



22 August, 2024

Standard time for Moon

Context: Last week, the International Astronomical Union proposed creating a timekeeping standard for the Moon.

➤ Background on Timekeeping Standards

- **Current Earth Time Standard:**
 - Coordinated Universal Time (UTC) is used worldwide, set by the International Bureau of Weights and Measures in Paris.
 - UTC is based on a weighted average of over 400 atomic clocks globally.
 - Atomic clocks measure time using the resonant frequencies of atoms, such as cesium-133, defining a second as the period of 9,192,631,770 vibrations of a cesium atom.
- **Determining Local Time:**
 - Countries adjust local time by adding or subtracting hours from UTC, depending on their position relative to the Greenwich meridian (0 degrees longitude).

➤ Need for a Lunar Time Standard

- **Time Flow on the Moon:**
 - Time flows differently on the Moon compared to Earth due to gravitational differences, as explained by Einstein's Theory of General Relativity.
 - A clock on the Moon would tick slightly faster than one on Earth, losing about 58.7 microseconds per Earth day.
- **Implications of Time Discrepancy:**
 - The time difference can affect spacecraft docking, data transfer, communication, and navigation.
 - Current lunar missions use their own timescales linked to UTC, which is manageable for a few missions but problematic for future multiple missions.
- **Future Lunar Missions:**
 - Countries like India, China, and the US plan to increase lunar activities. NASA's Artemis aims for 2026, China by 2030, and India by 2040, with proposals for a long-term human outpost.

➤ Establishing a Lunar Time Standard

- **Proposal for Lunar Timekeeping:**
 - Atomic clocks could be deployed on the Moon to establish a time standard.
 - At least three atomic clocks would be placed on the Moon at different locations to account for variations in the Moon's rotation and local mass concentrations (mascons).
- **Clock Placement and Synchronization:**
 - Clocks need to be positioned at various lunar sites due to slight variations in time flow caused by mascons.

- These clocks would be combined using an algorithm to create a unified lunar time standard, which would be aligned with UTC for consistent operations from Earth.

• Comparison to Earth Timekeeping:

- On Earth, atomic clocks are placed at different latitudes to account for variations in rotational speed from the Equator to the poles, which affects timekeeping.

➤ Current Time Standards

- **Geocentric Coordinate Time (TCG):** A theoretical time standard based on Earth's center of mass. Realizations of TCG have measurement errors.
- **International Atomic Time (TAI):** A time standard produced by the International Bureau of Weights and Measures (BIPM) using inputs from atomic clocks worldwide. TAI is a practical realization of Terrestrial Time (TT), which is a rescaling of TCG.
- **Universal Time (UT1):** Represents mean solar time at 0° longitude, adjusted for Earth's irregular rotation using data from quasars, the Moon, satellites, and GPS.
- **Coordinated Universal Time (UTC):** An atomic time scale designed to approximate UT1, with differences from TAI adjusted by leap seconds. UTC is kept within 0.9 seconds of UT1.
- **GPS Time (GPST):** Provides a precise time signal worldwide, with a constant offset from TAI (GPST = TAI - 19 seconds). It is regularly synchronized with UTC.
- **Standard/Civil Time:** Deviates from UTC by a fixed number of hours or adjusts twice a year for Daylight Saving Time.
- **Julian Day Number:** Counts days since 1 January 4713 B.C. Julian Date includes the fraction of the day elapsed. Modified Julian Day (MJD) starts at midnight and is calculated as $MJD = JD - 2400000.5$.
- **Barycentric Coordinate Time (TCB):** A time standard based on the Solar System's center of mass, known as the barycenter.

Sub-categorisation of SC quota

Context: On August 21, 2024, over 21 SC and ST groups protested nationwide, blocking roads and railways, demanding action on sub-categorisation, nullification of a recent Supreme Court judgment, and a caste census.

➤ Data and Facts Related to SCs and STs

- **Article 341:** Empowers the President to designate certain castes, races, or tribes as Scheduled Castes

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(SCs) based on historical injustice related to untouchability.

- **Census 2011:** SCs make up approximately 16.6% and STs about 8.6% of India's population.
- **Reservation:** SCs collectively receive 15% reservation in education and public employment. Some SC groups are underrepresented compared to others. Efforts to extend additional protection have faced judicial scrutiny.

➤ Related Constitutional Provisions

- **Article 14:** Guarantees equality before the law.
- **Article 15(4):** Allows the state to make special provisions for the advancement of socially and educationally backward classes, including SCs.
- **Article 16(4), 16(4A), and 16(4B):** Provide for reservation in posts and services.

➤ Background: Roots of the Case

- **1975:** Punjab government divided its 25% SC reservation into two categories: one for Balmiki and Mazhabi Sikh communities and one for other SC communities.
- **2004 Decision:** The Supreme Court in *E.V. Chinnaiah v State of Andhra Pradesh* ruled that SC/ST lists are a 'homogenous group' and cannot be subdivided.

➤ Committees for Sub-Classification

- **Committee of Secretaries:** Composed of five members including the Secretaries of Home, Law, Tribal Affairs, and Social Justice Ministries, chaired by the Cabinet Secretary. The committee's mandate excludes policy matters like reservation quotas and lacks a deadline for its findings.

➤ SC Observations

- **E.V. Chinnaiah vs State of Andhra Pradesh:** States cannot divide the SC list; it must be treated as a single, homogenous group.
- **State of Punjab and Others v. Davinder Singh:** States can decide on the quantum of benefits within the SC/ST lists without altering them.
- **Jarnail Singh v. Lachhmi Narain Gupta:** The 'creamy layer' principle applied to SCs for promotions, limiting benefits to the more disadvantaged within SCs.
- **SC Constitution Bench, 2020:** Recognized inequalities within SCs and STs, leading to a larger seven-judge bench review.

➤ SC Verdict on Sub-Classification of SCs and STs

- **Permission for Sub-Classification:** States can create sub-classifications within SCs and STs to better target support for the most disadvantaged groups, within the existing 15% reservation.

- **Empirical Basis for Sub-Classification:** Must be based on data and historical evidence of systemic discrimination, not arbitrary reasons.
- **Extension of Creamy Layer Principle:** The principle applied to OBCs is extended to SCs and STs, excluding affluent individuals from reservation benefits.
- **Judicial Review:** Sub-classification decisions by states are subject to judicial review to prevent misuse.
- **Generational Limit:** Reservation benefits are limited to the first generation of beneficiaries; subsequent generations may not qualify if the family has achieved higher social status.

National AVGC-XR Mission

Context: On August 21, 2024, the Information and Broadcasting Secretary announced the upcoming implementation of the AVGC-XR policy with the National AVGC-XR Mission.

➤ About the AVGC Sector

- **Overview:**
 - The sector includes animation, visual effects, gaming, and comics.
 - Growth has been robust, with potential to lead globally.
 - High skill demand in content creation.
- **Economic Potential:**
 - India aims to capture 5% of the global market share (\$40 billion) by 2025.
 - Expected annual growth of 25-30%, creating over 160,000 jobs annually.
 - Current employment stands at 185,000 AVGC professionals, with a growth forecast of 14-16% over the next decade.

➤ National AVGC-Extended Reality Mission

- **Policy Drafts:**
 - Draft national and state policies for promoting the gaming and digital sector have been submitted by the Task Force.
- **"Create in India" Campaign:**
 - Focused on content creation and aimed at:
 - Attracting foreign direct investment
 - Facilitating co-production treaties and innovation with international partners
 - Establishing national and regional centers of excellence for skill development
 - Leveraging the National Education Policy to foster creative thinking in schools
- **University Curriculum:**
 - Suggests a UGC-recognized curriculum for undergraduate and postgraduate degrees.

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- **Standardization:**
 - Proposes standardizing admission tests for AVGC-related courses.
- **Training and Capacity Building:**
 - Recommends signing MoUs with global AVGC markets (U.S., Japan, South Korea, Germany) for internships.
- **Infrastructure Development:**
 - Establish AVGC accelerators and innovation hubs in academic institutions.
 - Promote subscription-based pricing models for MSMEs, startups, and institutions to democratize AVGC technologies.
- **Cultural Promotion:**
 - Support indigenous technology development through incentive schemes and IP creation.
 - Set up a production fund for domestic content to promote India's culture and heritage globally.
- **Inclusion of Women and Children:**
 - Offer special incentives for women entrepreneurs.
 - Promote local children's channels to raise awareness of India's culture and history.
 - Establish a framework to protect child rights in the digital realm.

NEWS IN BETWEEN THE LINES

Almatti Dam



Recently, the Karnataka Chief Minister Siddaramaiah has urged the Centre to clear the decks for increasing the height of the Almatti dam over the Krishna river.

About Almatti Dam:

- The Almatti Dam, also known as the **Lal Bahadur Shastri Dam**, is a hydroelectric project on the Krishna River in Bijapur, Karnataka.
- It was **completed in July 2005** and is part of the **Upper Krishna River Project (UKRP)**.
- The dam is used for irrigation, flood control and hydroelectric power generation.
- The dam has a 290 MW power station on the right side that **uses vertical kaplan turbines to generate power**.
- The dam's backwaters also **attract many migratory birds** in the summer.

Krishna River:

- The Krishna River **originates from the Mahabaleshwar region** in the **Western Ghats in Maharashtra**.
- It flows through the states of **Maharashtra, Karnataka and Andhra Pradesh** before emptying into the **Bay of Bengal**.
- The major right-bank tributaries of the Krishna River include **Venna, Koyna, Panchganga, Dudhganga, Ghataprabha, Malaprabha, and Tungabhadra**, while the major left-bank tributaries include **Bhima, Dindi, Peddavagu, Halia, Musi, Paleru, and Munneru**.

Competition Commission of India



Recently, the Congress questioned the Competition Commission of India (CCI) over its approval of all acquisitions by the Adani Group, alleging that the conglomerate is building monopolies across key infrastructure sector to the detriment of customers.

About the Competition Commission of India:

- The Competition Commission of India (CCI) is an **independent statutory and antitrust body** of the Indian government.
- It was **established under the Competition Act, 2002**, which **replaced the Monopolies and Restrictive Trade Practices Act, 1969**.
- Its main goal is to create a **competitive business environment**, **protect consumers** and small businesses and **ensure freedom of trade**.
- It **investigates and takes action against anti-competitive practices**, such as abuse of dominance, **anti-competitive agreements** and combinations that could lead to monopolies or restrict competition.
- It can **imposes penalties** for unfair trade practices and **violations of competition norms**.
- The Commission **consists of one Chairperson and six Members**, all of whom are **appointed by the Central Government**.
- Its headquarter is located in **New Delhi**.

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Khadi and Village Industries Commission



Recently, the Khadi and Village Industries Commission KVIC has signed a Memorandum of Understanding MoU with the Department of Posts.

About Khadi and Village Industries Commission:

- The Khadi and Village Industries Commission (KVIC) is a **statutory body**.
- This apex organization **operates under the Ministry of Micro, Small and Medium Enterprises (MSME)**.
- It was **established by the Indian government in 1956** to promote and develop khadi and other village industries in rural areas.
- It **provides financial assistance** to institutions and individuals for developing and guiding the Khadi and Village industries **through the supply of designs, prototypes, and other technical information**.
- The schemes covered under the Khadi and Village Industries Commission include the Prime Minister's Employment Generation Programme (PMEGP), **Interest Subsidy Eligibility Certificate (ISEC)**, Workshed Scheme for Khadi Artisans, Khadi Reform and Development Programme (KRDP), **Scheme of Fund for Regeneration of Traditional Industries (SFURTI)** and the **Honey Mission**.

Khelo India



The ASMITA Yogasana League (East Zone) under Khelo India is beginning from today (22nd August 2024) at the Patliputra Sports Complex in Patna, Bihar and will conclude on 24th of August.

About the Khelo India Program:

- Khelo India ("Let's play India") is a **national program in India** that **aims to develop sports at the grassroots level**.
- The program was **proposed in 2017** by the Indian government and **launched in 2017-18** under the tenure of Prime Minister Narendra Modi.
- The program aims to revive India's sporting culture, build a strong sports framework, inspire and identify young talent, **provide top-notch infrastructure** and establish India as a great sporting nation.
- The program includes annual national sports competitions, such as the **Khelo India Youth Games (KIYG)**, **Khelo India University Games (KIUG)** and **Khelo India Winter Games (KIWG)**.
- The program also emphasizes including traditional Indian games in order to revive their popularity.
- The program is implemented by the **Sports Authority of India, the Ministry of Youth Affairs & Sports** and the **Lakshmi Bai National Institute of Physical Education (LNPIE)**.

Place in News

Poland

Recently, the Prime Minister of India reached Warsaw on the first leg of his two-nation visit to Poland and Ukraine.

Poland (Capital: Warsaw)

Location: Poland is a country located in Central Europe.

Boundaries: Poland shares its borders with **Ukraine** and **Belarus** (East), **Germany** (West), the **Baltic Sea** (North), **Lithuania** the **Russian exclave of Kaliningrad Oblast** (Northeast), the **Czech Republic** and **Slovakia** (South).

Physical Features:

- The highest point in Poland is **Rysy**, which is located in the Tatra Mountains along the border with Slovakia.
- Some major rivers in Poland include the **Vistula, Oder, Warta, Bug** and **Narew**.
- Some major lakes in Poland include Lake **Sniardwy**, Lake **Mamry**, Lake **Lebsko**, Lake **Wigry** and Lake **Mikolajskie**.
- Poland possesses significant mineral resources including **coal, copper, silver, zinc**, lead, salt, and **natural gas**, etc.

Membership: Poland is a member of various international organizations including the **European Union**, **NATO** (North Atlantic Treaty Organization) and the **United Nations**, **WTO** (World Trade Organization), etc.



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Current affairs summary for prelims

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POINTS TO PONDER

- In which Indian state was a recent case of Vaccine-derived Polio Virus (VDPV) infection reported? – **Meghalaya**
- When is the six-month period for reporting possession of exotic animal species under the Living Animal Species (Reporting and Registration) Rules, 2024 set to expire? – **August 2024**
- Which ballistic missile did the Pakistani military recently conduct a successful training launch for? – **Shaheen-II**
- What method was used by the Chhattisgarh Forest Department for planting saplings during the Van Mahotsav programme in the Manendragarh-Chirmiri-Bharatpur (MCB) district? – **Miyawaki method**
- Which product did the Agricultural and Processed Food Products Export Development Authority (APEDA) help export to Poland?
– **Ready-to-drink fig juice made from Purandar Figs**

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