

Factly Weekly

Compilation

2026

**For UPSC CSE Prelims
Exam**

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Sengol

News: The new NCERT Class 9 Social Science textbook mentions the Sengol as a cultural marker of rulership and good governance.

About Sengol

- The Sengol is a **sacred sceptre** linked to **righteous governance** and the **cultural traditions of ancient Tamil civilisation**.
- **Naming:** The term Sengol is **derived from the Tamil word “Semmai”, meaning “righteousness”**.
- **Origin:** The tradition of using the Sengol as a symbol of righteous governance began more than a **thousand years ago during the Chola dynasty**.
- **Key Features:**
 - **Symbol of Authority:** Emperors carried the Sengol during ceremonial occasions to **represent their authority**.
 - **Succession:** The Chola tradition involved **handing over the Sengol from one king to another as a mark of succession and legitimacy**.
 - **Religious Blessing:** A **high priest or guru traditionally blessed the new king and conferred the Sengol**.
 - **Symbol of Independence:** In **1947**, it was used in a ceremony to **symbolize the transfer of power from the British to the first Prime Minister of India, Jawaharlal Nehru**.
 - The act **signified the beginning of self-governance and the transfer of power to the people of India**.
 - **Post-Independence:** After the ceremony, the **Sengol was kept at the Anand Bhavan Museum (Allahabad Museum) for over seven decades** before being relocated to New Delhi.
 - **Parliamentary Installation:** On **May 28, 2023**, the **Sengol was formally installed** in a dedicated glass enclosure **near the Speaker’s chair** during the inauguration of the new Parliament building.
- **Making and Sanctification:** The **Sengol presented during the 1947 independence ceremony was handcrafted by Vummidi Bangaru Chetty and sanctified by the seers of the Thiruvaduthurai Adheenam**.

National Coastal Mission (NCM 2.0)

News: Environment Minister Bhupender Yadav launched guidelines for implementing National Coastal Mission (NCM) 2.0 in New Delhi.

About National Coastal Mission (NCM 2.0)

- **Administered By:** It is administered by the **Ministry of Environment, Forest and Climate Change (MoEFCC)**.
- **Nature of Scheme:** It is a **Central Sector Scheme**.
- **Origin:** The **first phase, NCM 1.0, was implemented from 2021–22 to 2025–26**.
 - It is **now subsumed by NCM 2.0**, the second phase of the Mission.
- **Tenure:** NCM 2.0 will be **implemented from 2025–26 to 2030–31**.
- **Aim:** It aims to strengthen the **resilience and sustainability of India’s coastal regions and unlock the potential of the Blue Economy**.
- **Financial Outlay:** The Mission has an **approved outlay of ₹767 crore**.
- **Key Features of National Coastal Mission (NCM 2.0)**
 - **Coastal Coverage:** It covers **all 9 coastal States and 4 coastal Union Territories**.

- **Integrated Spatial Planning:** It develops **Integrated Coastal Zone Management Plans (ICZMPs)** and **Coastal Marine Spatial Plans** across 1,000 km of priority coastline.
- **Ecosystem Restoration:** It supports the **restoration of coral reefs and mangroves**, including a **Centre of Excellence on Corals**.
- **Climate Resilience:** It promotes **coastal risk reduction and climate adaptation and mitigation measures**.
- **Blue Economy:** It promotes **sustainable Blue Economy activities**, including **sustainable tourism and green shoreline infrastructure**.
- **Coastal Pollution Management:** It focuses on **preventing, reducing and controlling pollution** in coastal and territorial marine waters.
- **Coastal Livelihoods:** It supports **diversified and resilient livelihood options** for coastal communities.

Green Energy Corridor Phase-III Scheme

News: The Union Cabinet approved GEC Phase-III on September 30 to enable evacuation of up to 135 GW of renewable energy across States and Union Territories.

About Green Energy Corridor Phase-III Scheme

- **Green Energy Corridors (GEC)** are dedicated **power transmission networks** developed to **evacuate and integrate renewable energy into the grid**.
- **Nodal Ministry:** Ministry of New and Renewable Energy (MNRE)
- **Objective:** The scheme aims to **strengthen the Intra-State Transmission System (InSTS)**, **improve renewable energy evacuation and facilitate better grid integration**.
- **Different Phases**

Phase	Duration	Specific Features
GEC Phase-I	Launched in 2015-16	<ul style="list-style-type: none"> ● It Covered 8 renewable-rich states (Gujarat, Andhra Pradesh, Karnataka, Himachal Pradesh, Maharashtra, Madhya Pradesh, Tamil Nadu, and Rajasthan.)and targeted evacuation of about 24 GW of renewable energy.
GEC Phase-II	FY 2021-22 to FY 2025-26	<ul style="list-style-type: none"> ● It covers 7 states (Gujarat, Himachal Pradesh, Karnataka, Kerala, Rajasthan, Tamil Nadu and Uttar Pradesh) and facilitates grid integration and power evacuation of approximately 20 GW of Renewable Energy. ● It provides 33% Central Financial Assistance (CFA) for the project cost.
GEC Phase-III	Targeted for FY 2032-33	<ul style="list-style-type: none"> ● It strengthens the Intra-State Transmission System (InSTS) to enable evacuation of up to 135 GW of Renewable Energy. ● For the first time under the Green Energy Corridor programme, it includes 50 GWh of Battery Energy Storage Systems (BESS) to improve grid flexibility.

- **Key Features of GEC Phase-III**
 - **Total Project Outlay:** It has a total project outlay of ₹1,86,405 crore.
 - It including ₹1,36,378 crore for **Intra-State Transmission System (InSTS)** and ₹50,000 crore for **Battery Energy Storage Systems (BESS)**.
 - **Central Financial Assistance:** It provides ₹54,082 crore as Central Financial Assistance (CFA) to offset intra-state transmission charges and keep power costs down.
 - **Project Implementation:** Greenfield projects will follow **Tariff Based Competitive Bidding (TBCB)**, while **brownfield upgradation and network strengthening** will follow **Cost Plus Basis (CPB)**.
 - **Implementation Agencies:** State Transmission Utilities will be the overall implementing agencies, while Transmission Service Providers will participate through a **Build, Own, Operate and Maintain (BOOM)** model.
 - **Long-term Benefits:** The scheme will support **900 GW installed non-fossil capacity by 2035**, strengthen energy security and promote sustainable growth.

Cardiff MoU

News: Leaders of Scotland, Wales and Northern Ireland signed an MoU in Cardiff, advocating constitutional change and affirming their nations' right to self-determination.

About Cardiff MoU



Source: CGTN

- **Signatories:** The Cardiff MoU is a **political statement and a non-binding** agreement signed by Scotland, Wales, and Northern Ireland, calling for **constitutional change** and asserting the principle of self-determination.
- **Key feature of the MoU:**
 - **Commitment to self-determination:** The leaders of Scotland, Wales and Northern Ireland expressed a common commitment to greater autonomy.
 - **Greater devolution of powers:** All three regions share the demand for more powers to be transferred from Westminster to their respective governments.

- **Right to decide their future:** The parties emphasise that **the people of each nation should have the opportunity to determine their own constitutional future** through democratic means.
- **Opposition to excessive centralisation:** The agreement represents a **collective demand for a less centralised UK and greater recognition of the distinct identities and aspirations** of its constituent nations.
- **Rejoining the European Union:** The three nations support **rejoining the European Union**, arguing that Brexit has harmed their economies and opportunities.

AASHVAST Labs

News: The Indian Army will soon operate six AASHVAST labs to inspect drones and, eventually, CCTV cameras for firmware-level vulnerabilities.

About AASHVAST Labs

- AASHVAST stands for **Assessment and Analysis of Electronic Systems Hardware for Vulnerabilities and Security Threats**.
- It is a **firmware analysis and validation suite** developed by QuickPay Pvt. Ltd. for the **Directorate General of Electronics and Mechanical Engineers (DG EME)**.
- **Objective:** To detect **firmware-level and embedded-system vulnerabilities** and identify **foreign-origin components** in defence electronic systems, including those that may be misrepresented in procurement records.
- The **Indian Army is establishing six AASHVAST labs** across India; one has been inaugurated in **Delhi**.
- **Initial focus:** Army UAVs/drones, with other electronic systems such as CCTV cameras potentially covered later.
- **Key capabilities:**
 - Detects **hidden passwords, embedded keys and remote-access tools**.
 - Identifies **foreign-origin components and proprietary protocols**.
 - Detects **geospatial and time-based vulnerabilities** that could affect drone operations.
 - Identifies **hidden or unused code** that could cause malfunction or premature termination.

Canadian Hydrogen Intensity Mapping Experiment (CHIME) Telescope

News: The CHIME telescope has made its first standalone detection of hydrogen's faint glow from when the universe was about five billion years old.

About Canadian Hydrogen Intensity Mapping Experiment (CHIME) Telescope



Source – TNIE

- The **Canadian Hydrogen Intensity Mapping Experiment (CHIME)** is a radio telescope built in 2017.
- **Location:** It is located in **British Columbia, Canada**.
- **Objective:** It was built to **map the distribution of hydrogen gas in the early universe** and study **cosmic expansion and dark energy**.
- **Working Mechanism:**
 - **Radio-wave collection:** Its **four massive parabolic antennas** collect **radio waves in the 400–800 MHz range**.
 - **Digital focusing:** It has **no moving parts**.
 - It uses **digital signal processing** to focus incoming radio signals and determine their direction.
 - **Data processing:** A powerful correlator **processes data at about 7 terabits per second**.
 - **Sky coverage:** As **Earth rotates**, the telescope receives radio signals from **half of the sky**.
- **Key Features:**
 - **Hydrogen mapping:** It maps the **combined radio glow of hydrogen** to study its **distribution and clustering**.
 - **Independent observations:** It can **study dark energy** using its own data without relying on other telescope results.
 - **Other capability:** It can **detect and study Fast Radio Bursts (FRBs)** from distant galaxies.

ASEAN-India Maritime Exercise (AIME-2026)

News: The Second Edition of AIME-2026 commenced at Subic Bay, Philippines, on 28 September 2026.

About ASEAN-India Maritime Exercise (AIME-2026)



Source – PIB

- **AIME-2026** is a **multilateral joint naval exercise**.
- **Participating Members:** It is between the **Indian Navy and maritime defence forces of ASEAN Member States**.
- **2026 Edition:** AIME-2026 is the **second edition** of the exercise.

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- The **inaugural** edition was hosted by **Singapore in May 2023**.
- **Location:** It is being **conducted at Subic Bay, Zambales, Philippines**, opening into the **South China Sea/West Philippine Sea**.
- **Theme:** The theme is “**Anchored in Trust, United at Sea.**”
- **Aim:** It aims to enhance **mutual trust, operational coordination, communication and interoperability** among participating maritime forces.
- **Key Features**
 - **Indian Naval Participation:** From the Indian side, **INS Sahyadri and INS Kulish** are participating in AIME-2026.
 - **Two-Phase Exercise:** It is conducted in two phases: the **Harbour Phase and the Sea Phase**.
 - **Harbour Phase:** It includes **Subject Matter Expert Exchanges, sporting and cultural activities, community engagement and Operational Synchronisation**.
 - **Sea Phase:** Participating maritime forces will **conduct coordinated maritime exercises and operational serials to strengthen practical cooperation at sea**.
 - **Professional Engagement:** It promotes **professional understanding, operational coordination and sharing of best practices**.
 - **Strategic Cooperation:** It supports **India's Act East Policy** and the vision of **MAHASAGAR (Mutual and Holistic Advancement for Security and Growth Across Regions)**.

Rashtriya Vayoshri Yojana

News: The Ministry of Social Justice and Empowerment organised a distribution programme under RVY, providing 662 assistive devices to 114 senior citizens in Delhi-NCR.

About Rashtriya Vayoshri Yojana



- Implemented through 'Artificial Limbs Manufacturing Corporation (ALIMCO)' (PSU under M/o SJ&E)
- First of its kind in the country
- To address disabilities like low vision, hearing impairment, Loss of teeth and Locomotor disability
- Beneficiaries will get walkers, crutches, hearing aids, tripods, wheelchair, Artificial Dentures & Spectacles
- Devices are of high quality and conforming to BIS standards



Source – PIB

- The **Rashtriya Vayoshri Yojana** is first of its kind scheme in the country for **providing Physical Aids and Assisted-living Devices for Senior citizens belonging to BPL category**.
- It was launched on **April 1, 2017**.
- **Objective:** The scheme aims to **improve the mobility, independence, dignity and quality of life of eligible senior citizens by providing suitable assistive devices**.
- **Nodal Ministry:** Ministry of Social Justice and Empowerment (MoSJE)
- **Implementing Agency:** The scheme is implemented by Artificial Limbs Manufacturing Corporation (**ALIMCO**), a PSU under the Ministry of Social Justice and Empowerment.
- **Nature:** It is a **Central Sector Scheme, fully funded** by the Central Government.
- **Funding:** The expenditure is **met from the Senior Citizens' Welfare Fund**.
- **Eligibility:** **Senior citizens** belonging to the **BPL category** with **monthly income not more than Rs. 15000** and **suffering from age-related disability or infirmity** are eligible.
- **Assistive Devices:** Free **devices** include **walking sticks, hearing aids, wheelchairs, artificial dentures and spectacles**, based on the disability or infirmity.
- **Doorstep Support:** **Senior citizens aged 80 years or more** receive devices at their doorstep.

Jawahar Dweep Becomes India's First Plastic-free Oil Terminal

News: Mumbai Port Authority declared Jawahar Dweep Marine Oil Terminal plastic-free on 2 October 2026 during Swachhata Abhiyan 2026.

About Jawahar Dweep



Source – The Week

- The **Jawahar Dweep** is a **restricted offshore island terminal in Mumbai Harbour**.
 - It lies in the **Arabian Sea off Mumbai's eastern waterfront**, about **8.25 km northeast of the Gateway of India**.
- It is historically **known as Butcher Island**.
- **Ownership:** It is owned and operated by the **Mumbai Port Authority (MbPA)**.
 - It **handles crude oil, LPG and petroleum products from ocean-going oil tankers**.
- **Geological Formation:** The island has **Deccan Traps basaltic bedrock**.
- **Island Formation:** It is a **submerged topographic high or continental island remnant** within **Mumbai's estuarine harbour basin**.

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- **Recent Achievement**

- **Mumbai Port Authority** declared **Jawahar Dweep Marine Oil Terminal** plastic-free on 2 October 2026 during Swachhata Abhiyan 2026.
- Jawahar Dweep has become the **country's first oil terminal to completely eliminate single-use plastics**.

Buxa Tiger Reserve

News: A tigress was released in Buxa Tiger Reserve, West Bengal, marking the beginning of a phased Tiger Reintroduction Programme.

About Buxa Tiger Reserve



Source: Mongabay India

- **Buxa Tiger Reserve** is situated in the **Jalpaiguri District, West Bengal**.
 - It is located at the **confluence of three major bio-geographic zones**: The lower Gangetic plains, Central Himalayas and the Brahmaputra valley.
- **Corridor connectivity**: It has corridor connectivity **across the border with the forests of Bhutan in the North**, on the **East it has linkages with the Kochugaon forests, [Manas Tiger Reserve](#)** and on the **West with the Jaldapara National Park**.
 - **Important corridors** are Buxa-Chilapata Corridor, Buxa-Titi Corridor and Buxa-Ripu Corridor.
- **Establish year**: It was notified **under Project Tiger in 1983 as the 15th tiger reserve in India**.
- **Total Area**: 760.87 sq. km.
- **Associated River**: It is crossed by major rivers like the **Sankosh, Raidak, Jayanti, and Dima**.
- **Vegetation**: It is covered mainly by **moist tropical forests**.
- **Flora**: The forest is dominated by **Sal, Champa, Gamar and Simul trees**.
- **Fauna**: **Elephants, Tiger, Gaur, Sambar, Chital, Wild boar, Leopards, [Clouded leopards](#), Dhole and Red jungle fowl** are found here..
 - Species such as the **Hill Myna, Crested Serpent Eagle, Black Francolin, Hornbills, and various species of waterfowl** are found in the reserve.

- **Tribes:** Various tribes such as **Rawas, Mechs, Santhals, Oraos and Garos** live around the region.

About Tiger Reintroduction Programme

- Under the **Phased Tiger Reintroduction Programme** initiation, a tigress was translocated from **Valmiki Tiger Reserve** to **Buxa Tiger Reserve**.
- **Aim:** It aimed at **restoring a viable and self-sustaining tiger population** in this historically important tiger landscape.
- **Objective:** Its objective is **to create the conditions in which a tiger population can establish, breed and ultimately become viable and self-sustaining**.
- **Nodal ministry:** Ministry of Environment, Forest and Climate Change
- The programme is being implemented in a **planned, phased and adaptive manner**, based on scientific assessments.

Kinnal Art and Bidriware

News: The Kinnal art and Bidriware pieces are part of Karnataka's collection showcased at the 8th edition of PM Mementos.

About Kinnal Art



Source – Deccan Herald

- **Kinnal art** is a **traditional wooden craft**.
- It is known for **handmade idols** with **vibrant colours and glossy finish**.
- **Location:** It originated in **Kinhal village of Koppal district in North Karnataka**.
- This art dates back to the **15th–16th centuries**.
- **Origin:** It originated during the rule of the **Vijayanagara Empire**.
- **Key Features:**
 - **Materials used:** The idols are **made from Ponki Marra wood**, which is **soft and lightweight**, making it **suitable for sculpting**.
 - **Process:** Each Kinnal idol is **entirely handmade**, and the process is laborious.

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- **Artisans:** The traditional artisans are called **Chitragars**, whose ancestors worked on the **temples and palaces of Hampi**.
 - only 25 families in Kinhal village currently practice the art.
- **Subject:** The idols usually depict **gods, mythological characters and animals**.
- **GI Status:** Kinnal wooden idols have **been accorded GI Tag**.

About Bidriware



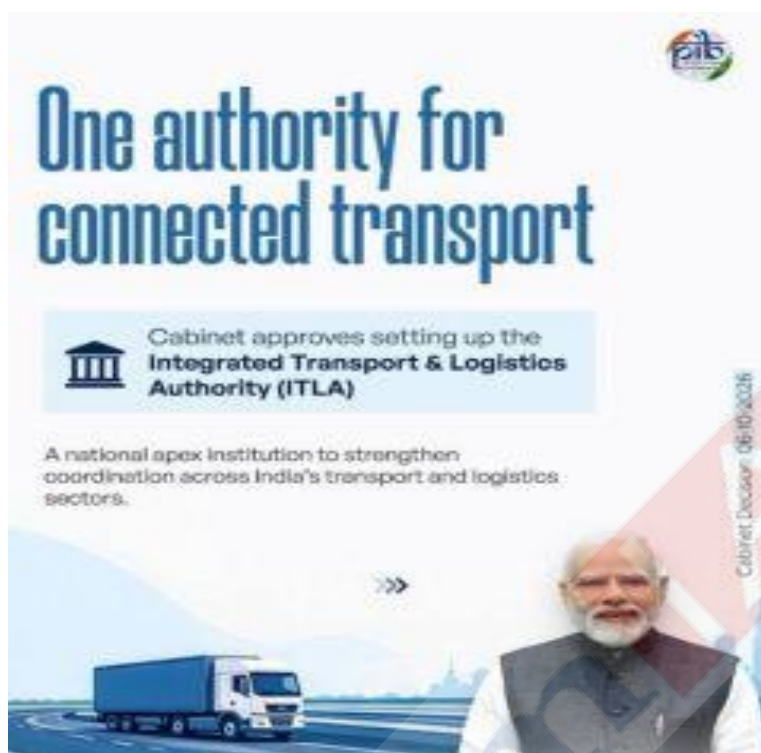
Source – Incredible India

- **Bidriware** is a **distinctive form of metal inlay work**.
- It is known for **silver, gold and brass** designs against a **dark background**.
- **Location:** Bidriware developed at **Bidar in Karnataka**.
- **Origin:** The art form **originated in Persia**, while its **development took place at Bidar**.
- **Bahmani period:** It is believed to have **developed under the Bahmani Sultanate in the 14th century** and reached its **zenith during the reign of Allauddin Ahmed Bahmani II**.
- **Key Features:**
 - **Material used:** The **base is made using a zinc-copper alloy, sometimes with tin**, while **silver, gold and brass** are used for **inlay work**.
 - **Process:** The craft involves **casting, engraving and inlaying**, followed by treatment with **special clay rich in saltpetre** to create its **black colour**.
 - **Design:** Its designs combine **Turkish, Arabic, Persian and Indian influences**, including **floral motifs, lotus, swastika, Quranic verses and the Persian rose**.
- **GI Status:** It has obtained a **Geographical Indications (GI) tag**.

Integrated Transport & Logistics Authority (ITLA)

News: The Union Cabinet approved ITLA as a Special Purpose Vehicle to improve coordination and multimodal integration in transport and logistics.

About Integrated Transport & Logistics Authority (ITLA)



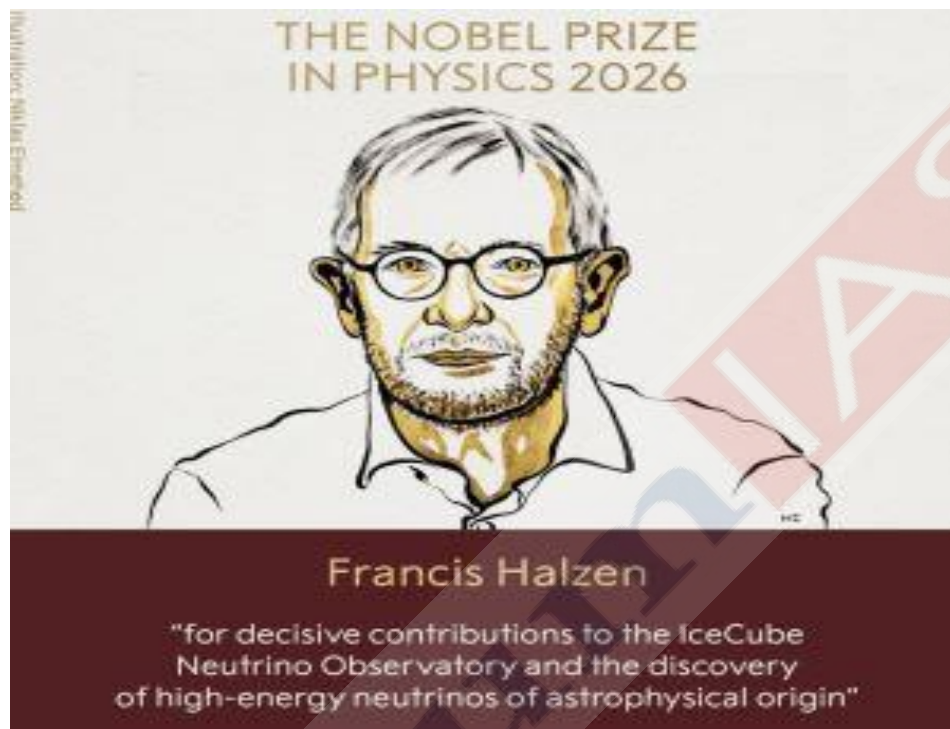
Source – PIB

- The **Integrated Transport & Logistics Authority (ITLA)** is a **Special Purpose Vehicle (SPV)** established for the transportation and logistics sectors.
- **Aim:** It aims to **address fragmented planning and implementation across transport-related ministries and agencies** through greater **coordination and multimodal integration**.
- **Nodal Agency:** It will be housed in the **Department for Promotion of Industry and Internal Trade (DPIIT)**.
- **Key Role and Responsibilities**
 - It will function as the **apex body for integrated transport and logistics planning, research, project appraisal, monitoring, policy support and data analytics**.
 - It will prepare a **National Transport Master Plan** with a **planning horizon of 10 years or more**, covering major transport and logistics sectors.
 - It will evaluate **short-term sectoral and annual plans** of transport ministries to **ensure their alignment with the National Transport Master Plan**.
 - It will **undertake technical appraisal** of Government of India infrastructure **projects costing ₹500 crore or more**.
 - It will **also monitor their implementation, support issue resolution and conduct post-implementation impact assessment**.
 - It will **create a unified transport data repository** using datasets such as **GSTN e-way bills, FASTag, Vahan, GPS-based systems** and urban traffic management systems for planning and monitoring.

2026 Nobel Prize in Physics and IceCube Neutrino Detector

News: Francis Halzen won the 2026 Nobel Prize in Physics for contributions to IceCube and discovery of high-energy astrophysical neutrinos.

About 2026 Nobel Prize in Physics



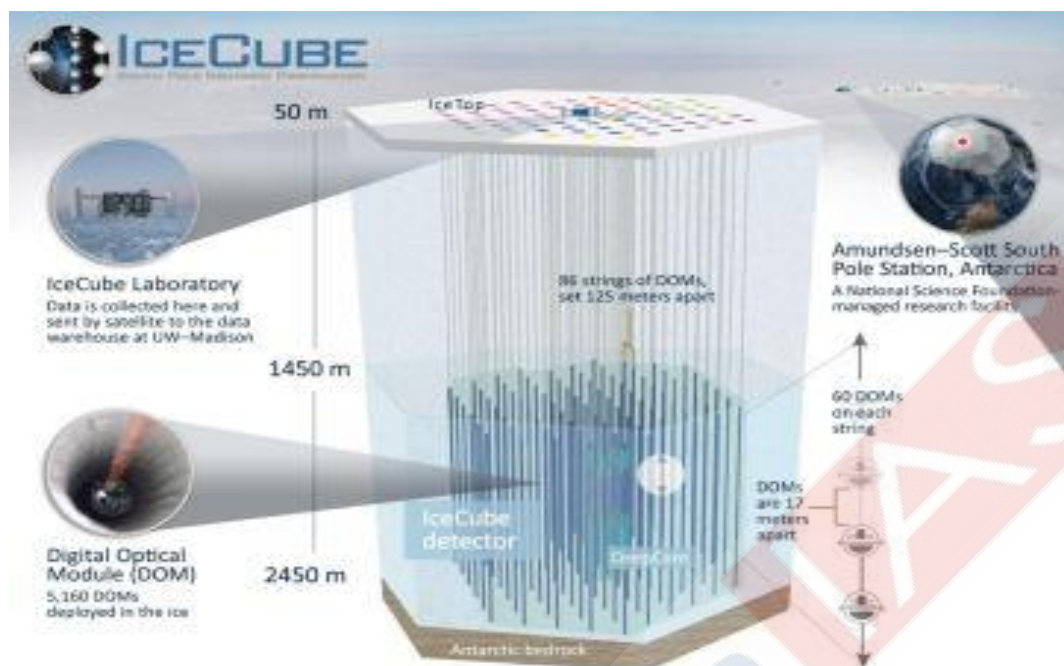
Source – Royal Swedish Academy

- **Winner:** The 2026 Nobel Prize in Physics was awarded to **Francis Halzen**.
 - He is from the **University of Wisconsin-Madison, United States**.
- **Awarded for:** It was awarded for contributions to the **IceCube Neutrino Observatory** and the **discovery of high-energy neutrinos of astrophysical origin**.
- **Key Contributions by Winner:**
 - **IceCube development:** In 1988, he **proposed an instrument to capture high-energy neutrinos at the South Pole**.
 - He later **led an international team** of researchers and engineers that **developed the IceCube detector**.
 - **Neutrino discovery:** IceCube enabled the **discovery of high-energy neutrinos originating outside the solar system**.

About Neutrinos

- Neutrinos are **tiny, almost massless** particles that **rarely interact with other particles** and can **pass through matter unnoticed**.
- They can **originate from natural particle accelerators in the universe** and **reach earth without changing direction or losing energy**.

About IceCube Neutrino Detector



Source – IceCube

- **Location:** It is located near the **Amundsen-Scott South Pole Station in Antarctica.**
- **Built by:** It was built and maintained by the **IceCube Collaboration, led by the University of Wisconsin-Madison.**
- **Aim:** It was **designed to observe neutrinos from the most violent astrophysical sources.**
- **Working Mechanism:**
 - **Detection:** A neutrino **occasionally collides with an atomic nucleus in the ice and produces charged particles.**
 - **Light production:** These **particles generate faint flashes of blue light.**
 - **Sensor detection:** **5,160 optical sensors** embedded in about one cubic kilometre of ice **detect this light.**
 - **Analysis:** Scientists **use the radiation's properties to study the neutrino and understand its cosmic origin.**

Advanced High-Altitude Parachute (AHAP)

News: Defence Research and Development Organisation (DRDO) conducted the maiden live jump of the Advanced High-Altitude Parachute (AHAP) at one of the highest-altitude drop zones, Nyoma (Mudh DZ).

About Advanced High-Altitude Parachute (AHAP)



Source: CSR Journal

- The **Advanced High-Altitude Parachute (AHAP)** is a static line parachute system meant for mass drop of paratroopers.
- **Developed by:** It is designed and developed by the **Aerial Delivery Research and Development Establishment (ADRDE)** in Agra.
- **Manufactured by:** The system has been manufactured by **Ordnance Parachute Factory (OPF)** Kanpur.
- **Features:**
 - It offers **multiple deployment modes** and has a wide operational altitude range of up to 18,000 feet.
 - It has the **safest rate of descent** especially suited for the tactical requirements of the **Indian Defence Forces** for high-altitude terrains.
 - It has been developed to meet the operational requirements of the **Indian Defence Forces**, particularly in difficult high-altitude environments.
- **Defence Research and Development Organisation (DRDO)** conducted the maiden live jump of the AHAP at one of the **highest-altitude drop zones, Nyoma (Mudh DZ)**.
 - Such extreme-altitude static-line jumps carry **risks from high opening shock and rapid descent** therefore it has been designed to **enhance safety and performance**.

SME Growth Fund

News: The Union Cabinet approved the Government of India's commitment of Rs.10,000 crore towards the establishment of the SME Growth Fund (SGF).

About SME Growth Fund



Source: PIB

- The SME Growth Fund is designed as a **direct equity investment fund**.
- **Announced by:** It has been announced by **Ministry of Finance**.
- **Fund allocation:** It will provide an **aggregate commitment of Rs.10,000 crore** to the [Alternative Investment Fund \(AIF\)](#) established under the SGF framework.
- **Aim:** It aimed at **catalysing growth-oriented capital for India's Small and Medium Enterprises (SMEs) and enabling the emergence of champion Indian enterprises** across manufacturing, services, technology, innovation-driven sectors, and strategic value chains.
- It will **provide patient equity capital to high-potential SMEs** with demonstrated business viability and scalability.
- **Strategic Focus of the Fund:**
 - **Manufacturing at the Core:** A major share of the **SME Growth Fund's allocations** will be directed towards **small and medium manufacturing-focused enterprises**.
 - It is intended to support firms seeking to expand **manufacturing capacity**, adopt **advanced technologies**, improve **productivity** and strengthen **export competitiveness**.
 - **Extending Growth to Industrial Clusters:** It will also consider SMEs operating in industrial clusters in **Tier-II and Tier-III cities**.
 - This is expected to support balanced **regional industrial development**, strengthen **local supply chains** and generate **quality employment opportunities**.
- It is expected to **improve scale, productivity, and strengthen export competitiveness** by enabling manufacturing enterprises to expand capacity, adopt advanced technologies and achieve greater scale.

Veerangana Durgavati Tiger Reserve

News: Two cheetahs, Vyom and Neera, were released in the reserve on October 7, 2026, expanding the cheetah conservation project in Madhya Pradesh.

About Veerangana Durgavati Tiger Reserve



Source – ANI

- The **Veerangana Durgavati Tiger Reserve** is the **largest tiger reserve in Madhya Pradesh**.
It is spread across **Sagar, Damoh, and Narsinghpur districts of Madhya Pradesh**.
It covers parts of the **Bundelkhand and Mahakoshal regions**.
- **Comprised of:** The reserve was formed by **integrating the Nauradehi Wildlife Sanctuary and Veerangana Durgavati Wildlife Sanctuary**.
It was officially **notified as a Tiger Reserve in September 2023**, under Section 38V of the **Wildlife (Protection) Act, 1972**.
- **Landscape:** The reserve lies on a **plateau forming part of the Upper Vindhyan range** and has **hills, valleys, grasslands, rivers, streams, and waterfalls**.
- **Main rivers:** The **Kopra, Bamner, and Bearma rivers**, which are **tributaries of the Ken River**, flow through the reserve.
- **Vegetation:** The reserve mainly consists of **tropical dry deciduous vegetation**, with **teak-dominated forests, bamboo thickets, and grasslands**.
- **Flora:** Important plant species found in the reserve **include Teak, Saja, Dhaora, Ber, and Amla**.
- **Fauna:** The reserve supports **tigers, leopards, wolves, jackals, Indian foxes, striped hyenas, Nilgai, Chinkara, Chital, Sambhar, Black Buck, Barking deer, Common Langur, and Rhesus Macaque**.
 - It is one of the few places where the **critically endangered White-Rumped and Indian Vultures** are found.
- **Historical Significance:** The historic **Singorgarh Fort** is located within the reserve.

Eastern Maritime Corridor (EMC)

News: Geopolitical disruptions in the Strait of Hormuz and Red Sea have highlighted India's need for safer and diversified energy routes like Eastern Maritime Corridor (EMC).

About Eastern Maritime Corridor (EMC)



Source – TH

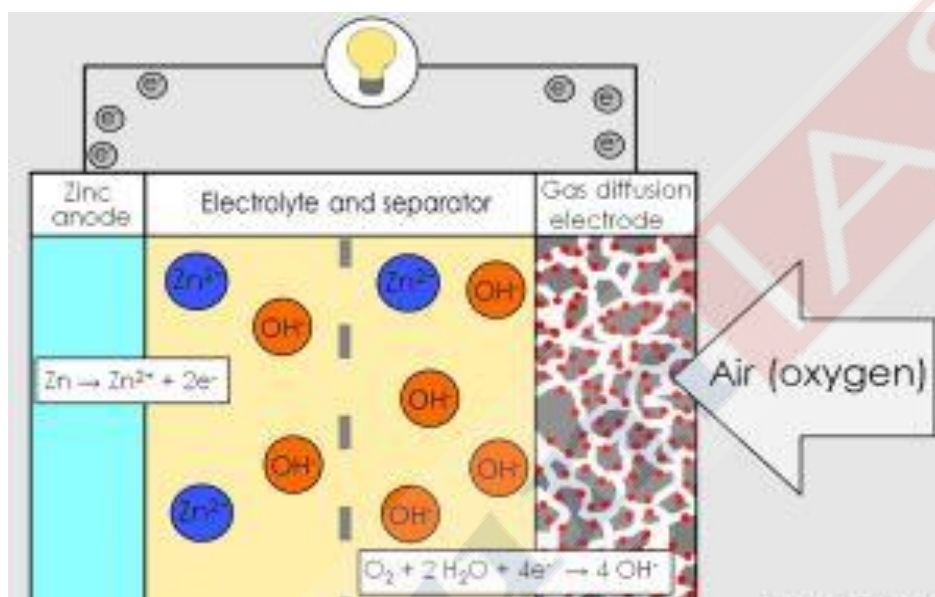
- The **Eastern Maritime Corridor (EMC)** is also called the **Chennai-Vladivostok Sea Route**.
 - It connects **South India** with **Russia's Far East**.
- **Origin:** It was launched in 2019 by India and Russia at the Eastern Economic Forum in Vladivostok.
- It passes through the **Sea of Japan, East China Sea, South China Sea, Malacca Strait, Andaman Sea and Bay of Bengal**.
 - It then reaches Chennai through the **Andaman and Nicobar archipelago**.
- **Key Features:**
 - **Shorter Distance:** The route covers about **5,647 nautical miles (10,458 km)**, reducing the distance by up to **40%** compared with the traditional route.
 - **Reduced Transit Time:** The EMC takes about **24 days**, compared with **40 days** on the traditional route, saving up to 16 days.
 - **Access to Russia's Far East:** The **Vladivostok Port** provides India with **access to the resource-rich Russian Far East**.
 - **Energy Security:** The EMC can help **reduce India's exposure to maritime chokepoints** by providing an **alternative route for trade and energy supplies from Russia**.
 - **Lower Freight Cost:** Ocean freight through the EMC is **expected to be more than 50% cheaper than the Suez route** because of its shorter distance and absence of canal transit charges.

- **Trade Potential:** India and Russia have linked the corridor with their goal of **achieving US\$100 billion annual bilateral trade by 2030.**

Zn-air Batteries and TTT-DHTD Material

News: Scientists have developed TTT-DHTD, a metal-free material that performs nearly as well as platinum in zinc-air batteries.

About Zinc-air (Zn-air) Batteries



Source – ReserachGate

- A **zinc-air battery** is a **metal-air electrochemical cell** that **generates electricity by oxidizing zinc using oxygen** from the **surrounding air**.
- **Anode (Zinc):** A porous mass of **zinc** particles saturated with an alkaline electrolyte (usually potassium hydroxide, KOH).
- **Cathode (Air):** An open structure that **absorbs oxygen from the air**, using a catalyst (like manganese or carbon) to reduce the oxygen.
- **Working Mechanism:**
 - Oxygen from air reacts at the **electrode** through **oxygen reduction reaction (ORR)** to generate electricity.
 - The battery **uses oxygen directly from air**, so it does **not need to store an active cathode material**.
 - The **efficiency of the ORR** strongly affects the battery's performance.
- **Advantages:** They have the potential for **higher theoretical energy density, lower material cost, improved safety and greater sustainability** than lithium-ion batteries.
- **Challenges:** Rechargeability, cycle life and oxygen reduction reaction (ORR) kinetics remain major challenges.

About TTT-DHTD Material



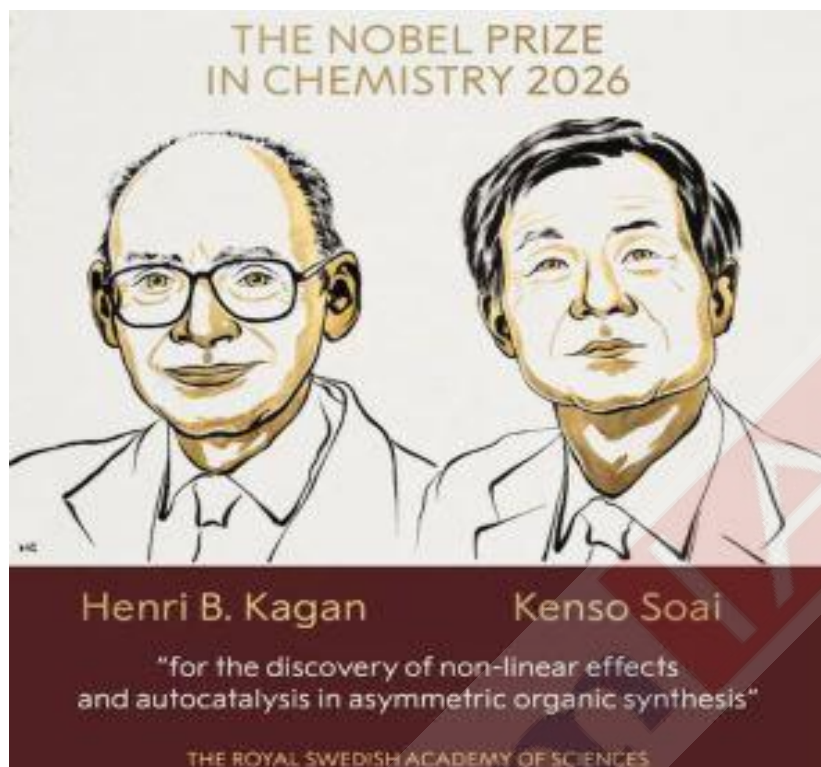
Source – DD News

- **TTT-DHTD** is a **metal-free organic porous material**.
- **Purpose:** It was **developed as an alternative to platinum-based oxygen reduction reaction (ORR) catalysts**.
- **Developed by:** It was developed collaboratively by researchers from the **S. N. Bose National Centre for Basic Sciences (SNBNCBS), Kolkata**; the **Institute of Nano Science and Technology (INST), Mohali**; and **SRM University, Amaravati**.
- **Composition:** It is made from **carbon, sulfur, nitrogen and hydrogen**.
- **Building blocks:** It is synthesized **using TTT (2,4,6-tris(4-aminophenyl)-1,3,5-triazine) and DHTD (4,8-dioxo-4,8-dihydrobenzo[1,2-b:4,5-b']dithiophene-2,6-dicarbaldehyde) linkers**.
- **Structure:** These linkers form an **ultra-porous, honeycomb-like covalent organic framework (COF)**.
- **Key Features:**
 - **Performance:** In laboratory tests, TTT-DHTD **performed almost as well as platinum in helping oxygen react to generate electricity**, achieving about 96% of platinum's performance.
 - **Stability:** It maintained its performance after **120 hours of continuous operation**.
 - **Molecular Structure:** Its structure **creates favourable sites for oxygen molecules to attach and react**.
 - **Metal-free:** It works **without using precious metals**.
- **Applications:** TTT-DHTD could support **Zn-air cells, clean transportation, portable power systems and renewable-energy storage**.

2026 Nobel Prize in Chemistry

News: The 2026 Nobel Prize in Chemistry was awarded to Henri B. Kagan and Kenso Soai for discoveries explaining how homochirality can emerge spontaneously.

About 2026 Nobel Prize in Chemistry



Source – CNBC

- **Winners:**
 - **Henri B. Kagan** from France, and
 - **Kenso Soai** from Japan.
- **Awarded for:** The 2026 Nobel Prize in Chemistry is awarded for **discoveries of non-linear effects and autocatalysis in asymmetric organic synthesis.**
 - These discoveries **enabled chemists to control reactions and produce predominantly or exclusively one of two molecular mirror images, leading to homochirality.**
- **Homochirality:** Homochirality refers to the **state in which only one of two mirror-image forms of a molecule is present.**
 - In life's chemistry, for example, **amino acids exist as two mirror-image forms, but only one form is found in proteins.**

Key Contributions by Winners

- **Henri B. Kagan – Controlling Molecular Asymmetry:**
 - Kagan studied **how chemical reactions could be made to produce more of one mirror-image molecule than the other.**
 - He found that **changing the proportion of the two mirror-image forms in a reaction could produce a much different proportion of the resulting products, showing a non-linear effect.**
 - **In 1986, he developed a method to manipulate chemical reactions so that they produced a greater excess of one mirror-image form than previously thought possible.**
- **Kenso Soai – Achieving Homochirality:**
 - Building on Kagan's work, Soai searched for **non-linear, asymmetric reactions that could catalyse their own formation.**

- In **1995**, he designed the **first chemical reaction with the potential to become homochiral**.
- In **2003**, he **demonstrated a reaction that produced only one of the two possible mirror-image forms**.

Sasol Solar Challenge 2026

News: Team AgniRath from IIT Madras has secured 3rd Place overall at the prestigious Sasol Solar Challenge 2026 in South Africa.

About Sasol Solar Challenge 2026



Source: DD News

- **Sasol Solar Challenge 2026** is a **South Africa's competition** that brings together **local and international teams to design, build and race solar-powered vehicles**.
 - It tests their **technology, manufacturing and strategy**.
- **Frequency:** It has been conducted **biennially since 2008**.
- **Hosting Country:** It is hosted by **South Africa**.
- **Feature:**
 - During the competition, cars can operate only from **8 a.m. to 5 p.m. each day**.
 - The winner is the team that **covers the longest distance over eight days** and not the team that finishes first.
- **India's Performance:**
 - **Team AgniRath from IIT Madras secured 3rd place** overall at the **Challenge**.
 - It is the **first Indian team to participate in the challenge and win a trophy**.
 - Their solar-powered car **Aagneya covered 1,192.6 km in 8 days**, from **Johannesburg to Cape Town**, through difficult terrain and weather.