

NEWSPAPER HIGHLIGHT

Indian researchers have developed an improved water management system that can completely reuse dye wastewater from textile industries, eliminating its toxicity and making it suitable for domestic and industrial usage, the Department of Science and Technology said. It can reduce water treatment costs and facilitate reuse of water in dry regions, it added. The current threestage treatment process for wastewater consisting of primary, secondary, and tertiary treatment is unable to treat toxic industrial wastewater. In order to remove this toxicity, an upgraded solution with the advanced oxidation process (AOP) technology is the need of the day, it added. Working towards this, researchers from Indian Institute of Technology (IIT) Kanpur along with Malaviya National Institute of Technology, Jaipur, and MBM College, Jodhpur, have developed a modified AOP solution.

Climate change affects not only humans but also animals. In adapting to a warming planet, some warm blooded animals are shape shifting and getting larger beaks, legs and ears to better regulate their body temperatures (Trends in Ecology and Evolution). Strong shape shifting has particularly been reported in birds. Several species of Australian parrot have shown, on average, a 4%10% increase in bill size since 1871. This is positively correlated with the summer temperature each year. North American darkeyed juncos, a type of small songbird, had a link between increased bill size and short term temperature extremes in cold environments. There have also been reported changes in mammalian species.

A novel experiment, described in a paper in Science, sets stringent bounds on what is called the fifth force or the Yukawa force – a component that plays a role in some extensions of the standard model beyond the four known fundamental forces – weak, strong, electromagnetic and gravitational.

Wingtips of some silk moths reflect sound more sharply than the rest of the wing. A bat hunting using echolocation would be more likely to attack the wing than the body, saving the moth's life. This study published in Current Biology may

FINDINGS OF CHANDRAYAAN-2

- 1.The Orbiter and other instruments of Chandrayaan-2 mission have, in two years, gathered a wealth of new information that has added to our knowledge about the Moon and its environment. Chandrayaan-2, India's second mission to the Moon, had failed to make a soft-landing on the lunar surface. The lander and rover malfunctioned in the final moments and crash-landed, getting destroyed in the process.
- 2.Why is this mission still relevant-Despite the failure, the mission's orbiter and other parts have been functioning normally, gathering information. Recently, the Indian Space Research Organisation (ISRO) released the information gathered by the scientific payloads till now, some of which were still to be analysed and assessed.
- 3.Information gathered so far- Presence of water molecules on moon: **The mission has given the most precise information about the presence of H₂O molecules on the Moon till date. Presence of Minor elements: Chromium, manganese and Sodium have been detected for the first time through remote sensing.** The finding can lay the path for understanding magmatic evolution on the Moon and deeper insights into the nebular conditions as well as planetary differentiation. Information about solar flares: A large number of microflares outside the active region have been observed for the first time, and according to ISRO, this "has great implications on the understanding of the mechanism behind heating of the solar corona", which has been an open problem for many decades.
- 4.**Exploration of the permanently shadowed regions as well as craters and boulders underneath the regolith, the loose deposit comprising the top surface extending up to 3-4m in depth.** This is expected to help scientists to zero in on future landing and drilling sites, including for human missions.

PRIVATISATION OF RAILWAYS

- 1.The employees union of the North Western Railway (NWR) protested recently against the privatisation of railways announced by Centre recently.
- 2.Objectives of privatisation-**To introduce modern technology rolling stock with reduced maintenance. Reduced transit time. Boost job creation.** Provide enhanced safety. Provide world-class travel experience to passengers. Reduce demand-supply deficit in the passenger transportation sector.
- 3.Pros-Improved Infrastructure – It will lead to better infrastructure which in turn would lead to improved amenities for travellers. Balancing Quality of Service with High Fares – The move would foster competition and hence lead to overall betterment in the quality of services. Lesser Accidents – Because private ownership is synonymous with better maintenance, supporters of privatisation feel that it will reduce the number of accidents, thus resulting in safe travel and higher monetary savings in the long run.
- 4.Cons: Coverage Limited to Lucrative Sectors – An advantage of Indian Railways being government- owned is that it provides nation-wide connectivity irrespective of profit. This would not be possible with privatisation since routes which are less popular will be eliminated, thus having a negative impact on connectivity. Fares – Given that a private enterprise runs on profit, it is but natural to assume that the easiest way of accruing profits in Indian Railways would be to hike fares, thus rendering the service out of reach for lower income groups. This will defeat the entire purpose of the system which is meant to serve the entire population of the country irrespective of the level of income.
- 5.Recent Decision of Ministry of Railways in this regard: **On July 1, 2020, the Ministry of Railways announced that 151 trains in 109 pairs of routes will be operated by private sectors. It comprises just 5% of the 2,800 Express and Mail services operated by Indian Railways.** Private trains will start operating tentatively in 2023 and in 12 clusters. Private companies will be given the freedom to procure locomotives and trains from their source of choice.

throw light on antiradar architectures.

New research published in Science reveals that 'hydraulic jumps' can be behind the cloudy ice plumes preceding deadly tornadoes. This is like what happens when streams of water smoothly run down a dam slopes but suddenly burst into froth when joining slower water below.

Orca, the largest direct air carbon capture facility, started operations in Iceland. It will pull CO2 from the air and trap it in the ground. It will do this at the rate of 4,000 tonnes of carbon dioxide per year, which is the amount the world would release in four seconds.

Chief Justice of India N.V. Ramana on Sunday said the unity and sacrifice of young people across faiths, beliefs and communities, who took to the streets to challenge authoritarian figures, gave the country democratic rights which were being taken for granted today. "The democratic rights that we take for granted are a result of the struggles of thousands of young people who took to the streets fighting authoritarian figures either during the freedom struggle or the dark days of Emergency. Many lost their lives, sacrificed lucrative careers, all for the greater good of the nation and society. Trust the youth to check the deviations in a society's journey towards peace and progress," Chief Justice Ramana said in his address on the 128th anniversary of the historic Chicago address of Swami Vivekananda.

The configuration for the Light Combat Aircraft (LCA) Mk2 has been frozen and steel cutting is expected to begin soon while configuration for the fifth generation Advanced Medium Combat Aircraft (AMCA) has been frozen and preliminary design completed, a senior scientist from the Aeronautical Development Agency (ADA) has said.

A week after hosting intelligence and security chiefs of U.S. and Russia, New Delhi is preparing for visits by the Saudi and Iranian Foreign Ministers, officials confirmed, as part of a series of engagements aimed at "broad basing" discussions on Afghanistan with partner countries. According to sources, newly appointed Iranian Foreign Minister Amir Abdollahian was due to travel to Delhi, but his visit has been "postponed" due to scheduling issues and the upcoming summit of the Shanghai Cooperation Organisation, where he is expected to meet External Affairs Minister S.

UDAN 4.0

1.The Civil Aviation Ministry has announced its agenda over the next 100 days. It includes: Launching 50 new routes under the UDAN scheme. Rationalising the value added tax (VAT) charged on aviation turbine fuel (ATF).

2.About UDAN scheme (Ude Desh Ka Aam Nagrik) Scheme-The scheme is aimed at enhancing connectivity to remote and regional areas of the country and making air travel affordable. It is a key component of Centre's National Civil Aviation Policy led by Prime Minister Narendra Modi and launched in June 2016. Under the scheme, nearly half of the seats in Udan flights are offered at subsidised fares, and the participating carriers are provided a certain amount of viability gap funding (VGF) – an amount shared between the Centre and the concerned states. The scheme will be jointly funded by the central government and state governments. The scheme will run for 10 years and can be extended thereafter.

3.UDAN 4.0: **The 4th round of UDAN was launched in December 2019 with a special focus on North-Eastern Regions, Hilly States, and Islands.** The airports that had already been developed by Airports Authority of India (AAI) are given higher priority for the award of VGF (Viability Gap Funding) under the Scheme. Under UDAN 4, the operation of helicopters and seaplanes is also been incorporated.

CRYPTOCURRENCIES AND RELATED ISSUES

1.RBI Governor Shaktikanta Das recently said the central bank continues to have "serious and major" concerns about cryptocurrencies like Bitcoin and has conveyed them to the government. Background: Private cryptocurrencies like Bitcoin, which are unregulated, mined through a complex process and have highly volatile prices, are under the regulatory gaze in India despite their proliferation as an asset class.

2.Present status of Cryptocurrencies in India-**An inter-ministerial panel on cryptocurrency has recommended that all private cryptocurrencies, except any virtual currencies issued by state, will be prohibited in India.** The Reserve Bank of India (RBI) has also raised concerns on the cryptocurrencies traded in the market and conveyed them to the Centre. Back in March 2020, the Supreme Court had allowed banks and financial institutions to reinstate services related to cryptocurrencies by setting aside the RBI's 2018 circular that had prohibited them (Based on the ground of "proportionality").

3.What are Cryptocurrencies-Cryptocurrencies are digital currencies in which encryption techniques are used to regulate the generation of units of currency and verify the transfer of funds, operating independently of a central bank.

4.SC Garg Committee recommendations (2019)-Ban anybody who mines, hold, transact or deal with cryptocurrencies in any form. It recommend a jail term of one to 10 years for exchange or trading in digital currency. It proposed a monetary penalty of up to three times the loss caused to the exchequer or gains made by the cryptocurrency user whichever is higher. However, the panel said that the government should keep an open mind on the potential issuance of cryptocurrencies by the Reserve Bank of India.

THAMIRABARANI RIVER

1.The literary community has hailed the Tamil Nadu government for calling the Thamirabarani River by its historical name 'Porunai.'

2.About Thamirabarani - Thamirabarani River is the only major perennial river in Tamil Nadu. It is the state's shortest river that originates from the Agastyarkoodam peak of Pothigai hills of the Western Ghats, Tamil Nadu. It empties into the sea at the Gulf of Mannar after passing through Tirunelveli and Thoothukudi districts. Naming -

3.**Thamirabarani River was historically called Porunai, Than Porunai, Porunai and Poruntham in Tamil literature - from the Sangam era to Nayakar era (6th century BCE to 17th century CE).** Amaravathi River flowing in Chera region has been called Aan Porunai and Than Aan Porunai.

4.The word 'Than Porunai' evolved into 'Tamira Porunai' before becoming 'Thamirabarani'. Porunai is a non-Sanskritised word and the right pure Tamil word, which should replace the word 'Thamirabarani'.

HYBRID CLOUD AND REMOTE REALITY

1.As businesses shift priorities to enable remote work, it's time to

Jaishankar, with a visit to India at an “early date” in the future.

Prime Minister Narendra Modi is soon expected to launch the National Intelligence Grid or NATGRID that aims to provide a “cutting edge technology to enhance India’s counterterror capabilities”, official sources said. They said the final “synchronisation and testing” of the ambitious electronic database, which was mooted after the 26/11 Mumbai terror attacks in 2008, is being carried out so that it can go live.

rely on an effective multi-cloud, multi-edge, hybrid approach
What is a hybrid cloud-Hybrid cloud is an IT infrastructure that combines and unifies public cloud and private cloud services from multiple cloud vendors. Hybrid cloud architecture focuses on the mechanics of transforming portions of a company's on-premises data centre into private cloud infrastructure. It then connects that infrastructure to public cloud environments hosted off-premises by a public cloud providers such as Google Cloud Services, IBM Cloud, Microsoft Azure, etc.

2.What are the benefits of hybrid cloud platform-High scalability - With the scope of new additions in existing infrastructure. Very secure - **Giving businesses crucial control over their data and improved security. High flexibility - Certain types of data can be stored on-premise while allowing less sensitive data to be stored on the cloud.** Greater infrastructure efficiency by strengthening remote work Cost and time efficient.

3.What parameters need to be assessed in this model-Regulatory requirements. Security compliance. Stringent latency. Connectivity issues. Dependency on internal IT infrastructure. Managing multiple vendors and platforms.