

Current Affairs search results for tag: science-and-technology

1. NASA DART mission: Spacecraft slams into asteroid 9.6 million kilometres away (Sept. 28, 2022)

In NASA's **Dart space mission**, the Dart spacecraft successfully collided with an **asteroid** in space on 27 September. The purpose of this mission was to change the direction and speed of the asteroid.

Important facts

- NASA's spacecraft collided with the asteroid at a speed of 22500 kilometers per hour in space.
- Through this test, NASA wanted to see whether the direction of an asteroid coming towards Earth could be changed or not.
- The asteroid that the spacecraft collided with is named **Dimorphos**.
- **Dimorphos orbits** around another asteroid, the asteroid **Didymos**.
- The purpose of this program is to see that if a dangerous **asteroid comes towards Earth**, it can be destroyed or its direction can be diverted.
- Now scientists will keep an eye on the speed and movement of the asteroid for the next two months, it will be calculated. Only after this will get accurate information about how successful NASA has been in trying to change the path of the asteroid.
- NASA has recorded more than 8000 **Near-Earth Objects (NEOs)** around the Earth.
- Some of these are larger than 460 feet in diameter, if they hit the earth, they can destroy many cities.

About NASA DART Mission

- 'DART' is a **low cost spacecraft**.
- This is a technique that can prevent an **asteroid from hitting the Earth**.
- Its purpose is to test a technology that can change the direction of incoming asteroids towards Earth.
- The purpose of this mission is to test new technology to be prepared in the event of an asteroid coming towards Earth in the future.

2. President Murmu unveils foundation stone for ICMR-National Institute of Virology, South Zone at Bengaluru (Sept. 27, 2022)

President **Droupadi Murmu** unveiled the foundation stone for ICMR-National Institute of Virology (NIV) Pune, South Zone at **Bengaluru** in virtual mode, in presence of Union Minister of State for Health and Family Welfare, Dr. Bharti Pravin Pawar on 27 September 2022.

The setting up of the zonal campus of the National Institute of Virology, Pune is part of the **Pradhan Mantri Ayushman Bharat Health Infrastructure Mission (PM-ABHIM)** of the central government.

Pradhan Mantri Ayushman Bharat Health Infrastructure Mission (PM-ABHIM)

- The Pradhan Mantri Ayushman Bharat Health Infrastructure Mission
- was launched by Prime Minister Narendra Modi in **Varanasi**, Uttar Pradesh on **25 October 2021**.
- The total outlay on the scheme is **Rs 64,180 Crore** and the duration of the scheme is from **2021-22 to 25-26**.
- The Pradhan Mantri Ayushman Bharat Health Infrastructure Mission is one of the largest pan-India schemes for strengthening healthcare infrastructure across the country.
- Its objective is to fill gaps in public health infrastructure, especially in critical care facilities and primary care in both urban and rural areas.
- It will provide support for 17,788 rural health and wellness centers in 10 high-focus states.
- Further, 11,024 urban health and wellness centers will be established in all the States.
- Under the scheme, a national institution for one health (**set up in Nagpur**), four new regional centers of the national institutes for virology, a regional research platform for WHO South East Asia Region, nine biosafety level-III laboratories, and five new regional national centre for disease control will be set up.
- For the first time in Asia, two container-based hospitals with comprehensive medical facilities will be kept ready at all times, which can be rapidly deployed via rail or air to deal with any disaster or calamity in the country.

National Institute of Virology (NIV)

The National Institute of Virology is one of the major Institutes of the Indian Council of Medical Research (ICMR).

It was established at **Pune**, Maharashtra State in 1952 as Virus Research Centre (VRC) under the auspices of the ICMR and the Rockefeller Foundation (RF), USA. Now it is fully funded by ICMR.

NIV is also the National Centre for Hepatitis and Influenza.

NIV has been designated as one of the collaborating laboratories of the World Health Organization (WHO).

Chairman: **Dr Priya Abraham**

3. Rohini RH-200 Rocket (Sept. 27, 2022)

The Indian Space Research Organization (**ISRO**) is planning the 200th consecutive successful launch of the **Rohini RH-200 sounding rocket**.

About Rohini RH-200 Rocket

- The RH-200 is a two-stage rocket capable of climbing to an altitude of **70 km**.
- The first and second stages of the RH-200 are driven by **solid motors**.

- The '200' in the name refers to the diameter of the **rocket in mm.**
- Other Rohini variants - **RH-300 Mk-II and RH-560 Mk-III.**
- Over the years, the RH-200 rocket used a **polyvinyl chloride (PVC)** based propellant.
- The first RH-200 to use a new propellant based on **hydroxyl-terminated polybutadiene (HTPB)** was successfully flown from TERLS in September 2020.
- Since the inception of the RH200 rocket, both solid stages are processed using polyvinyl chloride (PVC) based propellants.

About Sounding Rocket

- These are one- or two-stage solid propellant rockets used for exploration of the upper atmospheric regions and for space research.
- Rockets are used to launch instruments **48 to 145 km** above the Earth's surface.
- The first sounding rocket to be launched from **Thumba** was the **American Nike-Apache**, which was launched on November 21, 1963.
- The ISRO launched its own version, **Rohini RH-75 in 1967.**
- ISRO has so far launched more than **1,600 RH-200 rockets.**

4. President inaugurated ₹208-crore rocket engine manufacturing facility in Bengaluru (Sept. 27, 2022)

President **Droupadi Murmu** inaugurated the **Integrated Cryogenic Engines Manufacturing Facility** of **Hindustan Aeronautics Limited (HAL)** in **Bengaluru** on 27 September.

Important facts

- The facility will promote self-reliance in manufacturing **high-thrust rocket engines** and will fulfil ISRO's desire to manufacture rocket engines.
- It has been constructed over a **4,500 square metre** space and houses over **70 high-tech tools and testing facilities** for the production of **cryogenic (CE20) and semi-cryogenic (SE2000) engines** for Indian rockets.
- This facility (ICMF) will complete the entire rocket engine manufacturing for ISRO under one roof.
- An MoU was signed with ISRO in **2013** for setting up a Cryogenic Engine Module production facility in the Aerospace Division of HAL.
- It was later amended to set up ICEMF in 2016 with an investment of Rs 208 crore.
- This was later updated in 2016 to allow setting up of ICMF with an investment of ₹208 crore.

HAL has said that it will start production of the module by **March 2023**.

Manufactured by HAL Aerospace Division

- The Polar Satellite Launch Vehicle (PSLV),
- Geosynchronous Satellite Launch Vehicle (GSLV MK-II),
- Geosynchronous Satellite Launch Vehicle (GSLV Mk-III),
- Stage integration for GSLV Mk-II

Cryogenic engines

- Cryogenic engines are the most commonly used engines in launch vehicles worldwide.
- Only **France, China, Japan, Russia and the United States** have mastered cryogenic technology because of the complexity of the cryogenic engine.
- India became the **sixth country** to develop a cryogenic engine in 2014, when GSLV-D5 was successfully flown using a cryogenic engine.

Hindustan Aeronautics Limited (HAL)

- It was set up as Hindustan Aircraft Limited by **Walchand Hirachand** in **1940 at Bangalore (now Bengaluru), Karnataka**.
- It was taken over by the government of India and merged with Aeronautics India limited and was renamed as Hindustan Aeronautics Limited on 1 October 1964.
- Its main business is to design, develop, manufacture, repair and overhaul of aircraft, helicopters, engines and related systems like avionics, instruments and accessories.
- It comes under the **Ministry of Defence**.
- Headquarters: **Bengaluru**

5. Union Minister of Rural Development Giriraj Singh will launch the 'Jaldoot app' on 27 September (Sept. 26, 2022)

The Union Minister for Rural Development **Giriraj Singh** will launch the ministry's developed **"Jaldoot App"** in New Delhi on 27 September 2022.

The App will be used to capture the water level of selected wells in a village.

The Jaldoot app will enable Gram Rojgar Sahayak (GRS) to measure the water level of selected wells twice a year (pre-monsoon and post-monsoon). These will be representative of the ground water level in that village.

The app will facilitate panchayats with robust data, which can be further used for better planning of works. The ground water data could be utilised as part of the Gram Panchayat Development Plan (GPDP) and Mahatma Gandhi NREGA planning exercises.

Depletion in Groundwater Levels

Ground water levels in various parts of the Country are declining because of continuous withdrawal due to reasons such as increased demand of fresh water for various uses, vagaries of rainfall, increase in population, industrialization and urbanization etc.

As per the assessment of Dynamic Ground Water Resources (2017) carried out by the Central Ground Water Board (CGWB) in collaboration with States/UTs, out of the total 6,881 assessment units (Block/ Taluks/ Mandals/ watersheds/ Firkas) in the country, **1,186 units in 17 States/UTs have been categorized as 'over-exploited'** where 'Annual Ground Water Extraction' is more than 'Annual Extractable Ground Water Resource'.

Government scheme for rejuvenation of Groundwater

Water is a state subject in India. However the central government has launched a few schemes to recharge the groundwater in India.

Atal Bhujal Yojana

The Government of India has launched a Rs. 6000 crore Central sector scheme, **Atal Bhujal Yojana** (Atal Jal) with the assistance of with World Bank assistance.

The programme was launched on **1 April 2020** for a period of five years.

It aims for sustainable management of ground water resources with community participation in 8562 water stressed Gram Panchayats (GPs) of seven States, viz. Haryana, Gujarat, Karnataka, Madhya Pradesh, Maharashtra, Rajasthan and Uttar Pradesh.

Jal Shakti Abhiyan

Government of India launched Jal Shakti Abhiyan in **2019** in 256 water stressed districts in the country which continued during 2021 also to improve water availability including ground water conditions in these areas.

Further, the "Jal Shakti Abhiyan: Catch the Rain" campaign for the year 2022 have been launched by the President of India.

The JSA-2022 shall continue till 30 Nov 2022.

The campaign has given special emphasis on creation of recharge structures, rejuvenation of traditional water bodies, intensive afforestation etc.

6. Union Environment Ministry to launch Swachh Vayu Sarvekshan (Sept. 24, 2022)

The Union Environment, Forest and Climate Change is going to launch **Swachh Vayu Sarvekshan** that will rank **131 cities** in the country for implementing City Action Plans prepared as part of National Clean Air Programme (NCAP) for reducing air pollution upto 40% by 2025-26.

This was announced during the two day [National Conference of Ministers of Environment, Forest and Climate Change](#) held in Ekta Nagar, Gujarat on 23-24th September, 2022

Classification of cities for Swachh Vayu Sarvekshan

According to the Ministry, 131 cities will be categorized into three groups based on population.

- 47 cities are in the first group having a population more than 10 lakh.
- 44 cities are in the second group having a population between 3 to 10 lakh.
- Third group consists of 40 cities having a population less than 3 lakh.

How the cities will be assessed

Cities are required to do the self-assessment as per the framework provided on PRANA online portal. This assessment is carried out annually. Cities have to report implementation of activities and measures taken in respect of solid waste management, road dust management, management of construction and demolition waste, control of vehicular emissions and industrial pollution.

Aim of the Swachh Vayu Sarvekshan

The aim of the Swachh Vayu Sarvekshan is to promote constructive competition amongst the states in the spirit of competitive federalism and to take measures to improve air quality.

This Sarvekshan provides a tool to cities to plan their actions in order to improve the air quality.

3 best performing states in each group will be given cash awards by the Union ministry.

7. Dr Rajeev Behl appointed as Director General of ICMR (Sept. 24, 2022)

Dr Rajiv Bahl on 23 September was appointed as the new director general of the Indian Council of Medical Research (ICMR)-cum-secretary of the department of health Research for a period of three years.

IMPORTANT FACTS -

- Bahl is currently the Head of Research on Maternal, Newborn and Adolescent Health Co-Newborn Unit at the World Health Organization (WHO) in Geneva.
- Prior to Behl, Dr. Balram Bhargava's extended tenure as Director General of ICMR and Secretary, Department of Health Research ended in July.
- Bhargava was appointed to the post on 16 April 2018 for a period of four years.

ICMR :

- ICMR, New Delhi, promotes and supports internal and external research activities in the field of communicable and non-communicable diseases and basic medical sciences.
- It has 27 institutes located in different parts of India.

8. Jitendra Singh announces the launch of the “Innovation Roadmap of the Mission Integrated Biorefineries” (Sept. 23, 2022)

Union Minister Dr Jitendra Singh announced the launch of the Innovation Roadmap of the Mission Integrated Biorefineries” developed by co-leads and active inputs from Brazil, Canada, EC and the United Kingdom.

He was speaking at the **1st Roundtable on “Sustainable Bioenergy and Bio-refineries”** at the Global Clean Energy Action Forum in Pittsburgh, Pennsylvania in the United States.

Under the [Global Clean Energy Action Forum](#) the 7th Mission Innovation and 13th Clean Energy Ministerial -2022 are being held jointly from 21-23 September 2022.

IMPORTANT FACTS -

India’s effort in furthering Biorefineries :

- **A bio refinery is a facility that integrates biomass conversion processes and equipment to produce fuels, power, and value-added chemicals from biomass. Biomass is renewable organic material that comes from plants and animals.**
- Dr Singh said that a pilot plant of 10 Tons/day capacity plant with integrated enzyme production is being set up at **Panipat Haryana**, which will be commissioned by December 2022. This will be the 1st indigenous technology for on-site enzyme production.
- The Minister pointed out that Indian Oil Corporation Limited (IOCL) has also planned to supply this indigenous enzyme to a commercial 2G ethanol plant of 100 KL/day expected to be commissioned by 2024.
- He also said that India has established **5 Bioenergy Centers**, where an interdisciplinary team is working on advanced sustainable biofuels using modern biotechnology tools.

9. 2023 Breakthrough Prize winners announced (Sept. 23, 2022)

On September 22, the winners of the 2023 Breakthrough Prize, called the Oscars of Science, totaling more than \$15 million, were announced.

IMPORTANT FACTS -

- This year three awards were given in the Life Science category while one award each for Mathematics and Physics.
- Daniel Spielman of Yale University was awarded the Breakthrough Prize in Mathematics for his many discoveries in theoretical computer science and mathematics.
- Clifford Brangwyn and Anthony Hyman (British scientist) won the Life Science Prize for their discovery of a new mechanism of cellular organisation.
- Other life science prizes were awarded to Demis Hassabis (British scientist) and John Jumper (USA) for developing AlphaFold, which predicts the structure of proteins, and Emmanuel Mignot (France) and Masashi Yanagisawa (USA) for discovering the causes of narcolepsy.

ADDITIONAL INFORMATION -

About Breakthrough Prizes :

- The Breakthrough Prizes were started in 2010 by a group of Silicon Valley entrepreneurs.
- These Prizes were founded by Sergey Brin, Priscilla Chan and Mark Zuckerberg, Yuri and Julia Milner, and Anne Wojcicki.
- These prizes are the most richly endowed prizes in science, the prize money of which exceeds that of the Nobel Prizes.
- Breakthrough has an amount of \$3 million in each prize, which is more than \$1 million in prizes awarded to the winner of the Nobel Prize.
- The awards are presented in the fields of life sciences, fundamental physics and mathematics.

10. Lumpy skin disease virus different from 2019 version (Sept. 20, 2022)

The Lumpy Skin Disease (LSD) virus that has killed nearly 50,000 cattle in India this year may be structurally different from the version of the virus prevalent in India in 2019.

A new vaccine is being developed to protect cattle from this disease.

IMPORTANT FACTS -

What is Lumpy Skin Disease ?

- It is caused by infection of **cattle or buffalo** with the poxvirus Lumpy skin disease virus (LSDV).
- The virus is one of three closely related species of the genus **Capripoxavirus**.
- The other two species are **Sheeppox virus** and **Goatpox virus**.
- Due to its infectious nature and its impact on the economy, the World Organization for Animal Health (WOAH) has declared it a notable disease.

Symptoms of disease :

- The main symptoms are fever in animals, discharge from eyes and nose, saliva from the mouth, lump-like soft blisters all over the body, decreased milk production, difficulty in eating, which sometimes leads to the death of the cattles.

Transmission of disease :

- The virus is easily transmitted through blood-sucking insects such as mosquitoes, flies and ticks, and through saliva and contaminated water and food.

- The virus was first reported in Asia and the Pacific region in 2019 in north west China, Bangladesh and India.
- There is no treatment available for the disease.

Vaccine for disease :

- The vaccine **Lumpi-ProVacInd**, jointly developed by **ICAR's National Research Centre on Equines (NRCE)** and **the Indian Veterinary Research Institute (IVRI)**.
- Experimental trials with the vaccine on animals afflicted by the ongoing 2022 outbreak have yielded encouraging results.