

JAMES WEBB SPACE TELESCOPE



Recently, the James Webb Space Telescope has smashed its own record for detecting the most distant known galaxy.

- The galaxy called JADES-GS-z14-0, is revealed as it was just **290m years after the big bang**, at the dawn of the universe. The telescope's previous record holder was a galaxy seen at 325m years after the big bang, which happened nearly 14bn years ago.
- The newly observed galaxy is **much brighter** than expected, suggesting that the first generation of stars were either more luminous or formed much more rapidly than conventional cosmological theories have predicted.
- The impressive size and brightness of JADES-GS-z14-0 is likely being **fueled by young and actively forming stars**, rather than a supermassive black hole.
- In JADES-GS-z14-0, Webb can see a **significant amount of oxygen**, which tells researchers the galaxy is already quite mature.

About James Webb Space Telescope (JWST)

- It was **launched in 2021** as a joint endeavour of the **USA, European and Canadian space agencies**.
 - It is a large infrared telescope with an **approximately 6.5 meter primary mirror**.
 - It does not orbit around the Earth like the Hubble Space Telescope, it **orbits the Sun 5 million kilometers** away from the Earth at what is called the **second Lagrange point** or L2.
 - It was designed specifically to see **farther across the cosmos** and further back in time than any previous astronomical tool.
 - One of its key objectives was to **find the very first stars to ignite in the nascent Universe**.
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WHAT'S THE TWO-STATE SOLUTION?



Recently, India said that it was one of the first countries to recognise Palestine and has long supported the two-state solution to end the Israel-Palestine conflict.

- It has long been proposed as **the best hope for peace in the Israeli-Palestinian conflict**.
- It would see an **independent Palestinian state** established alongside the existing one of Israel, giving both peoples their own territory.

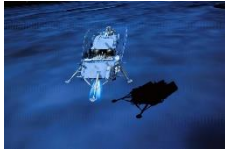
What are Two-State Solutions' origins?:

- In 1947, the **United Nations** agreed a **plan partitioning Palestine into Arab and Jewish states** with international rule over Jerusalem. Jewish leaders accepted the plan, which gave them 56% of the land.
- The **state of Israel was declared on May 14, 1948**. A day later, five Arab states attacked. The **war ended with Israel controlling 77% of the territory**.
- Some 700,000 Palestinians fled or were driven from their homes, ending up in Jordan, Lebanon and Syria as well as in the **Gaza Strip, the West Bank and East Jerusalem**.
- In a **1967 war**, Israel captured the West Bank, including East Jerusalem, from Jordan and Gaza from Egypt, securing control of all territory from the Mediterranean to the Jordan valley.
- The **Palestinians remain stateless**, with most living under Israeli occupation or as refugees in neighbouring states.

Is there a way forward?

- After Hamas attacked on Israel in October, 2023, Israel aims to **annihilate Hamas** and says it will **not agree to any deal that leaves it in power**. Prime minister of Israel has said Gaza must be demilitarised and under Israel's full security control.
- On another side, Hamas says it expects to survive and has said any arrangements for Gaza that exclude it are an illusion.

CHANG'E-6



China's space agency said that China landed an uncrewed spacecraft on the far side of the moon on 2nd of June.

- The Chang'e-6 craft successfully landed in the **South Pole-Aitken Basin** on the back of the moon.
- It is the **first human sampling and return mission** from the far side of the moon.
- It was launched by a **Chinese Long March-5 rocket** from Wenchang Space Launch Center on the southern island of Hainan before 53 days.
- Chang'e-6 consists of **an orbiter, a returner, a lander and an ascender**.
- The lander was equipped with **multiple sensors, including microwave, laser and optical imaging sensors** which can measure distance and speed and identify obstacles on the lunar surface.
- The probe is scheduled to **complete sampling within two days**. It has adopted **two methods of moon sampling**, which include:
 - using a drill to collect subsurface samples
 - grabbing samples on the surface with a robotic arm
- It has achieved a breakthrough in the **design and control technology of the lunar retrograde orbit** and aims to realize key technologies of intelligent and rapid sampling.
- It marks the **second time a mission has successfully reached** the far side of the moon. China first completed that historic feat in **2019 with its Chang'e-4 probe**.

WHAT IS PARAPARATRECHINA NEELA?



Indian researchers recently discovered a new ant species named **Parapatrechina neela** from Arunachal Pradesh's remote Siang Valley.

- It is a **new ant species** discovered from Siang Valley in **Arunachal Pradesh**.
- It belongs to the rare genus *Paraparatrechina* and has been named *Paraparatrechina neela*.
 - The word “**neela**” **signifies the colour blue** in most Indian languages—a fitting tribute to the ant's unique colour.
- This discovery signifies the **first new species of *Paraparatrechina* in 121 years** since the description of the sole previously known species, *P. aseta* (Forel, 1902), in the Indian subcontinent.

Features:

- It is a **small ant** with a total length of less than 2 mm.
 - Its body is predominantly **metallic blue**, except for the antennae, mandibles, and legs.
 - The head is sub triangular with large eyes and has a triangular mouthpart (mandible) featuring five teeth.
 - This species has a distinct metallic blue colour that is different from any other species in its genus.
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MULLAPERIYAR DAM CONTROVERSY

- The Mullaperiyar Dam is a **gravity dam** built over the Periyar River and its tributary, the Mullayar, in **Kerala**.
- It is situated in the Idukki district, on the Cardamom Hills of the Western Ghats.
- **Construction and Purpose:** Built between 1887 and 1895, the dam was constructed to divert water eastwards to the Madras Presidency (now Tamil Nadu) for irrigation and drinking purposes.
- **Type and Structure:** It is a gravity dam made primarily of stone and surkhi (a mixture of limestone and burnt brick powder). The dam is **53.6 meters** (176 feet) high and 365.7 meters (1,200 feet) long.

- **Reservoir Capacity:** The dam creates the **Periyar Lake**, which has a storage capacity of about 443 million cubic meters (15.66 billion cubic feet) at its full reservoir level.
- **Water Diversion:** Water from the dam is diverted through a tunnel to the **Vaigai River** in Tamil Nadu, providing irrigation to five districts in Tamil Nadu.
- **Management and Control:** Although the dam is located in Kerala, **it is operated and maintained by Tamil Nadu** under a lease agreement made during the British colonial period.

Conflict Between Kerala and Tamil Nadu Regarding the Dam:

- The conflict between the two southern most states of India over Mullaperiyar dam issue is for safety and water.
- A lease indenture for 999 years was made in 1886 between Maharaja of Travancore and Secretary of State for India for Periyar irrigation works.
- By another agreement in 1970, Tamil Nadu was permitted to generate power also.
- In 1979, reports appeared in Kerala Press about damage to Periyar Dam.
- Subsequently, meetings were held between the officials of the two states and it was opined that after the completion of emergency and medium-term measures, the water level in the reservoir can be raised up to 145 ft.
- However, the matter became sub judice with several petitions.

Court's Orders

- The Supreme Court in its orders in 2006, permitted the Government of Tamil Nadu to raise the water level of Mullaperiyar dam from 136 ft. To 142 ft. and to carry out the remaining strengthening measures.
- However, against the Court's order, the Government of Kerala passed the Kerala Irrigation and Water Conservation (Amendment) Act 2006 to prohibit the raising of water level beyond 136 ft.
- Tamil Nadu filed a petition in the Supreme Court for declaration of above Act as unconstitutional in its application to and effect on Mullaperiyar Dam and

restraining the State of Kerala from obstructing Tamil Nadu to increase the water level to 142 feet.

Conclusion:

- Kerala and Tamil Nadu have been in a legal battle since 1996.
 - The initial disputes focused on the safety of the existing dam, while from 1998, numerous legal challenges from both states questioned each other's actions.
 - Kerala's recent move to construct a new dam may lead to more legal conflicts.
 - According to a 2014 Supreme Court order, Kerala needs Tamil Nadu's consent to build the new dam.
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KEY FACTS ABOUT PAMPA LAKE

A team from the Karnataka State Department of Archaeology Museums and Heritage has uncovered rock shelter paintings estimated to be around 2,500 years old near Pampa Lake in the Hampi World Heritage Area.



About Pampa Lake:

- Pampa Lake/Pampa Sarovar is situated in Koppal district near Hampi in **Karnataka**.
- It is located to the south of the **Tungabhadra River**.
- It is one of the five **sacred lakes** known as **Panch-Sarovarin** Hindu mythology, which are namely, Man Sarovar, Bindu Sarovar, Narayan Sarovar, Pampa Sarovar and Pushkar Sarovar.
 - In Hindu mythology, Pampa Sarovar is regarded as the place where Pampa, a form of Shiva's consort Parvati, performed penance to show her devotion to Shiva.
 - It is also one of the Sarovars that finds a mention in the Hindu epic, Ramayana as the place where Shabhari, a devotee of Lord Rama, waited for the arrival of Rama.

- The lake is surrounded by hills and temples and filled with lotuses.

Key Facts about Tungabhadra River:

- It is a major river in the south Indian peninsula.
- It is a major tributary of the Krishna River.
- **Origin:**
 - It is formed by the union of two rivers, **Tunga and Bhadra**, hence the name.
 - Both the Tunga and Bhadra Rivers originate on the eastern slopes of the **Western Ghats**.
 - The two rivers merge at **Koodli** in the Shimoga district of Karnataka, giving birth to the Tungabhadra River.
- **Course:**
 - It flows in a more or less northwest direction before joining the Krishna River at Sangameswaram in **Andhra Pradesh**.
 - The Krishna River finally ends in the **Bay of Bengal**.
 - The river has a total length of **531 km** and a catchment area of 28,000 sq. km.
 - It flows through the states of **Karnataka and Andhra Pradesh**.
 - It is influenced chiefly by the **South-West monsoon**.
- **Major Tributaries: Varada River and Hagari (Vedathi) River.**
- The river has several dams and reservoirs built on it, including the **Tunga Anicut Dam**, the **Bhadra Dam**, the **Hemavathi Dam**, and the Tungabhadra Dam.

RELATIONSHIP BETWEEN THE HARAPPAN AND THE VEDIC AGE

Why in News? Archaeologists are working with Sanskrit scholars to decipher the Rigveda, carrying on research that could lead to a relationship between the people of the Vedic age and the Harappan civilization.

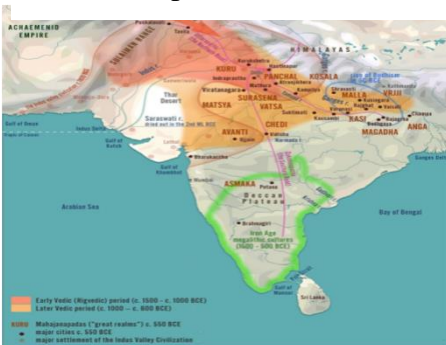


Indus Valley Civilisation (IVC)/ Harappa Civilisation (3300 - 1300 BCE):

- Also known as the Indus Civilisation, the IVC was a **Bronze Age civilisation** in the **northwestern regions of South Asia**.
 - The Indus civilisation is also known as the **Harappan Civilisation**, after Harappa (now in Punjab), which is the **first of its sites** to be excavated early in the 20th century.
 - Its sites stretch over an area spanning from today's northeast **Afghanistan**, through much of **Pakistan** and into western and northwestern **India**.
- It flourished in the basins of the **Indus River** and along a system of rivers that once coursed in the vicinity of the seasonal **Ghaggar-Hakra river** in northwest India and eastern Pakistan.
- The civilisation's cities were noted for their -
 - **Urban planning**, Baked brick houses,
 - Elaborate drainage systems, Water supply systems,
 - Clusters of large non-residential buildings,
 - **New techniques in handicraft** (carnelian products, seal carving) and
 - **Metallurgy** (copper, bronze, lead and tin).

The Vedic Age (1500 - 600 BCE):

- It is the period in the **late Bronze Age and early Iron Age** of the history of India when the Vedic literature, including the Vedas was composed in the northern Indian subcontinent.
 - It lies between the **end of the urban IVC** and the **second urbanisation**, which began in the central Indo-Gangetic Plain (c. 600 BCE).



How Archaeologists are Establishing Relationships Between the Harappan and the Vedic Age?

- The NCERT recently made a major addition (based on DNA evidence from the 4,600-year-old remains of a woman) to the Class 12 History textbook, **indicating that the Harappans were an indigenous people.**
 - The NCERT has added a disclaimer that more research is required to establish this relationship.
- Some historians believe that the **Vedas date farther back to 2,500 BC/ 4,500 years ago**, which would coincide with the IVC.
- **What archaeologists are trying to establish?**
 - Archaeologists are now working to test the hypothesis that **the Harappans and the Vedic people were the same.**
 - According to the renowned archaeologist Vasant Shinde, **a clear understanding of what is mentioned in the Rigveda text is important to co-relate archaeological evidence unearthed in excavations of Harappan settlements.**

What evidence shows?

- While excavating the site of **Rakhigarhi** (Haryana), the archaeologists found evidence of ritual platforms and fire altars. Fire worship is also mentioned in Rig Vedic texts.
- The mention of the **river Saraswati** (modern Ghagghar-Hakra river) is recorded at least 71 times in the Rigvedic text. During archaeological excavations, a majority of Harappan settlements were discovered along the banks of river Saraswati.
- Another point of reference which may link the Harappans with Vedic times is a **set of animal bones** found and studied by archaeo-zoologists in the **Surkotada region of Kutch, Gujarat.**
 - While some researchers stated that these bones belonged to a proper domesticated **horse** (which finds mention in Rigvedic texts), another group concluded that these were the bones of a **wild ass.**