

## RARE EARTH MAGNETS



- Rare earth magnets are **high-performance permanent magnets** made primarily from **rare earth elements** such as **Neodymium (Nd), Samarium (Sm), and Dysprosium (Dy)**.
- These magnets are **crucial components** in a wide array of modern technologies, including:
  - **Electric vehicles (EVs)**
  - **Wind turbines**
  - **Military defense systems** (e.g., missile guidance, radar)
  - **Consumer electronics** (e.g., smartphones, speakers)
  - **Drones and robotics**
- **China controls over 80% of the global rare earth refining capacity**, giving it significant leverage in the **global supply chain**.
- The strategic importance of rare earth magnets makes them a critical component for both civilian industries and military applications, making supply chain security a concern for nations dependent on imports, especially the United States.

### **About Rare Earth Elements (REEs)**

- This include **Scandium, Yttrium**, and the **15 Lanthanides**: Lanthanum (La), Cerium (Ce), Praseodymium (Pr), Neodymium (Nd), Promethium (Pm), Samarium (Sm), Europium (Eu), Gadolinium (Gd), Terbium (Tb), Dysprosium (Dy), Holmium (Ho), Erbium (Er), Thulium (Tm), Ytterbium (Yb), and Lutetium (Lu).
- **Classification of REEs**:
  - **Light Rare Earth Elements (LREEs)**: These include REEs with **atomic numbers 57 to 63**, namely **La, Ce, Pr, Nd, Pm, Sm, and Eu**.
  - **Heavy Rare Earth Elements (HREEs)**: These include elements with **atomic Ho, Er, Tm, Yb, and Lu**.

### CHEETAH RELOCATION FROM KUNO TO GANDHI SAGAR



- The **Cheetah Project Steering Committee** was set up in **May 2023** by the **National Tiger Conservation Authority (NTCA)** to **review, monitor, and advise** on the cheetah reintroduction program.
- **Project Cheetah** began in **2022** with the **translocation of 8 cheetahs from Namibia and 12 from South Africa to Kuno National Park**, but the project has faced setbacks, with **8 adult cheetahs and 5 cubs dying** so far.
- **Gandhi Sagar Wildlife Sanctuary** has been identified as a key part of establishing a **cheetah meta-population of 60–70 individuals** across the **Kuno–Gandhi Sagar landscape**, which stretches across **Madhya Pradesh and Rajasthan**.
- As of now, there are **26 cheetahs at Kuno**, of which **17 are in the wild** and **9 are still inside large enclosures**. It is yet to be decided whether the relocated cheetahs will come from the wild or enclosures.
- According to forest officials, **prey species at Gandhi Sagar** currently include **chinkara, chousingha, nilgai, and chital**.

#### About Cheetahs

- **Cheetahs breed year-round**, with peak breeding during the **rainy season**. **Females reach sexual maturity between 20–24 months**, while **males mature later, at 24–30 months**.
- The **gestation period** of a cheetah is approximately **90–95 days**, and they typically give birth to **3–5 cubs**.
- Cheetahs are listed as **Vulnerable** on the **IUCN Red List**.
- They are protected under **Schedule II** of the **Wild Life (Protection) Act, 1972**.
- They are also included in **Appendix I** of the **Convention on International Trade in Endangered Species (CITES)**, offering the highest level of protection from international trade.

### PLASTIC ICE VII



For the first time in scientific history, researchers have directly observed a strange phase of water known as Plastic Ice VII, which is believed to exist deep within the interiors of icy planets and moons, such as Neptune, Europa, and Titan.

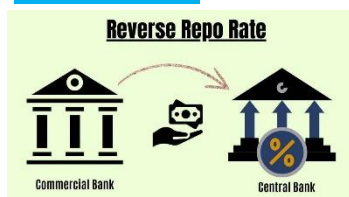
- Plastic Ice VII is a hybrid phase of water that displays the **dual characteristics** of both a solid and a liquid:
  - Like a **crystalline solid**, the **water molecules** remain in **fixed positions** within a **cubic crystal lattice**.
  - Simultaneously, these molecules can **rotate freely**, similar to the **behavior of molecules in a liquid**.
- This **unique plasticity** means the ice can **deform under pressure** like a malleable substance, making it fundamentally different from conventional ice types found on Earth.

Why is it called "Plastic" Ice?

- The term "**plastic**" refers not to synthetic materials but to its **physical property of plasticity**—the ability to **mold or deform under pressure** while still maintaining a **solid structure**.

Physicist **Livia Bove**, one of the lead researchers, describes it as a **solid that can be squeezed through a hole**, highlighting its **semi-fluid behavior under stress**.

### REPO RATE



- The **repo rate** is the **interest rate at which the RBI lends short-term funds** to commercial banks against government securities.
- It serves as a **primary tool for the RBI to regulate liquidity**, control inflation, and influence overall economic activity.

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- By adjusting the repo rate, RBI can either **encourage banks to borrow more** (by lowering the rate) or **discourage borrowing** (by raising the rate), thus influencing the money supply in the economy.

### Impact of RBI Repo Rate Cut

- **Lower Borrowing Costs:** Commercial banks benefit from reduced borrowing costs, enabling them to **offer loans at more competitive interest rates**.
- **Fixed Deposit (FD) Interest Rates:** Banks typically **lower FD rates after a repo rate cut**, as their own cost of funds decreases. This means new FDs will offer lower returns, while existing FDs remain unaffected until maturity.
- **Enhanced Credit Flow:** Lower interest rates encourage increased borrowing by businesses and consumers, **stimulating investment and consumption**.
- **Boost to Real Estate and Infrastructure:** Due to **more affordable financing options**, sectors like real estate and infrastructure may see **heightened activity**.
- **Support Amid Global Challenges:** The RBI's accommodative stance aims to bolster the Indian economy against global uncertainties, such as increased U.S. tariffs impacting exports.

### STELLAR MODEL



- The **STELLAR Model** (State-of-the-art, Totally indigenously developed Resource adequacy model) is designed to help **Indian states and discoms prepare comprehensive resource adequacy plans**, in line with the Ministry of Power's guidelines issued in June 2023.
- It is a vital tool for ensuring that the **power sector can reliably meet future electricity demand** through optimal planning of generation, transmission, and storage resources.

### STELLAR Model Key Features

- **Integrated Planning:** The model enables simultaneous planning for generation, transmission, and storage expansion, incorporating demand response as a key component.

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- **Resource Adequacy Compliance:** Assists states in meeting the dynamic, annually revised resource adequacy requirements mandated by the Ministry of Power.
- **User-Friendly and Transparent:** Developed entirely in India under CEA's guidance, the tool is transparent and will be regularly updated based on user feedback.
- **Free Distribution:** The software will be provided at no cost to all states and discoms, promoting uniformity and ease of use across the country.
- **Collaboration:** Developed in partnership with **The Lantau Group (TLG)** and the **Asian Development Bank (ADB)** under a technical assistance program.

### RBI PROPOSES NEW GOLD LOAN RULES

The surge in gold prices has led to increased gold loan disbursements, with NPAs rising by 28.58% and loan outstanding by 27.26% over the past year. The new framework aims to regulate the gold loan segment and mitigate potential risks.

#### **RBI Flags Irregular Practices in Gold Loans**

- A review by the RBI revealed several deficiencies in gold loan practices, including:
  - Use of third parties for sourcing and appraisal without proper oversight
  - Valuation of gold in the absence of the customer
  - Inadequate due diligence and end-use monitoring
  - Lack of transparency in gold auctions after defaults
  - Weak monitoring of Loan-to-Value (LTV) ratio
  - Incorrect application of risk weights

#### **RBI Directives to Lenders**

- The RBI instructed banks and NBFCs to review their gold loan policies and processes, identify gaps, and take corrective measures within a set timeframe.
- It also emphasized strict monitoring of the gold loan portfolio and greater control over outsourced activities and third-party service providers.



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#### Draft Guidelines Released

- **Prohibited Collateral**
  - Lenders are barred from granting advances against:
    - Primary gold/silver
    - Financial assets backed by primary gold/silver (e.g., ETFs, mutual fund)
- **Restrictions on Collateral Use**
  - Gold used as collateral for income-generating loans cannot be used simultaneously for consumption loans.
- **Ownership Verification**
  - Lenders must verify and maintain records of the ownership of gold collateral. Loans should not be extended where ownership is doubtful.

#### The Attractiveness of Gold Loans

- **Ease and Accessibility**
  - Gold loans are attractive due to easy availability, minimal documentation, and quick processing. PSU banks and major financial institutions offer instant loans with flexible repayment options.
- **Higher Loan Value**
  - The sharp rise in gold prices has enabled borrowers to secure higher loan amounts against their gold holdings.
- **Cultural Significance and Emergency Use**
  - Gold, often passed down through generations, is readily pledged during financial emergencies like medical or educational expenses.
- **Economic Uncertainty and Stability of Gold**
  - During economic slowdowns or uncertainty, gold is viewed as a stable asset, encouraging individuals to opt for gold loans.
- **Digital Expansion**
  - The rise of digital platforms and fintech solutions has made gold loans more accessible, even in remote areas, boosting their popularity.

## WORLD CHAGAS DISEASE DAY



- The 2025 theme, “**Prevent, Control, Care: Everyone’s Role in Chagas Disease,**” calls for global action to improve awareness, prevention, and access to care for those affected.

- The World Chagas Disease Day was celebrated for the first time in 2020.
- Over **7 million people are currently infected worldwide**, with more than 100 million at risk, and an estimated 10,000–12,000 deaths annually.
- The World Health Organization and partners are urging governments, health systems, and communities to strengthen early diagnosis, treatment, and comprehensive care for all.

### Chagas Disease

- Chagas disease, also known as **American trypanosomiasis**, is a **potentially life-threatening illness** caused by the **protozoan parasite Trypanosoma cruzi**.
- The parasite is primarily **transmitted to humans by triatomine bugs—commonly called “kissing bugs”**—but can also spread through blood transfusions, organ transplants, from mother to child during pregnancy, and, **rarely, through contaminated food or laboratory accidents**.
- It is often termed the “silent or silenced disease” due to its **asymptomatic nature and prevalence among marginalised populations**.
- Chagas disease is endemic in 21 countries in Latin America but is increasingly detected in the United States, Europe, and other regions due to migration.

## SIR SANKARAN NAIR



- Sir Chettur Sankaran Nair was born in **1857** in an **aristocratic family** from **Mankara village**, located in **Malabar’s Palakkad district** (present-day Kerala).

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- Nair graduated from **Presidency College, Madras**, and began his legal career under **Sir Horatio Shepherd**, who later became **Chief Justice of the Madras High Court**.

#### Key Positions and Recognitions

- In **1897**, Nair became the **youngest President of the Indian National Congress (INC)** — and remains the **only Malayali** to have ever held that post.
- He was appointed to the **Raleigh University Commission** by **Lord Curzon** in **1902**.
- Honored as **Companion of the Indian Empire** in **1904** and **knighted** in **1912** for his service.
- In **1908**, he became a **permanent judge in the Madras High Court**, where he was known for **progressive and reform-oriented judgments**.
- In **1915**, he joined the **Viceroy's Executive Council**, overseeing the **education portfolio**.

#### Role in the Freedom Movement

- Nair was a **strong nationalist** who firmly advocated for **India's right to self-rule**.
- In **1919**, he contributed significantly to the **Montagu-Chelmsford Reforms**, which introduced **dyarchy in provinces** and **increased Indian participation** in administration.
- Following the **Jallianwala Bagh massacre** on **April 13, 1919**, he **resigned from the Viceroy's Council** in protest — a bold move that **shook the British government**.
- His resignation triggered changes, including the **lifting of press censorship in Punjab**, the **termination of martial law**, and the formation of the **Hunter Commission** to investigate the massacre.

#### The Historic Defamation Trial Against Michael O'Dwyer

- In his book, Nair accused **Michael O'Dwyer**, then **Lieutenant Governor of Punjab**, of being **directly responsible** for the **Jallianwala Bagh massacre** due to his repressive policies.
- O'Dwyer filed a **defamation case** against Nair in an **English court** in **1922**, expecting support from the British legal system.



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- The trial lasted five and a half weeks and was the longest-running civil trial in Britain.
- The 12-member English jury, presided over by Justice Henry McCardie, mostly sided with O'Dwyer (11–1 majority), with only Harold Laski, a Marxist theorist, dissenting.
- Although Nair lost, the trial exposed the deep bias in the British legal system and galvanised nationalist sentiments in India.

#### ASIAN HORNET



- The Asian hornet (*Vespa velutina*), also known as the yellow-legged hornet, is an invasive species originally native to Southeast Asia.
- It is not the same as the Asian Giant Hornet (*Vespa mandarinia*), often wrongly labeled the “murder hornet.” While both are bee predators, the Asian hornet (*Vespa velutina*) is smaller but equally destructive in ecological terms.
- These hornets are predatory insects, feeding primarily on social bees and wasps, especially honeybees, which are critical pollinators in ecosystems.
- The Asian hornet’s specialised hunting tactics make it a lethal threat to honeybee colonies, as it can wait at hive entrances and kill bees mid-flight.

#### **Invasion History and Spread**

- The Asian hornet was first introduced to Europe in 2004, most likely via a shipment of Chinese pottery that brought a fertilised queen to France.
- Since then, the species has spread to 15 European countries, with France alone hosting over 500,000 nests.
- Britain recorded its first official detection of the Asian hornet in 2016.