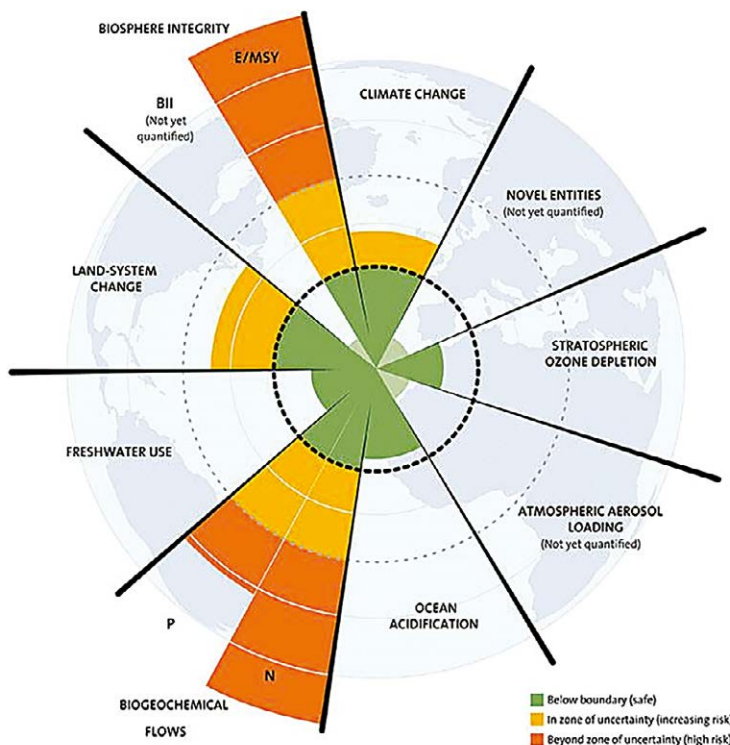
Some of these include acceptable levels of chemical pollution, climate change and loss of biodiversity.

The crossing of these boundaries, if not undone soon, can result in catastrophic failure of the planet's biosphere. Action on climate change is more important than ever. That is why initiatives such as LiFE are significant steps forward in ensuring that we can preserve the planet we call home.

Northeast India has already suffered the effects of climate change due to deforestation, loss of wetlands and other natural bodies. These effects are what mission LiFE hopes to reverse, opined the chief minister.

Mission LiFE uses the P3 model of Pro Planet People to conduct week-long activities targeted at specific categories - conscious energy consumption, reducing plastic and e-waste, water conservation and promoting healthy lifestyles.

These activities will happen across all districts of Assam and is expected to be a pilot programme that can be adopted across the nation.





Tamil Nadu's 18th wildlife sanctuary opens in Erode

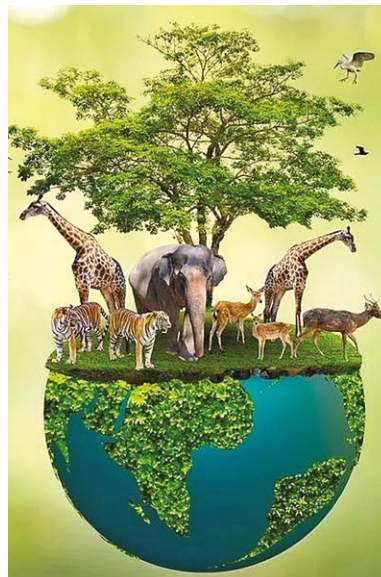
DO YOU KNOW ?

- ✔ **Vedanthangal Bird Sanctuary (1936)** was the first bird sanctuary in India.
- ✔ Tamil Nadu has four tiger reserves viz., **Anamalai, Kalakkad-Mundanthurai, Mudumalai and Sathyamangalam.**
- ✔ A 'Sanctuary for Tiger' in Mundanthurai was declared in 1962 before the launch of **Project Tiger** in the country in 1973.
- ✔ The total protected area covers 7,072.95 sq. km. which comes under 30.92% of the state's forest area.

The Tamil Nadu Government, in the state budget 2023-2024 announced the creation of yet another Wildlife Sanctuary in Erode - “**Thanthai Periyar Wildlife Sanctuary**”. This is the 18th Wildlife Sanctuary in the state next to Cauvery South Wildlife Sanctuary.

The sanctuary will be formed

over 80,567 hectares of forest land located between Anthiyur and Gobichettipalayam taluks inhabiting 136 bird species, 118 types of butterflies and 21 different mammals including tigers, elephants, leopards, wild boars, deer etc. Other sanctuaries in the district include Vellode Birds Sanctuary, Sathyamangalam Tiger Reserve (STR).



Objectives

- ✦ Protecting the rights of forest-dwelling communities to access, use and manage forest resources.
- ✦ Promoting conservation of Asian elephants and tigers.
- ✦ Protecting the endangered species of flora and fauna and promoting eco-tourism.
- ✦ Funds from the state to boost infrastructure, rescue and rehabilitation measures in the area.



‘Sagar Manthan’ and ‘Sagar Setu’

"Sagar Manthan dashboard will have a significant impact on the overall performance of organizations."

In the presence of ministry officials, the Real-time Performance Monitoring Dashboard of ‘Sagar Manthan’ was virtually launched by Sarbanda Sonowal, Union Minister for Port Shipping and Waterways (MoPSW).

Sagar Manthan is a dashboard with all the integrated data related to the ministry and other subsidiaries, with the purpose of improving well-coordinated real-time information. Developed completely in-house under the guidance of Sudhanshu Pant, IAS, Secretary, MoPSW in less than 1.5 months, this digital platform will transform the workings of various departments.

“The launch of the Sagar Manthan dashboard is a positive

development towards the Digital India vision of PM Modi,” said Sarbanda Sonowal. “It will have a significant impact on the overall performance of organizations.”

The features of ‘SAGAR MANTHAN’ include:

- Real-time monitoring
- Data visualization
- Improved communication
- Data-driven decision making
- Increased accountability

Future updates planned for the dashboard include live streaming from drones, integration with input from the CCTV cameras and AI-based algorithms to map actual progress Digital Twin features on





Sagar Setu will provide real-time information on vessel-related information, gate, container freight stations and transactions at fingertips.



board and mobile apps for easy use and access by all stakeholders to increase efficiency.

Sonowal also added, “Effective project monitoring can ensure the timely completion of projects, informed decision-making, and increased efficiency and effectiveness of projects. It also promotes real-time project tracking, risk management, resource allocation and progress reporting.”

The launch of ‘Sagar Manthan’ dashboard is a development towards digitalization and transparency in the maritime transport sector, and the Ministry of Ports, Shipping and Waterways is committed to supporting the growth of the sector in India.

Following the launch of Sagar Manthan, the Union Minister also launched the app version of National Logistics Portal (Marine) ‘Sagar-Setu’.

Proposals for this app

include features such as a Login Module, Service Catalogue, Common Application Format, Track and Trace, Bank Guarantee, Certification, Letter of Credit etc.

Sagar Setu enables digital transactions for payments required for the clearance process of import and export such as shipping line charges, container freight station charges, transportation charges etc.

It will also provide real-time information on vessel-related information, gate, container freight stations and transactions at fingertips - activities generally not within reach of the importer, exporter and customs broker.

The MoPSW and Ministry of Commerce and Industry conceived this one-stop digital platform in the month of January, 2023. Within two months the SAGAR-SETU app was launched to boost maritime trade and enhance the economy of the country.





Technique for creating Strong Bimetallic Structures

A group of Indian researchers has developed a novel technique to combine two metals, to create unique bimetallic structures. These amalgamations have the combined properties of both metals. Consequently, such a metal blend has varied applications in many fields.

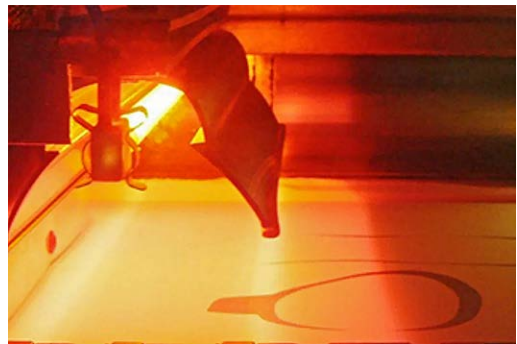
Scientists at the International Advanced Research Centre for Powder Metallurgy and New Materials (ARCI), which is one of the R&D divisions under Department of Science and Technology (DST), GOI, worked on developing a technique to create a copper-stainless steel alloy, which would have beneficial properties of both materials.

However, creating such a hybrid metal came with its own

challenges. The two metals have different physical properties – distinct melting points, dissimilar electrical conductivity and thermal and mechanical properties. Therefore, the group worked with the Laser – Powder Bed Fusion (L-PBF) method of Additive Manufacturing (AM) to accomplish the joining of these two metals.

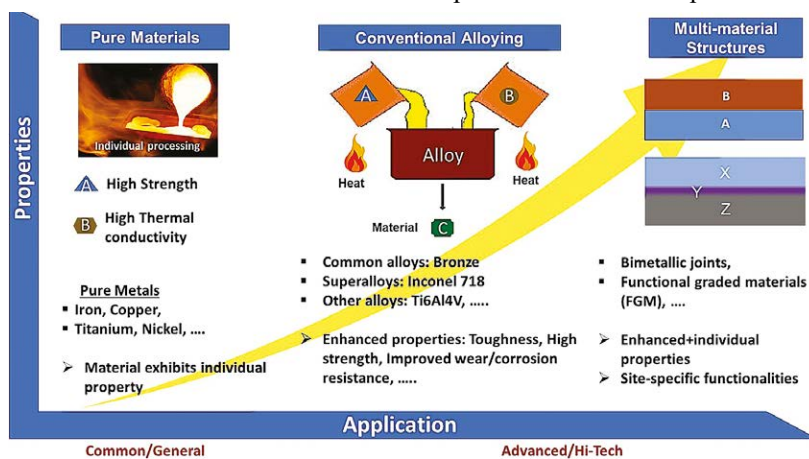
In this method, which is a type of 3-D printing technique, a layer of powdered metal is fused together by the usage of powerful laser beams. The beam causes the fusion of individual powdered metal particles.

Following this, a fresh layer of powdered metal is deposited on



the first layer, and the process is repeated. This process is continued until the desired thickness of the material is obtained. The researchers have confirmed the observation of microstructures in the alloy showing the presence of both metals in the interfacial region, where both metals merge.

The advantages of the material (copper-stainless steel blend) thus created are high thermal and electrical conductivity (a property lent by copper), remarkable resistance to corrosion (which is a property donated by the stainless steel) and excellent mechanical properties with high strength. Such characteristics are highly desirable in today's world of growing engineering demands, heat exchangers and of multifunctional structures. Its implementation prospects are many and diverse, which is currently being explored by the group.





ISRO's Reusable Launch Vehicle

Pseudolite - a contraction of "pseudo-satellite," refers to something that is not a satellite which performs a function commonly in the domain of satellites. Pseudolites are most often small transceivers used to create a local, ground-based Global Positioning System (GPS) alternative.

Lift-to-drag is a ratio of the lift generated at a given speed and drag incurred due to the aircraft's movement through the air.

The Reusable Launch Vehicle Autonomous Landing Machine (RLV LEX) was successfully tested at the Aeronautical Test Range (ATR) in Chitradurga, by ISRO on 2nd April 2023. The Bengaluru-headquartered national space agency collaborated with the Air Force and Defence Space Research Organisation for the experiment.

The autonomous landing was carried out under the exact conditions of a vehicle that had arrived from space, including the Space Re-entry vehicle's unmanned, high-speed and precise landing from the same return path. Landing parameters such as the sink rate of landing gears, ground relative velocity and precise body rates, as might be experienced by an orbital re-entry space vehicle in its return path, were achieved.

The RLV LEX required several state-of-the-art technologies including accurate navigation

hardware and software, Ka-band Radar Altimeter, Pseudolite systems, indigenous Landing Gear, NavIC receiver, brake parachute system and Aerofoil honey-comb fins.

It utilized several indigenous systems. ISRO developed the Localized Navigation systems based on pseudolite systems, instrumentation, sensor systems etc. Other operational launch vehicles of ISRO are now more cost-effective due to the adaptation of contemporary technologies developed for RLV LEX.

In a first in the world, a helicopter carried a winged body to an altitude of 4.5 km and then released for carrying out an autonomous landing on a runway. RLV is essentially a space plane with a low lift-to-drag ratio which requires an approach at high glide angles and a landing at high velocities of 350 kmph.

The Mission Director was Dr Jayakumar M, Project Director, RLV and the Vehicle Director was Muthupandian J, Associate Project Director, RLV. Also present for the occasion were Ramakrishna, Director, ISTRAC, and Shri S Somanath, the Chairman, ISRO/Secretary, DOS who witnessed the test and congratulated the team.

With LEX, the dream of an Indian Reusable Launch Vehicle arrives one step closer to reality.





Vedic Heritage Portal launched

The Indira Gandhi National Centre for the Arts (IGNCA) had recently launched the Vedic Heritage Portal, a digital repository of Vedic knowledge and traditions from across the country. Designed to be a one-stop solution for all who seek information about the Vedic heritage of India, it was launched by the Union Home Minister Amit Shah and Union Culture Minister G Kishan Reddy during the IGNCA's 36th Foundation Day celebrations.

The aim of the portal is to collate information for making Vedas accessible to people and provide a forum for further dialogue. It is a digital platform that

preserves and promotes the Vedas which are an intangible heritage of humanity as per the United Nations Educational, Scientific and Cultural Organization (UNESCO).

Features

- It gives detailed information about oral traditions, textual tradition in form of published books/manuscripts.
- The audio-visual recording of the four Vedas has been uploaded on the Vedic Heritage portal.
- This portal has over 18 thousand mantras of the four Vedas with a duration of over 550 hours.

- Available in a mix of English and Hindi, besides audio content in Sanskrit, the portal also includes research articles and lectures on scientific subjects explaining the relevance of 'Vedic knowledge' in the perspective of modern science.

About Vedas

The word "Veda" is derived from the Sanskrit root "Vid", meaning "to know". It has been universally acknowledged that the Vedas are the earliest available literature of humanity.

Apart from ideas and practices of Vedic religion, various subjects are described by Vedas including political science, medicine, agriculture, art, music, psychology etc. Hindu religious culture has its roots traced to the Vedas. In fact – the worship, rites and rituals in the Hindu Dharma are heavily influenced by the Vedas.



Smt Ghana Saraswathy M



Ganga

India's first cloned Gir female calf



The National Dairy Research Institute (NDRI), Karnal, has developed the country's first cloned female calf of the desi breed Gir, which can produce more

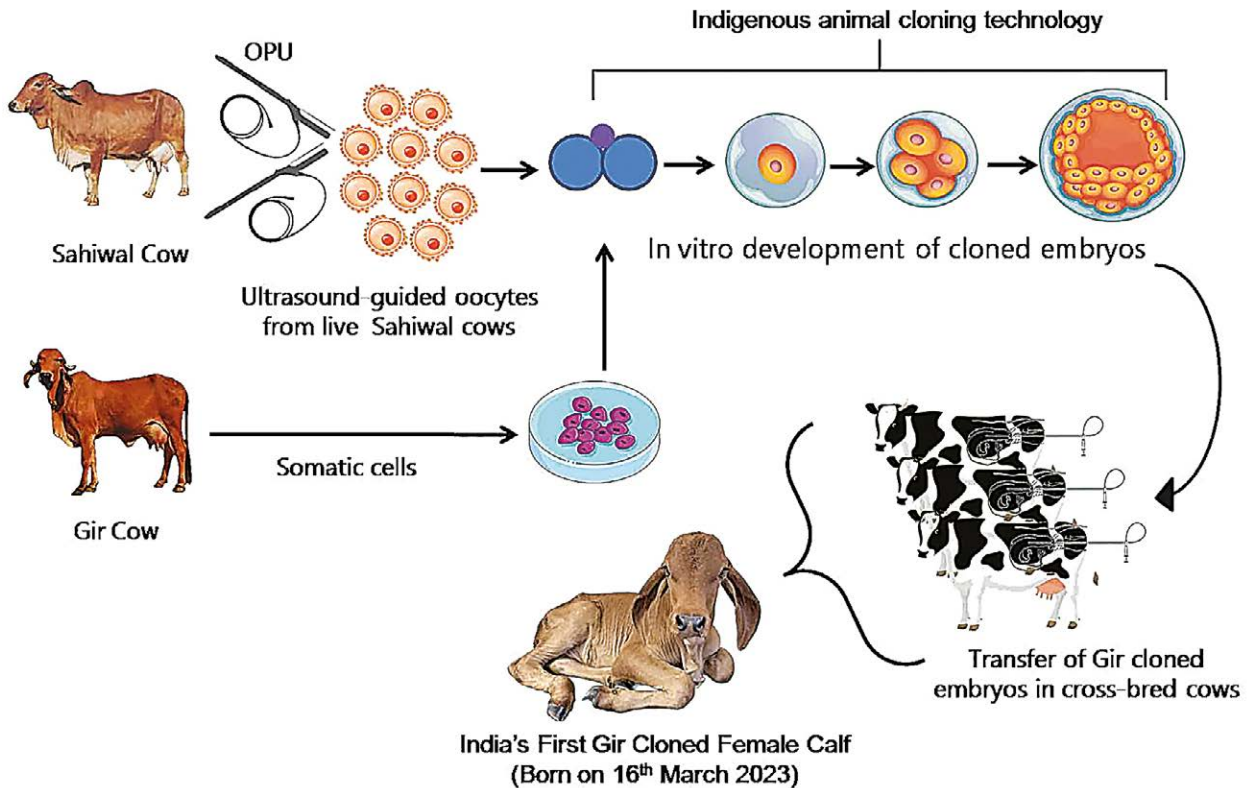
than 15 litres of milk per day, as part of the government's push to increase milk production.

Indigenous cow breeds like Gir, Sahiwal, Tharparkar and Red-Sindhi are significant to milk production and the expansion of the Indian dairy industry.

The programme was started by NDRI in collaboration with Uttarakhand Livestock Development Board (ULDB), Dehradun. For almost two years, a team of scientists led by Dr. Naresh Selokar, Manoj Kumar Singh, Ajay Aswal, SS Lathwal, Subhash Kumar, Ranjeet Verma, Kartikey Patel, and MS Chauhan has been striving to create an indigenous technology for producing cloned cattle and they successfully cloned a female calf named 'Ganga' weighing 32 kg, which is now growing well.



How India's First Cloned Cow, named Ganga, was produced



DO YOU KNOW ?

- ✦ **Cloning** - Technique used to make exact genetic copies of living things - genes, cells, tissues and even whole animals.
- ✦ **Cloning happens often in nature**—for example, when a cell replicates itself asexually without any genetic alteration or recombination.
- ✦ **Oocyte** is a developing egg.
- ✦ **Enucleated** - The egg cell's nucleus is removed so that it will read and duplicate the DNA of the donor cell.
- ✦ **Somatic cell** - any cell of a living organism other than the reproductive cells.
- ✦ **Blastocyst** - Three days after fertilization, a normally developing embryo will contain about 6 to 10 cells. By the fifth or sixth day, the fertilized egg is known as a blastocyst — a rapidly dividing ball of cells.



To clone the Gir, oocytes are isolated from live animals using ultrasound-guided needles, and then matured for 24 hours under control conditions. The somatic cells of elite cows are used as donor genomes, which are fused with enucleated oocytes. Following chemical activation and in-vitro culture, the developed blastocysts are transferred into recipient mothers to deliver the Gir calf.



Feline icons representing India's conservation success

Eight cheetahs
- five females
and three
males were
transferred
to India from
Namibia,
Africa on 17th
September
2022.

Project Cheetah: World's First Inter-Continental Carnivore Translocation

The cheetahs were brought under **Project Cheetah** with an aim to reintroduce the big cat in India. After the last cheetah was killed in India in 1947, it was officially declared extinct in 1952. Eight cheetahs - five females and three males were transferred to India from Namibia, Africa on 17th September 2022.

A positive sign

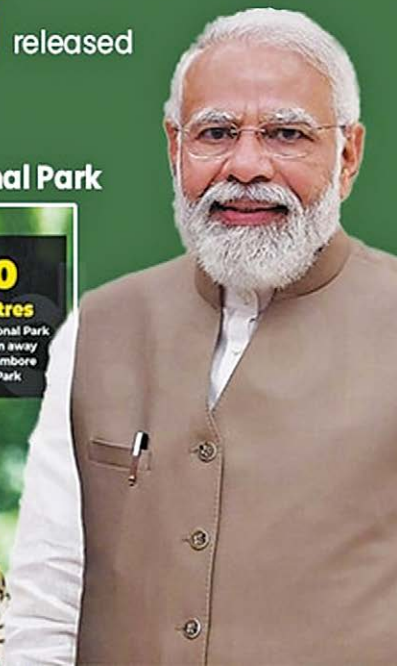
Environment minister Bhupender Yadav congratulated the entire team of **Project Cheetah** for their relentless efforts in bringing back the large carnivore to India

and for their efforts in correcting an ecological wrong done in the past.

A three-year-old captive-reared cheetah named *Siyaya* gave birth to four cubs in a soft predator-free enclosure in Kuno National Park. This development came days after a female cheetah Sasha had died of renal failure.

Siyaya was not visible for five days. Her location was showing at one place in the satellite collar. Namibian cheetah expert Eli Walker checked her by entering the enclosure on 29th March 2023 and found four cubs. The mother and cubs are looking healthy. The cubs weighed about 226 to 425 grams. The officials will not interfere because it is a natural process but they will keep a vigil on Siyaya and

Prime Minister **Narendra Modi** released
Wild Cheetahs
 which had become extinct from India - in Kuno National Park



<p>8 The number of African cheetahs brought to India from Namibia out of which five are female and three are male</p>	<p>20 The number of cheetahs to be reintroduced to India</p>	<p>1952 The last cheetah was seen in this year following which the Government of India declared the extinction of the animal</p>	<p>750 square kilometres The Kuno-Palpur National Park in Madhya Pradesh spans over this much area</p>	<p>100 kilometres The Kuno National Park is just 100 km away from Ranthambore National Park</p>
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cubs to protect them. It would take at least three months to know the gender of the cubs, after which they will be identified and named.

The cheetahs mate only in a stress-free environment and the birth of four cubs proved that cheetahs are comfortable and have adapted well here in Kuno National Park. According to forest officials, another cheetah, Asha, who was released into the wild last week, is showing symptoms of being pregnant but it will be confirmed only after the birth of cubs.

Kuno National Park has now 19 cheetahs- four from Namibia in the wild, 12 from South Africa in quarantine, and three from Namibia in a soft enclosure.

Though it is a step forward, the cheetahs will be exposed to true survival tests once they are released out in the wild and breed in free-ranging conditions. These little Indian cubs will have much better chances of becoming adult cheetahs living in the wilds under the monitoring of the Project Cheetah team, with veterinarians.





Pocket-friendly device to detect adulteration in milk

This device can help to monitor liquid food safety and thereby increases the traceability of tainted milk in remote areas of developing countries.

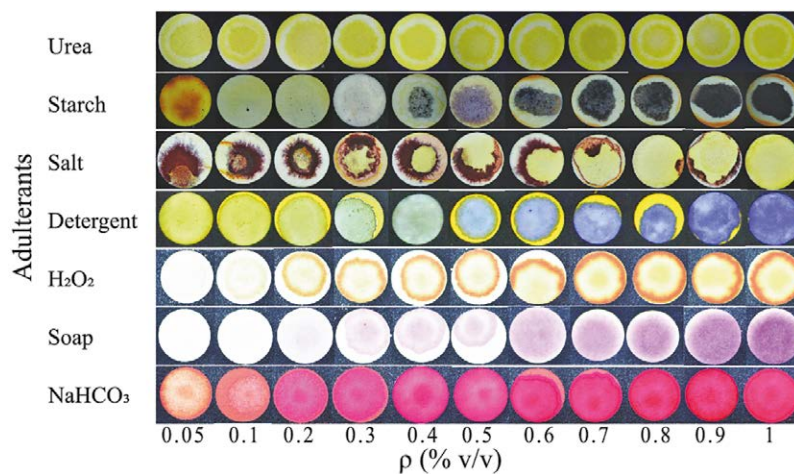
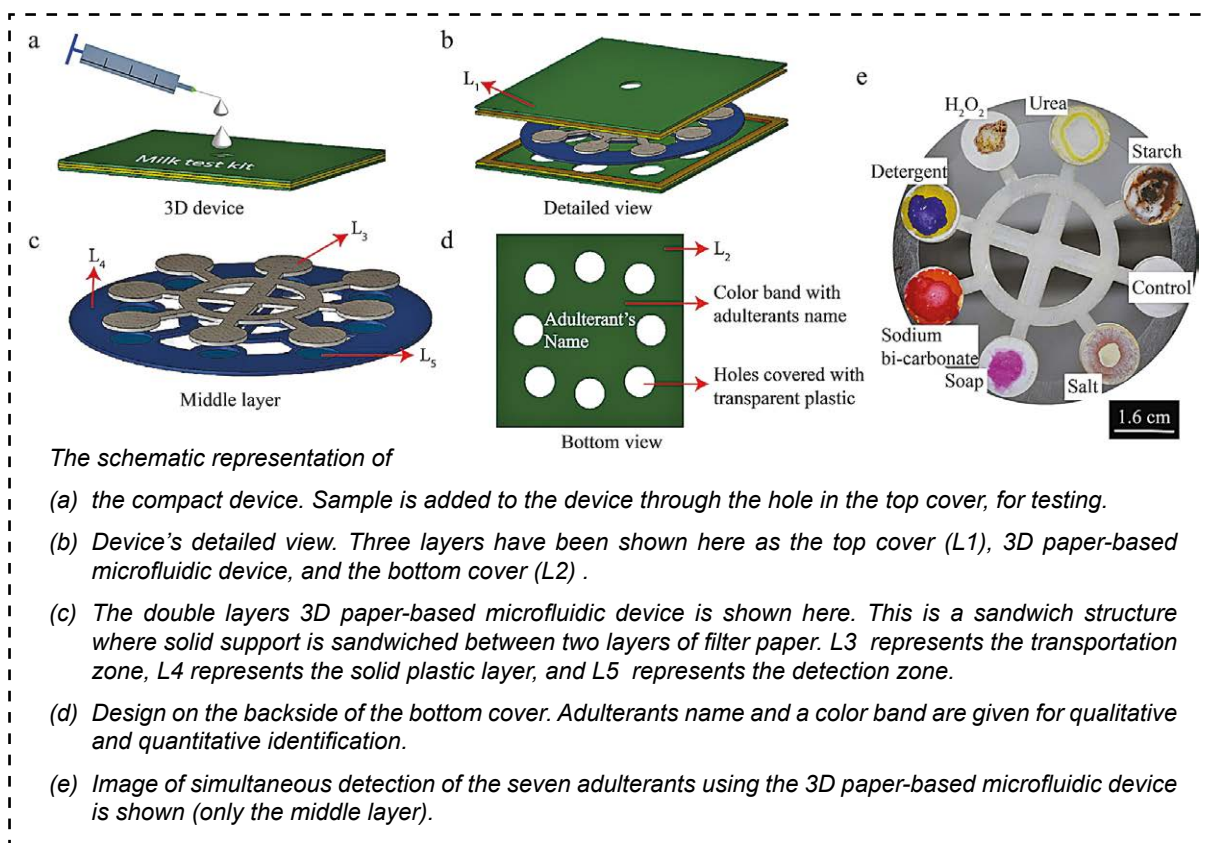
To detect adulteration in milk, IIT Madras has created a cost-effective and portable 3D paper-based gadget that can identify adulterated milk in under 30 seconds. Leading the research were Dr Pallab Sinha Mahapatra, Associate Professor in the Department of Mechanical Engineering at IIT Madras, Subhashis Patari and Dr Priyanka Datta.

The device has a top cover, a bottom cover, and a middle layer with a sandwich structure. It facilitates the consistent transportation of denser liquids at a steady pace. To prepare the device, the paper is treated with reagents and allowed to dry.

A reagent is a substance or compound that can facilitate a reaction, and is used in most widely used tests. This includes, for example, pregnancy tests, blood glucose tests, and most COVID-19 test kits.

All the reagents are dissolved either in distilled water or in ethanol, depending upon their solubility. Using colorimetric detection techniques, all the adulterants are detected in different liquid samples. The investigation shows that the reagent only reacts with the specific adulterant in this method and not with any milk ingredients. Hence, this analytical tool can help to monitor liquid food safety and thereby increases the





The change in color after the colorimetric reaction for different concentration of adulterants has been shown for all the adulterants.

traceability of tainted milk in remote areas of developing countries.

Considered to be one of the most vital foods important to lead a healthy lifestyle, milk is also the most adulterated food item in the world. It is considered a growing issue, especially in developing countries like India leading towards medical complications such as kidney problems, infant death, gastrointestinal complications, diarrhoea and even cancer.

This new device could be used to check the purity of various liquids including water, fresh juices and milkshakes for traces of adulteration, unlike traditional laboratory-based procedures that are both expensive and time-consuming. To check for adulterants, only a millilitre of any liquid would be used as a sample.



IPPB launches WhatsApp banking services



Steps such as these that increase access of citizens in rural areas to banking and insurance services will ensure the proper functioning of the Indian economy.

Since 2018, the Indian Post Payments Bank (IPPB) has been operating as a division of India Post and provided banking and payment services to more than 6 crore customers across India. With a license to run as a payment bank from the Reserve Bank of India, its aim is to provide accessibility to essential banking services such as savings accounts, money transfers, utility payments and insurances through post offices.

On 31st March 2023, IPPB announced that in collaboration with Airtel they were launching WhatsApp banking services in New Delhi. This would allow customers to access all banking services provided by IPPB through their phone.

Airtel and IPPB have collaborated to send around 250 million messages every month to IPPB's customers, who are largely situated in small towns and mid-sized cities. With the integration of WhatsApp messaging, customers will have even easier access to

connect with the bank digitally, aligning with the government's Digital India initiative. IPPB has been working diligently to provide banking services in rural areas as part of this mission.

Gursharan Rai Bansal, CGM & CSMO – India Post Payments Bank said, “We are delighted to work with Bharti Airtel as our partner in driving digital and financial inclusion in India. We believe that financial services driven by technology have great potential and can go a long way in ensuring that the best financial products reach the farthest corners of the country.”

The next step in this customer first initiative is the process of integrating a live interactive customer support agent into the Whatsapp platform, thereby allowing customers 24x7 support.

Steps such as these that increase access of citizens in rural areas to banking and insurance services will ensure the proper functioning of the Indian economy.

Smt Sumathi Ramakrishnan



Eravikulam National Park gets a Fernarium



Ferns are part of the Epiphytic family. They grow naturally in a soilless condition.

Eravikulam National Park (ENP), located in the Western Ghats of India, in the state of Kerala, has a new attraction — a Fernarium (collection of ferns) set up inside the park.

The new initiative aims to increase awareness among visitors about the park's biodiversity. As per data, ENP has 104 varieties of ferns, of which 54 are already planted. The fern park has been set up near the orchidarium and

Epiphytes are plants that grow on another plant, especially not parasitic. Say for example numerous ferns, air plants and orchids growing on tree trunks in tropical rainforests.

Eravikulam was declared a sanctuary in 1975 with the intention of protecting the indigenous population of Nilgiri Tahr (highly endangered mountain goat) but later declared as a national park due to its significance.

open to the public from April 2023.

Ferns are part of the Epiphytic family. They grow naturally in a soilless condition. The plants obtain water and nutrients through leaching from trees. A large number of ferns are on the trees inside the park.

A selfie point, buggy cars for exploration are some of the new facilities that are established for tourists in the park.



Recent additions to GI Tag List -2023



A geographical indication (GI) tag is a sign utilized on the products that trace their origin from a specific geographical location. These products encompass qualities or a reputation that are due to that origin.

The products can be both natural and man-made. It is an acknowledgment of intellectual property. Since the qualities depend on the geographical place of production, there is a clear link between the product and its original place of production.

GI Tag was implemented in India on 15th September 2003. The first GI Tag in India was **facilitated to West Bengal's Darjeeling Tea.**

Using GI tags can be regarded as a method of provisioning certification for a particular product that has been produced following the traditional methods, displays unique qualities, and/or has gained a distinct reputation owing to its place of geographical origin. It is imperative for a product to function with a GI tag, a sign must be there on it to ensure its identification.

As of 2023, there are 432 products from India that have been awarded GI tags. The various products included in GI Tags being Handicrafts and Handloom, Agricultural products, Food stuff, Manufactured, Natural products etc. Karnataka tops the list with 48 products with GI Tag. Other

states with major GI tags are Tamil Nadu (42), Maharashtra (34), Uttar Pradesh (32) and Kerala (32) to name a few.

The products are as varied as Marcha Rice, Benaras Pan, Hathras Hing, Sholavandan Vettrilai, Ramban Sulai Honey, Manapparai Murukku, Salem Sago, Ramnagar Bhanta (Brinjal) to name a few.

It is said that no one other than the registered and authorized users are to use the product's name. However, it should be noted that a protected Geographical Indication does not enable the holder to prevent someone from making a product using the same techniques as those set out in the standards given for that approval (Indication). Protection is usually obtained by acquiring a right over the sign that constitutes the indication.

Geographical indications are mostly traditional products, produced by rural communities over generations that have gained prominence in the markets for their precise qualities.

The recognition and protection of the markets of these products allow the producers' community to devote and maintain the precise qualities of the product on which the reputation is built. This might also allow them to invest together in promoting the reputation of the product.



India's First Solar-Powered Tourist Boat

Sooryamshu has an air-conditioned conference hall-cum-DJ floor in the lower deck and a cafeteria-cum-dining area in the upper deck.

On 7th April 2023, Kerala State Inland Navigation Corporation (KSINC) introduced '*Sooryamshu*', India's first solar-powered tourist boat at Kochi. It is a major step taken towards improving Kerala's tourism sector.

Accommodating up to 100 passengers at a time, the vessel has now begun operations in the waters of Ernakulam and is capable of producing 27 KW of power.

Built at a yard in Sri Lanka, this ₹3.95-crore boat is certified by the Indian Register of Shipping (IRS) for its safety and allied features. Permitted to travel at a speed of 5 nautical miles by the Kerala

Maritime Board, the boat has a maximum speed of 8 nautical miles. 75% of the energy requirements of the ship will be fulfilled by the solar panels, and the remaining 25% by other generators.

The boat has an air-conditioned conference hall-cum-DJ floor in the lower deck and a cafeteria-cum-dining area in the upper deck. The lift facilities are senior citizens and differently-abled friendly.

It is currently starting with two budget friendly packages. The first one being Kadamakkudy package which will provide travellers with sightseeing and kayaking. 14 islands make up the Kadamakkudy group, which is only 10 km away from Kochi.

Tourists can enjoy kayaking and paddling among other activities around Matsyafed farm in the Ernakulam district with the second package.

KSINC's other tourist vessels namely, Nefertiti, Sagar Rani-1 and Sagar Rani-2, are already conducting cruises in collaboration with Kerala State Road Transport Corporation's budget tourism packages.





First edition of Dogri version of Indian constitution

The release of the Dogri version is a step towards fulfilling the constitutional mandate of promoting linguistic diversity.

Dogri - language spoken in the state of Jammu and Kashmir. It is descended from Sanskrit, the language of the Vedas .

The Constitution of India is amongst the world's longest and has guided India's nation-building process for over seven decades.

The Constitution originally written in English and Hindi has been translated into several other languages. The translation of the Constitution into Dogri was a long-standing demand of the people of Jammu and Kashmir.

The first edition of the Dogri version was released at the University of Jammu on 8th April 2023 by Union Minister of Law, Justice and Parliamentary Affairs Kiren Rijiju. This was done after

enshrining Dogri language in the 8th Schedule of the Constitution.

The release of the Dogri version is a step towards fulfilling the constitutional mandate of promoting linguistic diversity in India.

This version will help people who speak this language understand the fundamental rights and duties of citizens, the functioning of the government and the role of various institutions in the country better.

The document is a joint accomplishment of the Department of Law and the University, and has been achieved after three years of hard work.

Project Sanjeevani to empower dairy farmers

The doorstep veterinary services will serve farmers in 44 blocks of all 12 districts.

Himachal Pradesh's economy is largely banking on agriculture and animal husbandry. With a livestock population of about 4.41 million, their care is an essential part of every rural household.

The state government has launched a project named **Sanjeevani** that helps in empowering the livelihood of small dairy farmers and livestock owners.

It will enhance the lives of farmers by providing them convenient and quality care for livestock at their doorsteps. Telemedicine and technology will help reducing the turnaround time of services and also arrest outbreaks to one extent.

For this a collaboration was signed by the Animal Husbandry Department with Bharat Financial Inclusion Ltd. (BFIL), a subsidiary of

IndusInd Bank.

The collaboration under National Animal Disease Control Programme-Mobile Veterinary Van (NADCP-AHD-MVV) will enhance the delivery of livestock care at doorsteps at just a phone call (toll-free telephone number).

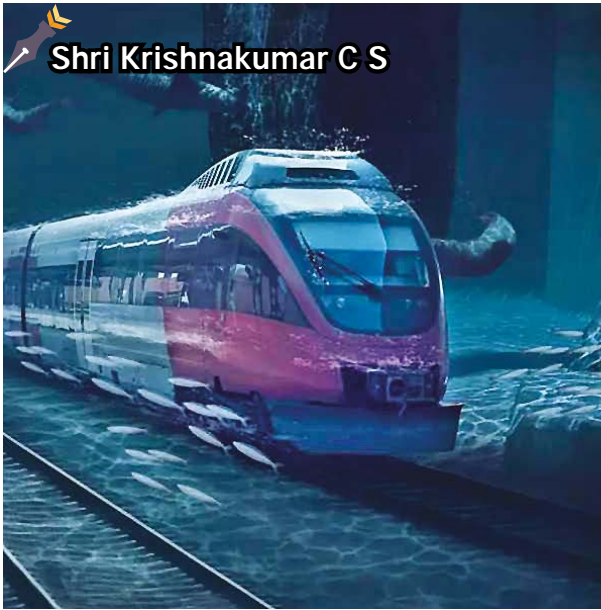
The government is ensuring that livestock is provided quality treatment in a time-bound manner and the farmer is saved of additional expenses like traveling to the point of care for availing quality medicines and veterinary services like artificial insemination, medicines, vaccination, surgery and infertility testing.

The doorstep veterinary services will serve farmers in 44 blocks of all 12 districts. The centralised call centre at Directorate of Animal Husbandry will be integrated with 44 mobile veterinary ambulances.

The uniqueness of the initiative lies in its ability to connect the doctor and the farmer through a mobile app, which also tracks the efficiency of service delivery, medicines prescribed and livestock diseases related data in one platform.

The one-of-its-kind telemedicine platform will ensure that the farmer avails quality treatment for cattle in a timely manner. Apart from veterinary services, farmers will also be given guidance on nutrition care for the livestock.





Shri Krishnakumar C S



India's First Underwater Metro

"Infrastructure is the backbone of economic growth. It improves access to basic services such as clean water and electricity, creates jobs and boosts business."

- Alok Sharma

Administrators who have a vision for the future invest heavily on infrastructural facilities. Our government has initiated several steps to develop world-class infrastructural facilities

in the country. Recent addition is the under-water metro rail across Hooghly River in Kolkata.

The trial run of the underwater metro rail from Howrah Maidan to Esplanade started on 12th April 2023.

It will be opened to commuters by the end of this year.

The rail runs under the river Hooghly through a tunnel with an internal diameter of 5.55 m and an external diameter of 6.1 m. The tunnel is located 13 meters below the riverbed and 33 meters below the surface level. It takes only 45 minutes to traverse it.

The German-made Tunnel Boring Machines named *Prerana* and *Rachana* completed tunnel construction in a record time of 66 days.

The concrete mixture composed of fly-ash and micro-silica are used to avoid water leakage to the tunnel.



Arcturus

The strain believed to be behind the recent spikes in India's Covid cases

Spike proteins are a structural part of the corona virus. They play a crucial role in penetrating the host cells and initiating an infection.

A variant of concern (VOC): It includes the Alpha, Beta, Gamma and Delta variants of the coronavirus.

A variant of interest (VOI): Under this category, WHO placed the Eta, Iota, Kappa, and Lambda variants of coronavirus.

Arrival of the corona epidemic was a rude awakening for the governments the world over. While the health care delivery systems that includes hospitals, physicians, pharma companies and medical research institutes had made impressive gains in fighting infectious diseases of the past with vaccines and antibiotics, COVID 19 tested their resolve to the limit.

The SARS - CoV-2 virus which causes COVID 19 infection presented varied challenges to the authorities involved in combating it. For the pharma companies it was the race against time to structure a vaccine, for the physicians the challenge was to understand the behaviour of the virus and offer strategies for prevention and spread. For the governments it was rigorous implementation of strategies, enforcement, education managing their economies with lockdowns, reduced cash flows and managing crucial medical supply lines.

Arcturus: Named after the biggest star in the northern celestial hemisphere, it is a mutated strain of the SARS- CoV-2 virus, Arcturus was first detected in India on 23rd

January 2023. It is believed to have fuelled the recent surge in corona cases. This variant XBB.1.16 is also gaining traction in America where it currently accounts for 7.2% of all cases.

Mutations and variants of interest: Spike proteins are a structural part of the corona virus. They play a crucial role in penetrating the host cells and initiating an infection. Mutations are bound to occur because the virus has spread far and wide. In the case of Arcturus, a mutation had occurred in the spike protein. So far Arcturus has been reported in 31 countries. Six other variants of interest are being monitored as **Variants Under Monitoring (VUM)**, for they may contain genetic changes that can show signs of faster spread.

Symptoms: Anecdotal reports from paediatricians in India suggests that Arcturus may be associated with itchy or sticky eyes as well as high fever and cough, especially in children. Mutations of the SARS-CoV-2 virus are bound to occur at various structural parts of the virus. The important part is if the variant is a **variant of interest** or **variant of concern**.



Upgrading Soviet era **INS** **Sindhukirti** submarine indigenously

**INS
Sindhukirti is
a Kilo-class
diesel electric
submarine
of the Indian
Navy.**

Ministry of Defence (MoD) signed a contract on 13th March 2023 with Hindustan Shipyard Limited (HSL) to refit the INS Sindhukirti submarine at an overall cost of ₹934 crore. INS Sindhukirti is a Kilo-class diesel electric submarine of the Indian Navy. The project aims to modernize the submarine with advanced weapons, electronic systems and sensors, and develop an alternative repair facility for submarines.

Modernisation

INS Sindhukirti was acquired from the Soviet Union in 1990 and is one of the oldest submarines in service. The present refit is necessary to upgrade its capabilities and extend its lifespan. This will make it a more potent force in the Indian Ocean to counter the Chinese Navy.

In 2017, our Navy celebrated "Year of Submarines" marking 50 years since it started operating their first submarine and INS Sindhukirti is one of its 13 diesel-electric submarines.

Till recently foreign shipyard were relied upon for refit and repair of submarines.

The project estimatedly will involve about 20 micro, small and medium enterprises (MSMEs) and generate employment. Their participation will be crucial as





The Kilo Class is the NATO designation for a naval diesel-electric submarine made in Russia. The original version of the vessels were designated Project 877 Paltus (Halibut) in Russia.

What does kilo mean in Navy?

Phonetic Pronunciation: KEY-loh. Navy & International Meaning: I wish to communicate with you. International Code of Signal Flags have double stitched seams, finished nylon rope distance lines and ash toggles.

Watch Discovery Channel exclusive four-part series titled, **“Breaking Point: The Indian Submariners”**.

it will help boost the country’s manufacturing sector and economy. The contract with HSL to upgrade indigenously is definitely a shot in the arm for our Navy and a boost to achieve 'Atmanirbhar Bharat'.

Fact file

- ⊙ INS Sindhukirti is among the oldest operational submarines and can launch torpedoes, missiles and even mines.
- ⊙ It will be refitted and rebuilt with modern sensors and weapon systems.
- ⊙ These " hole in the water" systems are so quiet that detecting them in the ocean's depths is almost impossible.
- ⊙ Designed in an era when crew comfort was unheard of, its every inch is occupied by machinery.
- ⊙ The submarine has one toilet for the nearly 70 people on board. There are no showers and the crew wear light-blue coloured gowns disposed once every three days.
- ⊙ In its battery pit, there are hundreds of batteries

on board -each weighing more than 900 kg.

- ⊙ As a Kilo-class submarine it is slower than nuclear submarines and cannot sail at more than 31 kph underwater. However, its main advantage is operating quietly.
- ⊙ Fully stocked, it can embark on missions lasting up to 40 days but then has to ascend once every 24 hours to what is known as” snorkelling depth“.
- ⊙ Once it hovers just short of the surface of the sea, fumes from its diesel engines are 'snorted' out and stale air on board the submarine is replaced with fresh air from outside.

Being the stealth force of India, Indian Navy’s submariners have remained elusive both to the enemy and own countrymen.

INS Sindhukirti entered its upgrade process in 2006. Originally scheduled for three years, it was eventually delayed for years due to a series of extensions by Russians working with HSL and other disagreements with Moscow in defence matters.





Col Shashidhar M V (Retd)



First joint conference of Army Chiefs of India and African countries

The aim of AFINDEX 2023 is to build positive military relations, imbibe each other's best practices and promote inter-operability while undertaking Humanitarian Mine Action and Peace Keeping Operations.

Backdrop

The second edition of the joint military “Africa-India” Field Training Exercise (AFINDEX-2023) was held in March 2023 in Pune. 25 African nations, 124 participants and Indian troops from the Sikh, Maratha and Mahar regiments participated in the multinational exercise.

Previously, the first one was held in Pune in March 2019 with 20 African nations participating.

The aim of AFINDEX 2023 is to build positive military relations, imbibe each other's best practices and promote inter-operability while undertaking Humanitarian Mine Action and Peace Keeping Operations under the UN mandate.

The exercise was divided into four phases commencing with training for the trainers, followed by

phases dedicated to Humanitarian Mine Action and Peace Keeping Operations.

The joint exercise concluded with a validation phase that assessed the level of assimilation and their training results. Training was specifically imparted to the forces towards correct interpretation of Rules of Engagements while undertaking Peace Keeping Operations.

An Equipment Display was organised in which 75 indigenous products from 32 industries manufactured under 'Make in India' were showcased.

India- Africa Legacy

India and Africa share a rich legacy across millennia from the perspective of evolution of our human civilisation which postulates that Africa is the cradle





A large number of armed forces personnel from African nations continue to visit India for training in different fields.

of all humanity irrespective of the continent, race or ethnicity.

African continent is the second largest continent, covering about one-fifth of the total land surface of Earth. The island of Madagascar, off the coast of Africa, is one of the largest islands. Africa has a population of over one billion, with a combined GDP of USD2.5 trillion, making it a huge potential market.

Africa is rich in crude oil, gas, pulses and lentils, leather, gold and other metals, all of which are lacking in substantial quantities in India. Further, India and Africa are maritime neighbours that are linked by the shared Indian Ocean and regional cooperation in maritime security and hydrograph besides countering terrorism and extremism.

Army Chiefs Conclave

The India-Africa Army Chiefs' Conclave was held on 29th March 2023 in Pune on culmination of AFINDEX 2023.

Rajnath Singh, India's Raksha Mantri addressed the conclave attended by 31 delegates from various African nations including 10 Army Chiefs and emphasised India's steadfast role and commitment towards providing support in all matters relating to defence to African partner countries besides capability enhancement.

A large number of armed forces personnel from African nations continue to visit India for training in different fields.

Conclusion

India has been at the forefront of providing training to the armed forces of African nations and equipping them with professional skills to face the security challenges of the 21st century. The training programmes include:

- counter-insurgency operations
- peacekeeping
- maritime security
- cyber warfare
- drone operations
- disaster management
- humanitarian aid
- medical assistance post the pandemic.





Secure maritime communications using Quantum Technology

Overview

In a landmark collaboration between Raman Research Institute (RRI) and the Indian Navy, an MOU to develop secure maritime communication will soon be operationalised. Weeks after the RRI demonstrated the breakthrough

capability in “Indian Quantum Communication” by making a transmission from a stationary object to that of a moving one, an agreement was signed in the first week of April 2023 with the Navy’s Weapons and Electronics Systems Engineering Establishment (WESEE).



Implication

Under this, RRI’s **Quantum Information and Computing (QuIC)** lab will lead the research efforts towards developing quantum key distribution techniques that our Navy will leverage in the nation’s efforts towards securing free space communications. Ship-to-shore communication solutions will be developed between QuIC Lab and WESEE.

The lab’s recently achieved capabilities are set to find applications in secure communication with the moving, offshore vessels.





QuIC lab will help establish secure communications in strategic areas like banking, defence and cyber security.

Raman Research Institute (RRI)

- An autonomous research institute engaged in research in basic sciences and located in Bengaluru.
- Founded in 1948 by the Indian physicist and Nobel Laureate Sir C V Raman with funds from private sources.
- Restructured in 1972 to become an aided autonomous institute receiving funds from the Department of Science and Technology of GOI.
- Main areas of research undertaken are Astronomy & Astrophysics, Light & Matter Physics, Soft Condensed Matter and Theoretical Physics.

What is Quantum Technology?

- Based on the principles of Quantum mechanics (including quantum entanglement and quantum superposition) developed in the early 20th century to describe nature at the scale of atoms and elementary particles.
- Quantum entanglement is the exchange of quantum information between two particles at a distance.
- Quantum superposition is the uncertainty of a particle

(or particles) being in several states at once (which could also involve the exchange of quantum information for a particle that is known to be in several locations simultaneously).

What is a QuIC Lab?

A leading research lab in the country in the field of secure quantum communication, its major achievements include the development of an end-to-end simulation toolkit named “**qkdSim**”, ensuring safety in communication platforms, establishing secure communication between two buildings and very recently between a stationary source and a mobile receiver.

QuIC lab also happens to be India’s first laboratory to propose and implement a wide range of applications using single and entangled photons particularly towards establishing secure communications in strategic areas like banking, defence and cyber security.

Conclusion

The collaboration will enable research towards identifying potential maritime uses for the Indian Navy besides leveraging quantum technologies for secure maritime communications. It will create a platform to identify potential uses for quantum key distribution techniques.





Financial Planning and Management

Introduction to shares and mutual funds



Mutual Fund

[myū-chə-wəl fənd]

A managed fund that pools money from shareholders to invest in securities.

Grandpa, Shrahan and Gita were walking back home from the park.

Grandpa suggested that they take a different route today.

Gita: “Grandpa, this road is lined by trees and it is very cool.”

Shrahan’s eyes brightened when he saw a sign board. “Srinath dairy & Ice cream.”

The children ran into the shop.

A young lad was at the counter listening to his mobile. He smiled at the children and greeted Grandpa. “What would you like to have today?”

“Ice cream,” the children said. The salesperson handed over their choice of ice cream.

Grandpa saw some presentation running on his mobile screen and asked, “Online classes?”

“I go to college in the mornings for my B.Com classes. This is a webinar for investors on share trading.”

Grandpa: “Good. What’s your name? You do share trading?”

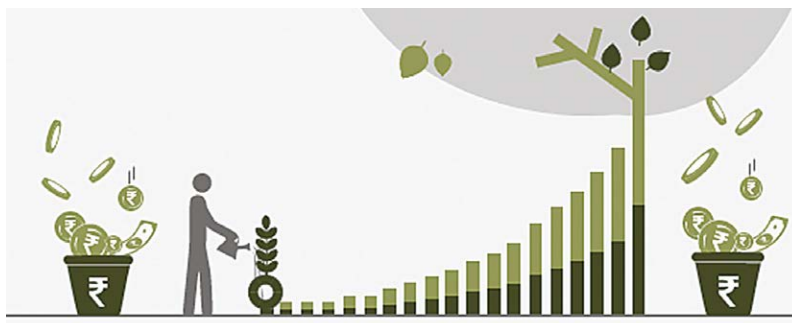
“I am Hari. I opened my share trading account on my 18th birthday. I also invest in mutual fund SIPs.”

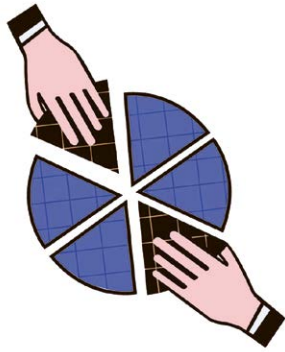
“You also work in this dairy?” Shrahan asked.

“This is our family business. I used to assist my father after school hours. This new shop is my first independent assignment. Here’s my card. Please do call me if you need any of these products. I will get it supplied to your house.”

Grandpa read the visiting card and smiled. “Hari, happy to see that you are taking so much interest in managing business and finance. Best wishes.”

At home, Shrahan and Gita couldn’t stop talking about Hari.





Shares

[sherz]

Units of equity ownership in a corporation.

Shravan: “Grandpa, can we make lots of money by doing share trading?”

Grandpa smiled. “Do you remember we talked about aggressive players who can help us achieve our financial goals faster? Shares and mutual funds carry higher risk than fixed deposits but they also offer higher returns.”

Gita nodded. “Grandpa, can you tell us about shares? Hari said he also invests in mutual fund SIP. What does it mean?”

value say ₹100 each to the public for investment.”

“So how many shares are on offer?” Grandpa asked.

Gita: “Two lakh shares.”

Grandpa continued. “When a company offers shares for the first time, it is called IPO - Initial Public Offer.” The public can invest in the company by applying for shares.

Shravan: “Ok. We can choose to buy shares in Shrinath Dairy Limited.”

Grandpa nodded. “Yes. **People look at the past performance, potential for the business, the reputation of the management before deciding to buy shares of a company.**

We can offer to pay ₹50,000 and buy 500 shares. There would be thousands of other investors who can come up with smaller amounts and buy shares.

Gita: “What benefit will the investors in shares get?”

Grandpa: “Shareholders get a share in the profits of the company in the form of dividends.”

Secondly shareholders can also sell the shares in the stock market for a higher value and make money.”

“**What is share trading?**” Shravan asked.

Grandpa answered. “Shares of public limited companies are listed in stock exchanges. **Buying and selling of shares is called share trading.** People can buy or sell shares online.”

“How do people make profits by selling shares?” Gita asked.

Grandpa: “If a company performs well and is profitable, demand for its shares will increase. There will be more and more people willing to buy the shares at a higher price. So, the price of the share in

WHAT ARE SHARES?



Introduction to shares

Grandpa: “Shares are units of ownership in a company.”

“Let’s take the example of Shrinath Dairy. Where does he get the money to pay rent, buy the dairy products and the packaging?”

Shravan: “I think his father has given him the money.”

Grandpa : “Suppose the business expands and Hari wants to start a big dairy unit, build his own milk factory. Let’s assume that he needs two crores of rupees for the expansion.”

“Issuing shares to the public is an option to raise money. For this, Hari needs to form a public limited company - Shrinath Dairy Limited. He can then offer shares of

- Shares are units of ownership in a company.
- Shareholders are owners.
- They have voting rights.
- They get a share in profits of the company in the form of dividends.
- Shareholders can also sell the shares in the stock market and make profits



stock market will increase to, say, ₹200.”

Shravan clapped. “Ok. Then, if we sell our 500 shares, we will get double the money, ₹One lakh.”

Grandpa nodded. “Yes. You get high returns. Can you see the risk?”

Gita: “What if the business fails and the price falls to ₹50.? If we sell, we would get only ₹25,000. We would lose half our investment.”

Grandpa smiled. “Yes. **Share trading is for people who are willing to take risks.**”

Gita: “How can we reduce the risk and still get profits?”

Grandpa: “There are good companies that give a steady performance. You can diversify your risk by investing in different companies so that even if one company shares fall, you’ll make profits from others.”

Shravan : “But we’d need lots and lots of money to invest in so many different companies.”

Grandpa “Right. This is where mutual funds play an important role as an investment option.”

Introduction to mutual funds

Mutual fund companies collect small amounts of investment from a large number of people, pool the amounts collected and invest in securities like shares and bonds. These investments collected from the public are called “UNITS.”

Each mutual fund company has fund managers who will invest the amount collected from the public in shares of different companies or bonds and other securities. They

also monitor the market and manage the funds so as to make profits for investors.

Grandpa: “If you have ₹1000, you can invest in a mutual fund.”

Gita asked. “What’s the return we get on mutual funds?”

Grandpa: “There are different types of mutual funds. Based on returns, we can classify them into Dividend and Growth funds.

- **Dividend funds** pay you returns at regular intervals.
- **Growth funds** accumulate the profits. When you sell the mutual fund units, you make profits. “

Mutual funds can also be classified into equity funds and debt funds.

- **Equity funds** invest in shares.
- **Debt funds** invest in Government bond and corporate bond markets.

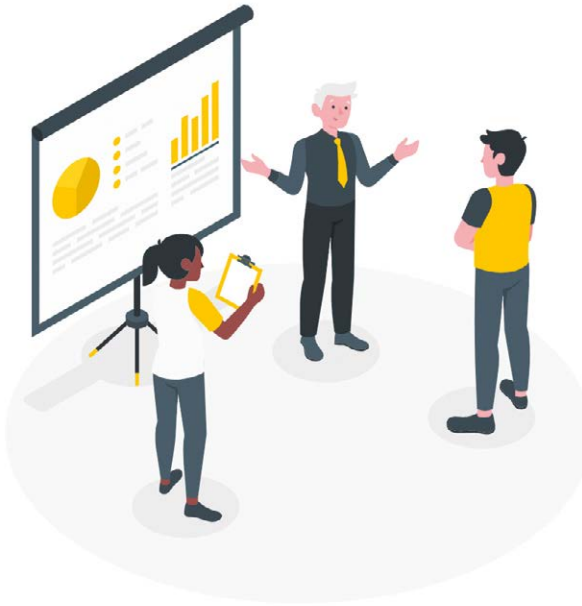
There are many more types of funds based on the type of securities they invest in.

Systematic Investment Plan

Systematic Investment Plan (SIP) in a mutual fund is similar to your bank recurring deposit. You can invest small amounts regularly, say ₹1000 every month in the mutual fund scheme and buy mutual fund units. This is a good strategy for beginners to build your wealth.

“How many units will we get for ₹1000?” Gita asked.

Grandpa: “Just like shares can be bought at the market price quoted in the stock exchanges, mutual funds can be bought at the day’s NAV i.e Net Asset Value. Mutual funds update the NAV of each fund daily. This NAV is updated on the website of AMFI – **Association of Mutual Funds in India.**”



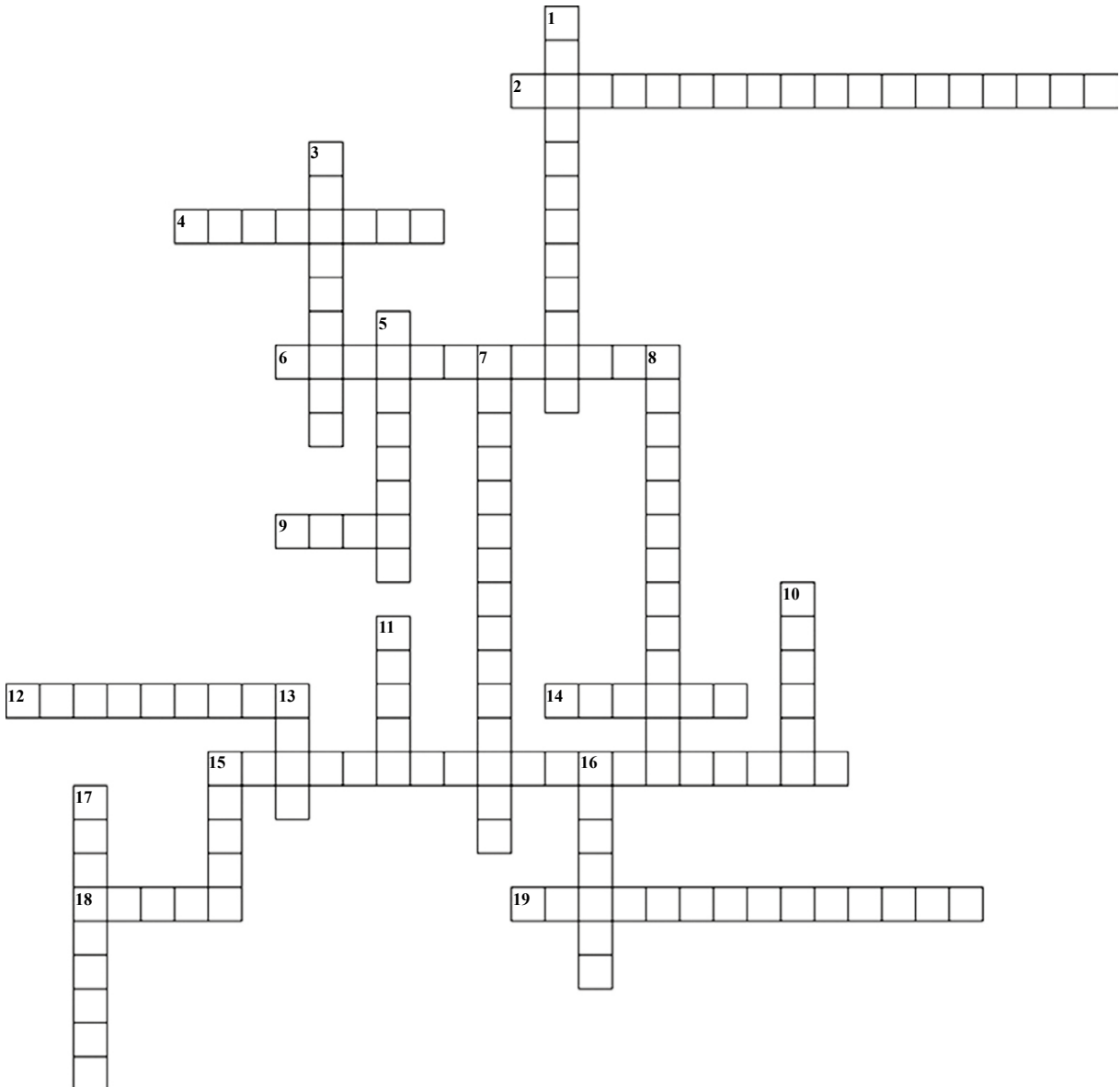
In a nutshell

- A **mutual fund** pools money from a large number of investors to purchase securities like shares and bonds.
- People can invest small amounts in mutual funds to purchase “UNITS”.
- Net Asset Value of a mutual fund is the market value of the assets of the fund minus its liabilities.
- NAV per unit is the NAV divided by the number of outstanding units.
- NAV of mutual funds is updated daily.
- NAV is the price at which investors can buy and sell units.





Explore the ocean-life and find out the answers with the given clues.



ACROSS



2. This is the largest arthropod known to humans.



9. A Japanese seaweed, which is probably most widely known for being wrapped around sushi?



15. Which fish makes a nursery out of bubbles?



4. Which male sea creature keeps its young in a pouch?



12. A "smack" is the collective term for a large group of what stinging, tentacle sea creatures?



18. What is the acronym of self-contained underwater breathing apparatus?



6. Sharing its name with a type of firearm is which species of shrimp, capable of using its claws to make a noise of up to 210 decibels?



14. Its elongated body and flattened head makes them look like what stringed musical instrument?



19. This silvery fish has a remarkable expanding stomach.



DOWN



1. These creatures live across the world's ocean floor.



8. Microscopic organism that inhabit the upper sunlit layer of almost all oceans.



15. What is the dark colored ink squirted by an octopus called?



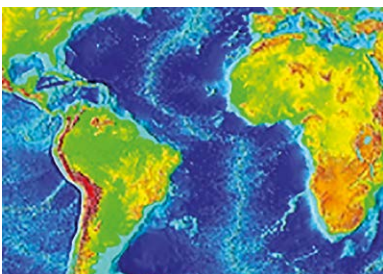
3. In "Finding Nemo," which type of anemone-dwelling fish were Nemo and his dad Marlin?



10. "Morse" is an archaic term for which large marine mammal characterized by prominent tusks and whiskers?



16. What "T" word is technically a wave generated by an undersea earthquake?



5. Which ocean does the Amazon River run into?



11. Dolphins breathe through their ____.



17. So far, scientists have seen this translucent fish alive just once.



7. The International Union for the Conservation of Nature (IUCN) has deemed this fish as a critically endangered species.



13. Where is a shrimp's heart located?

Answers on page 53





Information Technology Law

It also recognises digital signatures, provides for the validity and recognition of electronic records and licenses necessary for electronic signatures.

The past few decades have seen a rise in the use of technology in various spheres of our lives. Technology is a vital part of our business and communication. This brought up a new set of practices and issues including the storage of information in an electronic form instead of physical form.

To ensure regulation of such issues and to protect personal information of users and consumers, the Information Technology Act was passed in the year 2000. This law, which is based on the UNCITRAL Model Law, is useful for all citizens since it indicates the rights and duties of various parties involved in online transactions pertaining to collection and storage of information electronically.

Overview

The IT Act protects contracts made through electronic means by

laying down that they are legally valid. It also recognises digital signatures, provides for the validity and recognition of electronic records and licenses necessary for electronic signatures. A Cyber Regulation Advisory Committee is set up under the Act to advise the Government on matters related to these aspects.

Case study: Shreya Singhal v. Union of India

This is an important case involving the IT Act. The provision involved was Section 66A, which criminalised the sending of offensive messages through a computer or other communication devices. The petitioner filed this case contending that this Section was unconstitutional as it was vague and that the restrictions imposed were beyond the restrictions under Article 19 of the Constitution [discussed earlier in this series].

The Hon'ble Supreme Court accepted the submission of the petitioner and struck down this provision as it observed that discussion or advocacy of a cause, howsoever unpopular, is at the heart of the right to freedom of

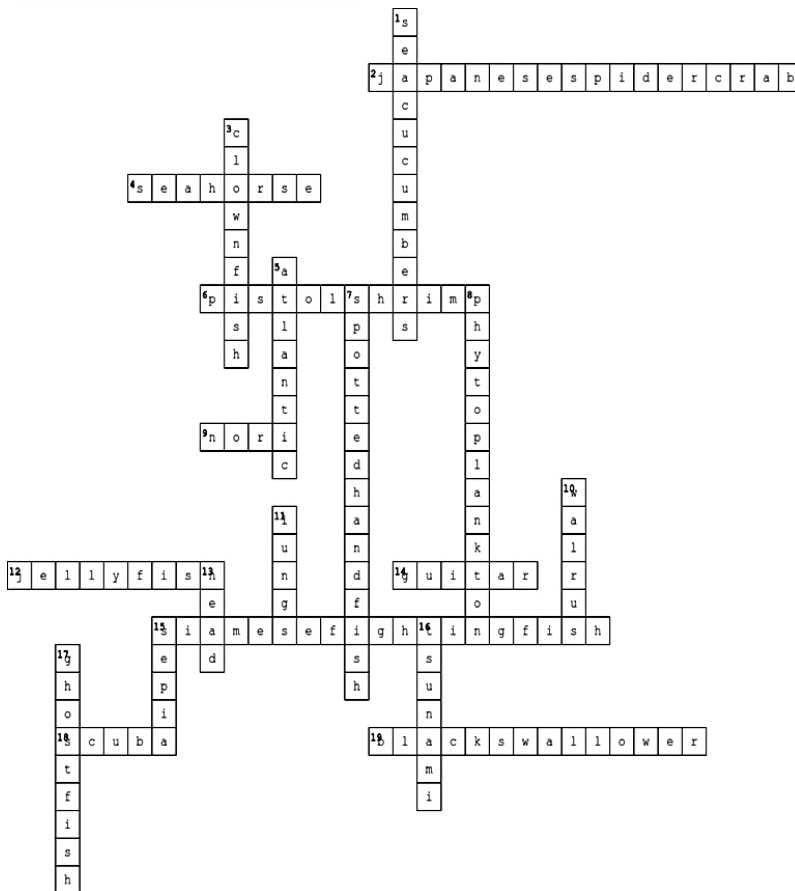
speech and expression under the Constitution. Since the provision failed to define specific terms, some scenarios of protected and innocent speech could also be curtailed by it and hence it was overly broad and vague.

Liability of intermediaries under the act

An intermediary under this Act is a person who receives, stores or transmits any electronic record and provides any service relating to such record. Intermediary includes internet service providers, search engines, online payment sites, social media platforms and online marketplaces.

Section 79 of the Act exempts the intermediary from liability for any third-party information, data or communication link made available by the intermediary. However, the intermediary must not have initiated or modified the information. Further, intermediaries must follow the Intermediary Guidelines and Ethics Code, 2021.

ANSWERS of page 49-51



ACROSS

2. Japanese spider crab
4. Sea horse
6. Pistol shrimp
9. Nori
12. Jellyfish
14. Guitar
15. Siamese fighting fish
18. Scuba
19. Black swallower

DOWN

1. Sea cucumbers
3. Clownfish
5. Atlantic
7. Spotted hand fish
8. Phytoplankton
10. Walrus
11. Lungs
13. Head
15. Sepia
16. Tsunami
17. Ghost fish

DO YOU KNOW ?

UNCITRAL is the United Nations Commission on International Trade Law, the arm of the UN whose function is to harmonise and modify the rules of international business.

Remedies under the act

The Act describes various offences related to data and defines their punishment. A controller appointed under the Act will decide the disputes pertaining to electronic transactions and breaches. Appeals from the controller's decisions would go before an Appellate Tribunal established under the Act. An appeal from the tribunal lies before the High Court.





Anna Mani

The weather woman of India

Sir C.V. Raman saw the potential in her and took her into his folds guiding her towards a Ph.D. degree.

Seven-year-old chirpy little girl Anna heard her parents discuss diamond earrings they were planning to buy for her eighth birthday. "Amma, I have a request. Recently I heard our librarian mention Encyclopaedia Britannica. Can you please buy that instead of diamonds?" and they agreed to import it for their curious daughter. This young girl soon switched to wearing Khadi, after hearing Mahatma Gandhi's address on swadeshi movement. Years rolled by.

She felt her call towards building our country, especially through progress in scientific research and joined Presidency College, Madras. After obtaining her B.Sc. (Honours) degree in Physics and Chemistry, she secured a scholarship to pursue research at IISc.

Sir C.V. Raman saw the potential in her and took her into his folds guiding her towards a Ph.D. degree. She was all set to prove the world that gender and nationality can never be a deterrent to beautiful

minds. A passionate and self-driven researcher, Anna spent hours and hours in the lab recording the spectra, sometimes sleeping there itself.

Same girl who refused diamond earrings was excited now to be surrounded by dazzling diamonds, rubies and many other precious stones all the time! Using the famous Raman spectroscopy, Anna Modayil Mani was analysing their structure under the direct supervision of her guru.

She published five research papers in reputed journals, which is not easy even in the current times and submitted her thesis for doctoral degree to the University of Madras. Despite her yeomen work, unfortunately, she was not awarded the Ph.D. because she did not possess M.Sc. degree. May be now, it is time to honour her posthumously!

Anna Mani was too strong to let anything shift her focus, especially not being awarded the doctoral degree she rightfully



When the word “ozone layer” was not even known to many researchers abroad, it was Anna Mani who set her eyes on ozone research even by 1960s.

deserved. Knowledge she gained at IISc and reputation through the research work with Raman, instilled more confidence in her to look for better avenues. Soon she was awarded a government scholarship for internship in England.

It was World War time and what an inner strength one should have to sail in a troop ship to Imperial College, London! Truly amazing!! She reconciled that she would not be able to pursue Physics; she had to work at the instrumentation division of the British meteorological office.

She studied weather instruments, their calibration, standardization procedures and visited a few observatories. Being a self-learner from childhood, Anna seized every opportunity to take notes on instrumentation design of meteorological instruments available then. She visited National

Physical laboratory learning the procedure for standardisation of different weather parameters, which in fact made her a leader in this field.

During British Raj we had to import even basic instruments like thermometers and barometers. To reverse this scenario, the great visionary Dr.S.P. Venkiteswaran of Indian Meteorology Department (IMD) had just then set up workshops to design and develop instruments, collect our own data, build a self-reliant sustainable R&D. In 1948, Anna Mani returned to our motherland and joined IMD, Pune in the Instrumentation division under this Gandhian.

Fuelled by swadeshi thoughts, she was behind hundreds of indigenously designed weather-related instruments, their standardisation and calibration according to our diverse weather conditions - thermographs, anemometers, hydrographs, barometers, to name a few. "Find a better way to do it!" was her motto! We can certainly say that she was the only woman in the world who led a huge team 121 men so successfully in that era. As well, she helped many to set workshops to produce these instruments and spent her life training the manpower to operate these.

When the word “ozone layer” was not even known to many researchers abroad, it was Anna Mani who set her eyes on ozone research even by 1960s. She went further and successfully designed **ozonesonde**, an apparatus to collect reliable data on ozone.

What more does one need to put our country in the global map than this path-breaking research? For her contribution, she was elected as a member of International Ozone





She was the first woman scientist to be appointed as Deputy Director General of IMD, New Delhi, in 1969.

Commission. In 1963, Dr. Vikram Sarabhai requested Anna Mani to set up a meteorological observatory and instrumentation tower for the Thumba rocket launching station.

She was a pioneer to equip Indian Navy ships and several airports across our country with weather observation facilities. She travelled to various parts of our country, faced tough weather conditions, handled different terrains in the process of creating weather maps, studying high altitudes, setting up state-of-art instruments, wind turbines, solar panels, telescopes for necessary data collection and man-power training.

An avid bird watcher, trekker, she was passionate about everything related to nature. We all owe her for helping our nation focus on harnessing wind energy and solar energy decades back. Anna Mani authored **Handbook of Solar Radiation data for India, Solar Radiation over India, Wind energy data for India, Wind energy resource survey in**

India which serve as an excellent reference material. These are indeed gems available online that can help the current generation to learn about how our country progressed in science and technology.

She was the first woman scientist to be appointed as Deputy Director General of IMD, New Delhi, in 1969. Post-retirement, she joined Raman Research Institute as a visiting professor; she continued research and training in her chosen field. She guided to set many instrumentation facilities, including millimetre wave telescope at Nandi hills, Bangalore.

For her relentless service to our nation through science and technology, she was awarded INSA K R Ramanathan medal in 1987. She was elected as a member of many national and international scientific bodies.

Such was her impact as a scientist, as a leader and as a great mentor, that Ms. Mani is fondly remembered till date by meteorological organisations from all around the world.





GOA - India's Pocket-sized Paradise

Mahabharata refers to the area now known as Goa, as Goparashtra or Govarashtra which means a nation of cowherds.

- **Baroque** – characteristic of ornate Europe architecture of 17th and 18th centuries.

- **Susegad** is a concept associated with the culture of Goa. Derived from the Portuguese word *sossegado* ('quiet'), it refers to the relaxed, laid-back attitude towards life historically found there.

Lying on the western coast of the Konkan region, Goa is a colourful blend of Indian and Portuguese cultures, endless beaches, stellar nightlife, *susegad*, spirituality and world-heritage listed architecture. The name Goa is derived from the Konkani word 'Goyan', meaning a patch of tall grass. Mahabharata refers to the area now known as Goa, as Goparashtra or Govarashtra which means a nation of cowherds.

Goa is divided into North Goa and South Goa. While North Goa is the nightlife hub where all the touristy beaches, flea markets and beach cottages are located. South Goa is the land of luxurious and laid-back beach resorts.

The Portuguese invaded Goa in 1510, lured by the exotic East and the promise of lucrative spice routes, before being booted out in 1961.

Their indelible mark is still evident in the state's baroque-style architecture, whitewashed churches, crumbling forts, colourful Catholic ceremonies, mournful fado music and the stunning cathedrals of Old Goa. The centre is well-connected with an international airport and roads and trains run from North to South part of Goa.

Its coastline stretches along the Arabian Sea from the tip to the toe of the state, and each beach community has developed its own personality and reputation since the hippie days of the 1960s. They cater to every tourist's wish: **Arambol** for backpackers; **Baga** for the bold and adventurous; **Palolem** with its palm-fringed sands; **Anjuna** for those who love hippie culture; lovely **Mandrem** for those who prefer a laid-back experience; expansive sandy beaches in front of fancy five-star resorts or the quiet hidden coves, where only the scampering crabs keep you company.

During winter, yoga takes the lead and spiritual activities increase year after year: sunrise yoga sessions on the beach, reiki courses for healing, meditation and just about every other form of spiritual exploration are all practised regularly.

Food is enjoyed as much here, as it is throughout India. The spices and unique flavours of Goa's cuisine will attract food-lovers with its fish curry rice, bhali-pau (bread roll dipped in curry), sharp vindaloo with its infusions of wine vinegar and garlic, or spicy xacuti sauce. The Indo-Portuguese confluence is a treat for the taste buds.





Pritikana Goswami

“People without the knowledge of their past history, origin and culture is like a tree without roots.”

— Marcus Garvey

A culturally strong country like ours must nurture our traditional art forms.

dhotis, lungis or rags to make bedspreads, quilts and bags.

Pritikana Goswami, originating from the Sonarpur village on the outskirts of Kolkata has been awarded the Padma Shri under the category of Art. She lost her father at the age of 10; started practising this art at a very young age. Pritikana took her passion for embroidery and stitching as a profession to manage her family.

The success and recognition have not come overnight to her. She has been practising Kantha for over 33 years. Her handcrafted masterpieces are on display at the Victoria Albert Museum, the Philadelphia Museum of Art, the Washington DC Textile Museum, and the Honolulu Museum of Art.

The state’s craft council recognised her in the year 1990. Passing on the art to the next generation, she has also taught the same to her daughters.

Kantha embroidery

Kantha is one of the oldest forms of embroidery. Different coloured threads are embroidered using a simple running or chain stitch. Motifs used are flowers, birds, animals etc.

Rural women have been using this art for centuries to create decorative items. It was traditionally done in homes by women in Bengal and Bangladesh who stitched several layers of discarded sarees,



DO YOU KNOW ?

- The word Kantha is derived from ‘Kontha’ a Sanskrit word meaning rags and was traditionally made from discarded and old sarees.
- It was referenced as warm clothing in Panini’s book “Ashtadhyayi”.

BAL PURASKAR AWARDS

APS Chauhan



Most of the microplastics on land surfaces come from UV rays shredding larger pieces of plastic.

Aditya Pratap Singh Chauhan a 17-year-old has been awarded Rashtriya Bal Puraskar for his innovation to tackle one of the biggest issues plaguing the planet – microplastics. Hailing from Chhattisgarh, Chauhan has developed Micropa, a simple yet innovative device to detect microplastics in water.

Aditya Pratap Singh Chauhan is a student of IIM Indore. He started his research after a person in his neighbourhood got infected by a water-borne disease and the authorities found a large presence of microplastics in the local water supply.

Though he had many setbacks and dead-ends, Chauhan has managed to persevere in his project.

Microplastics are tiny pieces of plastic that are less than 5 mm across. Though, this is the official size limit for a piece of plastic trash to be called "microplastic"; the dangerous ones are smaller than a micron and get through all filtration systems without being caught.

The most common types of microplastics are microbeads, microfibrils, microfoam, etc. These are made when plastic particles keep hitting the surfaces

around them, shredding larger pieces of plastic. Most of the microplastics on land surfaces come from UV rays shredding them, while those on the ocean surface come from waves.

As plastics do not decompose, these microplastics slowly find their way through all water systems. These plastics can become a haven for deadly bacteria and toxins.

Micropa and its features

Chauhan developed **Micropa** with his partner. The simple device uses a computer algorithm to detect, quantify and filter microplastics from water. There were not many ways other than complex lab processes to identify or remove microplastics from water samples. The device marks a milestone by providing such a facility.

Accolades

- ✦ One of the three students selected from Chhattisgarh for the ISRO Young Scientist Programme YuViKa 2019.
- ✦ Won the CSIR Innovation Award for School Children twice, receiving a cash reward of ₹5,000 in 2018 and ₹10,000 in 2019.
- ✦ Represented India at Regeneron International Science and Engineering Fair (ISEF), the largest international pre-college science competition.





Sleep

Sleep is a basic instinct of life which is essential for all living beings. We need to sleep adequately and appropriately for rejuvenating and re-energizing our body, mind, and soul. Additionally, sleep has important restorative functions and plays an important role in the repair and renewal of tissues in the body, including the brain.

Activities like muscle growth, tissue repair, wound healing, protein synthesis and the release of growth hormones occur predominantly during sleep. Sleep also promotes the efficient removal of metabolic wastes and supports the immune system.

Melatonin is an important hormone that regulates sleep-wake cycle and reaches its maximum level between midnight and early

morning. This melatonin secretion will be normal only if we go to sleep early and wake up early.

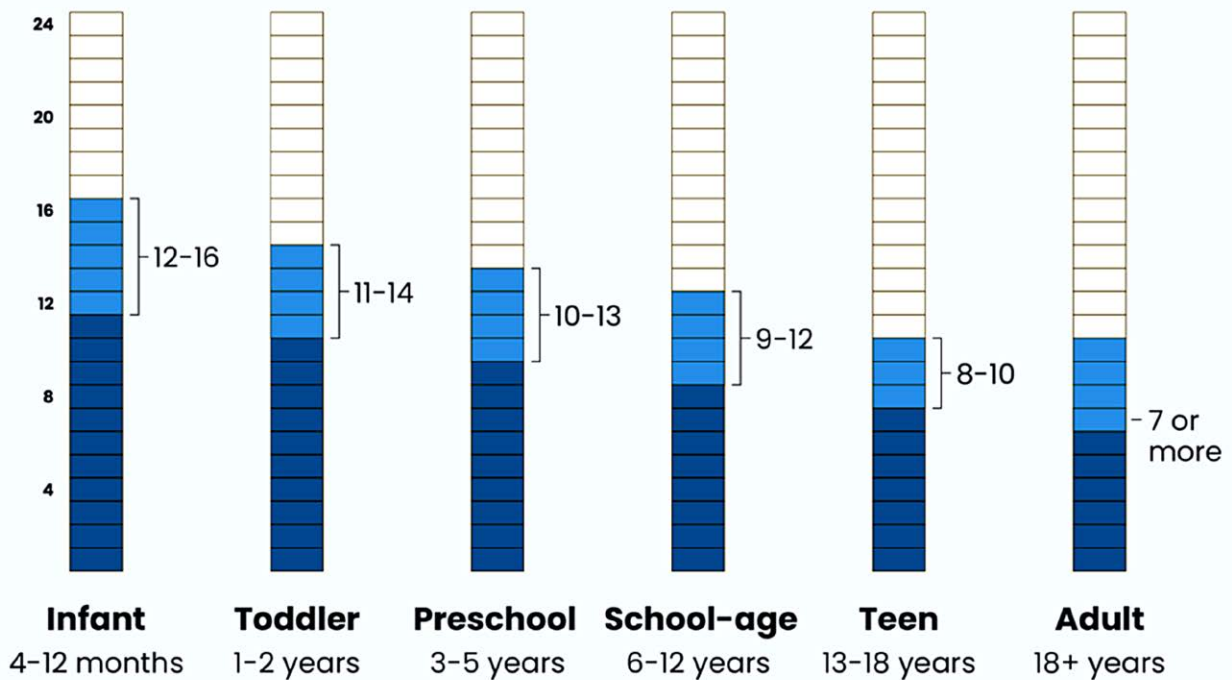
We are generally in the realm of the unconscious mind during sleep. During sleep, adenosine is actively cleared from the brain, which gives refreshed feeling and alertness after a good night's sleep. On the other hand, during wakeful periods, the neuromodulator adenosine slowly accumulates in the brain, causing us to feel more and more tired the longer we are awake.

Several ayurvedic and other health care researches recommend waking up before sunrise and sleeping before 10 pm. On an average, pre-school children can sleep for **12-14 hours**, **school age children for 10-12 hours**, **adolescent for 8-10 hours** and **adults for 7-8 hours**. Sleep is



We are generally in the realm of the unconscious mind during sleep.

Recommended Hours of Sleep

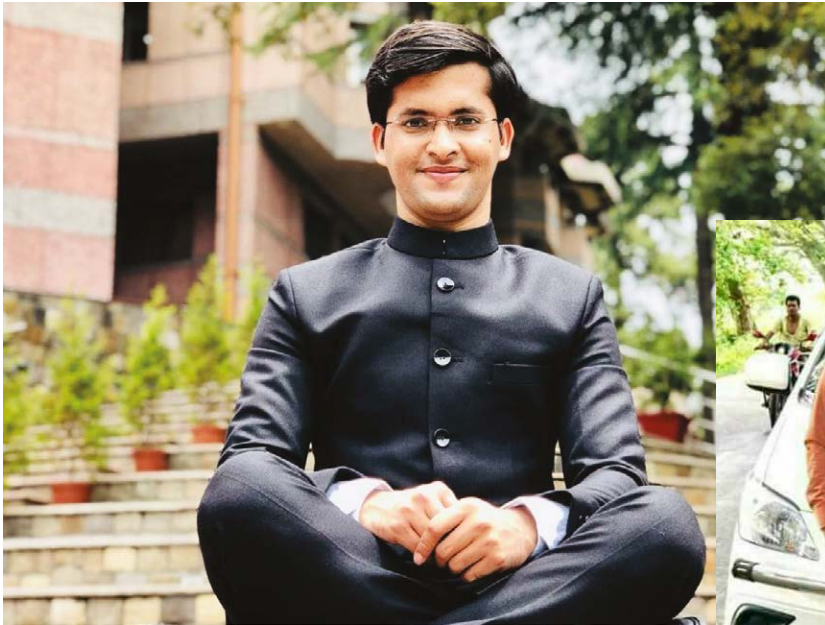


regulated by circadian cycle of the body and thus advisable to maintain the sleep and waking up time as much as possible. Day sleep is usually not recommended for adults.

Simple tips to follow for better sleep:

- ✦ Avoid watching screens one hour before going to bed and avoid using phone or any bright screen to check time in the morning.
- ✦ Can meditate or chant shlokas or listen to soothing music before sleep. Calming down the mind helps in better sleep without much disturbance.
- ✦ Wear loose and light clothes.
- ✦ Room should be dark or dimly lit instead of having bright lights.
- ✦ Duration between dinner and sleep should be 1.5 – 2 hours.
- ✦ Dinner should preferably be light.
- ✦ Having milk with turmeric powder along with almonds facilitate good sleep.
- ✦ Sleeping by turning to left or sides or straight is better recommended than other positions.
- ✦ Comfortable light cushion bed or flat surface is recommended than thick cushion beds.
- ✦ Soft and light or no pillow is better than hard and big pillow.
- ✦ Avoid waking up in a hurry or looking into screen or bright light immediately.





ANSAR SHAIKH

the youngest IAS officer

Ansar Shaikh is not only the youngest aspirant to clear the exam, but he also managed to do it in his first attempt.

The son of an auto driver cracked UPSC with All India Rank 361 at the young age of 21. Ansar Shaikh is not only the youngest aspirant to clear the exam, but he also managed to do it in his first attempt. What's more inspiring than this feat is his story of rising to the top.

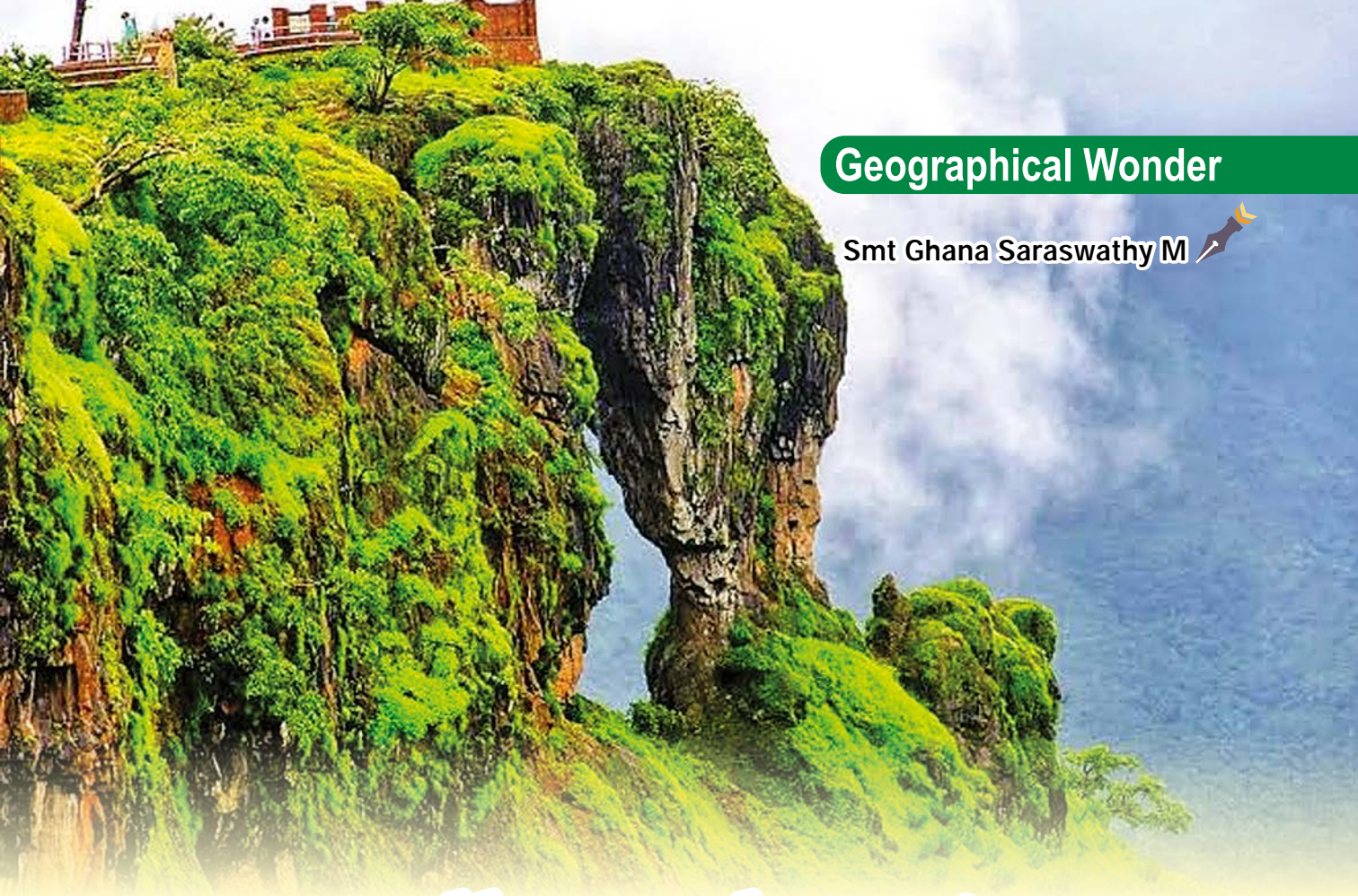
Although an academically bright student, Ansar Sheikh was asked to drop out of school due to the family's poor economic condition. If not for the teacher who convinced his parents not to do so, he would not have got a chance to study further. Ansar scored 91 % in his 12th board examinations. Growing up, he has seen poverty, alcoholism and domestic violence at close quarters.

During graduation in Political

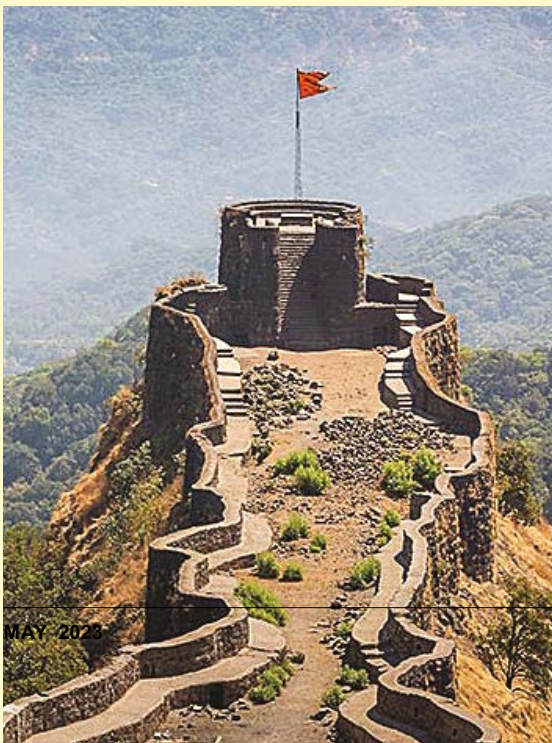
Science, **he took up several odd jobs and worked for about 12 hours every day for three consecutive years while preparing for the UPSC exam.** In 2015, when he attempted the UPSC exam for the first time, he was 21 years old and became the youngest IAS officer of the country – a record that remains unbroken.

Civil service examination is one of the hardest examinations in the country which can be cleared only through sheer mix of diligence, direction and determination. Through his extraordinary success, Ansar Shaikh has become a role model for aspirants, through hard work and persistence. He has been allotted the West Bengal Cadre and is currently posted as ADM, Cooch Behar.





- Needle Hole Point – Mahabaleshwar



India is an abode of nature’s fabulous creations and unexplained mysteries. A country of a large topographic diversity and natural wonders, she is the most popular destination for surreal experiences.

Mahabaleshwar, a weekend getaway from the commotion of the adjacent cities is popular with tourists. It is a popular hill-station in Maharashtra and is also known as the ‘Queen of Hill Stations’ of Maharashtra. With a number of view points in the vicinity, it is popular among the Mumbaikars.

Located about 120 km southwest of Pune and 285 km from Mumbai, Mahabaleshwar is a vast plateau measuring 150 sq. km bound by valleys on all sides. It reaches a height of 1,439 m at its highest peak above sea level, known as Wilson Point. Surrounded by several splashing rivers, evergreen forests, alluring hills and mountains, it is one of



DO YOU KNOW ?

The region's climate is ideal for strawberry growing and Mahabaleshwar strawberries account for around 85% of the nation's entire strawberry output. In 2010, it was also given the Geographical Indication (GI) tag.

This area of the Deccan Traps is one of the oldest of the plateau and was totally formed by basaltic rocks.



the very few evergreen hill stations in the country.

It is also a place of pilgrimage for Hindus because the Krishna River has its origins here. The British colonial rulers developed the town as a hill station and served as the summer capital of the Bombay Presidency during the British rule.

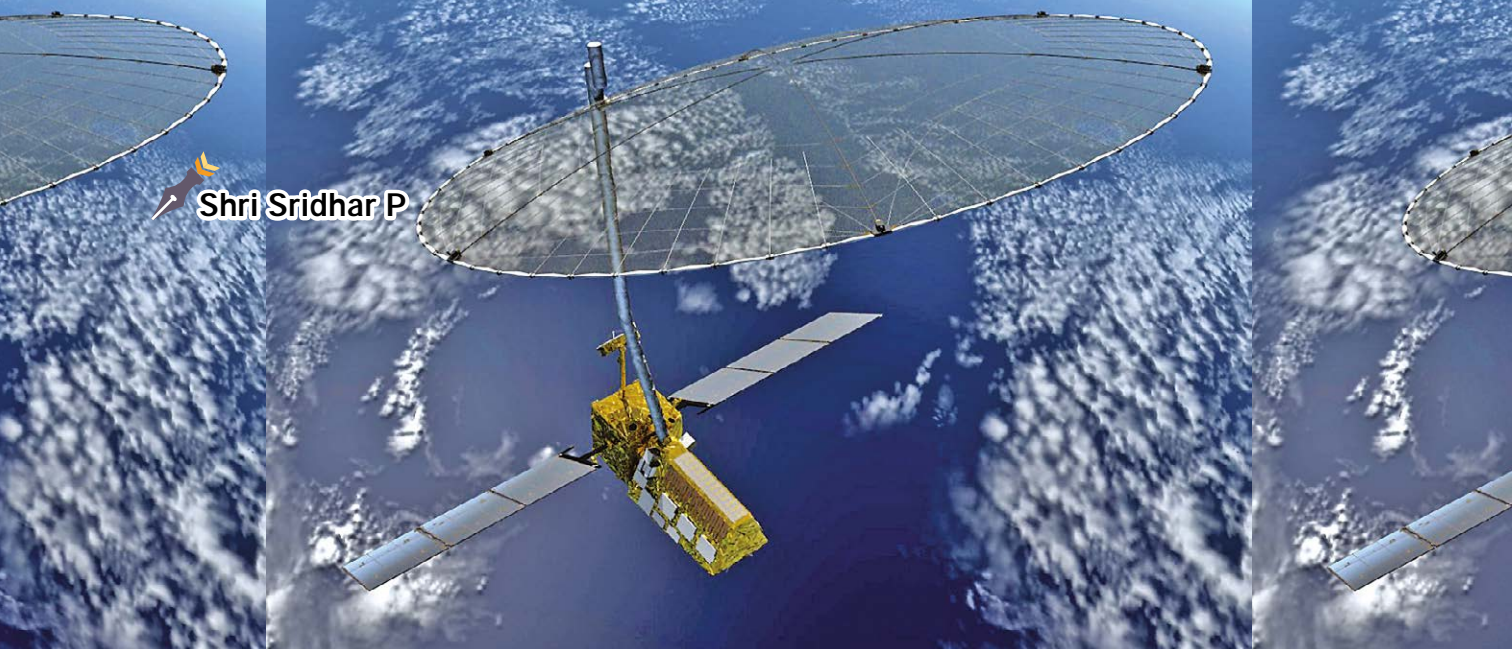
Needle Hole Point

Needle Hole Point is located 7 km away from Mahabaleshwar. The rock formation attracts tourists

and other visitors to it. Its structure, which resembles a needle hole and that of a standing elephant due to its small size and location between two boulders, makes the natural phenomenon a sight to behold.

It is also called the Elephant Head Point. From here one can get a stunning view of the Sahyadri mountain ranges. This area of the Deccan Traps is one of the oldest of the plateau and was totally formed by basaltic rocks.





 Shri Sridhar P



Satellite to map seismically active zones in Himalayas

NISAR satellite system will provide advance warning of land subsidence and so on in the Himalayan region.

The shape of continents, their arrangement, ocean depth, mountain ranges, sea floor and land surface configuration etc., are due to the activities in the earth's crust that prove that our earth is a dynamic planet. Earthquakes, tsunamis, volcanic eruptions, erosion due to other elements of nature keep changing the contours of earth's surface continuously. Some areas of the world are more prone to the effects of such natural force. the Himalayan region is one such region.

NISAR satellite

In order to study, evaluate and generate advance warning on the likely occurrence of earthquakes

the Indian government is to develop the NISAR satellite system, to be jointly developed by ISRO and NASA. NISAR satellite system will provide advance warning of land subsidence and so on in the Himalayan region.

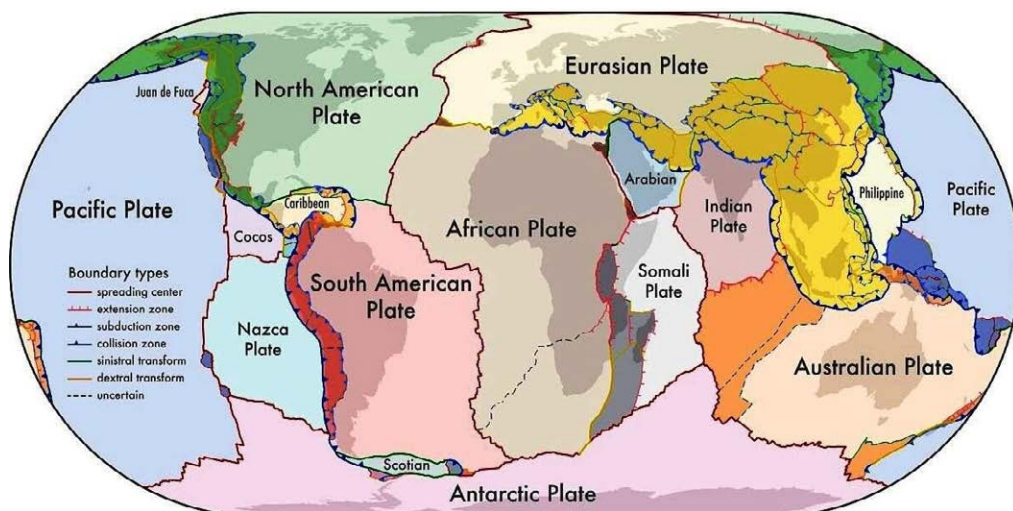
Before we judge the benefits of this magnificent remote sensing technology, it is worthwhile having a look at how tectonic movements in the earth's crust shape the contours of the land surface.

Shapes that hide a tale

If we study the shapes of continents, we will realise that they are shaped in such a way that it is possible to infer that they were once fused. Continental



As the tectonic plates move deep in the earth's crust or sea floor, the rock strata cannot stand the stress beyond a certain point and give way, resulting in a fracture.



drift prised them apart in a process running into millions of years. Land mass continues to drift creating new mountains, altering sea floor etc. The movement of tectonic plates in the earth's crust is the reason for all this phenomenon.

Tectonic plates and their movement

The earth's crust is divided into 14 tectonic plates of which half are major ones. The plates move in different directions continuously and the deformation that results keeps changing the contours of the earth. Tectonic activity is often slow running into millions of years that results in gradual formation of new land forms. Major mountain building occurs at the plates' boundaries.

When and why do earthquakes occur?

As the tectonic plates move deep in the earth's crust or sea floor, the rock strata cannot stand the stress beyond a certain point and give way, resulting in a fracture.

The likely tectonic border at which such fractures can occur is called a **fault line**. Huge amounts of energy is released at the place and time where a fracture occurs resulting in an earth quake. The place where

such a fracture occurs is referred to as the **epicentre of an earth quake**.

How will India benefit from NISAR?

The continuous deformation of the earth's topography in seismically active places warrants technologically advanced monitoring. The NISAR satellite system will do exactly that. NISAR will image the seismically active Himalayan regions every 12 days and create a **deformation map**.

The Geo science community can use this data to analyse how strain is building up in various parts of the Himalayan region. In fact, a strain map was published in the year 2021, based on data from 1252 GPS stations. It identified the regions that had the greatest odds of generating an earthquake of magnitude 8 and above on the Richter scale.

NISAR the game changer

NISAR the costliest space mission ever will be a game changer in earth science observation, observes Dr Prakash Chauhan, chairman ISRO National Remote Sensing Centre. The clarity of images and the frequency of monitoring which comes with NISAR deployment will be indeed make a huge difference.



RBI Foundation Day

1st April

The Reserve Bank of India was founded on 1st April 1935 to respond to economic troubles after the First World War



The primary objectives of RBI are to ensure the stability of the Indian rupee, regulate the supply of money and credit in the economy and promote the growth of the Indian economy in a sustainable and inclusive manner.

w world

ON THIS DAY
10th
APRIL

Homeopathy Day

It is one of the disciplines of medicine that generally works by triggering the healing responses of the patient's own body.



The World Homeopathy Day is celebrated on 10th April, every year.

The day is observed on the occasion of the birth anniversary of German physician Dr Christian Friedrich Samuel Hahnemann.



He was the founder of homeopathy and also considered as the father of homeopathy. He was born in Paris on April 10, 1755

The day aims to spread awareness about homeopathy as a form of medicine and work towards improving its success rate.



Today, homeopathy is in vogue in about 100 countries in the world. Homeopathy method has no harmful side effects. The medicines are not expensive.

