



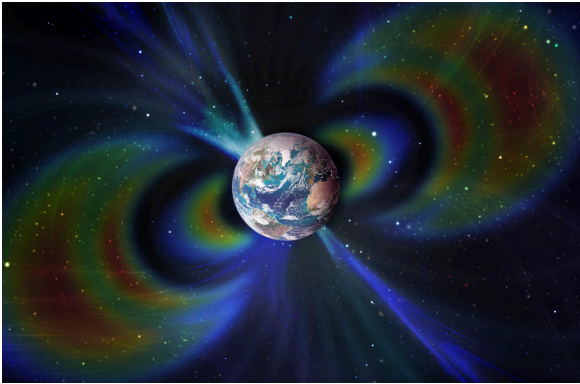
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7 May 2024

National & International News

Oldest Evidence of Earth's Magnetic Field Found in Rocks



Context:

- Geologists at MIT and Oxford University discovered ancient rocks in Greenland that contain the oldest traces of Earth's early magnetic field, dating back approximately 3.7 billion years.
- These rocks retain imprints of a magnetic field with a strength of at least 15 microtesla, comparable to Earth's current magnetic field.
- The researchers aimed to find rocks that still bore signs of Earth's magnetic field when they first formed, leading them to sample from rock formations in Greenland's Isua Supracrustal Belt.

Earth's Magnetic Field:

- The Earth's magnetic field, or geomagnetic field, emanates from the core and interacts with the solar wind in space.
- It resembles a tilted bar magnet, with north and south magnetic poles having opposite polarities.
- The field's lines form a loop, entering at the north magnetic pole and exiting at the south magnetic pole.
- Generated by convection currents of molten iron and nickel in the core, the field is compressed by the solar wind on the Sun-facing side and stretched into a tail on the night-facing side.
- Additional sources of the magnetic field include the Earth's crust, ionosphere, and magnetosphere.
- NASA states that the Earth's magnetic poles reverse every 200,000 to 300,000 years, with the last reversal occurring about 790,000 years ago. The process can take hundreds or thousands of years.



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Sri Madhava Perumal Temple



Context:

- The **Bhavanisagar dam in Erode has revealed inscriptions from a submerged temple, indicating the presence of a trade route.**
- Due to low water levels (less than 46 feet), the dilapidated temple has become visible. The dam's full reservoir level is 105 feet.
- Construction of the Bhavanisagar dam, Tamil Nadu's first major post-independence irrigation project, began in 1948 and was completed in 1955.

Historical Insights from Inscriptions:

- **10 to 15 inscriptions** found in the temple date back to different periods, revealing the **existence of Thuravallur village over 1,000 years ago.**
- Thuravallur had a temple for Lord Shiva called Thondreshwaramudiayar.
- **The area served as a peruvallu (a trunk road) for traders crossing River Bhavani and River Moyar to reach Wayanad in Kerala and various places in Karnataka.**
- Traders dealt in oil, clothes, cattle, and handicrafts, likely traveling on foot or using donkeys or horses for transport.

Under Hoysala Rule:

- The area was under the rule of the Hoysala rulers, with **King Veera Ballala III (1292-1342) ruling.**
- **Madhava Perumal Dhandanayaka**, the general of the army, was appointed by the king to rule the region and constructed the Dhandanayaka Fort along the river.
- The fort, constructed **680 years ago**, was destroyed, leaving only the damaged temple visible.
- Madhava Perumal Dhandanayaka's son, Veera Siddha Keththaya Dhandanayaka, built the Sri Madhava Perumal Temple inside the fort.
- **The fort was later called Danaikan Fort, with villages along it known as "Oduvanganadu."**
- The area was ruled by the Vijayanagara Empire, Ummattur chiefs, and Tipu Sultan.
- **The Battle of Sathyamangalam during the Third Anglo-Mysore War in 1790 was fought near the fort, guarded by Tipu Sultan.**



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	<ul style="list-style-type: none"> The British later controlled the area, merging the Nilgiris (part of the Mysore Province) with the Madras Province.
<p>Nifty Non-Cyclical Consumer Index Fund</p>	<p>Context:</p> <ul style="list-style-type: none"> On 7th May 2024, Groww Mutual Fund introduced India's first Nifty Non-Cyclical Consumer Index Fund, a significant milestone in the country's investment landscape. <p>Key points:</p> <p>Non-Cyclical Stocks:</p> <ul style="list-style-type: none"> Resilient stocks that perform well regardless of economic instability. Cater to daily necessities like food, LPG, power, etc., prioritizing consumer needs and essential services. <p>Difference between Cyclical Stocks vs. Non-Cyclical Stocks:</p> <p>Cyclical Stocks:</p> <ul style="list-style-type: none"> Impacted by economic changes, dependent on business cycle fluctuations. Season-specific demand influences stock prices. Profit maximization through buying during off-seasons and selling during high-demand periods. <p>Non-Cyclical Stocks:</p> <ul style="list-style-type: none"> Products in continuous demand, irrespective of economic cycles. Daily necessities like food and water. Less affected by economic instability, offering stability and consistent returns. <p>Objective and Strategy:</p> <ul style="list-style-type: none"> The fund mirrors the performance of the Non-Cyclical Consumer Index–TRI, aiming for long-term capital growth. Investing in securities of the Nifty Non-Cyclical Consumer Index, maintaining proportional weightage. <p>Investment Options:</p> <ul style="list-style-type: none"> Systematic Investment Plan (SIP) with a minimum investment of Rs 100, with subsequent increments in multiples of Re 1. Lump sum investments accepted with a minimum of Rs 500, followed by increments in Re 1 units.



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Index Composition and Rationale:

- Leading stocks from consumer sectors like Fast-Moving Consumer Goods (FMCG), and Textiles.
- Selection criteria prioritize companies with substantial market capitalization, reflecting established consumer brands.

Coral Bleaching of Lakshadweep

Context:

- The **ICAR-Central Marine Fisheries Research Institute (CMFRI)** found **severe coral bleaching** in the **Lakshadweep Sea** due to **prolonged marine heatwaves** since **October 2023**.

Measurement of Heat Stress in Corals:

- Corals experience thermal stress when sea surface temperatures **exceed 1 degree Celsius above the maximum mean temperature**. **This stress worsens with prolonged high temperatures.**
- Scientists use the Degree Heating Week (DHW) indicator to measure accumulated heat stress in an area over the past 12 weeks.
- DHW is calculated by adding any temperature exceeding the bleaching threshold during this period, in celsius-weeks.

Current Situation in Lakshadweep:

- **DHW values above 4 degrees Celsius weeks cause significant coral bleaching.**
- **Lakshadweep has now crossed this threshold.**
- Lakshadweep Sea has been consistently experiencing temperatures 1 degree Celsius above the norm since October 27, 2023.

Marine Heatwaves and Coral Bleaching in the Indian Ocean:

- A 2022 study by the Indian Institute of Tropical Meteorology (IITM), Pune, revealed increasing marine heatwaves in the Indian Ocean, **attributed to rapid warming and strong El Niños.**
- Previously rare, these heatwaves have become an annual event in the tropical Indian Ocean.
- **The western Indian Ocean region saw the largest increase in marine heatwaves at a rate of about 1.5**



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events per decade, followed by the north Bay of Bengal at 0.5 events per decade.

- Between 1982 and 2018, the western Indian Ocean had 66 events, while the Bay of Bengal had 94.
- An underwater survey showed that 85% of the corals in the Gulf of Mannar near the Tamil Nadu coast bleached after the marine heatwave in May 2020.

Impacts on Lakshadweep:

- **Heatwaves endanger coastal communities, tourism, fisheries, and critical marine habitats, including seagrass meadows.**
- Seagrass meadows and kelp forests are experiencing detrimental impacts like impaired photosynthesis, reduced growth, and hindered reproductive functions.
- As Lakshadweep is formed by coral reefs, their health is crucial for the islands' structure.
- Coral death may lead to organic matter accumulation, hindering future coral formation.
- **Besides excessive atmospheric heat due to global warming, shifts in ocean currents also contribute to unusually high water temperatures.**

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