



3 January, 2024

Amaterasu

Context: Astronomer Dr. Fujii at Osaka Metropolitan University discovered a cosmic ray in data from the U.S. Telescope Array Project (May 2008 to November 2021), as per a November Science journal paper.

➤ Discovery of Amaterasu Cosmic Ray:

- Japanese scientist Toshihiro Fujii, an astronomer at Osaka Metropolitan University, discovered a very high-energy cosmic-ray event in May 2021.
- Named the event 'Amaterasu' after the sun goddess in Japanese mythology.
- Detailed in a November Science journal paper.

➤ Cosmic Rays and Their Energies:

- Cosmic rays are energetic particles and clusters originating from outer space and the sun, including protons and alpha particles.
- Only low-intensity cosmic rays reach Earth's surface, losing energy in the atmosphere through collisions with atmospheric gases.
- Cosmic rays have energies ranging from about one billion eV to about 100 billion billion eV.
- Amaterasu cosmic ray had an extraordinary energy of 240 EeV, about 40 million times higher than particles from the Large Hadron Collider.

➤ Significance of Amaterasu Discovery:

- The discovery may aid in identifying similar cosmic-ray events and understanding their properties.
- Could contribute to solving the mystery of cosmic-ray sources and their extremely high energy.

➤ Ultra-High-Energy Cosmic Rays (UHECRs):

- UHECRs are subatomic particles from extragalactic sources with energies greater than 1 EeV.
- Amaterasu cosmic ray had an energy of 240 EeV.
- Cosmic microwave background (CMB) radiation limits UHECRs above 60 EeV, helping estimate their source distance.

➤ Amaterasu's Unique Characteristics:

- Amaterasu appears to have originated from an empty part of the universe.
- Dr. Fujii proposed three possible explanations for its origin: unidentified source, interaction with a stronger magnetic field, or a reevaluation of high-energy particle physics.

➤ Comparison with "Oh My God" Particle:

- In 1991, a cosmic ray with an energy of 320 EeV, known as the "Oh My God" particle, was detected at the Dugway Proving Ground in Utah.

➤ Cosmic Rays and Their Types:

- Galactic cosmic rays (GCRs) originate from beyond our solar system, while solar cosmic rays are high-energy particles emitted by the sun.
- GCRs include a variety of ionized nuclei, affected by magnetic fields.

➤ Role of Amaterasu in Understanding Cosmic Rays:

- The high energy of Amaterasu provides valuable data for refining theories about cosmic-ray behavior.
- Tracking cosmic rays helps scientists understand the elemental composition of cosmic particles.

➤ Implications for Physics:

- The discovery challenges existing understanding and may lead to a reevaluation of high-energy particle physics.
- The search for explanations includes considering unidentified sources and interactions with magnetic fields.

Amendment in Central Civil Services (Pension) Rules, 2021

Context: The Department of Pension & Pensioners' Welfare has amended the CCS (Pension) Rules, 2021, allowing female Government servants to prioritize their children for family pension over their husbands.

➤ Background:

- As per CCS (Pension) Rules, 2021, family pension is initially granted to the spouse of a deceased Government servant or pensioner.
- Eligibility for family pension for children and other family members arises only after the spouse becomes ineligible or passes away.

➤ Concerns Raised:

- The Department of Pension & Pensioners' Welfare received numerous queries from Ministries/Departments about the eligibility of a female Government servant/pensioner to nominate her child/children for family pension in case of marital discord, divorce proceedings, or legal actions.

➤ Decision and Process:

• Request During Legal Proceedings:

- If divorce proceedings or legal cases under specific acts are pending, a female Government servant/pensioner can make a written request to grant family pension to her eligible child/children instead of her spouse in the event of her death.

• Disbursement of Family Pension:

- If the female Government servant/pensioner, who made the request, passes away during the legal proceedings, family pension will be disbursed as follows:
 - If survived by a widower with no eligible child, family pension goes to the widower.
 - If survived by a widower with minor or disabled children, family pension goes to the widower as their guardian.
 - If survived by a widower with children who have attained majority but are eligible, family pension goes to the children.
 - Once children become ineligible, family pension goes to other eligible children, if any.
 - After all children are ineligible, family pension goes to the widower until his death or remarriage, whichever is earlier.

➤ Significance:

- This amendment is a progressive step toward empowering women employees/pensioners, addressing issues related to family pension eligibility during legal proceedings and marital disputes.

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Cold Wave

Context: The India Meteorological Department (IMD) stated on Monday that from January 5 to 11, a drop in temperatures is expected, causing cold wave conditions in some northern states.

- Cold wave conditions signify a significant temperature drop from the normal climatological values at a specific location.
- These conditions are prevalent in India during the months of November to March.
- **Impact on Health:**
 - During this period, the health of people, especially the underprivileged, is severely affected.
 - Extreme cases can result in serious casualties.
- **Regional Influence:**
 - Cold waves are a seasonal phenomenon in the northern parts of India, affecting states like Punjab, Rajasthan, Delhi, Haryana, U.P., Bihar, and Jharkhand.
 - Hilly regions like Jammu and Kashmir, Himachal Pradesh, and Uttarakhand are particularly influenced.
- **Cold wave Classification:**
 - Defined by the India Meteorological Department (IMD) based on actual minimum temperatures and departure from normal.
 - Categories include Cold Wave (CW), Severe Cold Wave (SCW), Cold Day, and Severe Cold Day.
 - **Based on Departure:**
 - Cold Wave (CW): Negative Departure from normal is 4.5°C to 6.4°C.
 - Severe Cold Wave (SCW): Negative Departure from normal is more than 6.4°C.
 - **Based on Actual Minimum Temperature (For plain stations only):**
 - Cold Wave: When the minimum temperature is $\leq 04^{\circ}\text{C}$.
 - Severe Cold Wave: When the minimum temperature is $\leq 02^{\circ}\text{C}$.

- **Cold wave conditions for coastal stations:**

- When the minimum temperature departure is -4.5°C or less over a station, a "Cold Wave" may be described if the minimum temperature is 15 degrees C or less.

- **Cold Day:**

- Maximum Temperature Departure is -4.5°C to -6.4°C .
- Severe Cold Day: Maximum Temperature Departure is $< -6.4^{\circ}\text{C}$.

- **Core Cold Wave Zone:**

- Encompasses northern regions, Himalayas, and western desert areas.
- Seventeen States/UTs with a population of 90.90 crores fall under this Core Cold Wave Zone.

- Reasons for Cold wave conditions include a ridge in the jet stream, surface high-pressure, movement of cold air masses, triggering mechanisms, and extensive snow cover in the northwest Himalayas.

- **Contributing Factors to Colder Temperatures in North India:** Factors such as wind and moisture content, large-scale fog cover, westerly winds, and climate change contribute to colder than normal temperatures.

- **Impact of Cold wave:**

- Adversely affects agriculture, livestock, human health, transportation, aviation, power sector, and causes significant economic losses.
- Cold waves have led to fatalities and health issues, affecting various sectors.

- **Measures and Mitigations:**

- A multi-dimensional approach is needed for disaster risk management during Cold waves.
- Improving the health sector, implementing early warning systems, national-level plans, and preventive measures are essential to minimize the impact of Cold waves.

NEWS IN BETWEEN THE LINES

Free Movement Regime



Recently, the Union government plans to end the Free Movement Regime along the Myanmar border, requiring those in border areas to obtain visas for entry into India.

About Free Movement Regime:

- The Free Movement Regime (FMR) is a **pact between India and Myanmar** that allows citizens of both countries to travel up to **16 kilometers** into the other country without a visa.
- It was **implemented in 2018** as part of the Indian government's **Act East policy**.
- Its aim is to address historical border demarcation issues that **divided people of the same ethnicity and culture** without their consent.
- To cross the border, citizens must present a border pass issued by the competent authority with a one-year validity, allowing them a **maximum stay of two weeks per visit**.

Indo Myanmar Border:

- The India-Myanmar border is 1,643 km long and runs through the states of **Mizoram, Manipur, Nagaland and Arunachal Pradesh**.
- The border is **unfenced and porous**, which has led to concerns about **illegal immigration**.
- It runs from the **tripoint with China** in the north to the tripoint with Bangladesh in the south.
- India and Myanmar signed a **Treaty of Friendship in 1951**, and Prime Minister Rajiv Gandhi's visit in **1987** strengthened the relationship.

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Surya Namaskar



Recently, Gujarat set a Guinness world record with over 50,000 people performing 'Surya Namaskar' simultaneously at 108 venues.

About Surya Namaskar:

- Surya Namaskar, also known as **Sun Salutation**, is an **ancient yogic practice** that involves a series of **12 asanas**.
- The practice can be traced back to the Vedic period in India, where the **sun is worshipped as a god**.
- The 12 steps of Surya Namaskar are-Pranamasana, Hastauttanasana, Hastapadasana, Ashwa Sanchalanasana, Dandasana, Ashtanga Namaskar, Bhujangasana, Adho Mukha Svanasana, Ashwa Sanchalanasana, Hastapadasana, Hastauttanasana and Tadasana.

Konark Sun Temple:

- The Konark Sun Temple is a **13th century temple** dedicated to the Hindu sun god Surya, located on the coast of Odisha.
- The temple was **built by King Narasimhadeva I** of the **Eastern Ganga dynasty** from 1238–1250 CE.
- The temple is designed in the shape of a **gigantic chariot**, with twelve pairs of wheels pulled by seven pairs of horses.
- It was declared a UNESCO World Heritage Site in **1984**.

Place in News

United Arab Emirates



Recently, India - UAE joint military exercise 'desert cyclone' commences in Rajasthan.

United Arab Emirates (Capital: Abu Dhabi)

Location: Located in the Arabian Peninsula, the UAE is situated in the southeastern corner of the Arabian Gulf.

Boundaries: It shares its border with **Persian Gulf (North)**, **Oman (East)**, **Saudi Arabia (South and West)** and **Qatar (Northwest)**.

Physical Features:

- Rich in **oil reserves**, the UAE has a significant role in the global energy market.
- The **Burj Khalifa** in Dubai, the world's tallest building.

Personalities in News

Savitribai Phule and Rani Velu Nachiyar

Recently, the Prime Minister of India paid tributes to Savitribai Phule and Rani Velu Nachiyar on their Jayanti.

Savitribai Phule (3 January 1831- March 10, 1897):

- Savitribai Phule is considered **India's first female teacher**.
- She and her husband, **Jyotirao Phule**, opened the first girls' school in India in **1848**.
- She was a **social reformer**, **educationalist** and **poet** from Maharashtra.
- She believed that education should be available to all children, regardless of religion, caste, race, creed, or color.
- She **believed in gender equality** and that men and women are equal in society.
- She opened **Mahila Sewa Mandal** in **1852** to raise awareness about women's rights.
- She took on the work of **Satya Shodhak Samaj** after the death of Jyotirao Phule.



Rani Velu Nachiyar (3 January 1730-December 25, 1796):

- Rani Velu Nachiyar was an **18th century queen** from the Sivagangai district of Tamil Nadu who fought against British rule to regain her kingdom.
- She is known as the **first queen to fight against the colonial power** during that time.
- She is known by Tamils as **Veeramangai** ("brave woman").
- In **1780**, **Rani Velu Nachiyar granted powers to the Marudhu Brothers** to administer the country.
- She **led a rebellion against British forces with the help of the Marudu Brothers**.

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Personality in News

Arun Yogiraj

About Arun Yogiraj:

- Arun Yogiraj a **renowned sculptor** from Mysuru, hails from a family of renowned sculptors.
- He is **one of the three artists** behind the creation of idols of Ram Lalla (Lord Ram in his childhood).
- He **runs the Brahmarshi Kashyapa Shilpakala Shala trust** in Mysuru, dedicated to training children in clay modeling and other artistic skills.
- His portfolio includes impressive sculptures such as a **28-ft monolithic black granite stone of Subhash Chandra Bose**, a **12-ft Adi Shankaracharya idol** for Kedarnath and **India's largest 10-ft monolithic white marble stone sculpture of Sri Ramakrishna Paramahansa**.
- He **collaborated with GL Bhat of Bengaluru** and **Satyanarayana Pandey** of Rajasthan for the creation of the Ram Lalla idol.
- He chose the **Krishna Shila stone from HD Kote**, known for its non-reactive properties to liquids.



POINTS TO PONDER

- The Kharsawan Massacre, recently in the news, happened in which current state? - **Jharkhand**
- Which country has recently filed a case against Israel at the International Court of Justice, accusing it of genocide? - **South Africa**
- Who has been recently appointed as the new Chief of Materiel of the Indian Navy? - **Vice Admiral Kiran Deshmukh**
- Recently, which oceanographic research vessel of the Indian Navy has embarked on the Sagar Maitri Mission-4 to Oman? - **INS Sagardhwani**
- What is the name of military exercise between India and UAE taking place in Rajasthan? - **Desert Cyclone**

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