

# My Notes....

## NATIONAL

### INDIA ADD TWO MORE RAMSAR SITES

The **Khijadiya Bird Sanctuary** near **Jamnagar in Gujarat** and **Bakhira Wildlife Sanctuary in Uttar Pradesh** has been listed as **Wetlands of International Importance by the Ramsar Convention**, an international treaty for the conservation and sustainable use of wetlands. The announcement by the Ramsar secretariat in Iran came on the **eve of International Wetlands Day** (2 February). With this, the total number of **Ramsar sites in India goes up to 49**.

#### What

1. **Khijadiya**, which is **part of the Central Asian Flyway**, has become the **fourth wetland of Gujarat** to get the Ramsar tag.
2. **Nalsarovar Bird Sanctuary, Thol Wildlife Sanctuary** and **Wadhvana wetland** are the other Ramsar sites in the state. The last two were included in April last year.
3. **Khijadia Wildlife Sanctuary** (Ramsar site No. 2464), a freshwater wetland near the coast of the Gulf of Kutch, was formed following the creation of a bund (dike) **in 1920** by the then ruler of the erstwhile princely state of **Nawanagar to protect farmlands from saltwater ingress**.
4. The sanctuary is now part of **Marine National Park**, Jamnagar and the **first marine national park** in the country.
5. On the other hand, **Bakhira Wildlife Sanctuary** (site no. 2465), a **freshwater marsh** in the Sant Kabir Nagar district, is the **largest natural floodplain wetland** of eastern Uttar Pradesh.
6. The **Sanctuary was established in 1980** and is protected under the **Wildlife Protection Act (1972)**; an **“eco-sensitive zone”** extends up to a kilometre around its boundary.

#### World Wetlands Day 2022

1. Every year on 2 February, people across the globe observe **World Wetlands Day** in order to raise awareness among people about wetlands.
2. The main aim of the day is to **understand the influence and positive production that Wetlands have had on the world** and in terms bring communities together for the benefit of Mother Nature.
3. The theme of this year is **'Wetlands action for people and nature'**, highlighting the importance of actions to ensure the conservation and sustainable use of wetlands for humans and planetary health.

### INDIA'S FIRST SPACE MISSION IN 2022

The **Indian Space Research Organisation (ISRO)** successfully launched the **earth observation satellite EOS-04** on 14 February 2022, along with **two other satellites**, on the **PSLV-C52 mission**. This is ISRO's first launch of the year, and follows the **failed launch of the EOS-03** satellite in August last year.

#### What

1. The two other satellites were **INS-2TD**, a technology demonstrator from ISRO with a **thermal imaging camera**, and **INSPIRESat-1**, a **student satellite** developed by the Indian Institute of Space Technology (IIST) **to study the ionosphere**.
2. The satellites were launched on the PSLV, from the first launch pad at Sriharikota. It was the **23rd flight of the PSLV in its XL configuration** with six strap-on motors.
3. Overall, it is the **54th flight of a PSLV rocket** and the 80th launch from Satish Dhawan Space Centre.

#### About EOS-04

1. The EOS-04, **formerly known as RISAT-1A**, is a **land-based earth observation satellite** that images using radar.

2. On 14 February 2022, it was inserted into a **sun synchronous orbit** at an altitude of **529 km** from the surface.
3. **EOS-04 is the sixth satellite** to be launched under the **RISAT (Radar Imaging Satellite) programme** in the last decade.
4. Built at **ISRO's UR Rao Satellite Centre in Bengaluru**, EOS-04 carries **synthetic aperture radar (SAR)** that can peer through all kinds of weather and clouds, during night time as well.
5. Its data will complement the data from **Resourcesat, Cartosat series, and RISAT-2B series**, and will be collected in the C-band.
6. It will be used in the **fields of plantations, flood mapping, hydrology** and more. The satellite weighs 1,710 kg and will function for **at least 10 years**.

#### About INS-2TD

1. **INS-2TD** is a precursor to the **India-Bhutan joint satellite**, INS-2B, built by Bhutanese engineers who were trained at UR Rao Satellite Centre from 28 December 2020 to 25 February 2021.
2. **INS-2TD** is a tech demonstrator carrying a **thermal imaging camera**. The satellite weighs **17.5 kg** and has a **mission life of six months**.
3. It will assess and monitor **land temperature, surface temperature of water bodies like lakes and wetlands**, delineation of vegetation of crops and forests, and thermal inertia or temperature variation between day and night times.

#### About INSPIRESat-1

1. **INSPIRESat-1** is developed by IIST in association with University of Colorado, US, Nanyang Technological University, Singapore, and National Central University, Taiwan.
2. **INSPIRE** stands for the **International Space Program in Research and Education**, and was **launched in 2017**.
3. The **cubesat carries** two scientific payloads, one each to study the **earth's ionosphere** and to **observe the solar flares**.
4. Contrary to what its name indicates, **INSPIRESat-1 is the third satellite** to be launched by the programme — **INSPIRESat-2** and **INSPIRESat-5** were launched by US giant SpaceX.
5. Weighing 8.1 kg, INSPIRESat-1 is expected to function for a **minimum of one year**.

## INDIA SUPPORTS LEGALLY BINDING UN TREATY

Prime Minister on 11 February 2022 pledged **India's support** towards creating a legally binding **international treaty** under the **United Nations (UN) Convention on the Law of the Sea** towards the conservation and **sustainable use of marine biological diversity** of areas beyond national jurisdiction. Speaking at the **One Ocean Summit** organised by **France** and jointly hosted by the **UN** and the **World Bank** in Brest, France.

#### What

1. **India supports the French initiative** of a high ambition coalition on **Biodiversity beyond National Jurisdiction (BBNJ)**.
2. A **coalition on BBNJ** was formally launched at the **One Ocean Summit** on 11 February 2022, with world leaders such as Canadian Prime Minister Justin Trudeau, Japanese Prime Minister Fumio Kishida, UK Prime Minister Boris Johnson, among others, pledging their support.
3. The **One Ocean Summit** featured discussions, some of which were hosted by French President Emmanuel Macron, on issues such as **combating illegal fishing, decarbonising shipping** and **reducing plastic pollution**.
4. The objective of the summit, held from 9-11 February, was **to mobilise the international community** to take tangible action towards preserving and supporting healthy and sustainable ocean ecosystems. It has been viewed as the **first high-level gathering** dedicated to the cause.

### Global initiative on single-use plastic

1. The prime minister emphasised **New Delhi's commitment** towards eliminating **single-use plastic** and invited France in launching a global initiative dedicated to the cause.
2. India recently undertook a **nationwide awareness campaign** to clean plastic and other waste from coastal areas.
3. India will be happy to join France in launching a **global initiative on single-use plastic**.
4. In November 2019, PM launched the **The Indo-Pacific Oceans Initiative (IPOI) at the East Asia Summit** held in Bangkok, Thailand.
5. The IPOI draws on existing regional cooperation to focus on such important issues as **maritime security, maritime ecology, maritime resources, maritime transport and disaster risk reduction**.

## FIRST UT TO BE INTEGRATED WITH NATIONAL SINGLE-WINDOW SYSTEM

Lt Governor Manoj Sinha on 6 February 2022 launched the **single-window portal for Jammu and Kashmir**, making it the **first Union territory** to be integrated with the national single-window system. While **130 industrial services** have been made online on the single-window system, over 160 more services will be integrated this year.

### What

1. Now **global investors** can apply for **all their business approvals in Jammu and Kashmir** through the national single-window system.
2. These reforms have helped us **receive investment** proposals worth Rs 70,000 crore in different sectors within a year.
3. In January last year, the UT administration announced a **new industrial developmental scheme (IDS)** to encourage new investment and to take industrial development to the **block level**.
4. The **integrated single-window system** will facilitate new investments **locally and globally**, either through the national single-window system or through J&K single-window system with user-friendly interfaces and timely approvals.
5. The **Department of Industries and Commerce**, being the nodal department, will coordinate with all departments of J&K administration for successful compliance of **Business Reform Action Plan (BRAP) 2022 and Regulatory Compliance Burden (RCB) 2022**.

## 'STATUE OF EQUALITY' INAUGURATED

The massive '**Statue of Equality**' of **Sriramanujacharya** that Prime Minister "**dedicated to the world**" on 5 February 2022 was made in China. Though one Indian company was also in the race to win the contract, **China's Aerosun Corporation** was given the order in August 2015.

### About the Statue of Equality

1. The **216-foot tall Statue of Equality** commemorates the **11th-century Bhakti Saint Sri Ramanujacharya**, who promoted the idea of equality in all aspects of living including **faith, caste and creed**.
2. The Statue is made of '**panchaloha**', a combination of five metals: **gold, silver, copper, brass, and zinc** and is among one of the tallest metallic statues in sitting position, in the world.
3. It is mounted on a 54-feet high base building, named '**Bhadra Vedi**'.
4. It has floors devoted for a **Vedic digital library** and research centre, ancient Indian texts, a theatre, an educational gallery detailing many works of Sri Ramanujacharya.

5. **14 models of Sriramanujacharya statue** were made initially incorporating **Agama and Shilpa shastra sutras**, out of which three models were examined with **3D scanning** and improved further.
6. The statue has been conceptualised by **Sri Chinna Jeeyar Swami** of Sri Ramanujacharya Ashram.
7. The inauguration of the **Statue of Equality** is a part of the **12-day Sri Ramanuja Sahasrabdi Samaroham**, the ongoing 1000th birth anniversary celebrations of Sri Ramanujacharya.

## INTERNATIONAL

### INDIA'S G20 PRESIDENCY APPROVED

The Union Cabinet on 15 February 2022 approved **setting up of a G20 secretariat** to put in place arrangements required for **India's presidency** of the prestigious grouping. India will hold the Presidency of the G20 from 1 December to 30 November 2023. **India will host the G20 summit** next year.

#### What

1. The Union Cabinet, chaired by Prime Minister approved the setting up of a G20 Secretariat and its **reporting structures**, which will be responsible for implementation of **overall policy decisions** and arrangements needed for steering **India's forthcoming G20 Presidency**.
2. **G20 is the premier forum for international economic cooperation** that plays an important role in global economic governance.
3. As per practice, a G20 Secretariat is being established to **handle work** relating to **substantive / knowledge / content, technical, media**, security and logistical aspects of India's G20 Presidency.
4. **Italy held the G-20 presidency in 2021** while **Indonesia** will play the role **till November, 2022**.
5. **Italy, Indonesia and India** are the **G20 troika countries** at present.

### INDIA, AUSTRALIA INK LOI ON RENEWABLE ENERGY

**India and Australia** on 15 February 2022 inked a **letter of intent (LoI)** for working together towards **reducing the cost of new and renewable energy technologies** and scaling up their deployment to **reduce emission globally**. The letter of intent (LoI) was signed at the **4th India Australia Energy Dialogue**.

#### According to the statement

1. This LoI will pave the way for working towards **reducing the cost of new and renewable energy technologies** and scaling up their deployment in order to accelerate global emissions reduction.
2. The focus of this LoI will be scaling up manufacture and deployment of **ultra low-cost solar and clean hydrogen**.
3. There is an urgent need to focus on advancing technology and **clean energy transition**. In this context, the agreed **forward action plan** includes areas like **energy efficient technologies; grid management; R&D collaboration on flue gas desulphurisation, biomass or hydrogen co-firing, water cycle optimisation**, renewables integration, batteries and electric mobility.
4. There are **five Joint Working Groups (JWGs)** under the India Australia Energy Dialogue -- **Power; New & Renewable Energy; Coal & Mines; Critical Minerals; and Oil & Gas**.
5. Apart from the power sector, there are many desirable areas of cooperation agreed under other JWGs like **reducing costs of green hydrogen**; cooperation in sphere of **coal-based energy security and resource deployment**; investment opportunities in the minerals sector; exploring potential for an **LNG partnership**, among others.

## ECONOMY

### KEY TAKEAWAYS FROM UNION BUDGET 2022

Finance Minister Nirmala Sitharaman on 1 February 2022 presented the **Union Budget 2022**, the **blueprint for 'amrit kal'** of the next 25 years, in Parliament. The Union Budget Finance Minister Nirmala Sitharaman said that **India's growth** is estimated to be at **9.27 per cent in FY23**.

#### Key takeaways of Budget 2022

1. The finance minister listed **four priorities** of the government -- **PM Gati Shakti, inclusive development, energy transition and climate action** and **financing of investments**.
2. **PM Gati Shakti masterplan** will encompass the **seven engines** for economic transformation, seamless multimodal connectivity and logistics efficiency.
3. FM extended the **credit-linked guarantee scheme** till March 2023. The scopes of portals meant **to support MSMEs will be widened**, with efforts to further formalise the economy. Emergency credit line gave support to **more than 1 lakh MSMEs**.
4. The finance minister added that **400 new generations Vande Bharat trains** with better efficiency will be brought in over the next three years.
5. The implementation of the **Ken-Betwa link** worth Rs 44,605 crore will be taken up to provide irrigation of over 9 lakh hectares of the farmers **land providing irrigation**, farming and livelihood facilities to farmers and local population.
6. The Centre plans to launch a **digital DESH e-portal for reskilling youth**. Skilling programmes will be reoriented. For **skilling, upskilling** and **reskilling** of our youth, Digital DESH e-portal will be launched.
7. **'One Class One TV Channel'** will be increased from **12 to 200 TV Channels** to provide supplementary education in regional languages for **classes 1-12**.
8. The government would promote the use of **'Kisan Drones'** in agriculture as part of the Budget for 2022-23. These drones would be used for assessing crops, **digitising land records**, and **spraying pesticides**, insecticides and other nutrients.
9. The Centre will set up an **Animation, Visual Effects, Gaming and Comics (AVGC)** promotion task force to recommend ways to realise this sector and build domestic capacity for serving markets and the global demand.
10. The **Special Economic Zones (SEZ) Act** will be replaced with new legislation for the development of enterprise and hubs. An **end-to-end e-Bill facility** will be launched for all government procurements.
11. The **Digital Rupee using blockchain** will be issued by the RBI in this fiscal year. In the tax corner, FM said that **taxpayers can now file updated returns** within two years. The **income from cryptocurrencies, NFTs and other virtual assets to be taxed at 30 per cent**
12. **'One Nation, One Registration'** will be established for anywhere registration to facilitate ease of living and doing business. Customs Duty on cut, polished gem stones has been reduced to 5 per cent.
13. **Tax deduction limit** will be reduced for central government employees **from 18 per cent to 15 per cent** in their contribution to NPAs.
14. **Co-operative surcharge** will be reduced **from 12 per cent to 7 per cent**.

### RBI ENHANCES CAP ON FOR E-RUPI

The **Reserve Bank of India (RBI)** on 10 February 2022 proposed **to increase the cap** on the **amount for e-RUPI vouchers** from **Rs 10,000 currently to Rs 1, 00,000** so as to enhance the scope of application of these vouchers and facilitate faster delivery of various government services to beneficiaries efficiently.

### What

1. The **e-RUPI vouchers** can be used multiple times, until the amount on the voucher is completely redeemed.
2. Currently, **each voucher can be redeemed only once**. The RBI will issue necessary instructions in this regard to the **National Payments Corporation of India (NPCI)**.
3. This will further facilitate the **delivery of various government schemes** to the beneficiaries more efficiently.
4. Launched in **August 2021**, **e-RUPI**, currently, is a **one-time use digital solution to facilitate cashless payment** which is person and purpose specific for various services like the **covid vaccinations**, donations, corporate gift vouchers, etc.
5. **e-RUPI can be issued only by banks authorised by RBI** to issue Prepaid Payment Instruments (PPI) and who are participating as **Payment Service Providers (PSP)** in the UPI ecosystem.
6. **e-RUPI vouchers** are presently being used largely for Covid-19 vaccination purposes. There are other use cases being actively considered by various state governments and central government ministries and departments.

### GOVT. PROPOSES TO REPLACE EXISTING SEZ LAW

The government on 1 February 2022 proposed **to replace the existing law governing special economic zones (SEZs)** with a new legislation to enable states to become partners in 'Development of Enterprise and Service Hubs'. The **existing SEZ Act was enacted in 2006** with an aim to create export hubs and boost manufacturing in the country.

#### Why it will replace

1. **These zones started losing their sheen** after imposition of **minimum alternate tax** and introduction of sunset clause for removal of tax incentives. These zones are **treated as foreign entities** in terms of provisions related to customs.
2. Industry has time and again demanded **continuation of tax benefits** provided under the law.
3. **Units in SEZs used to enjoy 100 per cent income tax exemption** on export income for the **first five years, 50 per cent for the next five years** and 50 per cent of the ploughed back export profit for another five years.
4. **Presenting the Budget 2022-23**, Finance Minister said: The **Special Economic Zones Act** will be replaced with a new legislation that will enable the states to become partners in **Development of Enterprise and Service Hubs**.
5. This will cover all large existing and new industrial enclaves to optimally utilise available infrastructure and enhance competitiveness of exports.
6. The government will also undertake reforms in **customs administration of SEZs** with a view to promote ease of doing business.

#### Flashback

1. **In the Budget 2016-17**, the government had announced that the **income tax benefits to new SEZ units** would be available to only those units which commence activity before 31 March 2020.
2. As on 27 January 2022, the government has given **formal approvals to 425 SEZ developers**. Out of this, 268 were operational till 31 December 2021.
3. An expert committee led by **Bharat Forge Chairman Baba Kalyani**, that was **formed in 2018** to review the **SEZ policy**, has already submitted its report, recommending **significant changes in the SEZ policy**, including the formulation of separate rules and procedures for manufacturing and service SEZs.

### CENTRE'S NEW RULES FOR IMPORT OF DRONES

The Centre on 9 February 2022 **banned the import of drones** with some exceptions in India. The **import of drone** components, however, has not been restricted by the government as it seeks to boost domestic manufacturing of drones.

### What imports are being banned?

1. The **import of any drones** either in **completely built up (CBU), completely knocked down (CKD)** /semi knocked down (SKD) forms have been banned, with the exception of drones imported **“for the purposes of defence, security and research and development”**.
2. Anyone looking to import drones under the exemptions will be **required to obtain clearances**.
3. The move is aimed at giving a **boost to domestic manufacturing of drones** which is seen as a sector that is set to witness rapid growth this decade.
4. India’s drone market is estimated to account for about **4.25 per cent of the global drone market** worth about \$28.5 billion in FY22.
5. **Government entities, educational institutions** and government recognised R&D entities will be allowed to import drones in **CBU, SKD and CKD** form after they acquire import authorisation from the **Directorate General of Foreign Trade** which would be provided after consultation with the relevant ministry.
6. **Drone manufacturers** seeking to import drones for R&D will also be able to import drones through this route
7. The Centre has, however, clarified that the **ban does not apply to the import of drone components**. The government has noted that the ban is in line with government efforts to boost domestic manufacturing of drones.

#### Flashback

1. The **new Drone Rules, 2021** notified in August 2021 have reduced both compliances and **fees required to operate drones**.
2. The **civil aviation ministry** also launched an **airspace map of India** on the Directorate General of Civil Aviation’s (DGCA) **digital sky platform** which demarcates the areas where drones can be used without permission and areas in which drone operators cannot operate drones without obtaining prior permission from government authorities.

## SCIENCE AND TECHNOLOGY

### INSAT-4B DECOMMISSIONED

The **Indian Space Research Organisation (Isro)** has **decommissioned INSAT-4B** through 11 manoeuvres that pushed the communication satellite into a desired orbit mandated by international guidelines. **INSAT-4B** has undergone **post mission disposal (PMD)** at the end of its life followed by decommissioning on 24 January 2022 to comply with the **UN** and the **INTER Agency Space Debris Coordination Committee (IADC)** recommended space debris mitigation guidelines.

#### What

1. **INSAT-4B** was launched on 12 March 2007 for **DTH** and other communication services.
2. After completing **nearly 14 years of on-orbit operations**, the **C band and Ku band** payload services of INSAT-4B were **migrated to other GSATs** before commencement of the post mission disposal.
3. As per **IADC space debris mitigation guidelines**, at its end-of-life, a GEO object should be raised to a nearly circular orbit well above GEO belt to prevent its orbit from coming back into the **GEO protected region** within 100 years of re-orbiting.
4. In this case, the **minimum orbit raise required was 273 km** and this is achieved through 11 re-orbiting manoeuvres executed during 17 – 23 January.
5. The space agency added that the **first manoeuvre** was aimed to circularize the orbit.
6. The subsequent re-orbiting manoeuvres were executed at the **perigees (nearest to Earth)** and the **apogees (farthest)** alternately making the intermediate orbits near circular.

7. **INSAT-4B** is the **21st Indian GEO satellite** to undergo PMD. The required propellant for such re-orbiting was included in the initial fuel budget as a part of standard practice followed in Isro's GEO mission planning.
8. The finally achieved orbit is about **340km above GEO altitude** in perfect compliance with IADC guidelines for space debris mitigation of GEO objects.

## MISSIONS FOR UNDERSTAND EARTH-SUN ENVIRONMENT

NASA has selected two science missions - the **Multi-slit Solar Explorer (MUSE)** and **HelioSwarm** - to help improve our understanding of the **dynamics of the Sun**, the **Sun-Earth connection**, and the constantly changing space environment. These missions will provide **deeper insights into our universe** and offer critical information to help protect **astronauts, satellites, and communications signals** such as GPS.

### What

1. **MUSE** and **HelioSwarm** will provide new and deeper insight into the **solar atmosphere** and **space weather**.
2. These missions not only extend the science of our other **heliophysics missions** -- they also provide a unique perspective and a **novel approach to understanding the mysteries of our star**.

### About MUSE mission

1. The **MUSE mission** will help scientists understand the **forces driving the heating of the Sun's corona** and the **eruptions in that outermost region** that are at the **foundation of space weather**.
2. The mission will offer deeper insight into the physics of the **solar atmosphere** by using a powerful instrument known as a **multi-slit spectrometer** to observe the **Sun's extreme ultraviolet radiation** and obtain the highest resolution images ever captured of the **solar transition region** and the **corona**.
3. The mission will also provide **complementary observations** from heliophysics research such as the **Extreme UltraViolet Spectroscopic Telescope** and ground-based observatories.
4. MUSE will help us fill crucial gaps in knowledge pertaining to the **Sun-Earth connection**.

### About HelioSwarm Mission

1. The **HelioSwarm mission** is a constellation or "swarm" of **nine spacecraft** that will capture the **first multiscale in-space measurements** of fluctuations in the **magnetic field** and **motions of the solar wind** known as **solar wind turbulence**.
2. The Sun's outermost atmospheric layer, the **heliosphere**, encompasses an enormous region of the solar system.
3. **Solar winds** spread through the **heliosphere**, and their interactions with **planetary magnetospheres** and disruptions such as **coronal mass ejections** affect their turbulence.
4. The technical innovation of **HelioSwarm's small satellites** operating together as a constellation provides the **unique ability to investigate turbulence** and its evolution in the solar wind.

## SUPERCOMPUTER PARAM PRAVEGA COMMISSIONED

The **Indian Institute of Science (IISc)** has installed and commissioned **Param Pravega**, one of the **most powerful supercomputers in India**, and the largest in an Indian academic institution under the **National Supercomputing Mission (NSM)**. The system, which is expected to **power diverse research** and educational pursuits, has a total **supercomputing capacity of 3.3 petaflops** (1 petaflop equals a quadrillion or 1015 operations per second).

### What

1. It has been designed by the **Centre for Development of Advanced Computing (C-DAC)**.



2. A **majority of the components used to build this system** have been manufactured and assembled within the country, along with an indigenous software stack developed by C-DAC, in line with the **Make in India initiative**.
3. The **NSM** is steered jointly by the **Department of Science and Technology (DST)** and **Ministry of Electronics and Information Technology (MeitY)**, and implemented by C-DAC and IISc.
4. The Mission has supported the **deployment of 10 supercomputer systems** so far at IISc, IITs, IISER Pune, JNCASR, NABI-Mohali and C-DAC, with a cumulative computing power of 17 petaflops.
5. These systems have greatly helped faculty members and students carry out major R&D activities, including **developing platforms for genomics and drug discovery, studying urban environmental issues**, establishing flood warning and prediction systems, and optimising telecom networks.

#### Flashback

1. IISc already has a **cutting-edge supercomputing facility** established several years ago. In 2015, the Institute procured and **installed SahasraT**, which was at that time the **fastest supercomputer in the country**.
2. Researchers have also used the facility to simulate **turbulent flows for green energy technologies, study climate change and associated impacts**, analyse aircraft engines and hypersonic flight vehicles, and many other research activities. These efforts are expected to ramp up significantly with **Param Pravega**.

## INDIA'S FIRST GRAPHENE INNOVATION CENTRE

The Kerala government on 2 February 2022 announced the **country's first Graphene Innovation Centre**, a joint venture of **Digital University of Kerala, Centre for Materials for Electronics Technology (C-MET)** and **Tata Steel Limited**. The **India Innovation Centre for Graphene** would come up in **Thrissur** at a cost of Rs 86.41 crore.

#### What

1. The project would give a **major fillip for scientific research** as well as the state's industrial sector.
2. Apart from **Tata Steel Limited**, which is the **major stakeholder** in the venture, other industrial enterprises would also give support for the Innovation Centre.
3. The state government would provide the **basic infrastructure** for the project. The Centre would help attract investors to develop **graphene products**.
4. **Graphene is a one-atom-thick layer of carbon atoms** arranged in a **hexagonal** lattice.
5. It is the **building-block of Graphite**, but graphene is a remarkable substance on its own with a multitude of astonishing properties.
6. It is the **thinnest**, most electrically and **thermally conductive material** in the world, while also being flexible, transparent and incredibly strong.
7. **Graphene** is also known as a wonder material due to its vast potential in the energy and medical world.

## NASA CONTRACT FOR MARS SAMPLES BACK TO EARTH

**Lockheed Martin's space division** has won a NASA contract to **build the rocket** that will return the **first Mars rock samples to Earth** in the 2030s, the US space agency said 7 February 2022. The "**small, lightweight rocket**" will be the first to take off from another planet, bringing back "rock, sediment and atmospheric samples from the surface of the **Red Planet**."

#### What

1. NASA's **Perseverance Rover** has been collecting samples from various Martian areas since landing on Earth's neighbor a year ago.

- The goal of the mission is **to find traces of ancient life** on the Red Planet. But these samples will have to be analyzed in laboratories back on Earth, capable of more **sophisticated tests** than anything that can be done on Mars.
- The samples will be gathered and then launched back to Earth in a complex operation in which the **Lockheed Martin rocket** will be a key element. The contract for this "**Mars Ascent Vehicle**" has a potential value of \$194 million.
- The pieces are coming together to bring home the **first samples from another planet**. Once on Earth, they can be studied by state-of-the-art tools too complex to transport into space.
- According to the space agency's plans, a mission will be **launched in 2026** at the earliest to send the **mini-rocket to Mars**, carrying another rover responsible for collecting the samples left behind by Perseverance.

## SATELLITES FALLING OUT OF ORBIT AFTER SOLAR STORM

SpaceX's newest fleet of satellites is tumbling out of orbit after being struck by a **solar storm**. Up to **40 of the 49 small satellites** launched last week have either reentered the atmosphere and burned up, or are on the verge of doing so. SpaceX said a **geomagnetic storm** on 4 February 2022 made the **atmosphere denser**, which increased the **drag on the Starlink satellites**, effectively dooming them.

### What

- Ground controllers** tried to save the compact, flat-panel satellites by putting them into a **type of hibernation** and flying them in a way to minimise drag.
- But the **atmospheric pull was too great**, and the satellites failed to awaken and climb to a higher, more stable orbit.
- SpaceX still has **close to 2,000 Starlink satellites orbiting Earth** and providing internet service to remote corners of the world. They circle the globe more than 340 miles up (550 kilometers).
- The satellites hit by the **solar storm** were in a temporary position. SpaceX deliberately launches them into this unusually low orbit so that any duds can quickly reenter the atmosphere and pose no threat to other spacecraft.
- Since launching the **first Starlink satellites in 2019**, Elon Musk envisions a constellation of **thousands more satellites to increase internet service**.

### What are solar storms/flares?

- Solar storms are magnetic plasma** ejected at great speed from the **solar surface**.
- They occur during the **release of magnetic energy associated with sunspots** ('dark' regions on the Sun that are cooler than the surrounding photosphere), and can last for a few minutes or hours.
- The **solar storm that deorbited the satellites** occurred on 1 and 2 February 2022, and its powerful trails were observed on 3 February 2022.

## JAMES WEBB TELESCOPE SEES 1ST STARLIGHT

NASA's new space telescope has captured its **first starlight** and even taken a selfie of its giant, gold mirror. All 18 segments of the primary mirror on the **James Webb Space Telescope** seem to be working properly 1 1/2 months into the mission. The telescope's first target was a **bright star 258 light-years away** in the constellation **Ursa Major**.

### What

- Over the next few months, the **hexagonal mirror segments** each the size of a coffee table will be aligned and focused as one, allowing science observations to begin by the end of June.
- The **\$10 billion infrared observatory** considered the successor to the **aging Hubble Space Telescope** will seek light from the first stars and galaxies that formed in the universe **nearly 14 billion years ago**.

3. It will also examine the atmospheres of **alien worlds** for any possible signs of life.
4. NASA **did not detect the crippling flaw in Hubble's mirror** until after its 1990 launch; more than three years passed before spacewalking astronauts were able to correct the **telescope's blurry vision**.
5. While everything is looking good so far with Webb, engineers should be able to rule out any **major mirror flaws by next month**.
6. **Webb's 21-foot (6.5-meter), gold-plated mirror** is the largest ever launched into space. An **infrared camera on the telescope** snapped a picture of the mirror as one segment gazed upon the targeted star.
7. **Webb blasted off from South America in December** and reached its designated perch **1 million miles** (1.6 million kilometers) away last month.

## MISCELLANEOUS

### CHANDRAYAAN-3 SCHEDULED FOR LAUNCH

The **Department of Space** has planned as many as **19 missions** this year even as the **Chandrayaan-3**, the next phase of **India's mission to the moon**, is scheduled for August 2022, the government said.

#### What

1. A **total of 19 missions** are planned during **January to December 2022**, including eight '**Launch Vehicle Missions**', seven '**Spacecraft Missions**' and four '**Technology Demonstrator Missions**'.
2. The space agency planned for a **third lunar mission** after **its lander rover failed to soft-land** on the surface of the moon in 2019.
3. The same year the **Israeli Beresheet** had also crashed on the surface of the moon.
4. A **soft-landing will make India the fourth country** to do so and the **first country to do near the lunar South Pole**. India had previously crashed a probe at what is now called the **Jawahar point** on the moon.
5. The **third mission** will carry **only a modified lander and rover** and will use the **orbiter of the Chandrayaan 2 mission** to communicate with the earth.

#### Flashback

1. The list of satellites launched in the last three years' time include **EOS-03** launched on 12 August 2021; **Amazonia-1** launched on 28 February 2021; **Satish Dhawan SAT (SDSAT)** on 28 February 2021, and **UNITYsat** on 28 February 2021.
2. In the year 2020 and 2019, **CMS-01** was launched on 17 December 2020; **EOS-01** (7 November 2020); **GSAT-30** (17 January 2020) while those launched in 2019 include **RISAT-2BR1** (11 December 2019); **Cartosat-3** (27 November 2019); **Chandrayaan-2** (22 July 2019); **RISAT-2B** (22 May 2019); **EMISAT** (1 April 2019); **GSAT-31** (6 February 2019); **Microsat-R** (24 January 2019) and **Kalamsat-V2** (24 January 2019).

### WORLD CANCER DAY

**World Cancer Day** is observed annually on **4 February**. It is an initiative of the **Union for International Cancer Control (UICC)** to take the lead in convening, capacity building, and advocacy initiatives that unite the cancer community **to reduce the global cancer burden, promote greater equity, and integrate cancer control** into the world health and development agenda.

#### History of World Cancer Day

1. **World Cancer Day** was born on the **4 February 2000** at the **World Summit Against Cancer for the New Millennium** in Paris.

2. The **Paris Charter** aims to promote research, prevent cancer, improve patient services, raise awareness and **mobilise the global community** to make progress against cancer, and includes the **adoption of World Cancer Day**.
3. Every year, World Cancer Day is observed on February 4 to raise worldwide awareness, improving education and catalysing personal, collective and government action.
4. **World Cancer Day** is to ensure that everyone is working together to reimagine a world where millions of preventable cancer deaths are saved and access to life-saving cancer treatment and care is equitable for all.
5. The theme of this year's World Cancer Day is "**Close the Care Gap**". The theme is all about raising awareness of the equity gap that affects almost everyone, in high as well as low- and **middle-income countries**, and is costing lives.

## HIGH-LEVEL CONFERENCE ON RENEWABLE ENERGY

**Union Power and New & Renewable Energy Minister** R K Singh on 6 February 2022 said **India and ASEAN** together can develop the **entire ecosystem for renewable energy (RE)** and explore the joint initiative for building **RE manufacturing hubs** in the region.

### What

1. At the **ASEAN-India High-Level Conference on Renewable Energy**, India and ASEAN (Association of Southeast Asian Nations) can work together to develop an **entire ecosystem for renewables** that promotes **knowledge sharing, capacity building and technical assistance**.
2. The conference also explores joint initiatives for the development of **renewable energy manufacturing hubs** in the region.
3. The **ASEAN-India High-Level Conference on Renewable Energy**, being organised by the Ministry of New and Renewable Energy and the Ministry of External Affairs of Government of India on 7 -8 February 2022, commenced on 6 February 2022.
4. The High-Level Conference will focus on the theme: '**Experience and Innovations for Integrated Renewables Market**'.
5. India's commitment to work together with ASEAN to establish a **strong relationship in the renewables sector** based on the foundation of historical and cultural ties between ASEAN and India.
6. The ASEAN-India High-Level Conference will feature **five technical sessions**, which would facilitate peer-to-peer discussions between experts from India and ASEAN on themes of mutual interest.

## CORONAVIRUS DETECT BY FLUORESCENT METHOD

A team of Indian scientists has developed a new technology platform for **fluorometric detection of pathogens** such as **viruses** by measurement of fluorescent light emitted. The potential of the new technology has been demonstrated for the detection of Covid-19 virus **SARS-CoV-2**.

### What is the technology?

1. The **technology platform** can also be used to **detect other DNA or RNA pathogens** such as **HIV, influenza, HCV, Zika, Ebola** and other mutating and evolving pathogens.
2. Scientists from **Jawaharlal Nehru Centre for Advanced Scientific Research**, an autonomous institute of Department of Science & Technology, along with researchers from **India Institute of Science** have developed a noncanonical nucleic acid-based **G-quadruplex (GQ) topology targeted reliable conformational polymorphism (GQ-RCP) platform** to diagnose Covid-19 clinical samples, an S&T department statement said.
3. This **RCP-based platform** is very general and can be easily adopted for the detection of **various DNA/RNA based pathogens**.

## AI-BASED TOOLS TO HELP FIND HABITABLE PLANETS

Astronomers from the **Indian Institute of Astrophysics (IIA)** in Bengaluru along with those from **BITS Pilani**, Goa campus have devised a new approach — an **anomaly detection method** — by which they can identify potentially habitable planets with a high probability. They have used an **Artificial Intelligence (AI)-based algorithm** for this.

### What

1. **IIA is an autonomous institute** under the Department of Science and Technology (DST). And, as per DST, the question that naturally arose was “whether there are other **life-harboring planets** and if there is a way to predict which exoplanet can potentially harbour life?”
2. The AI-based method, named **Multi-Stage Memetic Binary Tree Anomaly Identifier (MSMBTAI)**, is based on a novel multi-stage **memetic algorithm (MSMA)**.
3. MSMA uses the **generic notion of a meme**, which is an idea or knowledge that gets transferred from one person to another by imitation.
4. A **meme indicates cross-cultural evolution** in posterity and, therefore, can induce new learning mechanisms as generations pass.
5. The algorithm can act as a quick screening tool for evaluating habitability perspectives from observed properties.
6. The study identified a few planets which exhibit similar anomalous characteristics as Earth via the proposed technique, which shows reasonably good results, in agreement with what astronomers believe.

## 'RENEWABLE ENERGY CAPACITY ADDITION RISES

**Renewable energy** capacity addition **increased 80 per cent to 3.4 gigawatts (GW)** during the December 2021 quarter compared to a year ago, according to CEEW-CEF. New capacity addition of **non-hydro renewable energy increased to 3.4 GW** during the third quarter of FY22, compared to just **1.9 GW installed in the same period** last year (October-December 2020), according to the latest edition of the **CEEW Centre for Energy Finance (CEEW-CEF)**.

### What

1. This is **nearly an 80 per cent jump** in **new renewable energy (RE) capacity** addition on a year-on-year basis.
2. However, it stated that compared to the preceding quarter (July-September), **new non-hydro RE capacity additions fell 27 per cent** on account of intensifying supply chain constraints.
3. **Solar energy comprised 92 per cent** of the total RE capacity added during the quarter, driven **partly by a 142 per cent** rise in installations of rooftop solar to 700 megawatts (MW).
4. This growth in new capacity was registered despite a **40 per cent jump** in the prices of solar PV modules to Rs 21 per watt-peak, over the last year.

- The handbook showed that **sales of electric vehicles jumped by over 250 per cent** to over 1.3 lakh during the Q3 FY22, compared with around **34,000 units** in the third quarter of last fiscal.
- The surge in petrol prices, the introduction of new models along with incentives under the **Faster Adoption and Manufacturing of Electric and Hybrid vehicle (FAME-II) scheme** contributed to the growth in sales of **zero-emission vehicles**, especially electric two-wheelers.

## FIRST TO BE CURED OF HIV FROM CORD BLOOD TREATMENT

A **leukaemia patient in the US** has become the **first woman** and **the third person** ever to be **cured of HIV**, after receiving a transplant of **umbilical cord blood** in a novel treatment technique, a New York Times report said on 15 February 2022. The **previous two male patients** who had been cured received **expensive bone marrow transplants**. Both kinds of transplants have **stem cells** with a mutation that **blocks HIV**.

### What

- The latest case was presented this week at the **Conference on Retroviruses and Opportunistic Infections** in Denver, Colorado.
- The results show great promise in facilitating more accessible **HIV treatments**, especially for those who are already suffering from cancer. **Cord blood** is much more widely available than **adult stem cells** that are used in **bone marrow transplants**.
- The middle-age woman is of mixed race and received a partial match, unlike the previous **bone marrow transplants** where a closer racial match is required and donors are primarily Caucasian.
- Earlier, two other women had **naturally cured themselves of HIV** by locking away the virus in their genome in what is a '**sterilising cure**', where the body eliminates the virus completely.

### Cord blood treatment

- The US mixed-race patient had been diagnosed with HIV in 2013 and had been on **antiretroviral drugs**.
- In March 2017, she was diagnosed with **acute myelogenous leukaemia**, and in August the same year, received the **mutation-containing cord blood transplant**.
- She has not shown any signs of relapse since October 2020, when she received the transplant.
- Antiretroviral therapy**, which typically is a **drug cocktail** that prevents replication and keeps viral levels low,

#### Previous cures

- In 2008, **Timothy Ray Brown from California**, who came to be known as the '**Berlin Patient**', was the **first to be cured of AIDS**. His identity was revealed in 2010, and he died in 2020 from leukaemia.
- Adam Castillejo**, who was known as the '**London Patient**', was the second to be cured, in 2019.
- Both men had **painful and expensive bone marrow transplants** from donors with a rare genetic mutation that is resistant to HIV. They were also on antiretroviral therapy.

was discontinued 37 months after the transplant, and 14 months since then, she continues to be in remission. Blood tests show **no signs of both HIV** and antibodies to HIV.

5. While the blood from her relative formed a crucial aid in keeping the **immune system** running until the cord blood cells took over, it is still unclear **why cord cells were so effective**.

#### FACTS TO REMEMBER:

1. **INDIA ADD TWO MORE RAMSAR SITES**
2. **INDIA'S FIRST SPACE MISSION IN 2022**
3. **INDIA'S G20 PRESIDENCY APPROVED**
4. **KEY TAKEAWAYS FROM UNION BUDGET 2022**
5. **RBI ENHANCES CAP ON FOR E-RUPI**
6. **CENTRE'S NEW RULES FOR IMPORT OF DRONES**
7. **INSAT-4B DECOMMISSIONED**
8. **MISSIONS FOR UNDERSTAND EARTH-SUN ENVIRONMENT**
9. **SUPERCOMPUTER PARAM PRAVEGA COMMISSIONED**
10. **INDIA'S FIRST GRAPHENE INNOVATION CENTRE**

#### LINKS TO FOLLOW:

[HTTPS://WWW.BBC.COM/CULTURE/ARTICLE/20200424-CAN-A-BOOK-MAKE-YOU-VEGAN](https://www.bbc.com/culture/article/20200424-can-a-book-make-you-vegan)

[HTTPS://WWW.ALJAZEERA.COM/OPINIONS/2022/2/1/IN-CENTRAL-AND-EASTERN-EUROPE-UKRAINE-CRISIS-PROVES-NATOS-WORTH](https://www.aljazeera.com/opinions/2022/2/1/in-central-and-eastern-europe-ukraine-crisis-proves-natos-worth)

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[HTTPS://WWW.LIVEMINT.COM/OPINION/COLUMNS/OLD-NOTIONS-OF-MASCULINITY-STILL-HOLD-WOMEN-S-AMBITIONS-BACK-11645118052825.HTML](https://www.livemint.com/opinion/columns/old-notions-of-masculinity-still-hold-women-s-ambitions-back-11645118052825.html)

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