

NEWSPAPER HIGHLIGHT

A study published in The Astrophysical Journal identifies a new class of exoplanets – Hycean worlds – that could support life different from that on Earth. These planets are about 2.6 times the size of Earth, have temperatures about 200 degrees Celsius and planet wide oceans. These could support microbial underwater life. Search is now on for their biosignatures.

A recent study published in Cell Reports finds evidence that Rapid Eye Movement (REM) sleep refreshes the brain. REM sleep is a phase of sleep when dreaming takes place. The University of Tsukuba researchers directly observed the red blood cells in the blood capillaries of mice. They spotted a massive flow of RBCs into the capillaries during REM sleep.

Close to autumn every year, stubble burning returns to worsen air pollution across India's northern plains. However, to curb the menace during the paddy harvesting season, Punjab, the key grain producing State, is all set this year to promote paddy straw as a "resource to create wealth". The State government is working to present "paddy straw" as a resource that creates value and wealth for industry and the farming community, rather than being a waste product of paddy cultivation. While farmer outfits have welcomed the move, some industry bodies have their reservations. The government recently decided to permit certain categories of industries to install paddy straw fired boilers, for which the industries will be given fiscal incentives. The industries included in this scheme are sugar mills, pulp and paper mills, besides any industry having boiler installation with steam generating capacity more than 25 tonnes per hour (TPH). Also, new and existing units of distilleries and breweries, proposing replacement of old boilers or expansion with installation of new boilers, are required to use paddy straw as fuel in boilers.

Some 28% of the 1,38,374 species assessed by the International Union for the Conservation of Nature (IUCN) for its survival watchlist are now at high risk of vanishing forever, the global conservation body said. Habitat loss, overexploitation and illegal trade have hammered

FINANCIAL STABILITY DEVELOPMENT COUNCIL(FSDC)

1.24th meeting of Financial Stability and Development Council (FSDC). The 24th meeting deliberated on various mandates of the FSDC such as financial stability, financial sector development, inter-regulatory coordination, financial literacy, financial inclusion, and macro prudential supervision of the economy including the functioning of large financial conglomerates.

2.Discussed issues relating to Management of stressed assets, strengthening institutional mechanism for financial stability analysis, framework for resolution of financial institutions and issues related to IBC, data sharing mechanisms of government authorities, internationalisation of the Indian rupee and pension sector related issues.

3.About Financial Stability and Development Council (FSDC)- **Financial Stability and Development Council (FSDC) was set up by the Government as the apex level forum in December 2010.** The Chairman of the Council is the Union Finance Minister and its members include The heads of financial sector Regulators (RBI, SEBI, PFRDA, IRDA & FMC) Finance Secretary and/or Secretary, Department of Economic Affairs, Secretary, Department of Financial Services, and Chief Economic Adviser. The Council can invite experts to its meeting if required.

NASA'S PERSEVERANCE ROVER

1.NASA's Perseverance rover has successfully collected its first rock sample for return to Earth. NASA has called it a perfect core sample. NASA plans to launch more spacecraft to retrieve the samples collected by Perseverance. Perseverance arrived in February 2021 at Mars' Jezero Crater, the site on an ancient lake— in search of rocks that might hold evidence of ancient life.

2.Why is this mission significant? **It carried a unique instrument, MOXIE or Mars Oxygen ISRU Experiment: which for the first time manufactured molecular oxygen on Mars using carbon dioxide from the carbon-dioxide-rich atmosphere (ISRU means In Situ Resource Utilization:** or the use of local resources to meet human needs or requirements of the spacecraft). It carried Ingenuity, the first ever helicopter to fly on Mars. It is the planned first step to bring back rock samples from Mars for analysis in sophisticated laboratories on Earth: with the goal of looking for biosignatures: or signatures of present or past life.

3.These are some of the key mission objectives: Look for signs of ancient microbial life. Collect Martian rock and dust samples for later return to Earth. Deliver an experimental helicopter. Study the climate and geology of Mars. Demonstrate technology for future Mars missions.

4.What is the reason for the near-term interest in Mars? Mars is located in the very near backyard (about 200 million km away). **It is a planet that humans can aspire to visit or to stay for a longer duration. Mars had flowing water and an atmosphere in the distant past:** and perhaps conditions to support life. It also has implications for commercial travel.

DURAND LINE

1.Durand Line is the 2,670-kilometre long international land border between Afghanistan and Pakistan.

2.**The agreement demarcating the Durand Line was signed on November 12, 1893 between the British civil servant Sir Henry Mortimer Durand and Amir Abdur Rahman, then the Afghan ruler.**

3.The line cut through Pashtun tribal areas on both sides of the border.

4.The line stretches from the Afghanistan's border with China to Afghanistan's border with Iran. With independence in 1947, Pakistan inherited the Durand Line.

PLI SCHEME FOR SPECIALITY STEEL

1.The Union Cabinet recently approved the Production Linked Incentive (PLI) Scheme for specialty steel with an outlay of Rs 6,322-crore.

global wildlife populations for decades, and climate change is now kicking in as a direct threat as well, the IUCN reported. Komodo dragons, the largest living lizards, which are found only in the World Heritage-listed Komodo National Park and neighbouring Flores, were listed as "endangered".

Researchers at the University of California, San Francisco, have discovered a new pathway in the human brain that processes the sounds of language. They found that auditory and speech processing occur in parallel (Cell). For decades, scientists have thought that speech processing in the auditory cortex followed a serial pathway. It was thought that first, the primary auditory cortex processes simple acoustic information, such as frequencies of sounds. Then, an adjacent region, the superior temporal gyrus (STG), extracts more important features, like consonants and vowels, transforming sounds into meaningful words. But direct evidence for been lacking.

A tripartite agreement among five insurgent groups of Assam, the Centre and the State government was signed to end years of violence in the Karbi Anglong region. The insurgent groups which signed the peace accord include the Karbi Longri North Cachar Hills Liberation Front, the People's Democratic Council of Karbi Longri, the United People's Liberation Army and the Karbi People's Liberation Tigers factions. Under the peace accord, more than 1,000 armed cadres have abjured violence and joined the mainstream. The agreement provides for their rehabilitation.

Four days after announcing that the Indian government has held talks with the Taliban in Doha, Foreign Secretary Harsh Vardhan Shringla said in Washington that the Taliban thus far had been "reassuring" and "reasonable", but he stressed that the government continued to approach the new regime in Kabul cautiously. His comments came as the Taliban continued to work on government formation, which was delayed for the second day, amid reports of differences between various factions.

Chief Justice of India N.V. Ramana lamented that "very few women find representation at the top" and admitted that even a "mere" 11% representation of women on the Bench of the Supreme Court was achieved with "great difficulty". Ideally, women should have got at least 50% representation at all levels

2. What is the PLI scheme? For target segments, **the scheme provides incentive of 4% to 6% on incremental sales over the base year for goods manufactured in India.** Apart from inviting foreign companies to set shop in India, it encourages local companies to set up (or expand existing) manufacturing units. Objectives: Encourage local production. Reduce India's dependency on imports and cut the import bill. Boost export earnings. Increase the share of manufacturing to 20% by 2025.

3. How is the performance so far? The progress of the PLI scheme has been somewhat slow. Of the 13 sectors for which outlays have been finalised, guidelines need to be framed for a few. In others, the industry's concerns need to be addressed. For textile products and automobiles, the schemes are awaiting Cabinet approval. But the auto sector hugely relies on imports for a range of components and is one of the country's biggest employers.

4. What is the recent PLI scheme for speciality steel-**The PLI incentive is expected to boost the domestic production of specialty steel by - attracting significant investment. Infusing technology and know-how promoting exports.** It will apply for the following 5 indicative product categories: Coated/Plated Steel. Products High Strength/ Wear resistant Steel. Specialty Rails. Alloy Steel Products and Steel wires Electrical Steel.

5. Expected outcome. **Increase production of speciality steel by 140% by FY27, over the baseline period of FY20.** Reduced import dependence to the tune of 76%, Increase in exports by 244% Compete with Korea and Japan leading in the sector.

RBI AND G-SECS MARKET

1. The RBI Governor, Shaktikanta Das, recently emphasized that the RBI should continue to remain the regulator for the government securities (G-sec) market.

2. What are government securities? Government securities (G-Secs) are debt instruments issued by a sovereign government to borrow money. The investor buys the bonds and loans money, and in turn, receives fixed interest. This is for a defined period of time (till maturity date) and for a variable or fixed interest rate (coupon rate). The two key categories are: Treasury bills - short-term instruments which mature in 91 days, 182 days, or 364 days Dated securities - long-term instruments, which mature anywhere between 5 and 40 years.

3. What is the recent concern? SEBI's Chairman recently called for unification of corporate and government bond markets under the SEBI. **The RBI has been facing criticism due to the manner in which it is controlling government bond yields. There seems to be a conflict of interest with its other objectives such as inflation management and orderly functioning of the financial market.**

4. What is the challenge in handling this? The bond prices and yields generally move in opposite directions. This is because, **as a bond's price increases, its yield to maturity falls. The price of a bond primarily changes in response to changes in interest rates in the economy.** When the government demands so much money, the price of money (i.e., the interest rate) will move up. So, yield management / low bond yields are needed to - bring down the borrowing cost of government control the interest burden kick-start investments But at a larger level, this has revived the debate over whether public debt management should still remain with the RBI.

SPACE JUNK

1. In March, a Chinese military satellite, Yunhai 1-02 collided with a piece of junk leftover from a 1996 Russian rocket launch leaving a trail of debris high above the Earth.

2. What causes space junk? **Unoperational / Expired / Exploded satellites, rocket parts or spacecrafts.** Anti-satellite tests that incapacitates or destroys satellites for strategic or tactical purposes (like Mission Shakti conducted by DRDO, China's 2007 ASAT test, etc.). Rare collision between two spacecrafts. Mega-constellations of satellites planned by companies such as SpaceX's Starlink project.

3. What are the threats posed by space junk? Collision of space debris with other satellites or amongst themselves produces more fragments and exacerbates the problem. A belt of space junk would make certain low-Earth orbits unusable. Experts have warned of Kessler syndrome Astronauts in space would be harmed by space debris. Old batteries from defunct spacecrafts can explode and leaks may occur in the system. The International Space Station (ISS) is constantly at risk from space

after 75 years of Independence.

The Brunei diplomat appointed by a Southeast Asian regional bloc as its special envoy to Myanmar said on Saturday he is still negotiating with the military on the terms of a visit and has sought access to ousted leader Aung San Suu Kyi. The Association of Southeast Asian Nations (ASEAN) has been trying to end violence in Myanmar and open a dialogue between the military rulers and their opponents following the overthrow of Ms. Suu Kyi.

debris.

4. What has been done so far to manage the space junk? Orbital Debris Program Office was set up by NASA which issued the world's first set of debris-mitigation guidelines in 1995. **It proposed that satellites be designed to re-enter Earth's atmosphere within 25 years of mission completion Europe plans ClearSpace-1, Earth's first space debris removal mission in 2025.** Researchers from Purdue University are test-launching a first-of-its-kind Spinnaker3 drag sail to low-earth orbit, in an effort to clean up space debris. Japanese startup Astroscale launched a satellite that retrieves used satellites and other space junk. In August 2020, NETRA Project was initiated by ISRO which is an early warning system to protect the satellites from space debris and other hazards of Space.

5. What should be done? **Updation of the 1967 Outer Space Treaty which grants countries permanent property rights to their objects in space complicating the efforts to clean up debris.** Funding research into debris-removal technologies and partnerships with companies by NASA. Expansion of Artemis Accords, a framework for space cooperation that includes (so far) 11 other countries by US.