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Harappan society is 'Sindhu-Sarasvati civilisation' in NCERT's new textbook

ABHINAYA HARIGOVIND
NEW DELHI, JULY 20

FROM REFERRING to the Harappan civilisation as the 'Sindhu-Sarasvati' and 'Indus-Sarasvati' civilisation, to multiple mentions of the 'Sarasvati' river, including noting its desiccation as one of the reasons for the decline

of the Harappan society, to a mention of India having had a "prime meridian of its own" called the 'Ujjayini meridian' — the new NCERT Class 6 Social Science textbook released on Friday incorporates many new elements.

'Exploring Society: India and Beyond' is the first Social Science textbook released by the NDA government in alignment with

the National Curriculum Framework for School Education 2023. It is intended for use in schools starting from the current academic session. Unlike earlier, when there were separate textbooks for History, Political Science and Geography, the new textbook is the sole resource for Social Science.

CONTINUED ON PAGE 11

- **River Names:** The river, now seasonal, is known as 'Ghaggar' in India and 'Hakra' in Pakistan, referred to as the 'Ghaggar-Hakra River'.
- **Decline Factors:** Two agreed-upon factors for the Harappan civilization's decline are climate change reducing rainfall and the drying up of the Sarasvati river.
- **Abandoned Cities:** The drying up of the Sarasvati river led to the abandonment of cities like Kalibangan and Banawali.
- **Advanced Civilization:** The Indus-Sarasvati civilization is considered to be the most advanced among all its contemporary civilizations, with highly developed agriculture, architecture, trade, and urbanization in addition to advanced pottery and usage of script.

SINDHU-SARASVATI CIVILIZATION

(Syllabus: GS Paper 1 – History)

Context: The new NCERT Class 6 Social Science textbook incorporates several new elements, including references to the Harappan civilization as the 'Sindhu-Sarasvati' and 'Indus-Sarasvati' civilization

Sindhu-Sarasvati Civilization

- **About:** The Harappan civilization is also known as the 'Indus-Sarasvati' or 'Sindhu-Sarasvati' civilization, including major cities like Rakhigarhi and Ganweriwala.
- **Discovery of Civilization:** A civilization was discovered in the northwestern part of the Indian subcontinent in 1920-21 following the excavations at Mohenjo-Daro and Harappa.
- **Geographic Spread:** These settlements embrace Baluchistan, the whole of Sindh and Punjab, Gujarat and Rajasthan, a part of the Ganga Basin, banks of the Ghaggar-Hakra River, and the valley of the Narmada River.
- **Contemporary Political Boundaries:** In terms of contemporary political boundaries, of these 1400 settlements, nearly 925 are in India and 475 are in Pakistan.
- **Distribution Pattern:** A close look at the distribution pattern of these settlements discloses that about 80% of the sites are located on a vast plain between the Indus and the Ganga, mainly on the bank of the Sarasvati River.

What is a PC emulator, and why did Apple allow it on the App Store?

An emulator, as the name suggests, is a software that allows a computer device to emulate another software. The difference in how a device operates allows it to run and use software designed for other, previously, incompatible devices

Nabeel Ahmed

The story so far:

Apple approved a PC emulator for iOS for the first time this week. The move will allow users to run classic software, mostly games on iOS, iPadOS and visionOS. Earlier this year, Apple updated its App Store guidelines to allow retro game console emulators, mini games, and HTML5 mini apps on iPhones.

What is an emulator in PC?

An emulator, as the name suggests, is a software that allows a computer device to emulate another software. The difference in how a device operates allows it to run and use software designed for other, previously, incompatible devices.

For example, software designed for a Windows PC will have to be redesigned to run on macOS. This redesign will have to be done by developers, who may choose to not include all the functionalities available on Windows to Mac users.

An emulator can be used in this scenario to run software designed for Windows on macOS by emulating the design architecture of Windows. Emulators are commonly used to run applications designed for different operating systems, play video games from

older consoles, and test software across different platforms.

Why did Apple allow emulators?

Apple, in the past, did not allow emulators on its platform. The Cupertino-based tech giant approved IOTM SE, an app for emulating a computer, to run classic software and games. The move came weeks after the company rejected it and barred it from being notarised for third-party app stores in the European Union. The move may be an attempt by the company to shake off anti-trust allegations in the U.S. for operating as a monopoly and restricting certain gaming apps on its App Store and preventing competition.

Allowing emulators on its App Store could help the iPhone-maker ensure users do not use third-party app stores in the EU to download emulators.

Are PC emulators legal?

Emulators come in handy when testing and designing software, and they do not use proprietary codes. So, they are considered legal to use. However, sharing copyrighted ROMs (Read Only Memory) online is illegal.

But, as most emulators are used to running software not originally meant for a particular device, the question of

legality becomes complicated.

Using an emulator is considered legal if users own the software they are running on the emulator. However, if they use the emulator to run pirated copies of a software or use the emulator to distribute or download ROMs of software they do not own, it is considered illegal.

Are emulators risky?

Unlike proprietary software, which receives timely updates to ensure smooth and secure functions, using an emulator can be a risky proposition. Especially, if the emulator is downloaded from unofficial sources. These can contain malware that can compromise the security of a system.

Additionally, depending on the software users choose to emulate, they may inadvertently end up violating licensing agreements or copyright laws. This can result in refusal by the Original Equipment Manufacturer (OEM) to provide maintenance, or technical support and even lead to users being penalised for using proprietary ROMs.

Emulators can also impact the performance of a device. They are resource-intensive and may lead to decreased CPU performance, overheating, and potential damage to the battery. Additionally, poorly designed and

untested emulators may lead to data corruption, especially if the emulator crashes or if there are compatibility issues with the ROMs or software being used.

Are emulators banned?

Due to their ability to help developers use different operating ecosystems for testing purposes without having to switch hardware or the underlying software, emulators are not typically banned in any country. However, the legal status of emulators depends on specific laws in each country, and on how they are used in that jurisdiction.

Are emulators legal in India?

In India, the laws do not specifically ban the use of emulators. However, their use is subject to copyright and intellectual property laws.

While it is legal to use and distribute emulators in India, users may land in trouble if they use emulators to run software such as games, operating systems, or applications without the proper licences or ownership. Distributing ROMs without proper ownership can be problematic.

Additionally, the concept of fair use applies if users own an original copy of the software and are using the emulator as a backup.

PC EMULATOR

(Syllabus GS Paper 3 – Sci and Tech)

Context: For the first time, Apple has approved a PC emulator for iOS, marking a significant shift in its app store policies.

PC Emulator

- **About:** An emulator, as the name suggests, is software that allows a computer device to emulate another software.
- **Functionality:** The difference in how a device operates allows it to run and use software designed for other, previously, incompatible devices.
- **For example,** software designed for a Windows PC will have to be redesigned to run on macOS. This redesign will have to be done by the developers, who may choose to not include all the functionalities available on Windows to Mac users.
- **Uses:** An emulator can be used in this scenario to run software designed for Windows on macOS by emulating the design architecture of Windows.
 - Emulators are commonly used to run applications designed for different operating systems, play video games from older consoles, and test software across different platforms.
- **Legality of PC Emulators:** Emulators come in handy when testing and designing software, and they do not use proprietary codes. So, they are considered legal to use. However, sharing copyrighted ROMs (Read Only Memory) online is illegal.
 - But, as most emulators are used to running software not originally meant for a particular device, the question of legality becomes complicated.
- **Legal Use of Emulators:** Using an emulator is considered legal if users own the software they are running on the emulator. However, if they use the emulator to run pirated copies of software or use the emulator to distribute or download ROMs of software they do not own, it is considered illegal.

Emulators in India

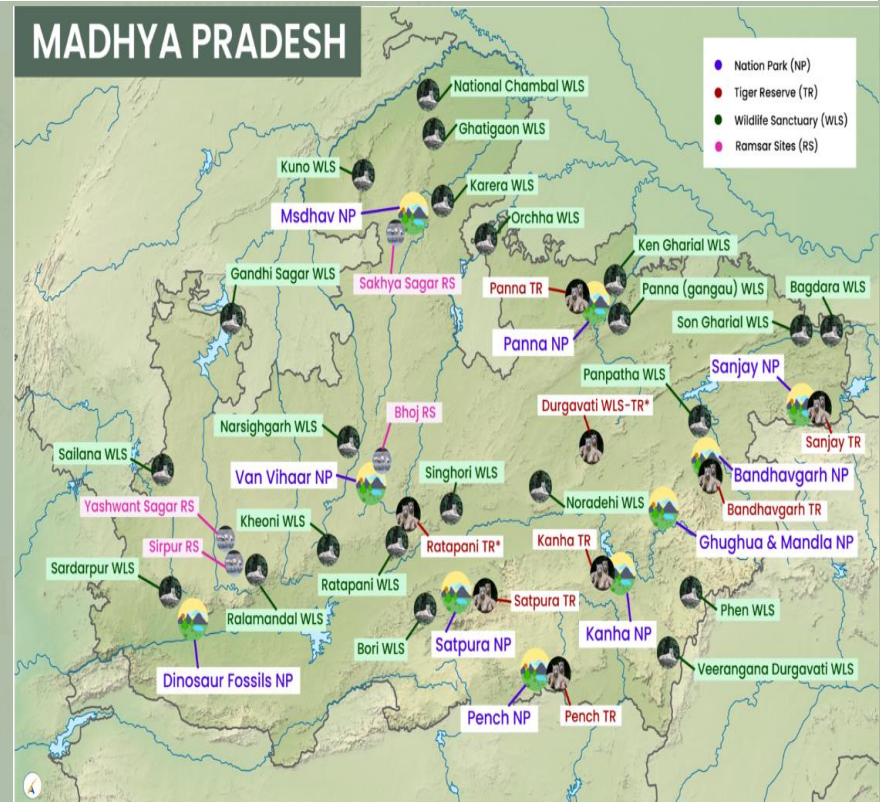
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- **Legal Use in India:** While it is legal to use and distribute emulators in India, users may land in trouble if they use emulators to run software such as games, operating systems, or applications without the proper licenses or ownership. Distributing ROMs without proper ownership can be problematic.

Ratapani Wildlife Sanctuary May Become 8th Tiger Reserve of MP, 1st One With Proximity to State Capital

Ratapani Wildlife Sanctuary

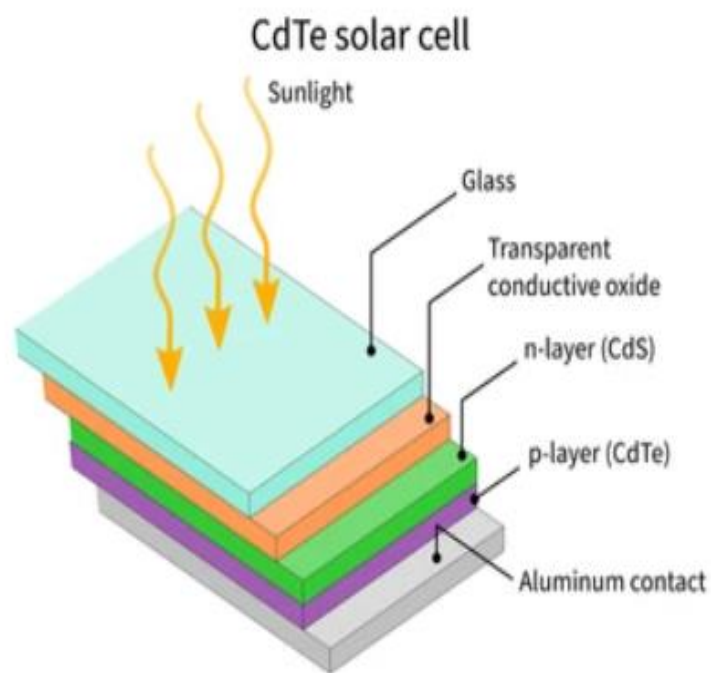
- **About:** It stretches across 823 sq. km in the Raisen and Sehore districts of Madhya Pradesh.
- **Geography:** This rocky forest with an aquatic environment is spread on the Vindhya Hills and runs parallel on the northern side of the Narmada River. The Kolar River forms the western boundary.
- **Historical Background:** The sanctuary was first notified in 1976, extended in 1983, and declared a Tiger Reserve in 2008.
- **Cultural Significance:** The Sanctuary is home to Bhimbetika, a group of rock shelters and paintings, recognized as a UNESCO World Heritage Site.
- **Landscape:** The terrain is rugged, featuring hills, valleys, plateaus, and plains.
- **Flora:** The forest consists of dry deciduous and moist deciduous types, with about 55% covered by teak. The remaining mixed forests include various dry deciduous species.
- **Fauna:** The apex predator is the regal striped tiger, with an estimated 40 individuals. The Sanctuary also houses the endangered Chinkara and other animals like the Panther, Hyena, Jackal, Indian Fox, Wild Dog, Jungle Cat, Small Indian Civet, Blue Bull, Black Buck, Chausingha, Spotted Deer, and Barking Deer.

MADHYA PRADESH



Context: The Madhya Pradesh State Wildlife Board has accorded approval to declare Ratapani Wildlife Sanctuary, on the outskirts of Bhopal, as the eighth tiger reserve of MP.

IIT Mandi researchers assess environmental impact of solar cells: Here's what they found



Context: A study by researchers at the Indian Institute of Technology (IIT), Mandi, reveals that CdTe (Cadmium Telluride) technology has one of the lowest environmental impacts among solar cell technologies in India.

Cadmium Telluride

- **About:** It is a material made from the combination of two elements: Cadmium (Cd) and Tellurium (Te).
- **Physical Properties:** It is an odorless and black crystalline solid.
- **Properties**
- **Solubility:** It is insoluble in water but resolves in nitrate acid, with resulting oxidation in moisture air under long-term exposure.
- **Environmental Impact:** It has the lowest carbon dioxide emissions, ozone depletion potential, human health effects, and particulate air pollution.
- **Applications**
 - **Semiconductor Detectors:** It is considered a prospective material for room temperature semiconductor detector applications such as infrared optical windows and lenses.
 - **Solar Cells:** CdTe is the second most common Photo Voltaic (PV) technology in the world, after silicon.
- **Sustainability Assessment:** It was one of five solar cell technologies on which IIT scientists conducted a life-cycle assessment (LCA) to identify the most sustainable options for solar energy production in India.
 - The other four were mono-silicon, polysilicon, Copper Indium Gallium Selenide (CIGS), and Passivated Emitter & Rear Contact (PERC).
- **Comparison:** CdTe was closely followed by CIGS (Copper Indium Gallium Selenide) PV cells in terms of sustainability and performance.

CPCB plans to check violations in plastic waste trading regime

Jacob Koshy
NEW DELHI

The Central Pollution Control Board has begun a national audit of nearly 800 plastic-waste recyclers across the country, *The Hindu* has learnt, after it emerged that four firms in Karnataka, Maharashtra, and Gujarat had issued nearly 6,00,000 fake certificates under the Extended Producer Responsibility (EPR) programme.

The EPR scheme mandates businesses that use plastic packaging material to recycle a certain percentage of the plastic used in the previous two years. On July 14, *The Hindu* had carried a report on the issue and on the chances of many more fake certificates having been generated.

Separately, the Board has also filed a complaint with the Delhi Police against unknown “hackers”, for having allegedly stolen several thousand EPR credits from its online portal. The Delhi Police is learnt to have lodged a first information report (FIR) and is investigating the matter.

A senior official of the CPCB, who declined to be identified, explained that fake certificates were a result of “teething issues” because this was the first full year since the scheme was

The Board has filed a complaint with the Delhi Police against unknown hackers for theft of EPR credits

cyclers on the mechanics of the scheme.

“This is a paradigm shift. All these years, companies had no mandatory targets and were alien to the concept of an online tracking system that showed how many certificates were generated and traded. While we are aware of the problem, it is akin to – say the early years of implementing GST (Goods and Services Tax) or filing Income Tax returns online. We will be keeping a track of EPR-filings by companies and in case of suspicious filings, we will be keeping a hawk’s eye. Errant companies will face heavy fines,” the official told *The Hindu*.

The official said an investigation has been on since last October. In the meantime, security features of the EPR-trading platform have been enhanced which required a major overhaul of the portal. Only after the investigation will it be clear how many companies traded in stolen certificates. The fines for the guilty would be worth “hundreds of crores,” the

Context: The Central Pollution Control Board has launched a national audit of nearly 800 plastic-waste recyclers after discovering that four firms in Karnataka, Maharashtra, and Gujarat issued approximately 600,000 fake certificates under the **Extended Producer Responsibility (EPR) programme**.

Extended Producer Responsibility (EPR)

- **About:** It is based on the polluter-pays principle, which aims to include producers of material goods in the management and treatment of waste and keep raw materials and goods in the economic cycle.
- **Foundation Principles of EPR**
 - The concept of EPR responsibility is based on three foundation principles:
 - Pollution Prevention Approach
 - Life Cycle Thinking
 - Polluter Pays Principle
- **The objectives of EPR are as follows:**
 - Integration of environmental costs
 - Improved waste management
 - Reduction of disposal
 - Reduction of burden on municipalities
 - Design of environmentally sound products
- **Responsibilities:** EPR responsibility makes it the responsibility of the producers not only to take back products for recycling but also to design better and longer life products to minimize the amount of waste generated.

Achievements of the draft EPR Policy

- Brand owners and e-commerce players have been brought under the ambit of EPR
- EPR is now applicable to both pre-consumer and post-consumer plastic packaging waste
- Producers and brand owners (PIBO) have finally been assigned targets for collection of plastic waste that they put out in the market
- Provisions and targets for collection, re-use (by brand owners), recycling (by PIBOs) and use of recycled plastic (by PIBOs) have been laid out.
- Bi-annual plastic characterisation studies.

Invasive species discovered in Colorado River is capable of wiping out ecosystems, causing costly damage

Impacts

- They are filter feeders that attach themselves to virtually any surface. Females can release up to one million eggs each breeding season.
- They disrupt food webs by wiping out phytoplankton. Zebra Mussels are especially harmful to native mussels, many of which are species at risk. They outcompete these species for food and will attach themselves to native mussels, suffocating them.
- Their massive clustering on water-intake valves and pipes, bridge abutments, and other structures can cause severe commercial damage.



Context: For the first time, zebra mussels—an invasive species known for destroying aquatic ecosystems have been discovered in the Colorado River, a crucial waterway in the American Southwest.

Zebra Mussels

- **About:** These are an invasive, fingernail-sized mollusk.
- **Scientific Name:** Dreissena polymorpha
- **Distribution:** They are native to the Caspian and Black Seas, south of Russia and Ukraine.
 - They entered the Great Lakes of North America in the late 1980s through ballast water discharged from ships.
- Since then, they have spread through much of eastern Canada and the United States.
- **Habitat:** They live underwater, attached to natural and manmade substrates such as rocks, wood, plants, native mussels, pipes, docks, boat lifts, swim rafts, moored watercraft, and other debris.
- **Identification:** They are easy to identify with their distinct, flat-bottomed 'D' shape to their shells and black, zigzag stripes against a cream background.
- **Size and Lifecycle:** They grow around two inches long at most, and are microscopic in their larval stage, known as a "veliger." They are short-lived (between two and five years) and begin reproducing at two years of age.

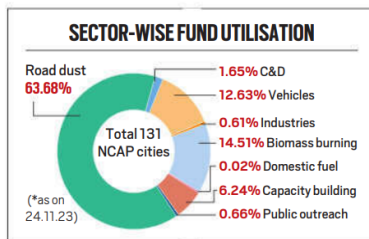
'Need more focus on PM2.5': Study says dust mitigation draining clean air scheme funds

NIKHIL GHANEKAR
NEW DELHI, JULY 20

ROAD DUST mitigation works undertaken to reduce particulate matter 10 (PM10) pollution is draining a lion's share — 64% — of funds under the National Clean Air Programme (NCAP), said a new study by Centre for Science and Environment (CSE) while recommending a shift of focus on curbing the finer, more lethal PM2.5 pollution.

"We need to worry about combustion sources rather than dust. Dust is not the main pollutant. When it gets coated with other pollutants, it becomes bad for your body," said Sunita Narain, Director, CSE.

The CSE report has appraised efforts to curb air pollution under the national scheme through the lens of fund utilisation, city level per-



formance in improving air quality and implementation gaps.

The heavy focus on PM10 pollution under NCAP has meant that road paving and widening, pothole repairs, water sprinkling, procurement of mechanised sweepers has accounted for a dominant share in the expenditure under NCAP, the report said.

A review of the sectoral pat-

terns showed that 64 per cent of the total funds went into road dust mitigation while only 12.63 per cent and 14.51 per cent funds were spent on combustion sources of pollution like vehicles and biomass burning, respectively. A mere 0.61 per cent was spent on industrial pollution control.

The National Green Tribunal (NGT) is also scrutinising the na-

tional scheme in a suo matter is appraising expenditure under NCAP across 53 cities. The NCAP was launched in 2019 to improve air quality in 131 cities, which were selected on their record of poor air quality for five consecutive years.

These cities, known as non-attainment cities for not meeting pollution standards, have to cut their pollution levels by 40 per cent by 2025-26 with 2019-20 as a base year. Public records with the Ministry of Environment show that as of May 2024, approximately Rs.10,566.47 crore was released to 131 cities between 2019-20 and 2023-24 financial years. Of the 1,615.47 crore released for 82 cities only 51 per cent or Rs.831.42 crore has been used. Meanwhile, 42 cities with a million plus population got Rs.8,951 crore of which 67 per cent or Rs.5,974.73 crore was spent.

FULL REPORT ON: www.indianexpress.com

Context: A new report by the Centre for Science and Environment (CSE) revealed that 64% of **National Clean Air Programme (NCAP)** funds are being spent on road dust mitigation to reduce PM10 pollution.

Key Findings of Report

- The CSE report has appraised efforts to curb air pollution under the national scheme through the lens of fund utilisation, city-level performance in improving air quality, and implementation gaps.
- **Expenditure on PM10 Pollution:** The heavy focus on PM10 pollution under NCAP has meant that road paving and widening, pothole repairs, water sprinkling, and procurement of mechanised sweepers accounted for a dominant share in the expenditure under NCAP, the report said.
- **Fund Allocation for Road Dust Mitigation:** A review of the sectoral patterns showed that 64 per cent of the total funds went into road dust mitigation, while only 12.63% and 14.51% funds were spent on combustion sources of pollution like vehicles and biomass burning, respectively.
 - A mere 0.61% was spent on industrial pollution control.
- **NGT Scrutiny of NCAP Expenditure:** The National Green Tribunal (NGT) is also scrutinising the national scheme in a suo matter, appraising expenditure under NCAP across 53 cities.
- **Pollution Reduction Targets:** These cities, known as non-attainment cities for not meeting pollution standards, have to cut their pollution levels by 40% by 2025-26 with 2019-20 as a base year.
- **Disproportionate Focus on Dust Control:** The report highlighted that the programme has a disproportionate focus on dust control and neglects key combustion sources and the transport sector.

National Clean Air Programme (NCAP)

- **About:** This marks the inaugural attempt in the nation to establish a national framework for managing air quality, complete with a time-bound reduction objective.
- **Aim:** To improve air quality in 131 cities (non-attainment cities and Million Plus Cities) in 24 States/UTs by engaging all stakeholders.
- **Launched:** January 2019
- **Nodal Ministry:** Ministry of Environment, Forests and Climate Change (MoEFCC).
- **Target:** To achieve 20% to 30% reduction in concentrations of PM10 (particulate matter of diameter between 10 and 2.5 micrometer) and PM2.

Scientists spot intermediate-mass black hole lurking at centre of Milky Way star cluster

Context: Scientists have uncovered an intermediate-mass black hole at the center of a star cluster in the Milky Way, situated near the supermassive black hole Sagittarius A* (SgrA*).

Sagittarius A* (Sgr A*)

- **Location:** It is a supermassive black hole located at the center of our spiral galaxy, the Milky Way.
- **Mass:** It is mostly dormant and only occasionally absorbs gas or dust, but has an estimated mass 4.3 million times that of the sun.
- **Constellation:** It is located in the constellation Sagittarius.
- **Diameter:** It has a diameter of around 14.6 million miles (23.5 million kilometers).
- **Radio Waves:** It is a strong source of radio waves. Most of the radio radiation is from a synchrotron mechanism, indicating the presence of free electrons and magnetic fields.
- **Event Horizon:** The event horizon of the black hole has a radius of 12 million km (7 million miles).

Black Hole

- **Definition:** A black hole is a region in space where gravity pulls so much that even light cannot get out.
- **Formation:** The gravity is so strong because matter has been squeezed into a tiny space, often occurring when a star is dying.
- **Detection:** Because no light can get out, it is difficult to detect a black hole.
- **Types:** The largest black holes are called "supermassive," having masses greater than 1 million suns combined.
- **Theoretical Prediction:** Albert Einstein first predicted the existence of black holes in 1916, with his general theory of relativity.
- **Event Horizon:** It is the boundary defining the region of space around a black hole from which nothing (not even light) can escape.

International study observes smaller object in a black hole pair directly for the first time

Context: A new study involving 32 scientists from 10 countries, confirmed by the Transiting Exoplanet Survey Satellite (TESS), has spotted a smaller black hole orbiting a pair in the galaxy OJ 287, located four billion light-years away. This marks the first time an orbiting black hole has been observed.

Transiting Exoplanet Survey Satellite

- **About:** It is a NASA mission searching for planets orbiting the brightest stars in Earth's sky.
- **Targeting Dwarf Stars:** Designed to discover thousands of exoplanets orbiting around the brightest dwarf stars in the sky.
- **Range of Planets:** TESS finds planets ranging from small, rocky worlds to giant planets, showcasing the diversity of planets in our galaxy.
- **Achievements:** It has discovered 410 confirmed exoplanets, or “new worlds,” circling stars other than the Sun.
- **Successor to Kepler:** TESS follows NASA's highly successful Kepler space telescope, which found thousands of exoplanets during a decade of work after its 2009 launch.
- **Launch Date and Vehicle:** Launched on April 18, 2018, aboard a SpaceX Falcon 9 rocket from Cape Canaveral.
- **Orbit and Observation:** It circles Earth in a high Earth orbit with a 12 to 15-day period, allowing a largely unobstructed view of the sky.
- **Mission Status:** The prime mission ended on July 4, 2020, and TESS is currently on an extended mission.

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