PRAJYA

MONTHLY NEWS MAGAZINE FOR CHILDREN

Volume: 03 Issue: 10 June 2024 Rs.85/-

Nilgiri Tahr

International Mother Earth Day

22nd April

Nurture Nature

Our home, Our future

THE PRAJYA TEAM

Published by:
Arya Samaj Charitable Foundation

Editorial Board:
Smt Mali Nandakumar
Educational Consultant

Shri Nandakumar V
Educational Consultant

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

Teacher Contributors:
Smt Ghana Saraswathy M
Smt Manju Aildasani
Smt Meenakshi S
Smt Ramamani N
Smt Sandhya Nair
Smt Sarada Devi Ravutu
Kum Shrivaishnavi R
Smt Silpa Nandakumar
Smt Shubha T R

Independent Contributors:
Kum Anu Narayan
Smt Anuradha V R
Smt Archana Sundar
Shri Bharath
Kum Deepasri
Smt Gaayathiri G
Kum Kavya R
Shri Mrithyunjay GN
Shri Nagarajan R
Shri Neeladrinath Sarangi
Kum Pavithra S
Dr Preethy S P
Shri Ramaswamy R
Shri Sampath D
Col Shashidhar M V (Retd)
Smt Shyamala Viswanathan
Shri Sridhar P
Smt Sumathi Ramakrishnan
Kum Sunita D Behera
Smt Uthra Dorairajan
Smt Vaishnavi V
Smt Vanaja Shankar

Technical Editor :
Shri Guhaprasath Subramanian

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

COMMENTS & SUGGESTIONS
prajya.magazine@davchennai.org

FROM THE EDITOR'S DESK

"Challenges are what make life interesting; overcoming them is what makes life meaningful."

Challenges can be daunting. But while facing challenges, we discover the endurance in us.

Climbing atop Mt Everest would be every mountaineer's dream. But **Kami Rita Sherpa** is no ordinary mountaineer. Completing the 29th summit on 12th May and beating his own record in another 10 days to complete the 30th summit is the ultimate exhibition of human potential and persistence.

The **four-member Indian contingent** at European Girls' Mathematical Olympiad 2024 **winning two silver and two bronze medals** is a shining example of tenacity while facing challenges at the global level.

Ethnic strife and natural disasters in Manipur posed challenges. But the state government launched **School on Wheels** to bring education directly to students in relief camps ensuring continuity while displaying the necessary commitment and resoluteness.

Forest fires are a huge challenge**. IAF's Bambi Bucket operation** to douse the flames prevented the fire from causing greater damage in the nearby areas.

Tackling hostile neighbours is India's perennial challenge. Indian Army secretly planned **Operation Meghdoot** to gain control of Siachen Glacier taking Pakistan by surprise. A vast distance in the world's toughest terrain, at such an altitude and forbidding climate, was covered on foot with complete battle loads. The achievement of 19 Kumaon was definitely a mindboggling example of grit, discipline and hardiness.

प्रतिकूलतायाः शक्तिः ||

(Translation: Strength through adversity)

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 New Leaders across Nations

8 The largest stellar Black Hole uncovered

9 Clouded Tiger Cat : New species discovered

10 Solar - powered spacecraft

11 NASA's Human Exploration Rover Challenge - Indians excel

12 90-million-year-old herbivore dinosaur fossil found

13 Nitroplast: A landmark discovery in biology

14 World's deepest blue hole is in Mexico

15 Ancient cave found in Saudi Arabia

17 Kami Rita Sherpa's 30th Everest ascent

National Current Affairs

18 CDP-SURAKSHA: Revolutionising horticulture subsidies

20 Adwaita Nayar - Young Global Leader 2024

21 SPACE: Sonar testing and evaluation facility

22 Indian students shine in European Girls' Math Olympiad

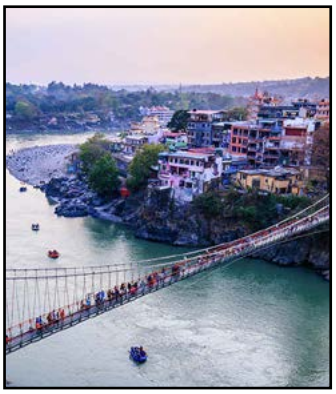
23 India's electronics exports surge

24 Pavuluri Subba Rao wins Aryabhatta Award

25 Shompen Tribe votes for the first time

26 Khongjom Day: Remembering martyrs of Anglo-Manipuri War

27 Women in top positions



28 Expansion of glacial lakes in the Himalayas

30 India's largest climate clock unveiled

31 Indian athletes shine on the world stage

32 Conservation efforts for Nilgiri Tahr

33 Nakshatra Sabha - India's first Astro Tourism Campaign

35 Manipur launches "School on Wheels"

36 Sesame -Revolutionising India's BFSI with AI

37 India ranks third in solar power generation

39 Combating forest fires in Uttarakhand

40 Semi-cryogenic engine using liquid oxygen kerosene

Defence updates

41 Siachen saga- 40 years of Operation Meghdoot

44 DRDO's lightest bullet proof jacket

45 SMART weapon to destroy hostile submarines

47 History of the fighter jet- Part 4

General Knowledge

50 Financial Literacy - Refresher Quiz- Consumer protection

53 Law in focus - Companies Act - Part 2

55 Param Veer Vandana - Major Dhan Singh Thapa

56 Padma Awardee - Dr K S Rajanna

57 Women scientists of India- Dr Urbasi Sinha

60 Living Naturally - Ayurvedic superfoods for a refreshing summer

62 Architectural wonder - Chenna Kesava Temple

63 Curiosity Corner - Varanasi

64 Unsung Heroes - Baikuntha Shukla and Yogendra Shukla

65 Spotlight of the month : Zehn Kashyap

Shri Ramasamy R

New leaders across Nations

Kuwait's new Prime Minister – Sheikh Ahmad Abdullah Al-Ahmad Al-Sabah

Kuwait is an Islamic country situated northernmost in the Arabian Peninsula, as buffer state between Iraq and Saudi Arabia. Kuwait also shares maritime boundaries with Iran. Kuwait is a member of the League of Arab States and is one of the 6 member countries of the Gulf Cooperation Council. His Highness Mishah Al-Ahmad Al-Jaber Al-Sabah (83) is the **Emir of Kuwait.**

Sheikh Ahmad Abdullah Al-Ahmad Al-Sabah

Sheikh Ahmad Abdullah Al-Ahmad Al-Sabah (72) was made the PM designate in April 2024 following the resignation of Sheikh Mohammed Sabah Al-Salem Al-Sabah. The new PM took oath of office on 15th May.

Earlier, the Emir of Kuwait had to dissolve the parliament as they had frequent tussles with the government. Still, the legislature in Kuwait is considered to wield more influence than similar bodies in other Gulf monarchies.

The incumbent PM holds a degree in Business Administration and has extensive experience in various ministerial positions.

Kuwait elections have no political parties and candidates participate only as individuals. External security is guaranteed by the USA which has stationed nearly 15,000 of their troops in the country.

Jose Raul Mulino wins Panama's Presidential elections

Presidential elections in Panama were held on 5th May 2024, The then incumbent President Laurentino Cortizo, by Constitution had become ineligible for a second term.

Jose Raul Mulino and seven others contested the elections. Earlier, Mulino was only to be running mate for Ricardo Martinelli, who as President between 2009 and 2014 faced corruption charges, was sentenced to 10-year prison term and

Country	App. Area (Sq.km)	Population (millions)	Language	Capital City	Currency	Economy
Kuwait	17,900	4.3	Arabic	Kuwait City	KWD (=3.3USD)	One of the richest nations of the world. Has the 6th largest oil & gas reserves.
Panama	75,000	4.4	Spanish	Panama City	Balboa (=1.01USD)	High middle income developing country.
Scotland	77,000	5.5	English	Edinburgh	Pound Sterling (=1.27USD)	Rich country. Food & beverages industry. Oil & gas reserves off North Sea.


Jose Raul Mulino


John Swinney

hence was disqualified to contest 2024 Elections. Martinelli evaded arrest and actively canvassed for Mulino, seeking asylum from inside Nicaraguan embassy.

Mulino, who will serve as head of state and prime minister for a single five-year term is set to take office on 1st July. He has promised to boost the economy, but face woes with government corruption, severe drought affecting traffic in the economically important Panama Canal and tens of thousands of illegal immigrants to USA, using his country as transit point.

John Swinney-Scotland's new First Minister and Veteran SNP leader

Scotland is one of the four non-sovereign countries that form the United Kingdom. England, Wales and Northern Ireland are the other 3 countries. Scotland accounts for nearly one-third of UK's land area, consisting of northern part of the island of Britain and more than 790 adjacent islands. Edinburgh is the capital and Glasgow is their largest city.

SNP leader John Swinney (60) was sworn in as the **seventh First Minister** of Scotland on 6th May 2024. Swinney took office 25 years after he first got elected to the Scottish Parliament and was backed by all 63 SNP MSPs. The rival candidate, veteran SNP activist Graeme McCormick withdrew his bid at the last moment.

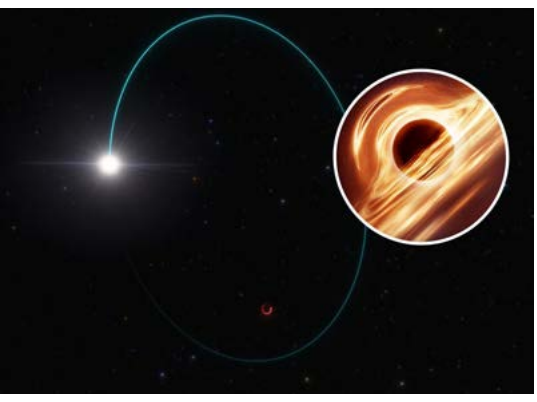
Born in Edinburgh, Swinney graduated with an M.A. in politics from the University of Edinburgh. He joined SNP at an early age and quickly rose to prominence by serving as the National Secretary from 1986 to 1992 and as Deputy Leader from 1998 to 2000.

Kum Anu Narayan

The largest stellar black hole uncovered

Astronomers have recently discovered the most massive stellar-mass black hole ever found in our galaxy. Named **Gaia BH3**, this black hole is incredibly close to Earth, located roughly 2,000 light-years away in the constellation Aquila.

Gaia BH3 is 33 times more massive than our sun. To put that in perspective, the next biggest known stellar black hole in our galaxy, Cygnus X-1, is only 21 times the mass of our sun. This discovery was made by a team of researchers who published their findings on 16th April in the journal **Astronomy and Astrophysics.**



"No one was expecting to find a high-mass black hole lurking nearby, undetected so far," said Pasquale Panuzzo, an astronomer at the Paris Observatory and a member of the Gaia collaboration. He added, "This is the kind of discovery you make once in your research life."

Black holes are formed when giant stars collapse. They grow by consuming gas, dust, stars and even other black holes.

There are two main types of black holes:

- stellar-mass black holes, which are a few dozen times the mass of our sun
- supermassive black holes, which can be millions to billions of times more massive than the sun.

Astronomers have a hard time finding intermediate-mass black holes, which theoretically range from 100 to 100,000 times the sun's mass. Finding and studying smaller black holes like Gaia BH3 helps scientists understand how black holes evolve and influence their surroundings.

The discovery was made using the European Space Agency's Gaia spacecraft which maps the positions and movements of stars in the Milky Way. The researchers noticed a star with a slight wobble in its path, suggesting it was being pulled by an invisible black hole companion. Further observations were made using the Very Large Telescope in Chile, confirming the black hole's existence and its mass. Gaia BH3 is now the second-closest known black hole to Earth, with Gaia BH1 being the closest at 1,500 light-years away.

Scientists are eager to study Gaia BH3 further to learn how it formed and how it affects nearby matter. Initial findings show that the star orbiting it is "metal poor," meaning it lacks elements heavier than hydrogen and helium. This supports the theory that **smaller black holes can form from stars that fused less nuclear fuel into heavier elements.**

Smt Sarada Devi Ravutu

Clouded Tiger Cat

New species discovered

The diversity of animal and plant species is a treasure that must be protected as all of them, including humans, rely on many other species for survival.

A new tiger species, the clouded tiger cat *(Leopardus paranoids)*, has been recently discovered in the dense rainforests of Brazil to the delight of scientists and animal lovers.

Distinctive features

- This small wildcat is about the same size as a housecat.
- It has a spotted coat that helps it blend in with its surroundings.

Habitat

- The cloud forests of the southern Central American and Andean mountain chains, span from Costa Rica to Argentina.
- The clouded cat's habitat vastly differs from that of its relatives, the northern tiger cat and the Atlantic Forest tiger cat, which live in savannahs and shrub lands.

Threats

- Widespread deforestation and habitat destruction.
- Aggressive land clearing for agriculture and urban development.
- Illegal hunting and disease transmission from domestic animals.

Importance of discovery

This discovery highlights the diverse range of wildlife found in the Americas. Conservationists warn that without urgent action, this species and its relatives could face extinction. We must adopt sustainable practices, to ensure the species' survival.

It is a call to action for governments, organizations and individuals to protect our planet's precious wildlife.

DO YOU KNOW ?

- **The Amazon rainforest is the world's largest intact forest.**
- **It absorbs about 25% of atmospheric carbon dioxide and produces 6% of the total oxygen in Earth's atmosphere through photosynthesis. For these reasons, the Amazon rainforest is called the "lungs" of the planet.**
- **A cloud forest is a type of rainforest but the altitude is usually much higher, in the range of 3,000 to 8,000 feet. It is hard to see the sky through the canopy of trees, as it is almost always misty. Hence the name cloud forest, as it looks like you are in a cloud.**

Shri Mrithyunjay GN

Solar - powered spacecraft

Imagine a ship sailing, not through waters, but through the darkness of space. Imagine its sails unfurling and as they catch the sunlight, the ship is propelled forward by solar winds. It would make for an incredible science fiction story. What if I told you it is much closer to reality than you think?

On 25th April 2024 the National Aeronautics and Space Administration (NASA) launched a spacecraft from New Zealand, in collaboration with US based aerospace manufacturer, **Rocket Lab.** The spacecraft is equipped with the **Advanced Composite Solar Sail System (ACS3),** a 90 square metre sail that will use the pressure of sunlight for propulsion.

The ACS3 consists of an extremely thin sail made of proprietary composite material that is folded in an intricate pattern, designed based on the Japanese principle of origami, to occupy as little space as possible. This folded structure will be attached to collapsible arms. The collapsible arms are part of a **cubesat**.

A CubeSat is a tiny, customizable satellite that ranges from the size of a Rubik's Cube to a small microwave oven. It is designed to be lightweight and cost effective in terms of construction and built in modular units, allowing for different configurations.

The cubesat is launched as part of any rocket mission to deposit satellites in space. Once in orbit around the earth, it will begin unfurling its arms to stretch out the solar sail. After 25 minutes, the solar sail will be fully deployed. Onboard cameras will obtain images of the sail during and after deployment in order to assess its shape and alignment.

Solar sails use the pressure of sunlight for propulsion, angling towards or away from the sun so that photons bounce off the reflective sail to push the satellite forward spacecraft.

After its launch and successful sail deployment, 1000 kilometers above the earth, the spacecraft has been in its testing stage. The mission team has been conducting a series of pointing maneuvers to test the craft's ability to lower and raise itself in orbit.

The success of ACS3's testing marks an important milestone in the development of a system of space travel that does not require large amounts of expensive and heavy rocket fuel. Further developments and success would result in extreme cost benefits in terms of space travel. So a future with more spectacular achievements is not far away.

Smt Archana Sundar

Indian students shine at NASA Human Exploration ROVER CHALLENGE

Two Indian student teams have brought laurels to the country by winning prestigious awards at the NASA **Human Exploration Rover Challenge (HERC).** The HERC is an annual engineering competition organized by NASA, celebrating its 30th anniversary this year. It is one of NASA's longest-standing challenges, reflecting the goals of the Artemis programme, which aims to land the first woman and the first person of colour on the Moon and establish a long-term lunar presence for scientific exploration.

This year's HERC witnessed participation of over 600 students across 72 teams from around the world. The teams represented 42 colleges and universities, as well as 30 high schools from 24 US states, the District of Columbia, Puerto Rico and 13 other countries, including India.

The teams were evaluated based on their performance in navigating a half-mile obstacle course, conducting mission-specific task challenges, and completing multiple safety and design reviews with NASA engineers.

In the high school division, Parish Episcopal School from Dallas, United States, secured the first place, while the University of Alabama in Huntsville captured the college/university title.

The KIET Group of Institutions from Delhi-NCR won the "**Crash and Burn"** award, recognizing their exceptional performance in a specific aspect of the competition. Meanwhile, the Kanakia International School from Mumbai was honoured with the "**Rookie of the Year**" award, acknowledging their impressive debut in the challenge.

The HERC is one of NASA's eight Artemis Student Challenges, designed to encourage students to pursue degrees and careers in the fields of **science, technology, engineering, and mathematics (STEM)**. By providing such opportunities, NASA aims to inspire and nurture the next generation of innovators and explorers who will contribute to the agency's future missions and advancements in space exploration.

The achievements of the Indian student teams at this prestigious competition not only showcase their technical prowess but also highlight the nation's growing prominence in the STEM fields.

Smt Vaishnavi V

90-million-year-old Dinosaur fossil found

Palaeontologists Rodrigo Alvarez and Sebastian Rozadilla from Argentina recently published their findings on a new medium sized dinosaur - *Chakisaurus nekul* discovered in 2018. This herbivore lived about 90 million years ago belonging to the late Cretaceous period. The species was found in the Patagonian region in Pueblo Blanco Natural Reserve, southern province of Río Negro, an area rich in fossils of fishes, turtles, crocodiles and dinosaurs.

Name origin - *Chakisaurus nekul*

Chaki is derived from the Aonikenk language of the indigenous Tehuelche people, meaning "old guanaco" - a medium-sized herbivore lizard and Nekul means "swift|" in the Mapudungún language, of the indigenous Mapuche people.

Features unveiled

The findings indicate that

1. it was about 2.5 m and 3 m in length and stood about 0.7 m tall.
2. it was a fast runner, a feature developed to escape its predators.
3. its most important characteristics - a tail, unlike other dinosaurs, was horizontal with a downward curvature.
4. its strong hind limbs and the unique tail allowed it to manoeuvre to the sides and balance during races.

Species open path to new study on Dinosaurs

The ancient creature belongs to Elasmaria, a class of Ornithopods -bipedal herbivorous dinosaurs with bird-like hips known from the cretaceous deposits in South America, Antarctica and Australia.

Despite the number of the Elasmarian dinosaurs found in the above regions, several aspects of anatomy has always remained poorly known. The discovery of certain parts of *Chakisaurus nekul* has contributed to the study of the ornithopod anatomy.

The anatomical information provided has also proven that elasmarians were very different from other ornithopod lineages and that further studies will be needed to recognize their uniqueness and diversity.

Kum Shrivaishnavi R

A landmark discovery in biology

We are aware that every cell has division of labour in it. Such designated roles are performed by structures called 'organelles'. These perform their cellular duties which lead to the successful functioning of the cell. One such organelle has been discovered: a nitroplast. But this is no ordinary discovery; this marks a significant event in the evolution of cells and their organelles. Let's see how.

There are two kinds of cells: prokaryotes (primitive cells) and eukaryotes (advanced cells). Both have different organization levels and complexity. In fact, it is believed that prokaryotes GAVE RISE to eukaryotes when one very large prokaryote engulfed a very small prokaryote.

This is the basis of the Endosymbiotic theory. This engulfed prokaryote becomes integrated with the host system to eventually become an organelle. So, basically, all complex life owes its existence to prokaryotes.

How does one confirm that a bacterium has coalesced with a eukaryotic host to become an organelle? While there are a few litmus tests to tick the boxes, one of the hallmark indications is that the prokaryote is no longer independent and relies on the host to carry out its activities. This act of seeking the host's support for existence leads the prokaryote to become an organelle in time.

It is said that this event happened 2 billion years ago. Such engulfment gave rise to two organelles we recognize ever so easily: the **Mitochondrion** (the powerhouse of the cell) and the **Plastid** (the kitchen of the cell). Both these organelles are absent in prokaryotes, but present in eukaryotes.

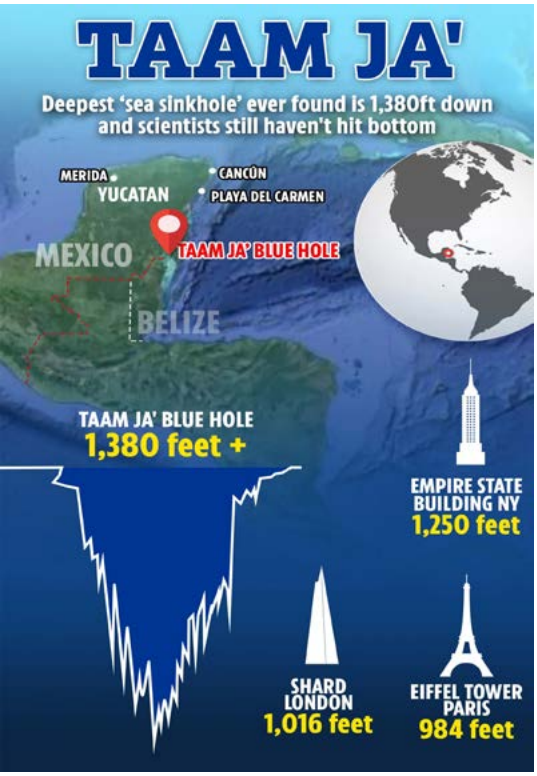
But one feature that was exclusive to prokaryotes was **nitrogen fixation**: converting the abundant nitrogen in the atmosphere to a better usable form for plants to use during photosynthesis. Until now.

A researcher, Tyler Coale in Professor Zehr's lab in the USA, has discovered a cyanobacterium capable of nitrogen fixation. On the other side of the world, Professor Hagino from Japan found that a marine alga was the host of the same cyanobacterium discovered by Coale and Zehr. Additional studies have confirmed that such a symbiotic relationship has probably started 100 million years ago – which is relatively recent considering the age of the planet and the pace at which such evolutionary events take place.

This is why this is a remarkable moment in biology: it is revolutionary and recent.

Kum Sunita D Behera

World's deepest Blue Hole is in Mexico



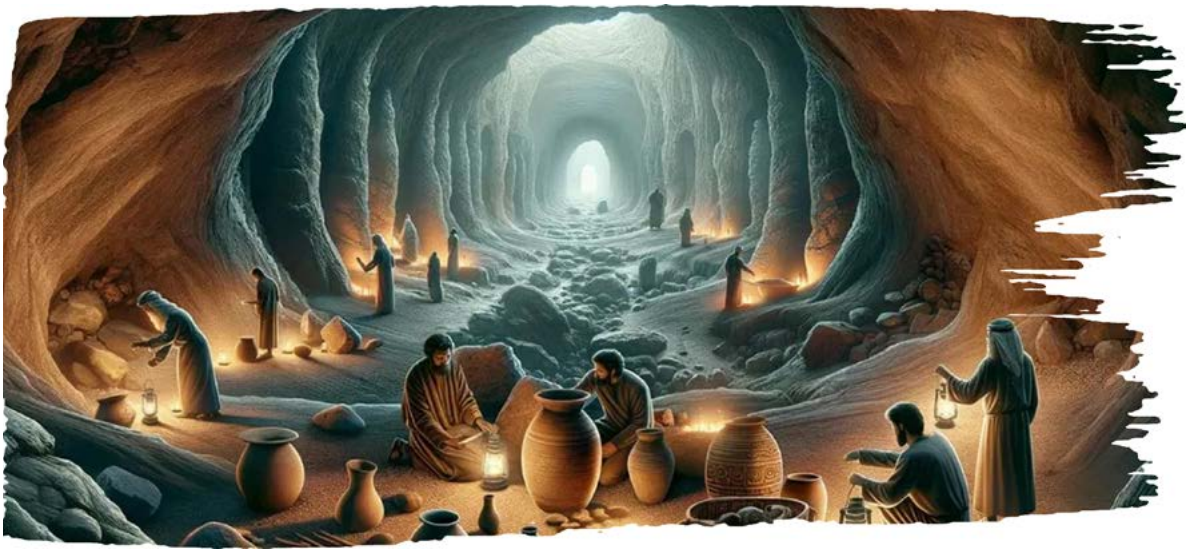
Scientists have made an incredible discovery in Mexico's Chetumal Bay. They found the **Taam Ja' Blue Hole,** which is now known as the deepest blue hole on Earth, reaching a depth of 1,380 feet. This is 480 feet deeper than the previous record-holder, the Sansha Yongle Blue Hole in China. This exciting find marks the beginning of a new journey in marine science.

Back in 2021, researchers used echo-sounders to measure the depth of the Taam Ja' Blue Hole and found it to be 900 feet deep. Recently, they used advanced technology, including a special device called a CTD profiler, to measure even deeper. However, they still have not reached the very bottom due to obstacles like underwater ledges or strong currents at 1,380 feet.

Blue holes serve as biological hotspots hosting diverse marine life, including corals, sponges, molluscs, sea turtles and sharks.Scientists are excited about what they might find in the Taam Ja' Blue Hole. They think it could have new types of marine life that have adapted to live in complete darkness and under high pressure. Similar discoveries in the Bahamas' blue holes have revealed unique bacteria that thrive in such extreme conditions. This could give us clues about life on other planets.

Exploration of blue holes has been limited due to challenging access conditions, as most blue holes have small openings that are several hundred feet underwater, making them inaccessible for automated submersibles. The absence of oxygen and the presence of dangerous gases mean that researchers need special equipment and skills. Despite these difficulties, scientists are eager to continue their exploration. They hope to uncover the secrets of this deep blue hole and learn more about Earth's deepest marine ecosystems.

Smt Anuradha V R



Ancient cave found in Saudi Arabia

The scientific study underscored the importance of caves utilized by ancient human groups and the ancient volcanic magma paths within Saudi Arabia.

The Saudi Heritage Commission has announced the discovery of new evidence of human settlement in Umm Jirsan cave in Harrat Khaybar in the Madinah region.

The research was conducted by the Heritage Commission under the Ministry of Culture with participation of some archaeologists in collaboration with King Saud University, the Max Planck Institute and the Saudi Geological Survey through the Green Arabian Peninsula project, which focuses on multidisciplinary field research.

The scientific study underscored the importance of caves utilized by ancient human groups and the ancient volcanic magma paths within Saudi Arabia. The study, published in the journal ***Plos One*** represents the first comprehensive study of archaeological research in caves in the Kingdom.

The study revealed evidence of human occupation dating back to the Neolithic period around 10,000-7,000 years ago, encompassing the Copper Age and Bronze Age periods.

The discovery revealed animal remains such as bones dating back to 4100BC, human skulls dating back to 6000 BC and other artefacts including wood, cloth fragments and stone tools. This is in addition to rock art facades that depicted scenes of grazing animals and hunting activities indicating pastoral life.

Animal bones, including those of striped hyenas, camels, horses, deer, caribou, goats, cows and wild and domestic donkeys were found to be remarkably preserved despite the passage of time. Furthermore, an analysis of human skeletal remains using radioactive isotopes

indicated a dietary shift over time, with ancient human groups primarily relying on a meat-based diet and gradually incorporating plants, suggesting the emergence of agriculture.

The study also highlighted the feeding habits of animals such as cows and sheep, which primarily consumed wild grasses and shrubs, and the region exhibited significant animal diversity throughout different historical periods.

For the first time, archaeologists have found evidence that human civilisation thrived inside lava tubes to fight the heat in the deserts of northern Saudi Arabia.

The **Umm Jirsan lava tube** lies some 125 kilometres north of the city of Madinah, in the Harrat Khaybar lava field. The tube was formed long ago by the cooling lava. It winds an impressive 1.5 kilometres and reaches 12 metres in height and 45 metres in width in some sections.

Researcher Mathew Stewart, excavated a trench inside Umm Jirsan along with his colleagues.

For more than 15 years, Stewart and his team have been exploring the region and earlier found numerous stone structures on the surface which proved human habitation.

A first-of-its-kind study in north western Saudi Arabia suggests that humans and their livestock have been using a cave for shelter sporadically for up to 10,000 years. The finding offers insight into the region's history and ecology.

In the past decade, satellite data and fossil finds have suggested that the Arabian Peninsula was not always an arid desert. Periods when the region contained lakes and lush greenery might have drawn people and animals there from Africa, according to the study's authors.

"Today, it's a fairly harsh environment," says Mathew Stewart. Across the surface of Saudi Arabia, "the fossil record is just horrendous", he says. Wind and scorching heat reduce bones and artefacts to dust, making them difficult to study.

But in 2018, Stewart and his colleagues discovered an 88,000-year-old finger bone from the Saudi Arabian desert — one of the oldest human fossils found outside of Africa. And in 2020, they discovered footprints on a lake shore dating back around 1,20,000 years. These suggest that the region had stories to narrate.

Shri Nagarajan R

Kami Rita Sherpa's 30th Everest ascent

Kami Rita (born 17th January 1970), is a Nepali Sherpa guide who, since May 2018, has held the record for most ascents to the summit of Mount Everest. Most recently, he scaled the mountain for the 30th time on 22nd May 2024, breaking his own record. His father was among the first professional Sherpa guides after Everest was opened to foreign mountaineers in 1950.

Everest is 8,848.86 meters above sea level, making it the tallest mountain peak on Earth. Kami Rita first climbed Everest in 1994 and has been making the trip nearly every year since. He is one of many Sherpa guides whose expertise and skills are vital to the safety and success each year of foreign climbers who seek to stand on top of the mountain. Kami holds the record for the most ascents of the world's tallest peak in its 71-year climbing history. He also currently holds the record for most 8,000 meter summits, totalling 40.

Kami Rita was born in Thame, a small village in the Solukhumbu district of Nepal. He lived with his large family in a one-room house. Thame is also the birthplace of other famous mountaineering Sherpas, including Tenzing Norgay who (alongside Sir Edmund Hillary) achieved the first ascent of Mount Everest in 1953.

Kami Rita lives with his wife and two children in Kathmandu. He has ensured that his children are getting an education to enable them to choose occupations that are less dangerous than guiding mountaineers. "We were illiterate and poor and there were no other means of survival (back then). As a result, we were compelled to climb dangerous mountains to eke out a living," he told a journalist.

His Instagram handle reads, **"Together, we defy limits and inspire others to reach for their own peaks of greatness. This summit isn't just a personal triumph; it's a testament to the power of resilience, teamwork and the human spirit. Here's to embracing challenges, chasing dreams and scaling new heights."**

DO YOU KNOW ?

- Since the first ascent seven decades ago, Everest has been climbed more than 11,000 times.
- Everest is known as Sagarmatha in Nepal.

Smt Shubha T R

CDP–Suraksha

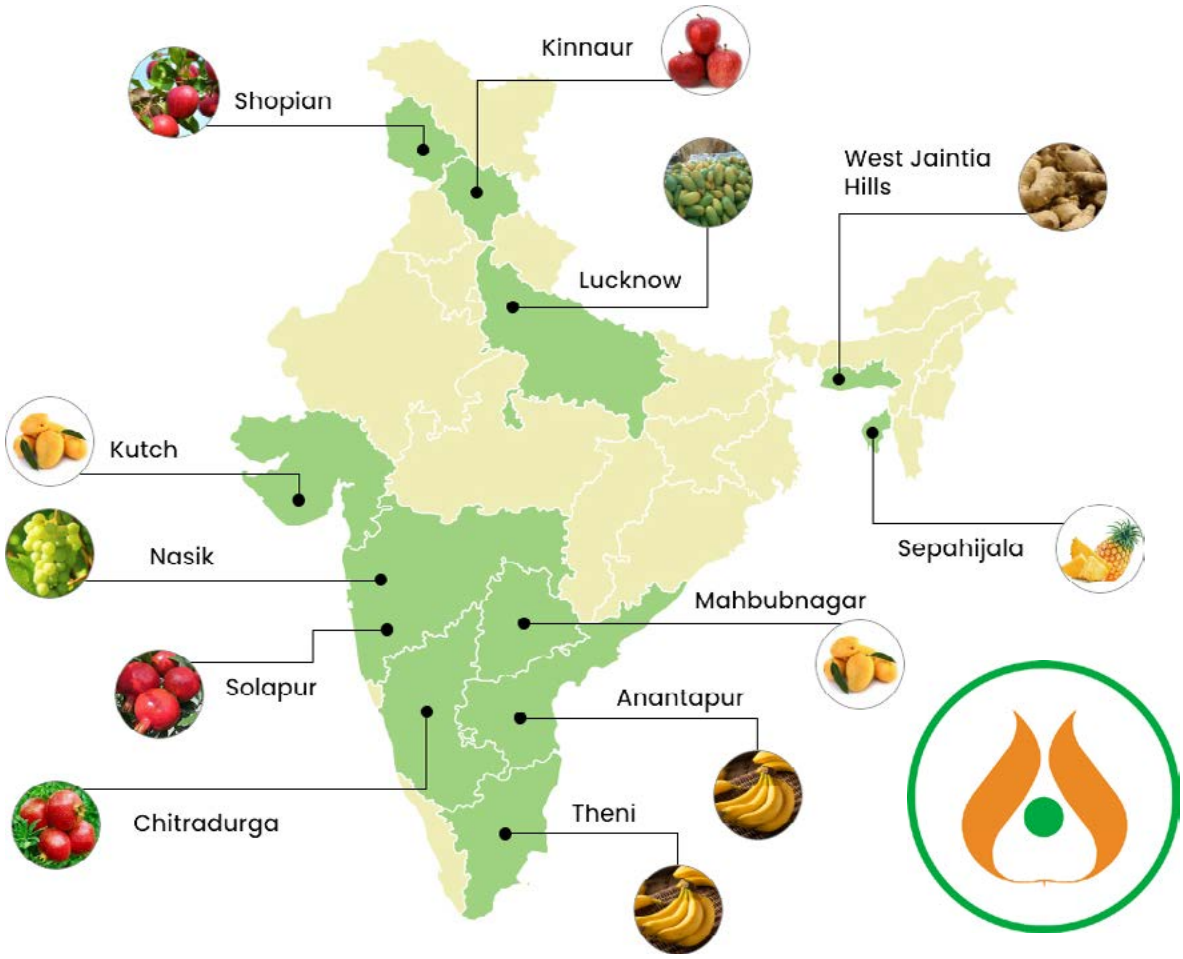
Revolutionising horticulture subsidies

DO YOU KNOW ?

- **Horticulture** derived from the Latin word *"hortus"* (garden) and *"cultūra"* (cultivation), is the branch of agriculture that deals with cultivation, production and sale of vegetables, fruits, flowers, herbs, ornamental plants etc.
- **M.H. Marigowda** is considered the 'Father of Indian horticulture'.
- **eRUPI** is a one-time payment mechanism developed by NPCI. It enables users to redeem the vouchers without a card, digital payments app or internet banking access. Merchants would accept UPI e-prepaid vouchers. The e-RUPI would be shared with the beneficiaries for a specific purpose or activity by organisations via SMS or QR code.

India is on the cusp of horticulture upsurge, thanks to significant shift in dietary preferences of its population with an emphasis on nutrition security than calorie intake. CDP-SURAKSHA is a shining example of digital innovation revolutionising the horticulture landscape.

The Indian horticulture sector utilizes only 10% of land while contributing about 33% to the **Agriculture Gross Value Add** (GVA) making a very significant contribution to the Indian economy. Also, the productivity of horticulture crops is much higher compared to productivity of food grains (12.49 tons/hectare against 2.23 tons/hectare.)



CDP **(Cluster Development Programme)**, a central sector programme under **National Horticultural Board** (NHB) aims at growing and developing identified horticulture clusters (Eg., Siphahijala (Tripura) for pineapple) to make them globally competitive.

SURAKSHA- "System for Unified Resource Allocation, Knowledge and Secure Horticulture Assistance" is a digital platform under CDP. It enables the government to instantly disburse subsidies directly onto the bank accounts of the farmers through e-RUPI Vouchers from **National Payments Corporation of India (NCPI).**

This platform integrates features like database integration (over 8,400 farmers details) with PM-KISAN, cloud-based server space from NIC (National Informatics Center), UIDAI (Aadhar validation), eRUPI integration, geo-Tagging etc.

How CDP-SURAKSHA works

A farmer can login (https://cdp.nhb.gov.in) using their mobile number, place orders (for seeds, fertilisers etc.) and contribute their share of cost. After the payment, an e-RUPI voucher (of subsidy) will be generated.

This voucher will then be received by a vendor, who will provide the required planting material to the farmer. After the delivery of material, farmers have to verify the delivery through geo-tagged photos of their field.

After verification, implementing agencies (IA) will release the money to the vendor for the e-RUPI voucher.

Thus, direct transfer of subsidies under CDP Suraksha ensures that **subsidies reach the intended beneficiaries promptly, minimizing leakages and enhancing the effective utilisation of funds.**

ADWAITA NAYAR

Young Global Leader 2024

The World Economic Forum has named Nykaa co-founder and Nykaa Fashion CEO Adwaita Nayar as a '2024 Young Global Leader' "What is particularly exciting, is to be able to learn from diverse delegates - learn about inclusive and sustainable practices in various countries and industries - and bring those ideas to India," said Adwaita Nayar.

In the third quarter of FY24, Nykaa Fashion achieved a Gross Merchandise Value (GMV) of ₹1,013 crores. Adwaita leads a vast team of nearly 400 people and is best known for being entrepreneurial, leading all things disruptive, a strong team builder and an unrelenting executor. With Nykaa Fashion, Adwaita has built a business that gives equal importance to price, style, value, choice and quality, further enabling the brand to stand out in the clutter of discount-led platforms.

During Nykaa's IPO, Adwaita played a critical role in showcasing the fashion story to investors as part of 300+ roadshows. Under her guidance, Nykaa Fashion has established partnerships with over 3,000 leading international and domestic brands across four consumer divisions: women, men, kids and home. Adwaita Nayar has been an integral part of Nykaa, the beauty and fashion e-commerce platform, since its inception. She has worked alongside her mother, Falguni Nayar, the founder of Nykaa, and has played a pivotal role in the company's growth and success.

DO YOU KNOW ?

- **Forum of Young Global Leaders programme is designed by World Economic Forum to identify and empower the next generation of leaders who have the potential to shape the future of the world.**
- **The programme provides individuals with access to resources, mentorship and a global network, enabling them to amplify their impact and forge collaborative solutions to pressing global challenges.**

Kum Pavithra S

SPACE

Sonar testing and evaluation facility

In a significant step towards boosting India's naval capabilities, the Department of Defence (R&D) and the Defence Research and Development Organisation (DRDO) inaugurated the **Submersible Platform for Acoustic Characterisation and Evaluation (SPACE)** on 17th April 2024. Located at the Underwater Acoustic Research Facility in Kulamavu, Idukki, Kerala, this state-of-the-art facility, set up by the Naval Physical & Oceanographic Laboratory of DRDO, will serve as a premier hub for testing and evaluating sonar systems for the Indian Navy. This is crucial for the country's maritime defence strategy.

Sonar (Sound Navigation and Ranging) systems are essential in modern naval warfare, enabling the detection, tracking and identification of submarines, surface vessels and other underwater objects. These advanced acoustic sensors are vital for effective Anti-Submarine Warfare (ASW) operations, which are key to protecting maritime interests and ensuring the safety of naval assets. As the Indian Navy expands its fleet and modernizes its capabilities, the need for robust and reliable sonar systems grows. The SPACE facility demonstrates DRDO's commitment to developing and testing these technologies. This ensures that the Indian Navy remains equipped with cutting-edge sonar systems to maintain a strategic advantage.

● **Sonar is a technique that uses sound propagation to navigate, measure distances, communicate with or detect objects on or under the surface of the water, such as other vessels.**

SPACE facility includes two platforms:

- a **floating platform** on the water surface and
- a **submersible platform** that can be lowered to depths of up to 100 meters using winch systems.

This design allows for comprehensive evaluation of sonar systems, enabling quick deployment and easy recovery of scientific equipment like sensors and transducers. Equipped with modern scientific instruments, SPACE facilitates the survey, sampling and data collection of air, surface, mid-water and reservoir floor parameters, meeting a wide range of research and development needs.

The facility also houses well-equipped scientific laboratories for advanced data processing and analysis, enabling detailed evaluation of collected data. **SPACE will play a crucial role in advancing India's Anti-Submarine Warfare research capabilities, strengthening naval defence and protecting maritime interests.**

Smt Archana Sundar

Indian students shine in European Girls' Mathematical Olympiad

In the 13th **European Girls' Mathematical Olympiad (EGMO)** held in April 2024, the Indian team emerged victorious, securing an impressive haul of medals. The four-member Indian contingent won two silver and two bronze medals, marking the second time since India's debut in 2015 that all participants have medalled at EGMO.

The team's achievement is attributed to the dedicated mentorship of Sahil Mhaskar (Head), Ms. Aditi Muthkhode (Deputy Head), and Ms. Ananya Ranade (Supervisor) from the **Chennai Mathematical Institute (CMI).**

India's participation in EGMO is supported by the **Tata Institute of Fundamental Research (TIFR) – Homi Bhabha Centre for Science Education (HBCSE),** the nodal centre for Olympiad programmes in various disciplines. With structured training through the **EGMO Training Camp (EGMOTC)** and continuous support from the National Board of Higher Mathematics (Department of Atomic Energy), HBCSE nurtures and prepares talented students for international competitions.

Since 2021, the EGMOTC has been conducted by CMI, selecting the EGMO team based on their performance in tests. The camp aims to inspire girls to participate in national and international STEM Olympiads, offering them a separate track to foster their talent. This initiative has successfully increased participation from schoolgirls worldwide.

To honour the achievements of the Indian delegation, a felicitation ceremony was held at the Main Building of HBCSE on 18th April 2024. The event celebrated the remarkable success of these young mathematical prodigies, acknowledging their dedication and hard work.

EGMO, which began in the UK in April 2012, has grown to include over fifty countries, welcoming participants from beyond Europe. It provides a platform for high school female students who enjoy mathematics beyond the regular curriculum, fostering cultural exchange and shaping students' interest in STEM fields.

Student's Name	Location (State)	Award/Medal
Gunjan Agarwal	Gurgaon, Haryana	Silver Medal
Sanjana Philo Chacko	Thiruvananthapuram, Kerala	Silver Medal
Larissa	Hisar, Haryana	Bronze Medal
Saee Vitthal Patil	Pune, Maharashtra	Bronze Medal

Shri Sampath D

India's electronics exports surge

India exported electronics goods worth USD29.12 billion in 2023-24, up 23.6 % compared to a year ago. The top 5 export markets for electronics goods being — the USA, United Arab Emirates, Netherland, United Kingdom and Italy. **The new markets where exports ventured into include, Montenegro, Cayman Islands, El Salvador, Turkmenistan, Mongolia, Honduras and St Vincent.** This reflects India's increasing presence and diversification in the global market.

This impressive growth not only signifies India's position in the global electronics market but underscores the potential for further expansion into newer and emerging markets. The diversification of newer export destinations showcases India's commitment to embracing new opportunities and enhancing its global trade footprint. It was spearheaded by surging smartphone shipments, especially Apple's iPhone.

Mobile phone exports, accounting for 52% of total electronics exports, reached USD 10.5 billion between April and December 2023. Notably, iPhones emerged as the primary driver of exports, contributing 35% of the total electronics exports and a staggering 70% to the country's overall mobile exports during this period.

The electronics exports experienced the fastest growth among the top 10 export categories in the current financial year, elevating the sector to the fifth position from sixth last year. This growth is attributed to the smartphone **production-linked incentive (PLI)** scheme initiated by the GOI in 2021.

Recent data highlights a notable surge in India's electronics exports to the US, which increased by approximately 253% to an estimated USD 6.6 billion in the current year (January-September), compared to an estimated USD 2.6 billion in the same period last year.

The share of electronics imports from China into the US has decreased from an estimated 46% in 2018 to an estimated 24% in January-September 2023.

India is swiftly emerging as a significant contender in the global

electronics manufacturing arena, experiencing a rapid upsurge in its electronics exports.

The factors contributing to this growth include:

Government initiatives: The Indian government's **"Make in India"** campaign and **production-linked incentive (PLI)** schemes are providing significant support to domestic manufacturing, attracting foreign investments in the electronics sector.

Shifting supply chains: Companies are increasingly diversifying their manufacturing bases to mitigate risks and reduce their dependence on China.

Large and skilled workforce: India boasts a young and growing population, offering a readily available and trainable workforce for the electronics industry.

Strategic partnerships: Indian companies are actively forging strategic partnerships with global technology leaders, further propelling the growth of the electronics sector.

Smt Silpa Nandakumar

Pavuluri Subba Rao wins Aryabhatta Award

A former scientist at ISRO, Pavuluri Subba Rao, currently the Founder, CEO and Chairman of Ananth Technologies, has been conferred with the prestigious "Aryabhatta Award" by the **Aeronautical Society of India (ASI)**. In addition, Dr. Rao was also bestowed with the title of ASI's "Distinguished Fellow" to recognise his "tremendous lifetime contribution to the promotion of astronautics in India".

An alumnus of the National Institute of Technology, Calicut, Rao began his journey as a scientist at ISRO, which gave him unparalleled experience and expertise in space technology. In 1992, he took the entrepreneurial leap for Ananth Technologies Limited.

Ananth Technologies Limited was incorporated to indigenously design and develop sophisticated avionics for ISRO and the Defence sector. The Hyderabad-based company has supplied key components and technologies to 98 satellites and 78 launch vehicles for the Indian space programme. Under Rao's vision and leadership, Ananth Technologies has been a driving force in fostering self-reliance and technological advancements in India. The company now has 1600 employees with three Centres of Excellence in Hyderabad, Bengaluru and Thiruvananthapuram.

The Aeronautical Society of India presents the Aryabhatta Award to people who have made significant contributions in the field of astronautics and aerospace technology in India. Established in 1990, the society is a member of the International Astronautical Federation. The award, named after Aryabhatta, a fifth-century astronomer and mathematician, commemorates Aryabhatta the first Indian satellite launched on 19th April 1975.

This prestigious award was presented to Dr. Rao by S. Somanath, President, ASI and Chairman, ISRO, and Dr. Kiran Kumar, former Chairman, President, ISRO on 17th April 2024 in an event held at Ahmedabad.

With valuable contributions from individuals like Pavuluri Subba Rao, India continues to make developments in the realm of astronautics and remains committed to fostering excellence and innovations in the field.

The Shompen Tribe votes for the first time

The Constitution of India guarantees universal adult suffrage .This in effect means that without any discrimination, every Indian citizen above a certain age has a right to vote. Despite this there are still people in this country who are not able to vote due to the lack of awareness, education, accessibility, communication and various other reasons. A significant section of the tribals fall into this category.

India has a tribal population of 8.6% that includes 75 groups of tribes called the **Particularly Vulnerable Tribal Groups (PVTGs)**. Due to the special outreach of the Election Commission of India (ECI) over the past two years, PVTG communities have been enrolled as voters to facilitate their participation in the electoral process. During the national level special summary revision of the electoral rolls in 2022-23, focused enrollment of the PVTGs was done. For the first time in 77 years the Shompen tribals who are a PVTG voted in this general elections in the Andaman and Nicobar Lok Sabha constituency. This community lives in the dense tropical rain forests of the Great Nicobar Island. They avoid contact with the outside world and they suffer from low fertility and genetic diversity. According to the 2011 census their estimated population is 229 and it is fast dwindling. Extrapolating the data it is estimated that they may become extinct by 2081 if suitable actions are not taken.

While on the one hand it is shameful that a tribe in free India has not voted for 77 years, it is of profound significance that they have participated in the elections this year. This marks the inclusion and integration of this tribe in the electoral process. Such inclusion of the marginalized communities will give them a handle in the decision making process that could shape their future lives.

Hearing such voices, understanding them and factoring their perspectives in policy formulations will promote inclusivity and bring out the rich and unimaginable cultural diversity and plurality of Bharat.

Kum Kavya R

Khongjom Day

Remembering martyrs of Anglo-Manipuri War

The state of Manipur observes Khongjom Day on 23rd April to honour the martyrs who lost their lives in the Anglo-Manipuri war against the British in 1891. The state-level observation was held at the Khongjom War Memorial Complex located at Kheba Ching in Khongjom, Thoubal district.

Manipur Governor Sushri Anusuiya Uikey, Chief Minister N. Biren Singh, cabinet ministers, MLAs and top civil and police officers attended the observation. As a part of the observation, the governor and chief minister laid floral wreaths. A guard of honour, a general salute, reverse arms, the sounding of the last post and a two-minute silence observation followed suit.

The tumultuous history of the Anglo-Manipuri War

The Anglo-Manipuri War is one of the most important historical events in Manipur's history. The background of this war begins in 1826, when Manipur regained its freedom from Burmese forces with the help of the British army.

After the Anglo-Burmese war, Manipur was placed under the protection of British officials, with payment of taxes in return. An office of the British Political Agent was established in 1935 to promote friendly relationships, which marked the beginning of British colonialism in Manipur.

After the death of the reigning king, Maharaja Chandrakirti, his son Surchandra became the king, with Kullachandra as the crown prince and Tikendrajit as the Senapati. But hostility between the princes led to Kullachandra revolting against Surchandra on 12th September 1890. Surchandra abdicated the throne, Kullachandra became the king, and Tikendrajit became the crown prince. Upon Surchandra's complaint that Tikendrajit was the mastermind behind the plan to dethrone him, the British ordered the arrest of Tikendrajit in fear of losing their control over Manipur.

Colonel Skene arrived with 400 Gorkha soldiers on 22nd March 1890 to arrest Tikendrajit. When Kullachandra refused to hand him over, the British force attacked

Kangla, the palace of Manipur, on 24th March 1890. Many innocent lives were lost on that day. This unjust attack agitated the crowd, leading to the public execution of all the British officers in front of the Kanglasa.

As soon as this news reached Calcutta in March 1891, the Government of British India declared war against Manipur. On 27th April 27 1891, all three British columns occupied Imphal, Manipur's capital. Kullachandra, Tikendrajit and Thangal were sentenced to death. Amidst the massive protests, Tikendrajit and Thangal were hanged to death on 13th August 1891. Manipur still observes Patriot's Day on 13th August to remember the brave soldiers of Manipur who laid their lives down for their motherland.

Women in top positions

Professor Naima Khatoon was appointed as the Vice-Chancellor of the Aligarh Muslim University (AMU) by President Droupadi Murmu. She is the first woman to occupy this position.

The AMU Vice-Chancellor holds an important position in the Muslim community, both in India and abroad. Khatoon's appointment is being viewed as a message to the Muslim world, showcasing the government's commitment to inclusive leadership.

Naima Khatoon's journey from a lecturer to the Vice-Chancellorship of a University is a testament to her academic excellence and perseverance. Different stakeholders on the campus are eager for the new Vice-Chancellor to put an end to the culture of ad-hocism and focus on research and the development of education at the university.

Meghalaya gets first woman police chief

Idashisha Nongrang is the state's first woman Director General of Police (DGP). She is a 1992 batch Indian Police Service (IPS) officer. She hails from the Khasi community which is one of the three matrilineal ethnic communities in Meghalaya.

Nongrang's appointment holds significant cultural significance. She previously served as the acting DGP in 2021, demonstrating her preparedness for the pivotal role.

Such appointments are a proof to the progress being made towards gender equality in leadership roles. Their appointments are expected to pave the way for future generations of women to aspire and achieve leadership positions in various fields.

DO YOU KNOW ?

The three main ethnic tribal groups that form Meghalaya are the Khasis, Garos and Jaintias. Their origins can be traced back to Burma and southern China. They have descended from the Mon Khmer race and follow a matrilineal system, where descent and inheritance are traced through the mother's lineage.

Smt Ramamani N

Expansion of glacial lakes in the Himalayas

The retreat in the Himalayan region leads to the formation of new lakes and the enlargement of existing ones.

The Indian Space Research Organisation (ISRO) has unveiled the lesser-known impacts of global warming and every sensitive citizen of the country must know about it in detail.

The Himalayan Mountains, often referred to as the **Third Pole** due to their vast glaciers and snow cover, are extremely vulnerable to global climate changes, which affect both their physical features and societal consequences.

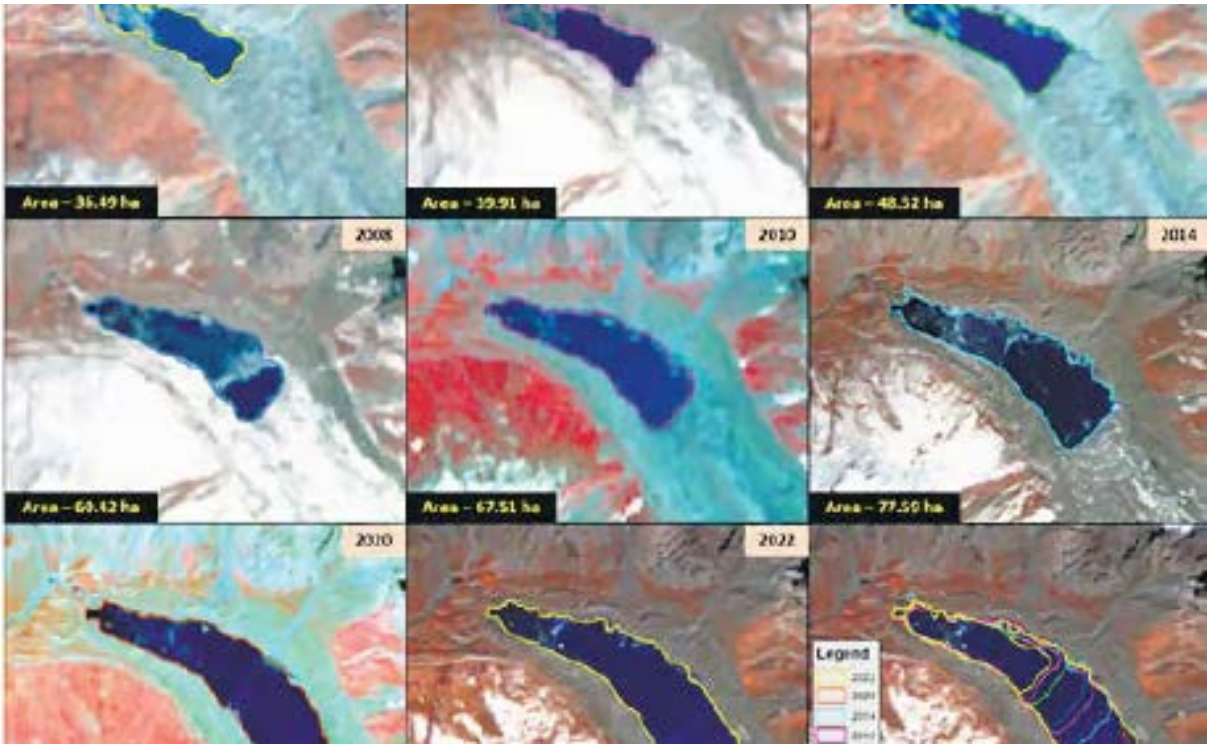
Research from around the world has consistently demonstrated that glaciers worldwide have been undergoing unprecedented retreat and thinning since the beginning of the Industrial Revolution in the eighteenth century.

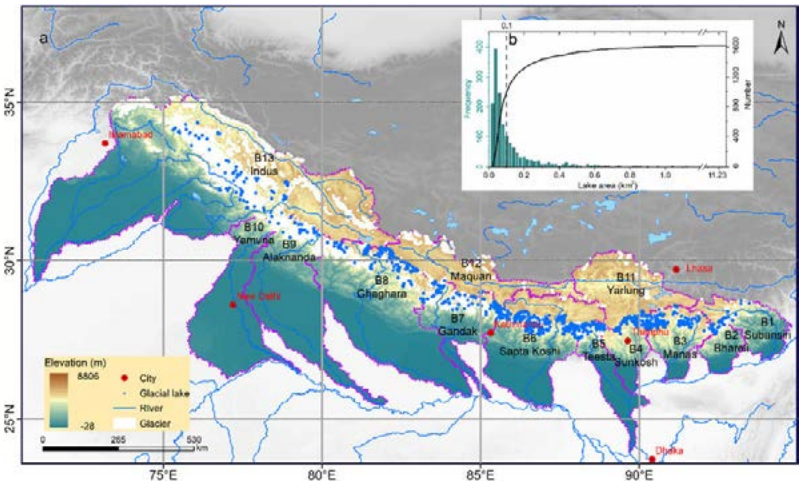
Importance of glacial lakes

The retreat in the Himalayan region leads to the formation of new lakes and the enlargement of existing ones. These bodies of water, created by the melting of glaciers, are known as glacial lakes and play a crucial role as freshwater sources for rivers in the Himalayan region. However, they also pose significant risks, such as **Glacial Lake Outburst Floods (GLOFs),** which can have devastating consequences for communities downstream.

Challenges

GLOFs occur when glacial lakes release large volumes of meltwater due to the failure of natural dams, such as those made of **moraine** or ice, resulting in sudden and severe





flooding downstream. These dam failures can be triggered by various factors, including avalanches of ice or rock, extreme weather events and other environmental factors. Monitoring and studying the occurrence and expansion of glacial lakes in the Himalayan region is challenging due to inaccessible and rugged terrain.

Satellite remote sensing technology proves to be an excellent tool for inventory and monitoring due to its wide coverage and revisit capability.

Insights

Satellite data archives spanning the past 3 to 4 decades provide valuable insights into changes occurring in glaciated environments. Long-term satellite imagery covering the catchments of Indian Himalayan River basins from 1984 to 2023 indicates significant changes in glacial lakes. Of the 2,431 lakes larger than 10 hectares identified during 2016-17, 676 glacial lakes have notably expanded since 1984. Specifically, 130 of these lakes are situated within India,

with 65, 7, and 58 lakes located in the Indus, Ganga and Brahmaputra river basins, respectively.

Elevation-based analysis reveals that 314 lakes are located in the 4,000 to 5,000 m range and 296 lakes are above 5,000 m elevation.

The Ghepang Ghat glacial lake in the Indus River Basin, located at an elevation of 4,068 m in Himachal Pradesh has increased in size by 178%, from 36.49 to 101.30 hectares between 1989 and 2022, at an average rate of 1.96 hectares per year.

In conclusion, we must make responsible use of natural resources instead of allowing fear of global changes to dictate our actions.

Shri Sampath D

India's largest Climate Clock unveiled

Recently as part of Earth Day celebrations, **Council of Scientific &Industrial Research (CSIR)**, installed and activated India's largest Climate Clock at its Head Quarters in Rafi Marg, New Delhi. It marks a pivotal moment in their commitment to environmental stewardship. This monumental event symbolizes the dedication to raising awareness and taking concrete actions towards a sustainable future.

The event signifies CSIR's aim to spread awareness about climate change and its ill effects.

Further the CSIR **Accelerating Modern Research, Innovations and Technologies (AMRIT)** Lecture Series aims to learn from the ideas and thoughts of India's foremost Science & Technology (S&T) leaders that can help pave the way for actions by R&D organisations in general and CSIR in particular.

Climate change refers to long-term shifts in temperatures and weather patterns. Human activities have been the main driver of climate change, primarily due to the burning of fossil fuels like coal, oil and gas.

The CSIR Climate Clock is a powerful statement of the collective responsibility to address the climate crisis. Designed to display real-time data on greenhouse gas emissions and global warming trends, this innovative installation serves as a constant reminder of the urgency to mitigate climate change and transition to renewable energy sources.

There is an imperative need to understand the significance of the Climate Clock and its role in driving meaningful change. From its intricate design to its technological capabilities, it makes this installation a landmark in India's environmental efforts. We need to pool in our resources and work together to harness the power of innovation and collaboration to combat climate change and safeguard our planet for generations to come.

There is an urgent need to spread awareness about climate change and to make people energy literate. It is a graphic to demonstrate how quickly the planet is approaching 1.5°C of global warming, given current emissions trends. It also shows the amount of CO_2 already emitted, and the global warming to date. The current climate temperature is 1.295°C.

Further CSIR have signed an MOU with Energy Swaraj Foundation through which a large number of scientists and staff in CSIR have undergone the Energy Literacy Training. Climate clocks provided by the Foundation have been installed in most CSIR labs.

Energy Swaraj Foundation
Energy by Locals for Locals

Smt Ghana Saraswathy M

Indian Athletes shine on the world stage

Recently, two big events highlighted India's growing success in athletics and unique sports.

U-20 Asian Athletics Championship

The 21st U-20 Asian Athletics Championship 2024 was held in South Korea and Indian athletes performed brilliantly.

Pavana Nagraj won gold in **Long Jump.** With remarkable stamina, she is a rising star in athletics.

Another highlight was **Rohan Yadav,** who grabbed the silver medal in the **Javelin Throw.** His strength and technique impressed everyone.

The Indian relay teams also did well, especially the **Men's 4x400 meters relay team,** which won the silver medal. Their teamwork and speed made India proud.

Takshvi Vaghani's amazing Limbo Skating record

A 6-year-old skater from Ahmedabad – Gujarat, Takshvi Vaghani achieved something truly extraordinary in limbo skating. Limbo skating is a sport where skaters bend backward and skate under a bar set at a certain height. She set a new world record for the lowest limbo skating over 25 meters.

Takshvi skated under bars set at just 17 cm above the ground for a distance of 25 meters. This feat requires amazing balance, flexibility and control. Her record-breaking performance has made her a sensation and an inspiration for young skaters everywhere.

As we celebrate these victories, we should also encourage more young people to take up sports and follow their dreams. With the right guidance and support, there is no limit to what they can achieve.

The future of Indian sports looks brighter than ever.

Kum Kavya R

Conservation efforts for Nilgiri Tahr

Nilgiri Tahr, the state animal of Tamil Nadu, is an endangered species of mountain ungulate found along the stretch of Western Ghats. The species that once used to be found along the entire stretch of Western Ghats is only found in small fragmented pockets at present. A large part of its population has been wiped out due to threats such as habitat loss and hunting. It is listed as Endangered in the International Union for Conservation of Nature (IUCN) Red List of Threatened Species and is protected under Schedule I of the Wildlife (Protection) Act of India, 1972.

In October 2023, the Tamil Nadu government launched 'Project Nilgiri Tahr', a conservation effort with the ₹25 crore budget. The objective of the project is to develop a better understanding of Nilgiri Tahr population, distribution and ecology, re-introduction of Nilgiri Tahr to their historic habitats, address proximate threat to the species, increase awareness among the public and develop eco-tourism activities at selected sites.

As a part of this initiative, the Tamil Nadu forest department plans to reintroduce the Nilgiri Tahr in the deep jungles of the **Sathyamangalam Tiger Reserve (STR)** after identifying habitats with right elevation and adequate fodder. They are spotted at heights of about 400 metres-2500 metres above sea level.

STR is the only reserve in Tamil Nadu which doesn't have Nilgiri Tahr at present while they had been spotted in 140 blocks in Mudumalai Tiger Reserve, Anamalai Tiger Reserve, Srivilliputhur Megamalai Tiger Reserve and Kalakad Mundanthurai Tiger Reserve.

Another component of **'Project Nilgiri Tahr'** is a biennial synchronised survey across divisions. As per the last assessment done in 2015 by WWF-India, there are 3,122 Nilgiri Tahrs in the wild in Tamil Nadu and neighbouring landscapes of Kerala. To improve conservation planning and management, a three-day synchronised Nilgiri Tahr census commenced on 29th April 2024.

"We have roped in the World Wide Fund for Nature and the Wildlife Institute of India for the population estimation. The third is IUCN, whose country director will be an observer in the exercise," said Supriya Sahu, Additional Chief Secretary to the Departments of Environment, Climate Change and Forest.

These efforts combined with clear steps to eradicate the threats faced by these mountain ungulates can remove these species from the endangered list and protect the pride of Western Ghats.

Smt Shyamala Viswanathan

India's first Astro Tourism Campaign

Nakshatra Sabha is India's inaugural annual campaign focused on promoting Astro tourism. It is India's first such campaign launched collaboratively by the **Uttarakhand Tourism Development Board** and an astro-tourism company, **Starscapes**.

It offers a variety of activities such as stargazing, solar observations, astrophotography contests and camping under the stars. People interested in participating in this amazing initiative can register themselves on the official website of Starscapes company at **https://starscapes.zone/nakshatra-sabha/.**

The state of Uttarakhand is a unique combination of abundant forest cover, easy access to major cities, nature-based tourism, a well-established hospitality sector, homestays etc., which makes it an ideal destination for astro tourists from around the globe. The campaign's first edition kicked off in early June at George Everest in Mussoorie and go on until mid-2025.

Highlights

- Many huge events at various locations across Uttarakhand will be organized for visitors.
- People will get opportunities for stargazing, exploring beautiful night sky sites of districts like Uttarkashi, Pithoragarh, Nainital and Chamoli.
- Experts from various fields will organize seminars and webinars to increase awareness and education for this initiative.
- Will foster a community of ambassadors dedicated to promoting dark sky conservation.

Dark sky conservation

We all love gazing at the night sky. But one hardly sees the stars

these days. It is due to light pollution (Yes!! you read it right, light CAN cause pollution) - Humans light up everything. Due to decreased darkness, there has been rapid nocturnal ecosystem imbalances. It is necessary to understand and conserve the natural darkness of the night-time environment by decreasing light pollution.

Many organizations are putting efforts into protecting the clarity and visibility of stars, planets and other celestial objects, along with maintaining the natural flow of nocturnal ecosystems. This included reducing unnecessary artificial light sources, reducing skyglow, directing outdoor lighting downward and advocating the use of energy-efficient lighting sources.

It is necessary to appreciate the beauty of the universe alongside supporting the health and living habits of nocturnal animals, promote sustainable tourism and human well-being and conserve energy.

Nakshatra Sabha will offer professional training and skill development opportunities for local people who are interested in astronomy and tourism. It will boost local economies and promote the preservation of night skies.

DO YOU KNOW ?

- **Every star you see in the night sky is bigger and brighter than our sun!! In fact, 5 billion Suns could fit in UY Scuti, one of the biggest known stars!**
- **Jupiter's magnetic field is bigger than the Moon's.**
- **Neptune has only completed one orbit around the Sun since its discovery.**
- **The Moon is getting farther away every year and our days are getting longer.**
- **Venus spins backwards!!**

Smt Sandhya Nair

School on Wheels in Manipur

School on Wheels is an initiative being implemented by Vidya Bharati Shiksha Vikash Samiti Manipur.

Sushri Anusuiya Uikey, Governor of Manipur, inaugurated the programme at a ceremony held in Imphal .

Violence erupted between the Kuki and Meitei communities in Manipur. This claimed the lives of around 200 people and left more than 70,000 people displaced. These families are being housed in makeshift camps. It has affected the day to day life of the families including children.

This initiative is a boon. It ensures that the displaced students do not face any educational setbacks and overcome the challenges caused by the conflict,

The aim is to reach out to students residing in relief camps across the state ensuring that uninterrupted education remains accessible to all, even in the most difficult circumstances.

The school bus, equipped with a library, computers and sports items will have a teacher as it travels to different relief camps across the state.

VIDYA BHARATI SHIKSHA SAMITI

It is an organisation that has contributed greatly to the cause of education since 1979 in various parts of India. **Its sole intention is to make quality education accessible to children even in the remotest parts of the country. 15 schools, 36 Sanskar Kendras in Manipur have been contributed by the Samiti.**

Shri Mrithyunjay GN

Sesame

Revolutionizing India's BFSI sector with AI

India's **banking, financial services and insurance (BFSI)** sector is on the cusp of a major transformation driven by Sesame. Not the seed but rather an ingenious piece of technology that is part of a groundbreaking collaboration between **Setu**, a company focused on providing financial services to various industries, and **Sarvam AI**, a company that aims to produce AI systems indigenous to the Indian subcontinent.

Sesame is poised to be the first BFSI-focused **Large Language Model (LLM)** developed in India.

An LLM is a powerful language programme trained on massive amounts of text in a particular language so that it can understand and generate human-like text in the language it is trained in.

Sesame harnesses the immense power of artificial intelligence to analyze vast amounts of financial data allowing it to serve the specific needs of the financial sector.

One key advantage is **enhanced customer service**. Sesame can handle complex customer interactions with ease, providing real-time assistance and personalized recommendations to customers in the Indian languages they are comfortable with.

Sesame also aims to empower financial institutions **to make faster and more informed credit decisions** with providing loans to people and businesses. By looking through vast amounts of data in a short time, Sesame can potentially provide clear details and can make the **approval process for loans much more streamlined.**

Thirdly, Sesame has advanced **fraud detection capabilities.** Its real-time monitoring can identify and flag suspicious activity, helping to prevent financial fraud and protect both institutions and customers.

The development of Sesame marks a significant step towards, "democratizing financial services" in the words of Setu's co-founder, Nikhil Kumar.

This innovation has the potential to reshape the Indian BFSI landscape by streamlining processes, improving customer interaction and unlocking new avenues for financial inclusion. This could end up being as immense a step for Indian finance as UPI was in 2016.

India ranks third in global solar power generation

While speaking at the first International Solar Alliance Summit, co-hosted by India and France in 2018 , PM Modi said, "Vedas consider the Sun as the soul of the world. It has been considered as a life nurturer. Today for combating climate change we need to look at this ancient idea to find a way."

He called for a global solar revolution. In five years India has become the third largest solar power generator in the world, next only to China and the United States of America. India generated 113 billion units of solar power in 2023.India was ranked 9th in the world in 2015. This was revealed by the ***Global Electricity Review*** released by the global energy think tank **Ember**. This encompasses 80 nations accounting for 92% of the global electricity demand.

The need for solar power

With growing concerns on the overall global climate situation, global warming, carbon emissions and the rapid depletion of fossil fuels, the need for power generation through the non-fossil fuel route which is also called the renewable energy (RE) route has gained huge significance.

Solar and wind are two sources of RE that help reduce carbon emissions in the power sector and also in meeting the enhanced electricity demand in an increasingly electrified economy. This would also help decouple economic growth from emissions.

Due to better availability, consistency and ease of conversion, solar power generation is being increasingly adopted by nations to achieve their climate goals.

Some facts and figures

As per Ember's report, the global solar power generation in 2023 was six times of that in 2015. Globally 5.5% of electricity generation is through solar. In India the contribution of solar to the total electricity generation is 5.8%. It has grown from 0.5% in 2015. This brings out the rapid deployment of solar energy by India.

India's national plan to combat climate change is to achieve 50% cumulative electric power installed capacity through RE resources by 2030. However, meeting this target requires substantial acceleration in annual capacity additions.

World leaders have committed to triple the global RE capacity by 2030 to achieve the target of limiting the average temperature rise to 1.5 degree Celsius.

Sustainability

Sustainability is the buzzword today. The development models that the outside world had adopted has brought with it a range of problems related to the indiscriminate exploitation of resources for human consumption and the negative impact that it leaves behind apart from causing serious concerns about the availability of resources for the future generations. **Unfortunately, Independent India had jettisoned the ecofriendly, sustainable and inclusive model of development that ancient India had.** It is in this context that the whole world is having a re-look at the development models to make them sustainable.

While India has responsibly increased its solar share in the energy mix, to achieve the target of 50% installed capacity by 2030 we need to leapfrog. On the generation efficiency too there is a lot of headroom as it is currently at about 6% on an installed capacity of 18%. Given India's recent track record on achieving targets and new milestones in various areas, India will certainly hit the target.

Let the sun shine.

Shri Ramasamy R

Combating *forest fires* in Uttarakhand

Uttarakhand is a state fully made up of Himalayan Mountains and their 27 rich and diverse reserve forest divisions. The forest cover approximately 24,500 sq.km and make up app.45% of the geographical land area. The State witnessed over 1000 incidents of forest fire this year alone, causing 5 deaths and burn out of about 1,500 hectares of forests. The State Government under Chief Minister Pushkar Singh Dhami took strong steps, mobilizing our IAF to carry out Bambi Bucket Operations and themselves launching on 8th May 2024, the innovative ***Pirul Lao-Paise Pao*** scheme.

IAF's Bambi Bucket operations

Our Indian Air Force (IAF) vigorously assisted the state in combating, by dumping thousands of litres of water on the raging forest fires, in what was known as Bambi Bucket Operations. In the Pauri Garhwal sector, the IAF operated Mi17 V5 helicopters and the instantaneous water dumping provided much-needed relief in dousing the fire.

Over the course of 8 sorties spanning more than 4 hours, the IAF helicopters dropped 17,700 litres of water to douse the forest fires. In a few days, the IAF had undertaken a total of 23 sorties, spanning 11.5 hours, and utilized 44,600 litres of water to combat the raging flames in the mountains. Thus, our IAF did great service in protecting our forest wealth.

Pirul Lao-Paise Pao scheme

Uttarakhand CM Dhami launched this campaign in May 2024. This has significantly reduced forest fires and also provided income to villagers living near forest areas. Between February and June, the pine trees shed their dry leaves known as pirul; the soil loses its moisture and the forest becomes prone to wildfire.

The State Government arranged for gathering of pirul from the forest floor by villagers and their collection at predesignated centres. The villagers were paid ₹0.50 per kilogram of Pirul and the amount was directly credited into their bank account.

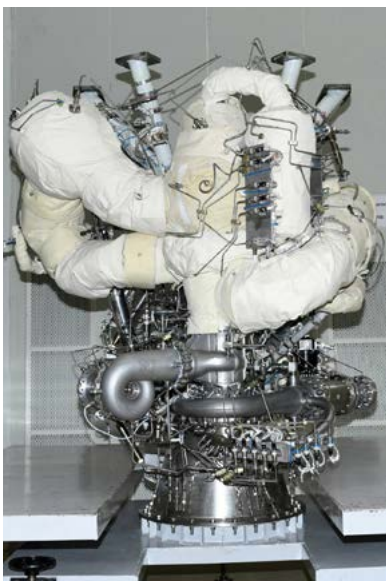
The collected leaves are then processed, packed and made available to industries. ₹50 crores was allotted to Pollution Control Board and entrusted with administration of the scheme. The cooperatives **Yuva Mangal Mandal** and **Van Panchayat** also participated in the campaign.

Uttarakhand government has established a 25 kW power plant in the Chakori Dhanari village of Uttarkashi district, which uses pirul as raw material to produce electricity. With the forests of Uttarakhand producing the highly combustible leaves, as high as 23 lakh metric tonnes annually, the power station has the potential to produce 200 kW of electricity.

Kum Anu Narayan

Semi-cryogenic engine
using liquid oxygen kerosene

Indian Space Research Organisation (ISRO) has reached a significant milestone by successfully conducting the first ignition trial of a semi-cryogenic pre-burner at its ISRO Propulsion Complex (IPRC) in Mahendragiri, Tamil Nadu. This achievement is a crucial step towards developing a 2,000 kN thrust semi-cryogenic engine, set to boost the payload capacity of ISRO's Geosynchronous Satellite Launch Vehicle Mk III (LVM3) and power future launch vehicles.



The semi-cryogenic engine, being developed by ISRO's Liquid Propulsion Systems Centre (LPSC), uses a propellant combination of liquid oxygen (LOX) and refined kerosene (ISROSENE). This engine aims to provide heavy-lift capabilities to ISRO's upcoming launch vehicles, including the Next Generation Launch Vehicle (NGLV).

On 2nd May 2024, ISRO conducted the successful ignition test at the newly dedicated Semi-Cryogenic Integrated Engine and Stage Test (SIET) facility. The test demonstrated the smooth and sustained ignition of the pre-burner, a critical component for starting the semi-cryogenic engine.

ISRO highlighted the importance of this achievement in a statement: "The ignition process is one of the most critical parts in the development of liquid rocket engine systems. With the successful ignition of the semi-cryo pre-burner, a major milestone in the semi-cryo engine development has been achieved."

The ignition was accomplished using a start fuel ampule combining **Triethyle Alumnide** and **Triethyle Boron**, a novel ignition system developed by ISRO's Vikram Sarabhai Space Centre (VSSC). This marks the first time this technology has been used in ISRO's semi-cryogenic engine development.

The successful pre-burner ignition test sets the stage for the next phase of development, including testing the engine power head and the fully integrated engine. Additionally, ISRO is working on developing a semi-cryogenic stage with a propellant loading of 120 tons.

"The development of a semi-cryo stage with 120 tonnes of propellant loading is also under progress," ISRO noted.

The semi-cryogenic engine is a key component in ISRO's efforts to enhance the payload capacity of its launch vehicles, particularly the LVM3, which is currently powered by the Vikas engine. The successful ignition test marks a significant milestone in ISRO's journey towards achieving self-reliance in the development of advanced propulsion systems for its space programme.

Col M V Shashidhar (Retd)

SIACHEN SAGA

Forty years of Operation Meghdoot

Rewind

- Operation Meghdoot launched on 13th April 1984 to capture Siachen is an unparalled operation in the annals of military history.
- Daunting and hazardous, it was unique and epitomises the raw and spine - chilling courage and valour, determination and sacrifice of Indian soldiers against the harshest of odds.
- Beneath the veneer of this bleak beauty, lay menacing hazards that snatch away human lives without a warning. The battle ground meant encountering temperatures ranging below minus 50°C and altitudes above 6,400 meters.
- At approximately 20,000 feet in the Karakoram ranges, Siachen is the highest militarised zone in the world.

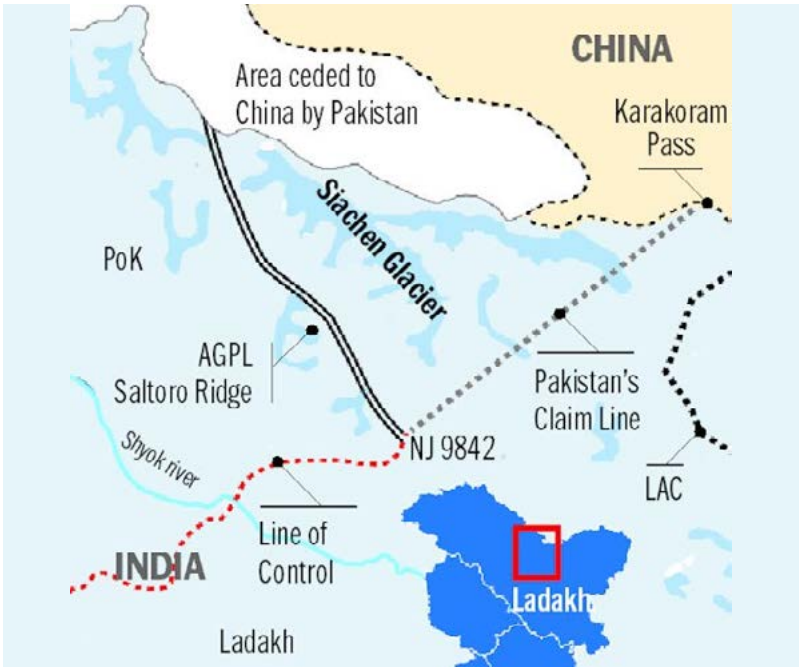
Why is Siachen important?

- Demarcates central Asia from the Indian subcontinent and separates Pakistan from China in the region.
- The Saltoro Ridge of the Siachen glacier serves as a divide that prevents direct military linking of PoK with China.
- Serves as a watchtower for India to keep a deep watch on Gilgit and Baltistan regions of Pakistan.
- Control over Saltoro Ridge offers India s better place to strike a bargain while settling any future bilateral territorial disputes.
- Allows India to monitor Chinese infrastructure and military activities (China-Pakistan Economic Corridor (CPEC)) in the Shaksgam region by retaining the psychological and physical edge to target this corridor.

Operation Meghdoot

Operation Meghdoot was executed to correct three strategic oversights namely, first in 1949, then in 1965 followed by the developments after the 1971 war. After the India-Pak war of 1947-48, the Karachi Agreement of 1949 agreed upon a ceasefire line (CFL). The 1965 India-Pak war ended with an agreement at Tashkent. The Shimla Agreement was signed post the 1971 war.

None of the three agreements demarcated on ground the Line of Control beyond NJ 9842 and there lay the ambiguity on the presumption that neither side would be interested in contesting in an area where constant threats of avalanches, crevasses, high-speed



winds and fatal altitude - related ailments like frost bites, hypoxia, hypothermia and white outs will make it untenable for troops.

Pakistan's nefarious designs commenced when it saw the potential of this strategically unoccupied "No Man's Land".

- Illegal ceding of some 5180 sq km of Indian territory to China where the boundaries of India, Pakistan and China meet thus altering the geo-strategic importance of the area.
- Permitting and assisting foreign mountaineering and scientific expeditions to cross the Saltoro Ridge and the Siachen Glacier and raising claims of rights over the area. The glacier is the source for the Nubra river that eventually feeds the Indus, a major water source that irrigates the plains of Punjab in Pakistan.
- A cartographic aggression of joining NJ9842 to the Karakoram Pass thus including both Siachen and Shaksgam Valley in their area.

Indian Army's sequence of actions

- **1978-** Colonel Narinder Kumar led major military mountaineering expeditions to climb peaks around the Siachen Glacier.
- **1980&1981 -** Expedition followed and Pakistan's cartographic aggression in Siachen detected.
- **1983-** the 'Siachen plan' was given shape. Two Indian Army patrols were launched between June and September.
- **1984**
  - own intelligence was tipped off when Pakistan ordered large mountaineering gears from a London company.
  - Pakistan Army planned a mission to occupy the area but was aborted due to an intelligence failure.
  - Indian troops reached the glacier a week earlier than Pakistan to pre-empt the seizure of Sia La and Bila fond La passes on the glacier in a well thought out, calibrated and practised action.
  - From the North to South, the four important passes were occupied on the Saltoro Ridge include **Sia La, Bilafond La, Gyong La** and **Chulung La.**

Modern Day developments

- The induction of heavy-lift helicopters and logistic drones, deployment of all-terrain vehicles (ATV) and laying of an extensive network of tracks are among a host of measures that have enhanced India's combat prowess in Siachen.
- DRDO-developed ATV bridges have enabled the

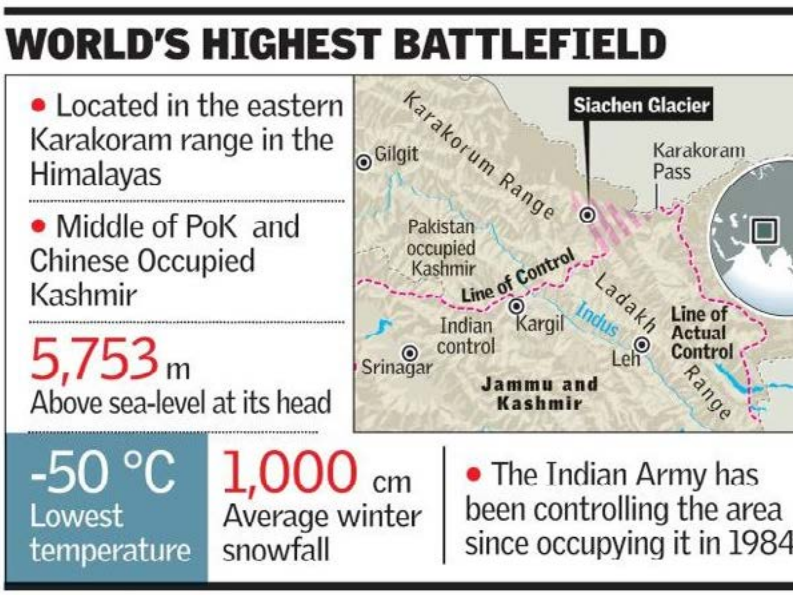
Army to overcome natural obstacles while high-quality **"Dyneema"** ropes in aerial cableways ensures seamless supply lines to even the most-remote outposts.

- Availability of special clothing, mountaineering equipment and advanced rations have enhanced the ability of soldiers to withstand the harsh conditions of the world's coldest battlefield.
- Pocket weather trackers, with each soldier provide timely weather updates and warn them about possible avalanches.
- introduction of the VSAT technology has revolutionised communication by providing troops with data and internet connectivity.

Conclusion

The illustrious history of Operation Meghdoot is a testament of the fighting spirit of the Indian Armed Forces and those who supported them over the decades witrh respect to logistic supplies and medical assistance by the doctors. Border Roads Organizationcontributed immensely by developing the infrastructure in this inhospitable terrain.

Operation Meghdoot is one of the greatest examples of jointness and synergy between the Indian Army and Indian Airforce in what can be termed as the longest joint operation undertaken by any nation. Siachen will forever remain a saga of indefatigable combat grit , determination and valour in the rich lexicon of military history.



On a personal note

It indeed was a singular honour to have been at the world's highest battlefield during the early years of Operation Meghdoot. Human endurance, grit and self- motivation kept us all going.

Amar post (see picture) at an altitude of 19,980 feet located on the Saltoro ridge was where yours truly was stationed for eight months - well the world was arguably at one's feet. The sole lifeline to the post were the IAF helicopters whose sorties all depended on clear weather, winds and artillery firing, the last, more effective on a clear day thus precluding landing of helicopters.

Col M V Shashidhar (Retd)

DRDO's Lightest bullet proof jacket

DRDO- A formidable force

In the realm of national defence, innovation is a necessity and a force multiplier not necessarily an advantage or trumping your rivals.

- DRDO's success story reflects a culture of relentless research and development, a multidisciplinary approach and collaborative team effort.
- Use of cutting-edge technology to remain at the forefront of defence innovation by consistently pushing boundaries and setting new standards besides tackling new challenges.

Bulletproof jackets are indispensable assets for military personnel and central police organisations operating in high-risk environments. Traditionally bulky and restrictive, it hampered mobility and agility. But a recent breakthrough innovation has now overcome limitations by introducing a lightweight yet robust solution with superior protection.

Defence Materials and Stores Research and Development Establishment (DMSRDE) has successfully developed the lightest bullet proof jacket in the country for protection against 7.62 x 54 R API (Level 6 of BIS 17051) ammunition.

- **7.62 x 54 R API - 7.62 refers to the diameter of the rifle's bore in millimeters and 54 is the length of the cartridge case. The (R) I added typically denotes this as a round with a rim on the base of the cartridge case.**
- **API – Armour Piercing Incendiary.**
- **Areal density (surface density) of a 2D object is calculated as the mass per unit area.**

Defence Material Research & Development Establishment

- DMSRDE is a laboratory of DRDO in Kanpur designed for research and development of material including various types of protective clothing and equipment for the tri-services.
- A globally recognized centre of excellence to make the country self-reliant and leading in the field of strategic non-metallic and speciality materials.

Salient features

- Successfully tested at **Terminal Ballistics Research Laboratory** (TBRL) Chandigarh. This will provide protection from Level 6, the highest threat.
- The front **Hard Armour Panel (HAP)** can defeat multiple hits (06 shots) of 7.62 x 54 R API (Sniper rounds) in both ICW (in-conjunction with) and Standalone design. The jacket has been able to withstand AK -47 bullets during close combat.
- The ergonomically designed front HAP is made up of monolithic ceramic plate with polymer backing which enhances the wearability and comfort during operations besides preventing injury from enemy bullets.
- The areal density of ICW HAP and standalone HAP is less than 40 kg/m^2 and 43 kg/m^2 respectively.
- Monolithic ceramic plate has been installed in accordance with level six of Bureau of Indian Standards No. 17051-2018.

Col M V Shashidhar (Retd)

A SMART weapon to destroy hostile submarines

With the world's sixth largest Navy, India is a major player and key actor in the Indian Ocean Region.

Maritime operations

Maritime operations feature one of the most sophisticated and asymmetric fighting environments given their multi-dimensional threat scenarios and vastness of area of operations (both surface and sub-surface) particularly in a domain that calls for accurate and long-range smart sea weapons.

With the world's sixth largest Navy, India is a major player and key actor in the Indian Ocean Region (IOR). It is fully aware that only steady diversifying of its stock of smart weapons will prove crucial to counter the increasing challenges from an expansionist Chinese Navy in IOR.

The game changer

Maritime warfare combines multiple formats namely anti-submarine, anti-surface, land attack and air defence. The significant advancements in weapons of supersonic or hypersonic speed, warhead lethality and extended ranges in missile technology in recent years have witnessed shifting of balance of power. Efforts to acquire advanced weapons and sensors technology have attained critical momentum resulting in plethora of force multipliers ranging from autonomous unmanned platforms, electronic warfare suites and smart weapons.

Successful flight test of SMART missile torpedo system

On 1st May 2024, DRDO successfully flight-tested a new missile system designed to

revolutionize the Indian Navy's anti-submarine warfare capabilities. The **Supersonic Missile-Assisted Release of Torpedo** (SMART) system was launched from a ground-based mobile launcher off the coast of Odisha.

SMART is a canister-based missile system that consists of several advanced sub-systems:

- A two-stage solid propulsion system.
- An electromechanical actuator system and precision inertial navigation system etc.
- The system carries an advanced lightweight torpedo as payload along with a parachute-based release system enabling it to travel a long distance and strike the target.
- The torpedo will be placed on the warhead of the missile as a payload and is called Torpedo Advanced Light (TAL) which is digitally controlled with guidance systems.
- SMART torpedo has a range of about 600 kilometres.

The game-changer anti-submarine weapon system was first sanctioned in 2018 followed by two successful tests conducted in 2020 and 2021.

Conclusion

Use of a missile to shoot a torpedo towards the targeted submarine of an adversary is indeed a unique technological achievement as the supersonic speed enables the torpedo to hit the target within a very short time. Whether deployed from a warship or from the coast, the SMART torpedo will pose a substantial threat to enemy submarines.

India has thus added a new dimension to its anti-submarine warfare unique and first amongst rival navies. DRDO's SMART missile could be the game changer against China's submarines.

Shri Neeladrinath Sarangi

History of the FIGHTER JET

Part-4

In part - 3 we covered how technologies emerging from WWII, primarily radar, the gas turbine engine (aka jet engine) and the guided missile were applied in air combat. We also covered early experiences in the operational deployment of these technologies in the major armed conflicts from 1950 to 1970.

Western bloc constituents tended to focus on large, heavy, long range fighter interceptors and deep strike fighter-bombers (often variants of the baseline fighter jet with modifications for ground strike capability). Eastern bloc members emphasized smaller, lighter fighter aircraft with less technological sophistication but are fit for purpose and practical for the combat environment, which in most cases were in developing countries.

The missions of such eastern bloc fighters and fighter bombers were tactical defence of local airspace and attack of enemy positions on the surface at or few hundred kilometers behind the frontline. Long range aviation, as the superpower of the east called it, did not develop to a degree comparable to the west due to the traditional weaknesses in the design and production capabilities of the eastern bloc. These institutional and structural limitations manifested in gas turbine engines which were less fuel efficient and more prone to degradation than western counterparts.

High performance, high reliability, durable and fuel efficient gas turbine engine development requires wide ranging capabilities across diverse fields. This includes:

- fluid dynamics (blade design, inlet and chamber design etc.)
- mastery of both the science of thermodynamics (the combustion process and energy extraction from hot gas flow)
- its technology (stages of compression/turbine extraction…etc),

- miniaturization of parts & components
- instrumentation and electronics (for engine sensing and control)
- aerospace materials (alloys with required thermal and mechanical properties) and
- mass production of complex structures to precise specifications and low tolerances.

While there were some notable long range deep penetration fighter aircraft in the eastern stable, they still suffered from range, altitude and speed limitations. **The eastern bloc left it to large bomber aircraft, ballistic and cruise missiles to carry out ground attack on strategic high value targets deep in the enemy's interior.**

By the 1980s, engine development breakthroughs were achieved in the east which allowed for the development of large bomber aircraft that could sustain high altitudes and speeds to achieve some level of surprise/reduced reaction time in an attack and protection from interception.

Experiences in armed conflict led the western bloc to spread resources more evenly. This led to more investment in light, less expensive aircraft. These aircraft could be deployed on many missions that did not require high value frontline assets to be put at risk. Often these frontline fighter jets had capability in excess of what was required for these sorties.

Air to air missiles had started to become more effective, but a considerable number of aerial engagements between fighter aircraft led to 'merges', in which short range weapons came into play. Merges are when opposing

combat aircraft approach each other, when long range weapons are either exhausted or have failed/ been evaded successfully. The battle moves into the visual range and opposing aircraft get into close up 'dog fights'. The short range weapons, typically infra-red guided missiles and Gatling guns, required the firing aircraft to get the opponent onto the target cross hairs of the weapon prior to weapons discharge.

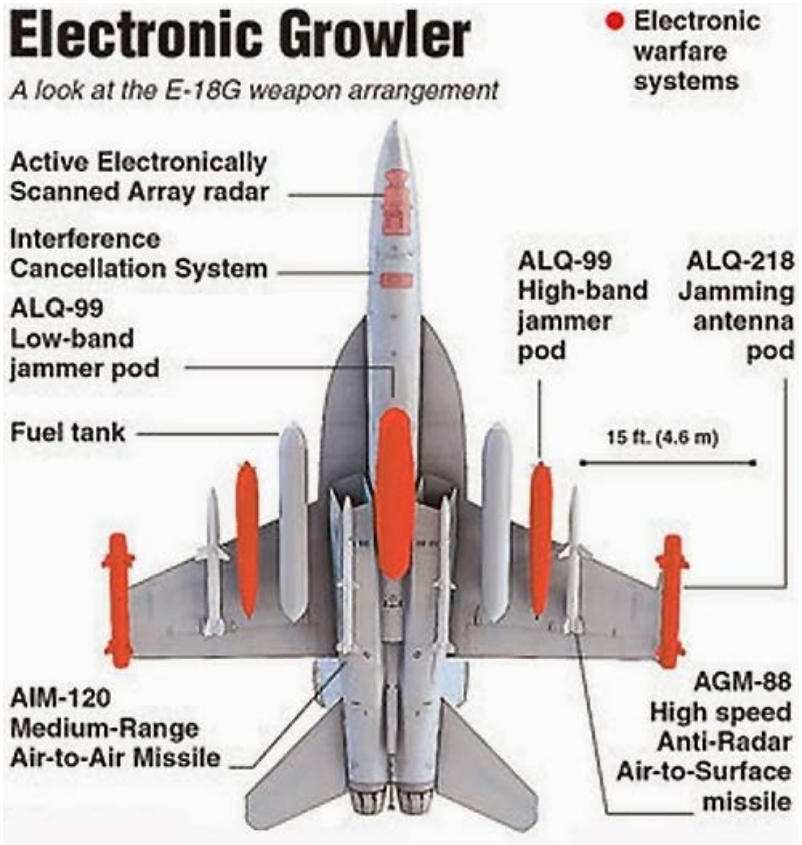
Doing this required aircraft that can outmanouvere its opponent, to get into firing position and also evade the attempts of its opponent to get it in its sights. The light weight, small fighters of the eastern bloc generally had higher thrust:weight ratios that gave them higher acceleration (not necessarily equivalent to higher speed) and better control over their velocity vector.

Such aircraft were at an advantage in these combat situations. The realization that close in air combat requiring extensive maneuvering remains a major endgame scenario in air combat also spurred the redistribution of resources and growth of the western medium and light fighter jet fleet.

It is this maneuverability that fighter jets display at airshows. **To an unaccustomed observer, the pilot seems to be putting the aircraft in twists and turns, ascents and descents in an attempt to dazzle the crowd. To a practitioner, the pilot is demonstrating the range of manoeuvres the aircraft offers to its customer / operator Air Force necessary for close up dog fights in war time.**

The increasing role of SAMs (Surface to Air Missiles) in air defence led to two major changes in the planned war doctrine:

- One was the use of surface to surface (and to a lesser extent air to surface) missiles (typically cruise, some ballistic) to take out SAM sites identified by human and signals intelligence, satellites and reconnaissance aircraft at the outbreak of hostilities.



⏩ Second was the fitment of electronic jamming equipment in western combat aircraft, particularly fighter bombers and fighters which would carry out missions when some SAM sites are yet to be taken out.

The electronic jammers would superimpose distorting waveforms in the electromagnetic spectrum that radar systems use to propagate their original screening signals and receive returns. Jamming makes it much harder for the processing of returns and consequent identification of return signatures of detected contacts from waveform library. Once the airspace was clear of SAM threats and air superiority was achieved, the large vulnerable bombers would come over for dropping of heavy ordnance. Air transport aircraft would also be able to enter and air drop supplies, paratroopers and military equipment as the ground battle commences and the frontline advances deeper and deeper into enemy territory.

The eastern approach is less known as there were limited armed conflicts in which its constituents were party too. The few such conflicts that did occur did not have the scale and military objectives that would qualify them as full scale wars which would require the constituents to enact their military strategy and war plan.

One major conflagration was in Central Asia during the 1980s. For most of the conflict, air power was used in exacting losses of personnel and material on the adversary towards the goal of attrition and weakening of resolve. Ground action was comparatively less due to the mountainous terrain and limited infrastructure that made the movement and stationing of large columns of highly mechanized forces challenging.

However, by examining the investments made and fleets built, inferences can be drawn on how the bloc's superpower may have carried out a full blown conventional war. The reliance on guided missiles to minimize/eliminate air defence elements would be high, possibly higher than that of the west. Guided missiles may have also been the primary means of delivery of armament, not just strategic nuclear, but conventional as well as tactical nuclear. In totality, guided missiles may have had a larger role in the Eastern doctrine vis-à-vis the West.

Customer protection against digital frauds

A. Choose the correct answer/answers from the options given below each question:

1. According to clean note policy of Reserve Bank of India

a. One should not write on a currency note.

b. One should not staple currency notes.

c. Banks should not issue recycled soiled notes to customers.

d. Banks are required to sort the soiled notes received and send it to currency chest.

e. All of the above.

2. What is a soiled currency note?

a. A note which has become dirty due to normal wear and tear.

b. A note torn into two pieces pasted together, with no piece or part missing.

c. Cash earned through illegal means.

d. All of the above.

3. What is a mutilated bank note?

a. A note torn into more than two pieces.

b. A note where a piece is missing.

c. Both of the above.

d. None of the above.

4. Which of these are the rights of a banking customer as specified by RBI?

a. Fair treatment

b. Transparency

c. Suitability

d. Privacy

e. Grievance redressal and complaints resolution.

f. All of the above.

5. Mr. X gave a complaint to his bank two months ago. He followed up many times but the bank has not solved his problem. What should he do?

a. Continue writing to the bank.

b. Close his bank account and move his funds to another bank.

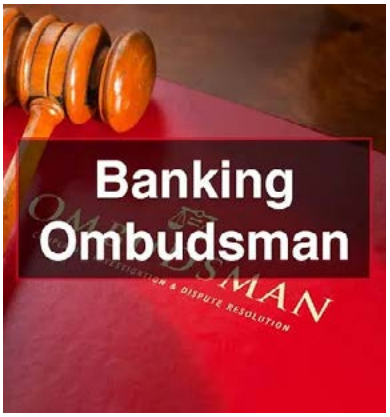
c. Complain to the Banking Ombudsman.

d. Complain about the bank on social media.

6. What is a Banking Ombudsman?

a. A bank set up by RBI for supervising the work of commercial banks.

b. An officer appointed by RBI to settle disputes between customer and bank.



c. A bank for giving loans for purchase of commercial vehicles.

d. A bank for giving housing finance.

7. What are the conditions under which customers can claim refund of money debited to their account due to a digital banking fraud?

a. The customer is not at fault.

b. The customer has not shared the account number, OTP, user id or pin with anyone.

c. The customer has reported the fraud to his/her bank within 3 days.

d. All of the above.

8. Which of these rules should be followed to protect ourselves from digital banking fraud?

a. Change your internet banking password at regular intervals.

b. Choose a complex password that is a combination of alphanumeric and special characters.

c. If you get an SMS alert about a transaction in your bank account, and you have not authorized it, inform the bank immediately.

d. Whenever you raise an issue with the Bank, ask for the complaint reference number or acknowledgement from the Bank.

e. All of the above.

9. What is a Phishing fraud?

a. A fraud where somebody steals the debit card of customers and withdraws money at the ATM.

b. A fraud where someone offers you a new job and asks you to pay cash to initiate the appointment process.

c. A fraud where you receive a link through email or SMS and you are asked to update your account details through the link.

d. All of the above.

10. How to protect oneself from ATM fraud?

a. Keep your card safe.

b. Do not give the card to anyone.

c. Do not share the card number, PIN, CVV number, expiry date with anyone.

d. All of the above.

B. Based on your learning about customer protection in banking and prevention of digital banking frauds, read the questions below and identify which statements are true.

11. RBI has encouraged customers to adopt digital banking with the assurance of zero liability against fraud.

12. If your debit card or credit card is stolen or misplaced, you must call the customer care number of your bank and block the card immediately.

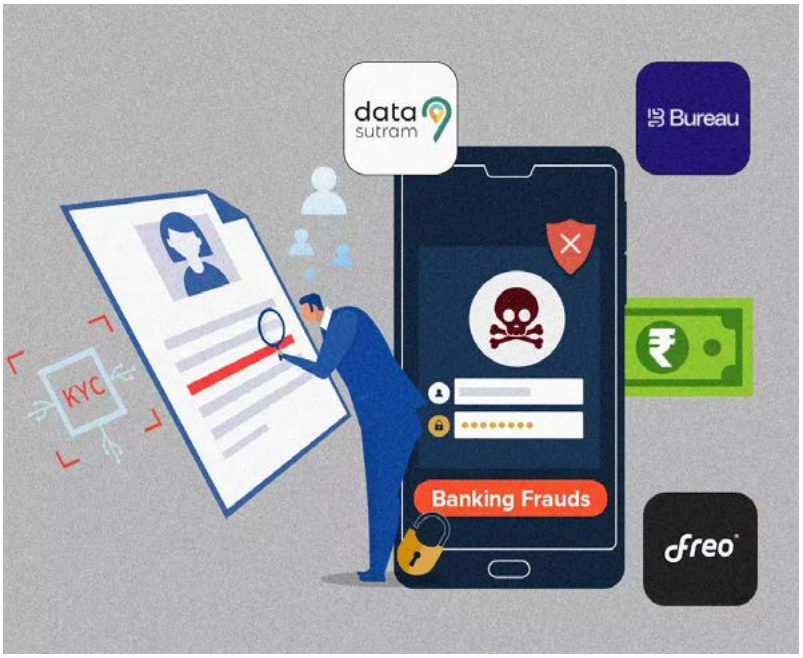
13. You can store your ATM pin, internet user id and password in your mobile so that you do not forget.

14. It is important to register your mobile number and email id with your bank to receive alerts for transactions.

15. If you have a soiled currency note, you can exchange it at your bank branch.

16. As per RBI's clean note policy, Banks can staple the currency notes and write the number of notes on the top most note in the section.

17. You can share the ATM pin, internet banking user id and password with the bank staff and ask them to put through transactions on your behalf.



C. Read the situations below and suggest the solution/next course of action.

18. Radha received the following SMS from her bank. "Dear Customer, ₹10,000 withdrawn at IDB ATM ID 065004 from A/c XX0081 on 13 May 2024. Transaction number 241866587. If not withdrawn by you, forward this SMS to 92230083333/ call 18001111109 to block your card." Radha panicked because she had not gone to the ATM to withdraw cash. How could there be a debit to her account at an ATM?

Her husband was sure that she had given the card to someone or misplaced it. She checked her wallet and to her relief found her debit card. Yet the message showed that amount was withdrawn at an ATM. She was upset about losing ₹10,000 and couldn't think what to do next.

Based on the above scenario, answer the following questions:

- Do you think Radha is at fault?
- What type of fraud could have happened in this case?
- Can she claim the money back from the Bank?
- What steps should Radha take to claim the money back and also avoid further loss?

19. Suresh had visited the town hall branch of ABC Bank to deposit cash ₹40,000 into his savings account. The cashier gave him an acknowledgement slip and advised that since the systems were down, he will be able to put through the transaction and credit the account of Suresh only after two hours. At the end of the day, Suresh was shocked to find that the cash was not credited to his account.

The next day he visited the branch. The cashier who received his cash was on leave. The branch manager checked the acknowledgement slip and told Suresh that they will need some time to check the records. Suresh gave a written complaint to the manager and got an acknowledgement. He then followed up over phone regularly and was frustrated that each time he called, a different person answered and he had to repeat his story.

He visited the branch again and learnt that the cashier to whom he had paid the money had quit the bank. There was a new branch manager who heard the whole story from Suresh and asked for some more time to check the records.

What course of action will you suggest to Suresh to solve his problem?

20. Shreeja received a message from an unknown number saying that her electricity connection will be cut for non-payment of electricity bill. The message said "To make payment click the link here or call this number."

She panicked and was about to click the link when she remembered that she had already paid the electricity bill last month. She had not yet received the bill for the current month. She read the message again and found that neither her name nor her consumer number was mentioned. She ignored the message.

However, Shreeja's husband Kumar had got a similar message while he was busy in his office. Thinking that Shreeja must have forgotten to pay, he clicked on the link and paid the amount of ₹ 5000 mentioned therein through his credit card.

In the evening, he was shocked to find that their bill of ₹2000 had already been paid by Shreeja. Just then, there was another SMS notifying a transaction of ₹10,000 through his credit card.

- Can Kumar claim the money back from his bank under zero liability? What would you advise Kumar to do to prevent further loss?

Answers on page 66

Kum Deepasri

THE COMPANIES ACT - Part 2

- **'Winding up'** in the context of company law means dissolution or closing of the operations of a company.
- **Securities** include shares and several other instruments such as debentures, units etc.

Raising of funds by a company

The previous edition of the series contained a reference to how companies face the need to raise money to pursue day-to-day operations and long term-capital expenditures. For these and other purposes, companies generally raise funds in two ways – broadly categorised as 'equity' and 'debt.' The Companies Act, 2013 ("Act") and the rules and regulations made thereunder, contain several requirements for raising of funds by either of these modes.

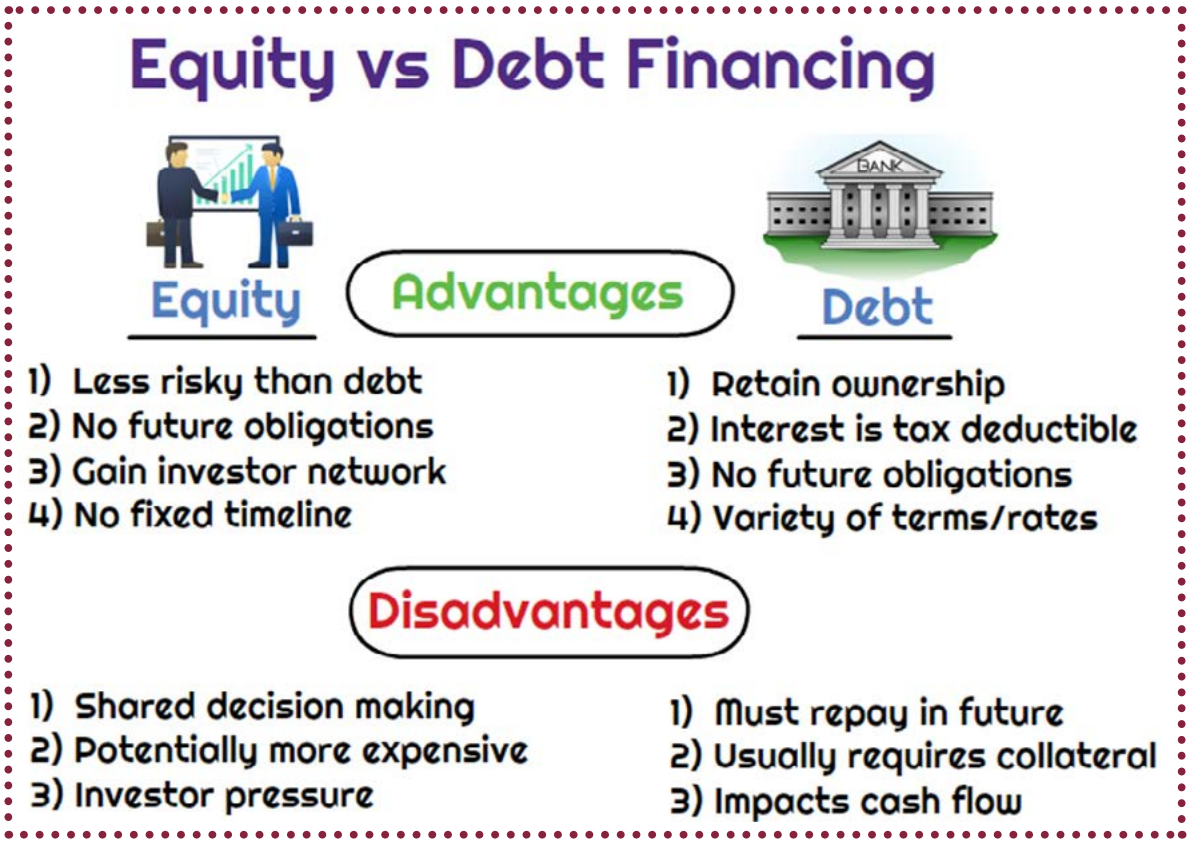
Raising money by way of debt

'Debt' refers to borrowings by a company from identified lenders and creditors, which it will have to repay such persons, over a specified period of time. Debt may include term loans, working capital loans, debentures or external commercial borrowings.

The Companies Act, 2013 and the rules and regulations contain certain requirements around such borrowings by companies. One such requirement is that any borrowing has to be within the authorised limits and through a resolution passed at a Board meeting of the company.

Raising money by way of equity

This mode of fundraising involves issue of shares or securities, in exchange for share capital invested by investors in the company. 'Shares' of a company held by shareholders, may be equity shares or preference shares. The major difference between the two



DO YOU KNOW ?

- **The Board in the context of companies, refers to the group of directors of a company, who constitute part of the management of the company.**
- **Companies are generally not permitted to issue securities at a discounted rate (lower than the fair market value of the relevant securities), unless in certain scenarios as permitted under the Act.**

types of shares is that preference shareholders get preferential rights in case of distribution of dividends or repayment of their share capital in the event of winding up of the company.

A company may issue securities by way of

(i) A public offer to the general public,

(ii) Rights issue or bonus issue to existing shareholders or

(iii) Private placement to certain identified individuals or entities, by following the procedure laid out in the Act.

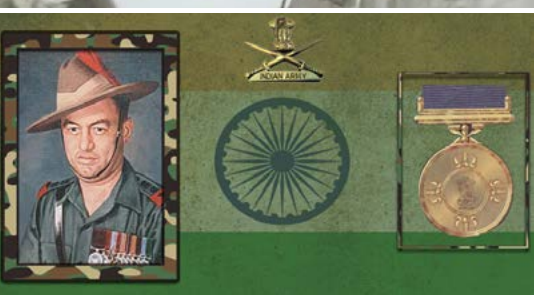
PROSPECTUS

A prospectus is basically an information booklet or document, on the basis of which potential investors may invest in the securities of a company.

It includes a **red herring prospectus** (a prospectus which does not include complete particulars of the quantum or price of the relevant securities), **abridged prospectus** or any notice, circular or other document issued by a company, inviting offers from the public for the subscription/purchase of its securities.

Major Dhan Singh Thapa

Major Dhan Singh Thapa (IC-7990), the son of P.S. Thapa, was born on 10th April 1928, in Shimla, Himachal Pradesh. He joined the 8 Gorkha Rifles on 28th August 1949. The Sirijap valley, situated north of Pangong Lake in Ladakh, was strategically significant for the defence of the Chushul airfield. The 1/8 Gorkha Rifles maintained outposts in the area to prevent any enemy advances.



On 21st October 1962, the Chinese launched an attack on Sirijap-1, an outpost held by a platoon of C Company under Major Dhan Singh Thapa. At 0600 hours, the Chinese initiated a barrage of artillery and mortar fire, which lasted until 0830 hours, causing extensive damage to the area. The command post was hit, resulting in damage to the wireless set. Subsequently, the Chinese launched a large-scale attack on the outpost.

In a display of extraordinary bravery and resilience, Major Thapa and his troops successfully defended the territory against the initial enemy assault, causing significant losses to the opposing forces.

Despite their initial defeat, the Chinese forces regrouped and launched a second, larger attack following relentless artillery and mortar shelling. Once again, Major Thapa and his unit bravely rose to the challenge, repelling the assault and inflicting heavy casualties on the enemy. Despite their own losses, their unwavering determination remained unshaken.

However, the Chinese forces launched a third, even more formidable assault.

This time, the Chinese forces arrived with tanks to support the infantry. Despite sustaining casualties from previous attacks, the platoon held their ground until they ran out of ammunition.

When the post was eventually overrun, Major Thapa displayed incredible bravery by engaging in hand-to-hand combat with the intruders, resulting in the elimination of many of them. Although he was ultimately overpowered and captured, Major Dhan Singh Thapa's outstanding courage led to him being awarded the Param Vir Chakra.

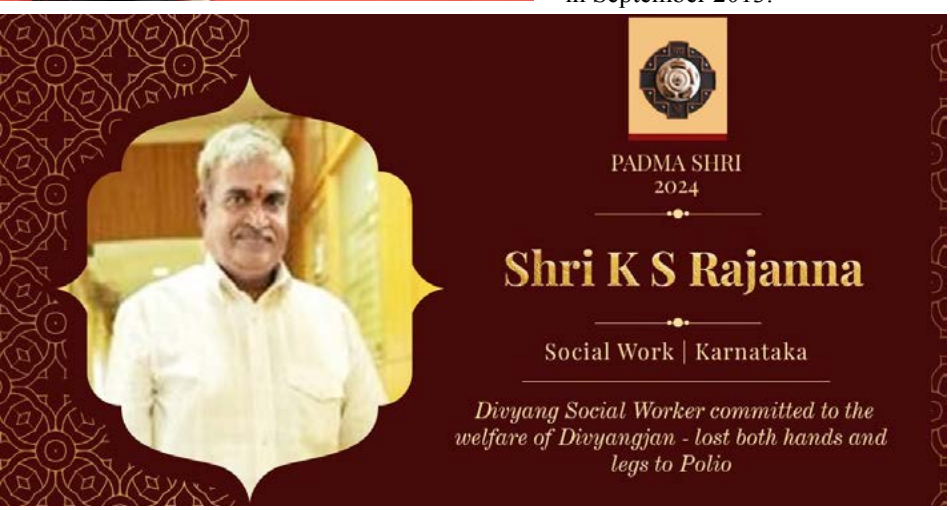
Smt Ramamani N

Padma Shri Awardee

Dr K S Rajanna

President Droupadi Murmu honoured Dr K S Rajanna, a dedicated social worker from Karnataka, with the Padma Shri for championing the cause of persons with disabilities. Despite facing physical challenges, Rajanna pursued education, excelled in sports at the Paralympics and advocated for the rights and well-being of the differently-abled, leaving a lasting impact on society.

K S Rajanna lost his arms and legs to polio in his childhood. **Undeterred by his physical challenges, he earned a diploma in mechanical engineering. His achievements extend beyond academics, as he clinched gold in discus-throw and silver in swimming at the 2002 Paralympics while representing India.** Rajanna was appointed as Commissioner of the state department for the disabled in September 2013.



He was Karnataka's first differently-abled person to hold this post.

During his term as the commissioner, K S Rajanna led government officials including principal secretaries, secretaries, heads of departments and deputy commissioners and implemented the Supreme Court directive on effectively implementing the Persons with Disabilities (equal opportunities, protection of rights and full participation) act, 1995 (PWD Act) by December 2014.

He advocated measures like free entry to Vidhan Soudha, free bus passes, parking facilities, grievance redressal cells and enhancing job and education opportunities for the differently-abled.

Functioning as a quasi-judicial officer, Rajanna ensured that justice was done to the disabled by the commission.

Rajanna had initiated a process to conduct a fresh survey of differently-abled individuals across the state to begin implementing reforms. However, he was replaced by a new commissioner in January 2015. Rajanna's unwavering perseverance and resilience in his social work earned him the Padma Shri and people across the country admire his commitment. His refusal of assistance from a soldier during the event exemplified his independence and determination.

Dr.Urbasi Sinha

The founder head of India's first quantum computing lab

When asked why she chose be a physicist, Dr Urbasi Sinha in a recent interview to **Nature Communications Physics** replied, "The choice of pursuing science stems from my very early years as I had a natural inclination towards science and maths-based topics in school, and I was always intrigued by various natural phenomena. I am a logical, curious and rather direct person and thus the scientific method has been a natural choice of vocation." This internationally reputed quantum scientist is the founding head of the **Quantum Information and Computing (QuIC)** laboratory at the Raman Research Institute (RRI), Bengaluru, India.

Even as a school girl, the keen interest little Urbasi showed in Mathematics and Physics helped her parents understand her inclination. Though both of them were not scientists, they supported her choice to pursue pure science and sign up for B.Sc. Physics (Hons.) in Jadavpur University, when most parents in that period preferred their wards to take up engineering. Their encouragement throughout her formative years has been instrumental in making her choice become a reality.

Young Urbasi then proceeded to University of Cambridge, U.K. to pursue her Masters with financial aid through Chevening-Nehru Cambridge Scholarship in 2000. Her superlative scholastic performance gained her tutorial and travel awards of St. Edmund's College during 2001-2002. With the prestigious Gates Cambridge Scholarship, where just 1% scholars are chosen every year from around 10,000 applicants worldwide, she completed her Ph.D. in Physics and Material Science by 2006. In this period she received Overseas Research Students awards (2002-2005) that recognises only one

● **A qutrit (or quantum trit) is a unit of quantum information that is realized by a 3-level quantum system, which may be in a superposition of three mutually orthogonal quantum states.**

or two students every year in a department. Later, she immersed herself on an industry funded research project as a postdoc fellow in the Cavendish laboratories investigating soft condensed matter based techniques to develop a thinner, whiter version of papers.

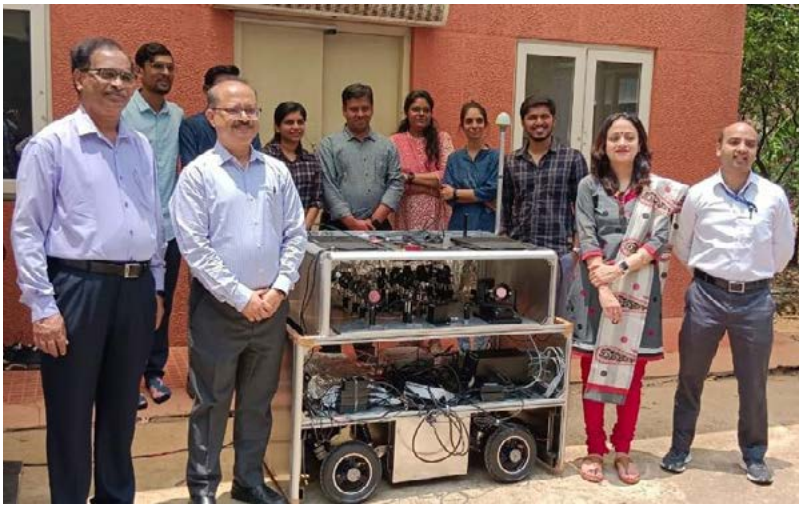
Dr.Urbasi strongly believes that scientific bent of mind can transform the world and it is necessary that each of us should continuously contribute to building the society. That's why we can see her interact with young minds in different forums all through her career. In fact, while pursuing her research at Cambridge, she supervised junior students and mentored them through tutorial sessions. Creating excitement at a young age and mending them towards research are crucial to build scientific temperament. Dr.Sinha has been engaging with society, be it public, students and teachers all throughout and this shows her faith in outreach.

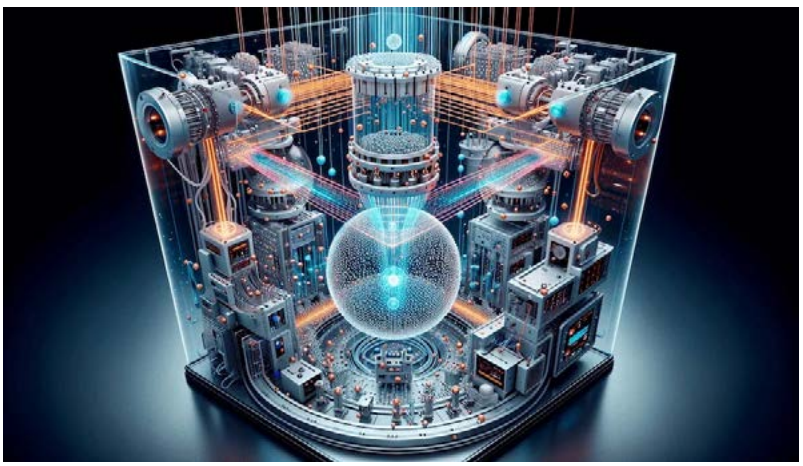
With passion for experimental Physics and inclination for breakthrough research, she plunged into the field of quantum mechanics as a postdoctoral fellow in the **Institute for Quantum Computing (IQC)**, Canada in 2007. Here she was encouraged by the founder-director Raymond Laflamme (student of Stephen Hawking) to perform experiments in the quantum optics lab. "I wanted to learn quantum optics by experimentation, and this was one of the best environments to do that in," Dr.Sinha exclaims.

One of her first experiments there was to test a key concept of the Nobel Laureate Max Born, which had never been explicitly tested until then. She proved its validity and received broad media coverage after it was published in Science magazine in 2010. The "thank you note" she received from Gustav Born that adorns the walls of her lab at RRI speaks volumes on how much she treasures it.

Back from Canada, Dr.Urbasi was offered a position at Raman Research Institute, Bengaluru, India. She established Quantum Optics Laboratory there, focusing on ground-breaking research in quantum information and computing. This is one of the first labs in India to manufacture and establish the usage of entangled single photon sources for various applications in quantum technology. She is also a professor at **Light and Atomic Matter Physics group (LAMP)** at RRI.

Dr.Urbasi Sinha has been investigating new frontiers in the world of quantum optics and quantum computing. Her current research areas include experimental secure quantum communications including **quantum key distribution (QKD)** in free space, fibre and integrated photonics, quantum teleportation, quantum entanglement, fundamental tests in quantum optics and quantum mechanics. One of the activities at her lab is investigating a higher dimensional system, a unit of





quantum information called a **qutrit.** "Quantum information is a very new area in India, especially experimental, and ours is one of the first modern labs to be dedicated to this field," Sinha explains, referring to their superior innovative technology.

Urbasi is among the 34 global scientists who was selected for the latest **Canada Excellence Research Chair (CERC)** in Photonic Quantum Science and Technologies recently. Sinha's CERC will create a test bed for quantum computing technology that could revolutionize our lives by disrupting the foundation of information science. It is for the first time that a scientist based in India has bagged this top recognition awarded by the Government of Canada. Over a period of eight years, she will receive a grant worth $8 million opening up possibilities for international interactions at various levels in academia, industry, and other relevant sectors, developing lab-to-market innovative models - all important steps towards a future ecosystem based on quantum technologies.

"I have always believed that science is global and that it is through international as well as national alliances and collaborations we can achieve more than what we would do working in silos. The CERC gives me an opportunity to put these words to action. Not only does it allow me to expand our activities to a different country and environment, it also provides a once in a lifetime opportunity to contribute towards quantum ecosystem development in India and Canada in parallel," says Dr.Urbasi Sinha.

Dr.Urbasi Sinha plays multiple national and international leadership roles. For her exemplary work in quantum technology and quantum communications, our government has funded her research under **Ministry of Electronics and Information Technology (MEITY), DST, India Trento Programme on Advanced Research (ITPAR), VAJRA (Visiting Advanced Joint Research)** scheme of the SERB, DST and many.

Career highlights / accolades

2017 - Homi Bhabha Fellowship.

2018 - International Commission for Optics(ICO)/ICTP Gallieno Denardo Award.

2020 - Led the two-member winning team as a mentor, at the World Skills International Competition in Quantum Technology organised by the Russian Quantum Centre.

2021

- Won the ASSOCHAM Women in Cyber: Making a Difference award in the category "Cyber - Leading from the front".
- Appointed a Simons Emmy Noether Fellow.

Sinha's lab has been chosen to represent India, through the Indian Space Research Organization, in an international collaboration with Canada to explore satellite-based experiments for hack-proof communications.

"Do not let your gender limit your thinking, aspirations and desire to pursue STEM. Half the world's population is female. Let us work towards creating gender balance in STEM as well. This requires a change in mind-set at various levels across age groups. **Let us be the change we want to see,"** says Dr Urbasi.

Ayurvedic superfoods for a refreshing summer

As the sun stretches its rays, painting the sky with vibrant hues, summer beckons us with its warmth and vitality. Amidst the sweltering heat, Ayurveda, the ancient science of life, offers us a treasure trove of superfoods to stay cool, hydrated and energized during this season. Among these, sugarcane juice, ice apple (*nongu*) and watermelon stand out as nature's gifts, brimming with nourishment and rejuvenation.

Sugarcane Juice: The elixir of cooling

Known as "***ikshu***" in Sanskrit, sugarcane holds a revered status in Ayurveda for its cooling properties. Laden with essential nutrients like carbohydrates, proteins and vitamins, sugarcane juice acts as a natural coolant, pacifying the fiery pitta dosha predominant during summer.

This elixir not only quenches thirst but also replenishes vital electrolytes lost through perspiration, combating dehydration effectively. Its alkaline nature aids in balancing acidity in the body, promoting digestive health and soothing gastrointestinal discomfort.

Rich in antioxidants, sugarcane juice shields the body from oxidative stress, bolstering immunity and fostering radiant skin. Its innate sweetness satiates cravings healthily, making it an ideal alternative to processed sugary beverages.

Ice Apple: Nature's coolant

Emblematic of summer's bounty, ice apple, or *nongu* in Tamil, emerges as a prized delicacy cherished for its remarkable cooling properties. Laden with electrolytes, vitamins and minerals, this translucent fruit replenishes hydration levels swiftly, making it a quintessential choice for scorching days.

In Ayurveda, ice apple is revered for its *pitta*-pacifying attributes, alleviating heat-related imbalances and fostering internal equilibrium. Its high water content not only hydrates the body but also aids in detoxification, flushing out toxins and impurities effectively.

Moreover, ice apple possesses astringent properties, which help tone and refresh the skin, lending a radiant glow. Consuming this natural coolant promotes mental clarity and tranquility, offering respite from the restlessness often associated with summer's intensity.

Watermelon: Nature's juicy blessing

Watermelon, with its luscious pink flesh and succulent sweetness, epitomizes summer's essence, offering a plethora of health benefits rooted in Ayurvedic wisdom. Replete with water, vitamins and antioxidants, this hydrating fruit emerges as a potent ally in combating heat-induced ailments.

Ayurveda extols watermelon for its *tridoshic* nature, harmonizing all three *doshas* and fostering holistic well-being. Its high water content keeps the body cool and hydrated, while electrolytes like potassium and magnesium prevent muscle cramps and fatigue. Furthermore, watermelon's rich antioxidant profile shields cells from oxidative damage, bolstering immunity and promoting vibrant health. Its natural sweetness satiates cravings without burdening the body with excessive calories, making it a guilt-free indulgence for summer revellers.

As we embrace the warmth and vibrancy of summer, incorporating Ayurvedic superfoods like sugarcane juice, ice apple and watermelon into our diet can enhance our well-being manifold. These gifts of nature not only cool and hydrate the body but also nourish the mind and spirit, fostering balance and vitality amidst the seasonal fervour.

By savouring these bountiful offerings with mindfulness and gratitude, we embark on a journey of holistic health and rejuvenation, aligning ourselves with the innate wisdom of Ayurveda and the abundance of the natural world. So, as the sun blazes overhead, let us relish these summer delights, rejoicing in the harmony they bestow upon our body, mind and soul.

Smt Ghana Saraswathy M

Architectural Wonder

Chenna Kesava Temple, Belur

Located in the serene town of Belur in Karnataka, the Chenna Kesava Temple stands as a magnificent testament to the architectural prowess and spiritual devotion of the Hoysala dynasty. Commissioned in 1117 CE by King Vishnuvardhana, this temple was built to commemorate his victory over the Cholas, symbolizing both a political triumph and a spiritual dedication to Lord Vishnu, to whom the temple is dedicated.

DO YOU KNOW ?

Belur is approximately 200 km northwest of Bangalore, the capital city of Karnataka. It is also around 35 km from Hassan, the district headquarters.

Highlights

Hoysala architecture: The temple is a prime example of Hoysala architecture, characterized by its star-shaped platform, intricate carvings and detailed sculptures. The temple is primarily built from soapstone, which allows for the detailed and intricate carvings for which Hoysala temples are famous.

Design: The temple complex includes

- main shrine (*garbhagriha*),
- vestibule (*antarala*), and
- hall (*mandapa*).

The outer walls and pillars are adorned with exquisite sculptures and panels depicting scenes from Hindu *puranas* and *itihasas*.

Iconography: The temple features numerous sculptures of deities, puranic figures, animals and floral patterns. One of the most notable sculptures is the ***Darpana Sundari*** (Lady with a mirror) and another one is the statue of *Mohini* (the female avatar of Vishnu)

Cultural and religious significance

The temple is an important pilgrimage site for Vaishnavites and attracts visitors for its architectural beauty and spiritual significance. Various festivals and rituals are conducted here, with the annual chariot festival being one of the major events.

UNESCO Tentative List: The Chenna Kesava Temple, along with other Hoysala temples, is on the UNESCO World Heritage tentative list due to its architectural and cultural significance. The temple is a major tourist attraction in Karnataka, drawing visitors from around the world who are interested in history, architecture and religion. The Chenna Kesava Temple stands as a testament to the artistic and cultural achievements of the Hoysala dynasty and continues to be a vital part of India's heritage.

Smt Vaishnavi V

Varanasi

The oldest living city

CURIOSITY CORNER

I

Quick five !

1. Other names of Varanasi - _____
2. Located in this state - _____
3. River that flows through this city - _____
4. Regional languages spoken here _____
5. Total number of Ghats (riverfront steps) in this city - _____

II Facts Fantastic!

1. The largest university in Asia founded by the famous leader Pandit Madan Mohan Malviya is located here.
2. Acclaimed as one of the greatest poets, this famous saint of the 16th century, also the author of the *Ramcharitmanas* hailed from this city. One of the Ghats is named after him.
3. Not only is Varanasi a pilgrimage centre, it is also a leading trade centre. These are the major items that this city is sought after for.
4. 10 km from Kashi is this place where Lord Buddha delivered his first sermon. Ruins of ancient Buddhist monasteries and temples are seen here.
5. Standing on the western banks of the River Ganga, this temple is one of the most famous Hindu temples dedicated to Lord Shiva. Tens of thousands of pilgrims visit the temple daily. Every year during Mahashivaratri, a massive procession arrives at this place.

III

What am I?

Unscramble the highlighted boxes in the crossword to find me.

Hint: A traditional embroidery style from Uttar Pradesh - delicate and artfully done by hand on a variety of fabrics.

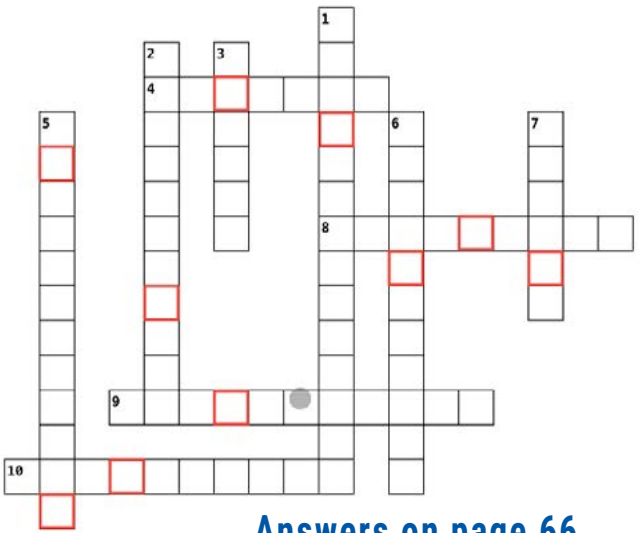
IV Crossword - Heritage of Varanasi

Across

4. According to Hindu *puranas*, Varanasi is situated on Lord Shiva's _____.
8. Varanasi is the _____ capital of India.
9. This industry employs a significant number of the local population in Varanasi.
10. This Ghat is believed to be a confluence of 5 rivers - Yamuna, Ganga, Saraswati, Dhupapapa and Kirana (out of which only Ganga remains to be visible).

Down

1. This form of Hindustani classical music was developed in Varanasi.
2. Ganga is also called by this name in Varanasi.
3. Also known as the "City of _____".
5. Astronomical observatory made by Sawai Jai Singh in Kashi.
6. Considered as a sacred place, this is one of the two Ghats where people cremate their dead.
7. This and Assi are the other two rivers that flow through Varanasi and confluences with Ganga.



Answers on page 66

Baikuntha Shukla and Yogendra Shukla

Yogendra Shukla

Yogendra Shukla, born on 29th March 1896, in Jalalpur, was a key figure in the Indian independence movement. He was an active member of the **HSRA (Hindustan Socialist Republican Association)** and played a significant role in mobilizing revolutionary activities in Bihar.

Shukla participated in the Kakori Train Robbery of 1925, an attempt to steal government funds to support the revolutionary cause. Over the years, Shukla faced multiple arrests and endured severe torture, yet remained committed to the freedom struggle. Post-independence, he continued his work in public life, advocating social justice. Yogendra Shukla passed away on 19th November 1960, leaving behind a legacy of courage and dedication.

Baikuntha Shukla

Baikuntha Shukla, nephew of Yogendra Shukla was born in 1907 in Jalalpur, Muzaffarpur district, Bihar. Deeply inspired by the Indian independence movement, he joined HSRA, which advocated armed resistance against British rule. Shukla's most notable act was his involvement in the assassination of Phanindranath Ghosh, a government informant who backstabbed by providing testimony that led to the execution of prominent revolutionaries like Bhagat Singh, Sukhdev Thapar, and Shivram Hari Rajguru—in the Lahore Central Jail.

Shukla was arrested, tried and sentenced to death for his role in Ghosh's murder. He appealed to the High Court of Patna against the Sessions Judge's decision, but the verdict remained the same. On the night of 13th May 1934, Baikunth Shukla sang patriotic songs while other prisoners refrained from eating in a show of solidarity. Finally, on 14th May 1934, the valiant Baikunth Shukla was hanged in Gaya Jail. Thus came to an end the life of a fearless fighter. His martyrdom remains a symbol of sacrifice in India's struggle for independence.

Zehn Kashyap

with cerebral palsy is Class 10 topper

Zehn Kashyap represents the growing population worldwide of students who have special needs. An advocate for de-stigmatizing disability, she is an internationally published writer and award-winning speaker. She has done programmes on causes such as different-ness, mental health and **diversity, equity & inclusion (DEI)** in national and international forums including the CBSE Board, Girl Up Global Leadership Summit, Lady Gaga's Born this Way Foundation, People Matters, TribesforGOOD, NRF and PHD Chambers of Commerce and Industry, Ashoka University, India Autism and Neurodiversity Summit by NASSCOM/ SAP, Diversity Mahotsav and Neurodiversity India Summit.

Zehn Kashyap with cerebral palsy has inspired many people with her remarkable CBSE Class 10 score of 94.8%. Vasant Kunj, Delhi's Vasant Valley School, too has a high success rate due to the outstanding work of the kids. Zehn Kashyap is a student that has received a lot of praise.

Zehn Kashyap was given the diagnosis that she would struggle to sit, move around and even communicate. She never allowed her condition to become a liability and by having faith, she demonstrated that anybody can do anything. When questioned about her success, Zehn stated that learners should study consistently because they couldn't get good results overnight.She firmly thinks that regular study may lower stress and aid in acing tests. Zehn's success story is proof of the value of diligence. Her accomplishment serves as motivation for pupils with problem.

FUN FACTS

"I am a Netflix buff and a diehard fan of Money Heist, so much so that I've watched it over 10 times and my favourite character is...no surprises for guessing - Tokyo (Spanish actor - Úrsula Corberó). Infact, I wrote a poem on her (Tokyo), but alas, I did not get a reply from her!" says Zehn.

I Quick five!

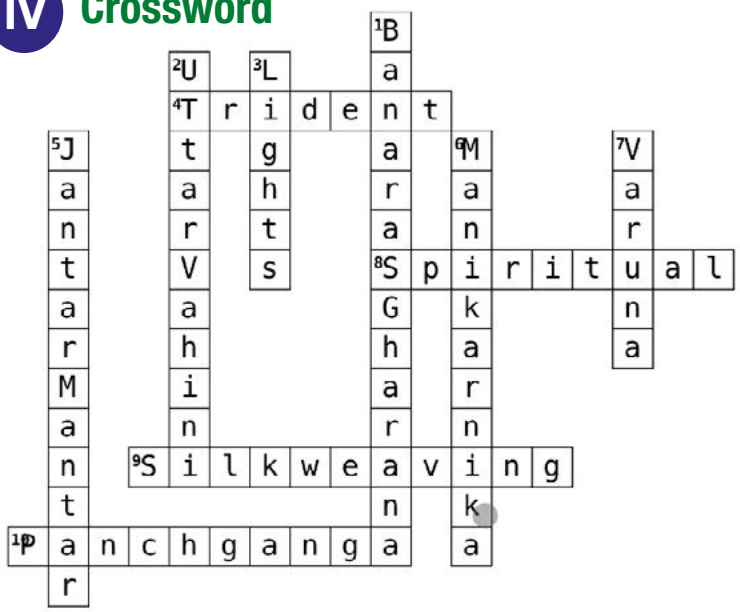
1. Benaras, Kashi
2. Uttar Pradesh
3. Ganges
4. Bhojpuri, Hindi
5. 84

II Facts Fantastic!

Answers of page 63

1. Banaras Hindu University
2. Tulsidas
3. Banarasi silk and Silver & gold brocades
4. Sarnath
5. Kashi Viswanath Temple.

IV Crossword



III

What am I ? Hidden word :

CHIKANKARI

Answers of page 50 to 52

Solutions – Refresher Quiz on Customer protection against digital frauds

A. 1. e
2. a &b
3. c
4. f
5. c
6. b
7. d
8. e
9. c
10. d

B.
11. True
12. True
13. False
14. True
15. True
16. False
17. False

C. 18. Refer article on Consumer protection for digital banking transactions. It is not her fault. The fraudsters could have inserted a chip in the ATM machine to scan the details of debit cards inserted. She can inform the bank immediately, block her card, claim zero liability since it was not her fault. She can ask for reversal of the debit.

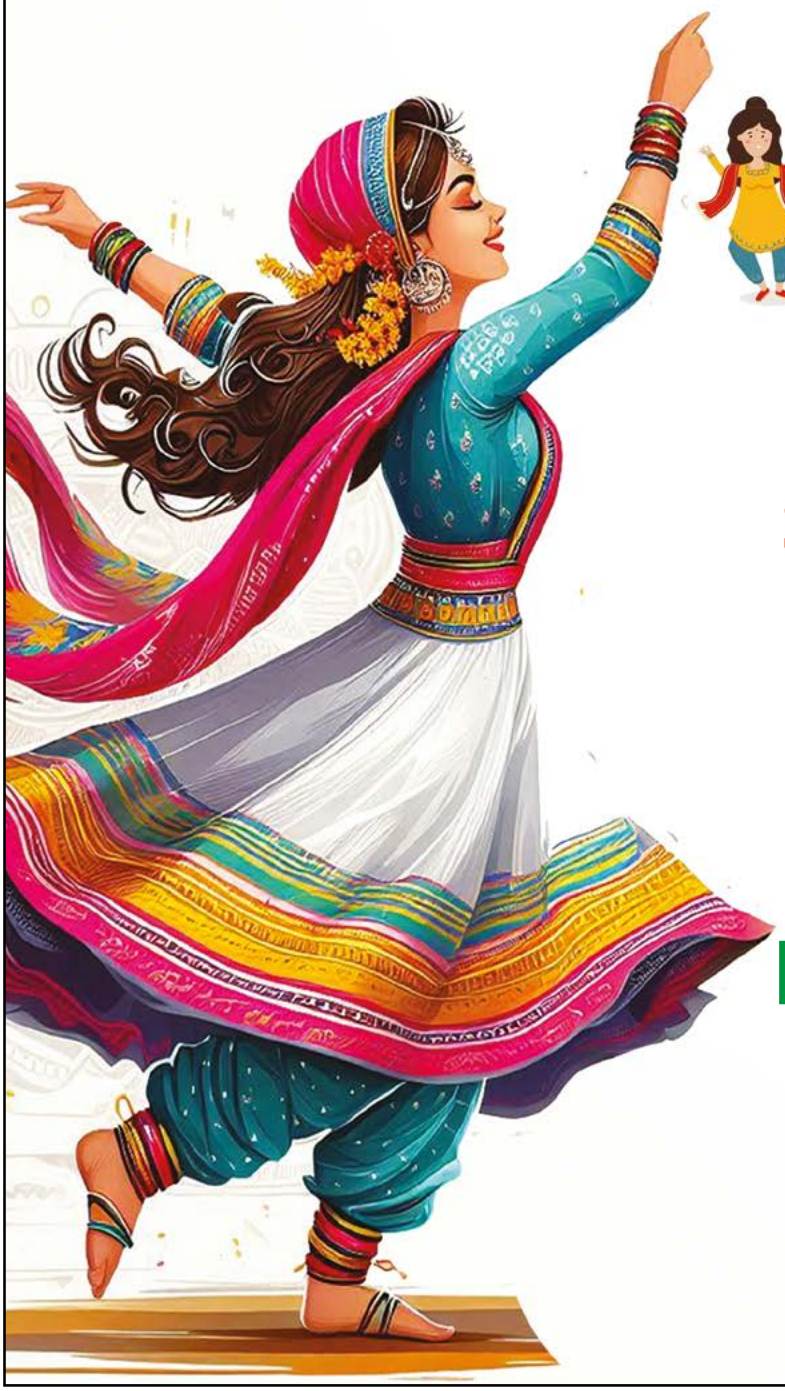
19. Refer article on Consumer protection in banking. Customer can register a complaint with Banking Ombudsman.

20. Refer Dos and Don'ts to prevent digital banking frauds. Customer is at fault as he had clicked a link sent by an unknown person and entered his credit card details. He can prevent further loss by calling up the bank and blocking his credit card.


World
Migratory Bird Day
2nd Saturday of May
Let us make the most of World Migratory Bird Day by joining hands to protect the migratory birds from the different threats they face.

International Dance Day

29th April



On this special day, may your steps be light, your heart be full and your dance floor be endless.